

# Determinants of utilization of maternal health care services among mothers in Harare, Zimbabwe

**CURRENT STATUS:** UNDER REVIEW



Eunice Nyarambi  
Africa University

Paddington Tinashe Mundagowa  
Africa University

✉ mundagowap@africau.edu *Corresponding Author*

Prosper Chonzi  
Ministry of Health and Child Care

Elizabeth Chadambuka  
Africa University

## DOI:

10.21203/rs.2.15879/v2

## SUBJECT AREAS

*Health Economics & Outcomes Research*    *Health Policy*

## KEYWORDS

*Utilization; Maternal; Antenatal Care; Postnatal Care; Midwives; Harare*

## Abstract

**Background:** Provision of quality maternal health care services is an essential component in ensuring a healthy mother-baby dyad both pre- and post-delivery. In Africa, antenatal care, postnatal care, and skilled birth attendances are very low when compared to high-income countries. The continent has a high burden of maternal and infant morbidity as well as mortality rates. According to the Harare Annual Report of 2016, the number of women seeking maternal health care services was gradually declining from 2014 and pregnant women reported various challenges in accessing health care services. **Methods:** A 1 to 1 case-control study was conducted in Harare West South Western District using pretested interviewer-administered questionnaires. The study was carried out at all three clinics in the district and a total of 73 cases and 73 controls were selected using a systematic random sampling method. Quantitative data were analyzed using Epi Info statistical package and qualitative data was analyzed thematically. **Results:** The median ages for cases and controls were 29 and 24 years, respectively and the age-group 19 to 24 years constituted the majority of participants (41%). Predictors of utilization of services were young age (< 24 years), birth order of < 2, maternal and paternal occupation, and religion. Enabling factors included: asking for permission to seek care, absence of transport challenges, a shorter distance to the health facility, affordability of health services, and a higher household income. Besides the shortage of skilled staff at the clinics, mothers endured long waiting hours to be served. The majority of the cases (78.1 %) and controls (72.6%) preferred to be attended by male nurses. Mothers were required to pay a \$25 fee for booking and city medical staff rarely visited the clinics. **Conclusion:** The utilization of maternal health care services in Harare is dependent on the individual, household, and system-related factors. There was a need to articulate policies and design maternal health care programs that target socially and economically marginalized women. Creating women-friendly health facilities with extended hours for the antenatal care, delivery care and post-natal care services for mothers can help to decongest the health facilities.

## Background

The health care services received by a mother during pregnancy, labor and delivery, and the

postnatal period are critical to the survival of both the infant and the mother. Although it is a complex behavioral phenomenon, maternal health care service utilization is both need driven and supply-induced. When the quality of care in a health center is perceived as good by the consumers, demand for the service increases and this can lead to positive maternal and neonatal outcomes which further strengthens service utilization [1]. Deficiencies in access to care are mainly due to poverty, distance from health centers, and lack of information, inadequate services as well as cultural practices [2]. Identification of these limiting factors can help in channeling attention towards realizing the gains in maternal health care utilization.

Key interventions like ensuring at least four antenatal care (ANC) clinic attendance, having a skilled birth attendant (SBA) at delivery, three post-natal care (PNC) clinic visits, and increased exposure to mass media maternal health education (such as radio and television) are used to improve maternal and neonatal health in many developing countries [3]. Failure to book or the late booking may result in the missing of high-risk pregnancies which can result in fatal complications for both the mother and the fetus [4]. Maternal health services are equally important during the post-partum period which is associated with life-threatening sepsis and severe hemorrhage. The majority of complications occur during the post-delivery period yet post-natal care is the worst underutilized of maternity care services [5].

In the developed world, skilled attendance at delivery is about 99.5% whilst that of the African region is a low 51% [6]. Africa was trailing well below the World Health Organization (WHO) target of 85% in 2010 and 90% by 2015 [7]. Approximately all maternal deaths (99%) occur in low resource settings [8]. In 2016, the maternal mortality rate in the developing world was averaging 242 per 100 000 live births which were 14 times higher when compared to that of high-income countries [9]. It is estimated that 74% of maternal deaths could be avoided if all women had access to maternal health care utilization [10]. Most of the common causes of maternal and neonatal morbidity and mortality are readily preventable, detectable and manageable [8].

High maternal mortality rates in the developing world reflect inequalities regarding the accessibility of health services. Globally more than 70 % of maternal deaths are due to key complications namely:

hemorrhage (27.1 %), hypertensive disorders (14%), infection (10.7%) unsafe abortion (7.9 %), and embolism and other direct causes (12.8%) [9]. Such complications can occur at any point during antepartum, intrapartum or postpartum periods without any warning signs and the resultant demand for emergency obstetric care can be costly from individual to national levels. Both the mother and the neonate have susceptible immunity and non-institutional deliveries that are conducted under unsafe conditions expose them to infections. Non-institutional deliveries can cause neonatal mortality as a result of hypothermia [11].

According to the Zimbabwe Demographic Health Survey (ZDHS) 2015, 93% of women had at least one ANC visit while 76% had at least 4 visits [12]. Institutional deliveries were at 77% while maternal postnatal check-up in the first two days after birth was at 57%. Women are recommended to go for the first ANC visit in the first trimester however, the ZDHS 2015 cited that more than a third were four or five months pregnant when they had their first ANC visit and 17% delayed until the sixth or seventh month.

Improved utilization of maternal health care services could aid in achieving the Sustainable Development Goal number 3 which targets a global maternal mortality rate of not greater than 70 per 100 000 live births and neonatal mortality of at least 12 per 1000 live births by 2030 [13]. The Harare Annual Report of 2016 showed a gradual decline in the utilization of maternal health care services. Antenatal care coverages were at 55.2 % in 2015 but dropped to 50.8% in 2016. Booked deliveries dropped by 17% from 4887 in 2015 to 4171 in 2016 and the unbooked deliveries increased by 9% from 2015 to 2016. In spite of the interventions in place to improve utilization of maternal health care services through health educational and promotional activities, Harare Wes South West District (HWSWD) continued to have the least utilization of maternal health services when compared to other districts covering high-density suburbs. Figure 1 shows the utilization of maternal health care services in HWSWD from 2014 to 2016.

The ZDHS 2015 also revealed that 45% of pregnant women in Harare reported at least one problem associated with accessing health care. This study sought to establish the determinants of utilization of

maternal health care services among maternity clients in the HWSWD. Improving utilization of ANC services, institutional delivery services as well as PNC services is an integral approach to achieving greater reductions in maternal and neonatal morbidity and mortality as well as reduction of costs of associated complications to the health sector [14].

Figure 2. shows the behavioral model in which the utilization of health services relies on a set of three functional characteristics which are: predisposing factors, enabling factors and need factors. The availability of predisposing and enabling factors may not be enough to compel a woman to seek health care. The pregnant or nursing mother needs to perceive the threat of complications and believe that the ANC, skilled birth attendance and PNC would provide the expected benefits [16, 17].

## **Methology**

### **Study design**

An institutional-based 1 to 1 unmatched case-control study design was carried out from March to April 2018.

### **Study setting**

The city of Harare is divided into nine districts and the study was conducted in the West South West District covering Mufakose, Glen View and Budiro Polyclinics. The three clinics provide services to residents residing in the surrounding high-density suburbs and slums. The study was conducted at the three polyclinics which are urban public health institutions.

### **Study population**

Mothers attending the day 42 of postnatal services in HWSWD and were 18 years or above made up the study population. Critically ill and mentally challenged mothers were excluded from the study. Postnatal care registers, maternity booklets, and stock cards were reviewed.

### **Definitions of study variables**

#### **Outcome variable**

1. Maternal health care utilization was defined as at least four ANC visits, skilled birth attendance at a health facility and at least three PNC visits by the mother.

#### **Explanatory variables**

1. Sociodemographic characteristics which included maternal age, residents, education, birth order, marital status, occupation, religion, and paternal education as well as occupation
2. Exposure to maternal health education on media was defined as having heard/seen information on the importance of utilization of maternal health services in an advert or program broadcasted on radio or television at least once when the mother was pregnant, giving birth or post-delivery.
3. Affordability of health services was defined as what the mother said was a fair fee according to their ability to pay for the service.
4. Cases were mothers who were presenting for the 42<sup>nd</sup> day of PNC services after failing to utilize at least four ANC visits, mothers who had non-institutional delivery and mothers who missed the 3-day and/ the 7-day PNC visits.
5. Controls were mothers who presented for the 42<sup>nd</sup> day of PNC services after they had attended at least four ANC visits, had an institutional delivery, and attended the 3-day and 7-day PNC visits.

### **Addressing potential sources of bias**

This study was predominantly made up of women from low-income high-density suburbs in urban Harare, where a lot of private surgeries are sprouting up in the area. However, pregnant women in this setting tend to favor public clinics that are perceived as affordable despite the \$25 initial payment. Using the systematic random selection method to select the mothers may have reduced selection bias associated with nonprobability sampling methods. The study also depended on the woman's narrative which can be influenced by recall bias however the researches double-checked the utilization of maternal health services using the maternity health booklets which clearly stated the dates when the women visited the clinic.

For those mothers who reported to have sought maternal health services at the same clinic, facility

registers were used for triangulation. For the consistency of data collection tools, pretesting was done at a nonparticipating clinic and the tools were modified before the actual data collection. A language expert was used for translating the questionnaire to Shona and back translation of the responses to English. During analysis, logistic regression was done to determine independent factors associated with the utilization of maternal health services by the mothers.

### **Sample size determination**

Fleiss formula embedded in Epi Info™ statistical software was used to calculate the sample size.

Number of cases =  $[z\alpha/2\sqrt{((r+1)pq)} + z(1-\beta)\sqrt{(rp1q1 + p2q2)}] 2 \div r(p1 - p2)2$  where:

$Z\alpha/2$  = z value for a two tailed test based on the desired confidence level,

r = ratio of cases to controls,

p = proportion of cases with the exposure,

q = 1- p and

Z (1-β) = power of the study.

According to a study conducted in Ethiopia on UMHCS, at 95% confidence interval, 80% power and 50% exposure to radio and television maternal health education in the control group and an odds ratio of 2.998; 66 cases and 66 controls were generated making a total of 132 respondents [3].

Expecting a 10% non-response rate, the sample was adjusted to 146 thus, 73 cases and 73 controls.

### **Sampling technique and procedure**

According to the PNC Registers, an average of 200 mothers visited each of the Glen View and Budiriro Polyclinics seeking services offered on the 42<sup>nd</sup>-day post-delivery while the Mufakose Polyclinic had an average of 184 mothers. Using a systematic random sampling of 200 as the sampling frame from the PNC Registers at Glen view and Budiriro Polyclinics, divided by the sample size of 50, a sampling interval of 4 was used to recruit participants into cases and controls. The sampling frame for Mufakose was 184 which was divided by 46 to get the sampling interval of 4. A random sampling method was used to select the first cases and the first controls by tossing a six-sided die. After being tossed, the die displayed a 1 (first maternal case) was adopted for the cases and a 4 (fourth maternal control) for the controls marking the first participants and subsequent participants were recruited by

adding an interval of 4.

### **Data Collection**

An interviewer-administered questionnaire was used to solicit information from mothers while a self-administered instrument was used for the key informants. The maternal questionnaire contained items to assess socio-demographic information, predisposing, enabling and need factors that are known to influence utilization of maternal health care services. The questionnaire was made up of both open and closed ended questions while the key interview guide was unstructured. To ensure consistency, the maternal questionnaire was translated to the local language- Shona, and back-translated into English by a language expert. The data collection tools were pretested on five mothers attending day 42 of PNC at a non-participating clinic (Kuwadzana Polyclinic) two weeks before the commencement of data collection.

The principal investigator collected the data and the interviews were carried over a period of three weeks. After obtaining written informed consent, participants were interviewed using a standard pretested questionnaire. Permission to conduct the study was sought from the Ministry of Health and Child Care through the Harare City Director of Health Services and ethical clearance was sought from Africa University Research Ethics Committee. Participation in the interviews was voluntary.

### **Data analysis**

The descriptive method was used for the analysis of sociodemographic data and bivariate analysis was used in comparing the sociodemographic data between cases and controls.

Quantitative data from both the maternal questionnaire and key informant guide were coded and analyzed using Epi Info Version 7.2.1.0; calculating means, and frequencies, measures of association and Odds Ratios for the independent variables. Stratified analysis was carried out to assess for confounding and effect modification. Forward stepwise logistic regression analysis was performed to control for confounding. Qualitative data were analyzed thematically. Data from key informants and questionnaire open-ended questions were also analyzed thematically.

### **Results**

A total of 146 study participants (73 cases and 73 controls) were recruited and the sociodemographic

characteristics and predisposing factors for the utilization of maternal health services are presented in Table 1. The participant response rate in this study was 91% and Figure 3 shows the study participant recruitment in this study. There were no missing data since the researchers rechecked the completed questionnaire soon after the interview.

The age group 19-24 years made up the majority of respondents (41%) while only 8% were 18 years old. About 39% were aged between 25- 34 and 12% were more than 35 years old. Women who were more than 24 years were 41% less likely to utilize the maternal health care services than those who were under 25 years of age (Crude Odds Ratio: 0.41; 95%CI: 0.21-0.80;  $p < 0.01$ ).

Predisposing factors affecting maternity care utilization in the HWSWD

Cases and controls were compared statistically to find out if there were differences with regards to socio-demographic characteristics. The characteristics under consideration included maternal education, religion, paternal occupation, marital status, maternal age, birth order, maternal occupation, and paternal education.

Need related factors associated with the utilization of maternal health care services in HWSWD.

About 59% of the cases and 84% of the controls reported having planned to become pregnant.

Pregnant women who had a planned pregnancy were 60% more likely to utilize maternal child health services compared to those who did not (COR 0.4, 95% CI 0.2-0.8;  $p = 0.01$ ). Mothers who received respectful and friendly maternal health services were 84% more likely to utilize maternal child health services compared to those who did not (COR 0.16, 95% CI 0.07-0.04;  $p < 0.01$ ). Women who used a delivery plan were also likely to utilize maternal health services (COR 0.08, 95% CI 0.03-0.8;  $p < 0.01$ ).

Most of the respondents' husbands did not attend routine clinic visits. Only 4.1% of the cases and 37% of the controls had their husbands attending. Pregnant women whose husbands managed to attend ANC, labor or post-natal care were more likely to utilize maternal health services although the results were not statistically significant (COR 0.08, 95% CI 0.02-0.3;  $p = 0.1$ ).

Upon using forward stepwise logistic regression to determine independent factors associated with

utilization of maternal health care services, seeking permission to attend care (Adjusted Odds Ratio: 11;  $p < 0.01$ ), having a transport problem (AOR: 2.5;  $p < 0.01$ ) and affordability of health services (AOR: 0.04;  $p < 0.01$ ) were still significantly associated with utilization of maternal health services.

Qualitative data from open-ended questions in the maternal questionnaire revealed that most women had to endure long waiting hours in the queue to access services and the facilities were short-staffed. Some women visited the clinic towards delivery time to reduce the ANC visits which were associated with long waiting hours. Some went to private doctors and pharmacies for the essential regular blood pressure checks while others were seen by faith healers. The women reported that faith healers were able to 'predict' the wellness of the growing fetus as well as the presentation. Women reported that delivery beds were not adequately cleaned after a procedure due to human resource constraints and this deterred some mothers who opted for home delivery. Mothers were asked to pay a once-off fee of \$25 to be booked for the three maternal services (ANC, labor and delivery, and PNC). The majority of the cases (78.1 %) and controls (72.6%) preferred to be attended by male nurses.

A review of facility records showed that midwives were annually trained on new information in emergency obstetric and neonatal care (EmNOC) to keep them updated on real-time information on maternal and child health care. The key informants recommended that the existing Community Health Club committee members should be trained to assist in encouraging mothers to book and report for delivery early to prevent complications associated with delays. The ANC average waiting time for the first booking was five hours and three hours for the subsequent visits. Medical care in maternal and child health care had diminished at Budiriro and Glen View Polyclinics (some doctors came once a week) and non-existent at Mufakose Poly Clinic. The three polyclinics had above 60% of the supplies essential for use in maternal health service provision.

## Discussion

The quality of maternal health service provision is one of the indicators of a vibrant health system. Over the years, the utilization of maternal health services in the city of Harare had gradually declined. This study aimed to establish the determinants of utilization of maternal health care services among maternity clients in the HWSWD. The results of this study can be used as baseline findings for similar

low-income settings.

Approximately, half of the world's population is under 25 years and the young women in this age group are twice more likely to die in childbirth when compared to women over 25 years [18]. This study showed that the majority of the respondents were in the 19 to 24 and were 59% times more likely to utilize the maternal health care services than those above 25 years. A similar study conducted in Kenya and Bangladesh also revealed that younger women were more likely to utilize skilled birth attendance and maternal health care than older women [19, 20]. This is a good indication revealing that more young women are proactive towards ensuring a healthy mother and a healthy infant post-delivery.

Mothers who had fewer than two children (most likely young) were also more likely to utilize maternal health care services when compared to those who had more than two children. This was consistent with other studies which also found that maternal health care utilization was significantly associated with birth order of less than or equal to two [21- 23]. With increasing parity, mothers become more confident due to the cumulative experience of childbirth and they missed ANC and PNC visits which were detrimental to their health as well as the health of the developing or newly born baby. Many women in this study opted to visit the facility for the first booking after the recommended first trimester. This result was similar to those of an Indian study where most of the pregnancy registrations were done between 16 and 24 weeks [24]. Late registration can result in mothers missing fundamental health education opportunities.

Cultural background, norms, and beliefs can potentially influence one's decision to seek health care services or not. Apostolic faith which constitutes 33% of the Zimbabwean population is linked to the diminished use of modern health services due to their doctrine, teaching, and regulations [25]. In this study women from the apostolic sects were less likely to use the maternal health services. This may be due to a common belief among the congregants that prophets from these sects can be able to diagnose and address the health problems faced by both the mother and the developing baby. This can lead to complications since most of these women often seek services late. Cultural beliefs, women's autonomy, economic conditions, physical and financial accessibility are a major predictor of

utilization of health services [26].

The use of health services can be hampered by the distance to be traveled by women to seek maternal health services [27, 28]. Shorter distance to the health facility was significantly associated with the utilization of services due to reduced costs of traveling to the clinic or hospital. Transport problems were viewed as a strong determinant of the utilization of health services in HWSWD and this finding complied with findings from another previous study [29]. Women from the slums surrounding the district faced a challenge of poor road networks and long distances since these areas are remote and lack development. This results in delays especially if the mother is faced with imminent labor and delivery issues at night.

Families with better income status are more likely to utilize maternal health services [23, 24, 27]. In the Shona culture, the husband/male partner is perceived as the provider for the family and our study found out that a husband/male partner's monthly salary of more than \$100 and those who were formally employed was associated with improved utilization of maternal health services. Although the maternal services offered at the facilities are 'free', many related expenses such as transport to the clinic, CT-scan, and consumables used during delivery are dependent on out of pocket payments from the mothers. Formally employed husbands/partners are more likely to have health insurance which enhances access to health services. Poverty is associated with non-use of health services in India [30]. Consequently, pregnant and nursing mothers who cannot afford these expenses are bound to have difficulties in seeking health care services.

Even when services are readily available, women's decision making power has a major impact on the ability of mothers to seek health services [31]. Thus, women who earn a stipend or salary are more likely to seek health services. However, this study noted that women who earned less than \$100 a month were more likely to use maternal health services than their counterparts who earned more. Due to stringent long working hours in Zimbabwe, those who earn more may have little time to visit the facility on the recommended days. This was confirmed by participants (mainly case) who reported that they failed to book in time and meet the recommended appointments because they were at work.

Skilled birth attendance during labor and delivery is only possible if the referral system is active, the health system is adequately equipped and sufficient health care workers are well trained and motivated [23]. These two interventions are instrumental in reducing maternal and infant mortality and morbidity. However, health systems in low resource settings are usually grossly underfunded and women services received by the mothers are of poor quality. Women attending facilities for maternal services in HWSWD endure long waiting hours in the queues due to a shortage of staff. Thus, it was no surprise that some women ended up seeking services from private institutions. Literature also reviewed that poor services in the public health sector led to women seeking ANC services from private doctors [24].

Maternal education is a strong predictor of the utilization of maternal health services and this was supported by studies in Ethiopia and Bangladesh [23, 32]. Conversely, the current study did not find a significant difference in the utilization of services and maternal education status. The majority of the mothers (97%) had gone beyond the primary school level hence we assumed they understood the importance of utilizing the services.

Pregnant women who sought permission to visit health facilities from their spouses were less likely to utilize maternal health services compared to those who did not. This shows that a woman's autonomy is vital in the utilization of maternal health services. In a study conducted in Burkina Faso, it was noted that to increase utilization of maternal health services, the empowerment of women and exemption of user fees/cost-sharing could help improve access [33]. The need to seek permission contributed to the three delays in seeking health services which increases the risks of severe complications or maternal death. A study conducted in Ethiopia found out that more than half of the respondents reported that the decision to seek obstetric care was made by the husband/partner [34]. Our study revealed that exposure to radio and television maternal health education was not significantly associated with the utilization of maternal health services in Harare. This was contrary to a study by Birmeta et al (2013) which showed that mothers exposed to radio and television maternal health education were almost three times more likely to utilize maternal health services.

In most countries in the African region, women are still vulnerable to common and preventable causes

of maternal morbidity and mortality like postpartum hemorrhage and sepsis. This is mainly due to a lack of access to maternal health care because of user fees. In Nigeria, the introduction of user fees has been widely implemented in government health programs as a means of alleviating pressure on constrained budgets as demands for services increase [35]. However, many sub-Saharan African countries have introduced “free” maternity services in a bid to eliminate poverty as an important barrier to maternal health service access and utilization [36]. Our study revealed that maternal health services in this urban setting were not entirely free since women were made to pay \$25 at initial booking.

Surprisingly, almost three quarters of both the cases and controls reported that they preferred to be attended by a male nurse during all the three episodes of maternal visits. This finding is strange and difficult to interpret since women are known to be more caring than men. Mothers in this study perceived male nurses as kindness and empathetic when compared to female nurses who were perceived as brusque and cynical. Health worker’s attitude of disrespect and abuse of women during institutional delivery services can be a barrier to the utilization of maternity care services. A similar study revealed superior respectful maternity care performance of male providers over female providers [37]. Another study in South Africa cited that female nurses ‘deployed violence against patients in their work’ [38]. The female nurses mainly did this to create a social distance and assert their professional identity.

Satisfaction with the service provided by clinicians at the health facility during pregnancy was significantly associated with the utilization of maternal health care. Pregnant women who were satisfied with the service provided were more likely to utilize maternal health care services than those who were not. The process of care dominates the determinants of maternal satisfaction in developing countries. In a study to determine client satisfaction with delivery care service in Southwest Ethiopia, client satisfaction was seen to play a significant role in increasing utilization of institution-based delivery and thus reducing maternal morbidity and mortality mostly through focusing on women-friendly care in hospitals [39].

Our study found out that women who had unplanned pregnancies were less likely to utilize maternal

health services. Two studies in east Africa also found out that women who had unplanned pregnancies were two times more likely to book for ANC late compared to women who had planned to have a baby [40, 41]. This may be attributed to the late diagnosis of the pregnancy thus, the woman may be shy visit the clinic and register the pregnancy especially in cases where the pregnant mother is very young, dependent, and not married.

The utilization of maternal health care services is influenced by many individuals, household and system-based factors. The factors constitute health beliefs and personal characteristics of the users, social structure, availability, quality and cost of services. Inequity in the use of health care services is also an important element affecting maternal and child survival. High standards of maternal health care utilization are the only measure towards safe motherhood.

### Study Limitations

This study was predominantly made up of women from high-density suburbs in urban Harare, where a lot of private surgeries are sprouting up in the area. Thus, women who were seen at these surgeries and never visited the public facilities were excluded from the study. The study also depended on the woman's narrative which can be influenced by recall bias. Although the maternity booking register, ANC and PNC registers were reviewed, some mothers reported having attended all the visit at another clinic or hospital. Thus, the subjective nature of the mothers' responses could be affected by social desirability bias.

### Conclusions

This study revealed that religion, paternal occupation, maternal age, birth order, and maternal occupation were significant factors associated with the utilization of maternal health services. Besides, permission to visit a health facility, transport problems and distance to the health facility, presence of a delivery plan and having money to pay health service were also strongly influenced access to maternal health services.

Maternal health care service utilization in HWSWD can improve if the user user-fee is completely stripped-off, more midwives are recruited and employers are educated on the importance of allowing pregnant women to access maternal health services. There is the need to articulate policies and

design maternal health care programs that target the socially and financially marginalized women and create women-friendly health facilities with extended hours for the ANC, delivery care and PNC services for mothers to decongest the health facilities.

## List Of Abbreviations

ANC	Antenatal Care
AOR	Adjusted Odds Ratio
BBA	Born Before arrival at the clinic
CI	Confidence Interval
COR	Crude Odds Ratio
EMNOC	Emergency Maternal and Neonatal Obstetric Care
HWSWD	Harare West South West District
PNC	Post Natal Care
SBA	Skilled Birth Attendance
WHO	World Health Organization
ZDHS	Zimbabwe Demographic Health Survey

## Declarations

### **Ethics approval and consent to participate**

Ethical clearance to carry out this study was sought from Africa University Research Ethics Committee (Approval Number: AUREC 386/18. Date of approval: 20/03/18) and permission was sought from the Ministry of Health and Child Care through the Director of Health Services of the city of Harare. The researchers obtained written consent from all participants who took part in this study.

### **Consent for publication**

None applicable

### **Availability of data and materials**

The datasets used and/or analyzed during the current study has been provided as supplementary information file.

### **Competing interests**

The authors declare that they have no competing interests

### **Funding**

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

### **Authors' contribution**

EN and PC came up with the concept and wrote the protocol. EN collected and analyzed the data. The study was supervised by EMC. PTM wrote the manuscript which was reviewed by all the authors. All authors read and approved the final manuscript

### **Acknowledgments**

We would like to thank the mothers and Harare city health workers who participated in this study. Their valuable insights were vital to the success of the study. We are also grateful to the City Health Director for permission to carry out the study.

### **Authors' Information**

Eunice Nyarambi (SCM, BScNS, MPH), Africa University, College of Health, Agriculture and Natural Sciences, PO Box 1320, Mutare, Zimbabwe

Paddington Tinashe Mundagowa (BScNS, MPH), Africa University, Clinical Research Center, 132 H. Chitepo Street, Mutare, Zimbabwe

Prosper Chonzi (MBCHB, MPH), Ministry of Health and Child Care, Harare City Council, Zimbabwe

Elizabeth Chadambuka (SCM, BScNS, MPH), Africa University, College of Health, Agriculture and Natural Sciences, PO Box 1320, Mutare, Zimbabwe

### **References**

1. Srivastava A, Avan BI, Rajbangshi P, Bhattacharyya S. Determinants of women's satisfaction with. *BMC Pregnancy and Childbirth*. 2015; 15(97).
2. Maternal Mortality. Available at: <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality> Accessed on 19 March 2018. [Last updated 16 February 2018]
3. Birmeta K, Dibaba Y, Woldeyohannes D. Determinants of maternal health care

- utilization in Holeta town, central Ethiopia. BMC Health Services Research. 2013; 13(256).
4. Ujah LAO, Aisien OA, Mutihir JT, Vanderjagt DJ, Glew RH, Uguru VE. Factors contributing to maternal mortality in North-Central Nigeria: Seven-year review. African Journal of Reproductive Health. 2005; 9(3): 27-40.
  5. WHO Technical Consultation on Postpartum and Postnatal Care. World Health Organization. 2010. 65 pages.
  6. (2017). Maternal Health: Delivery Care. UNICEF DATA.
  7. Adegoke AA, van den Broek N. Skilled birth attendance: Lessons learnt. BJOG An International Journal of Obstetrics & Gynaecology. 2009; 116(1): 33-40.
  8. Maternal Mortality. WHO Press, Geneva, Switzerland. Available at: <https://www.who.int/news-room/fact-sheets/detail/maternal-mortality>. Retrieved 22 December 2018. [Last updated: 16 February 2018]
  9. Fillipi V, Chou D, Ronsmans C, Graham W, Say L. Level and causes of maternal mortality and morbidity (Chapter 3). In: Reproductive, Maternal, Newborn, and Child Health: Disease Control Priorities, 3rd Edition Vol 2. Available at: <https://www.ncbi.nlm.nih.gov/books/NBK361917/>
  10. Ayele DZ, Belayihun B, Teji K, Ayana DA. Factors Affecting Utilization of Maternal Health Care Services in Kombolcha District, Eastern Hararghe Zone, Oromia Regional State, Eastern Ethiopia . International Scholarly Research Notices. 2014; 917058: 7 pages.
  11. Demissie BW, Abera BB, Chichiabellu TY, Astawesegn H. Neonatal hypothermia and associated factors among neonates admitted to neonatal intensive care unit hospitals in Addis Ababa, Ethiopia. BMC Pediatrics. 2018; 18:263
  12. Zimbabwe National Statistics Agency and ICF International. Zimbabwe Demographic

- and Health Survey 2015: Final Report. Rockville, Maryland, USA: Zimbabwe National Statistics Agency (ZIMSTAT) and ICF International. 2016.
13. Sustainable development Goal 3: Ensure healthy lives and promote well-being for all at all ages. United Nations. 2017. Available from: <https://www.who.int/sdg/targets/en/>  
Date accessed: 19 March 2018.
  14. Bhattacharyya S, Srivastava A, Saxena M, Gogoi M, Dwivedi P, Giessler K. Do women's perspectives of quality of care during childbirth match with those of providers? A qualitative study in Uttar Pradesh, India. 2018, 1527971.
  15. Andersen R, Newman JF. Societal and individual determinants of medical care utilization in the United States. *Milbank Mem Fund Q Health Soc.* 1973; 51: 95-124.
  16. Nitai C, Ataharul IM, Rafiqul IC, Wasimul B, Akhter HH. Determinants of the use of maternal health services in rural Bangladesh. *Health Promotion International.* 2003; 18(4):327-337.
  17. Birgit B, Daniela G, von Lengerke T. Re-revisiting Andersen's Behavioral Model of Health Services Use: a systematic review of studies from 1998-2011. *GMS Psycho-Social-Medicine.* 2012; 9.
  18. Morris JL, Rushwan H. Adolescent Sexual and Reproductive Health: The global challenges. *International Journal of Gynecology and Obstetrics.* 2015; 131: 40-42.
  19. Lidoroh SA. Factors associated with utilisation of maternal health care services in Western Province, Kenya. 2013. University of Nairobi. [Dissertation].
  20. Bashir SMA. Determinants of the use of skilled birth attendants at delivery by pregnant women in Bangladesh. Semantic Scholar. Available from: <https://www.semanticscholar.org/paper/Determinants-of-the-use-of-skilled-birth-attendants-Bashir/bb64174a2692ddcab42cef6d9fd796ecb4252e44>
  21. Celik Y, Hotchkiss DR. The socio-economic determinants of maternal health care

- utilization in Turkey. *Soc Sci Med.* 2000; 50:1797-806.
22. Bell J, Sian LC, Siliva A. Trends in Delivery Care in Six Countries. Calverton, Maryland, USA: ORC Macro and the International Research Partnership for Safe Attendance for Everyone (SAFE). DHS Analytical Studies No. 2003.
  23. Mehari K, Wencheke E. Factors affecting maternal health care services utilization in rural Ethiopia: A study based on the 2011 EDHS data. *Ethiop. J. Health. Dev.* 2013; 27(1): 16-23
  24. Srivastava A, Mahmood SE, Mishra P, Shrotriya VP. Correlates of maternal health care utilization in Rohilkhand Region, India. *Annals of Medical & Health Sciences Research.* 2014; 4(3):417-425.
  25. Maguranyanga B. Apostolic religion, health and utilization of maternal and child health services in Zimbabwe. Collaborating Centre for Operational Research and Evaluation, UNICEF and M consulting group. 2011.
  26. Shaikh BT, Hatcher J. Health seeking behavior and health service utilization in Pakistan: Challenging the policy makers. *J Public Health.* 2005; 27:49-54.
  27. Tarekegn SM, Lieberman LS, Giedraitis V. Determinants of maternal health services utilization in Ethiopia: analysis of the 2011 Ethiopian Demographic and Health Survey. *BMC Pregnancy and Childbirth.* 2014; 14(161).
  28. Fisseha G, Berhane Y, Worku A, Terefe W. Distance from health facility and mothers' perception of quality related to skilled delivery service utilization in northern Ethiopia. *International Journal of Women's Health.* 2017; 9:749-756.
  29. Gitimu A, Herr C, Oruko H, Karijo E, Gichuki R, Ofware PLA et al. Determinants of use of skilled birth attendant at delivery in Makueni, Kenya: a cross sectional study. *BMC Pregnancy Childbirth.* 2015; 15(9).
  30. Saxena D, Vangani R, Mavalankar DV, Thomsen S. Inequity in maternal health care

- service utilization in Gujarat: analyses of district-level health survey data. *Global Health Action*. 2014; 6.
31. Ahmed S, Andrea A, Creanga M, Gillespie DG, Tsui AO. Economic Status, Education and Empowerment: Implications for Maternal Health Service Utilization in Developing Countries. *PLoS One*. 2010; 5(6)
  32. Munsur AM, Atia A, Kawahara K. Relationship between educational attainment and maternal healthcare utilization in Bangladesh: Evidence from the 2005 Bangladesh Household Income and Expenditure Survey. *Research Journal of Medical Sciences* 2010;4(1):33-37
  33. De Allegri M, Ridde V, Lous VR. Determinants of utilization of maternal care services after the reduction of user fees: A case study from rural Burkina Faso. *Health Policy*. 2010; 99(3):210-218.
  34. Nigatu D, Gebremariam A, Abera M, Setegn T, Deribe K. Factors associated with women's autonomy regarding maternal and child health care utilization in Bale Zone: a community based cross-sectional study. *BMC Women's Health*. 2014 Jul 3; 14:79.
  35. Ganle JK, Parker M, Fitzpatrick R, Otupiri E. A qualitative study of health system barriers to accessibility and utilization of maternal and newborn healthcare services in Ghana after user-fee abolition. *BMC Pregnancy and Childbirth*. 2014; 14(425).
  36. Kalu-Umeh NN, Sambo MN, Idris SH, Kurfi AM. Costs and Patterns of Financing Maternal Health Care Services in Rural Communities in Northern Nigeria: Evidence for Designing National Fee Exemption Policy. *International Journal of MCH and AIDS*. 2013; 2(1):163-172.
  37. Sheferaw, ED, Baznt E, Gibson H, Fenta HB, Ayalew F, Belay TB, et al. Respectful maternity care in Ethiopian public health facilities. *BMC Reproductive Health*. 2017; 14(60).

38. Jewkes R, Abrahams N, Mvo Z. Why do nurses abuse patients? Reflections from South African obstetric services. *Soc Sci Med.* 1998; 47(11):1781-95.
39. Tesfaye R, Worku A, Godana W, Lindtjorn B. Client Satisfaction with Delivery Care Service and Associated Factors in the Public Health Facilities of Gamo Gofa Zone, Southwest Ethiopia: In a Resource Limited Setting. *Obstetrics and Gynecology International.* 2016; 5798068: 7 pages.
40. Sinyange N, Sitali L, Jacobs C, Musonda P, Michelo C. Factors associated with late antenatal care booking: population based observations from the 2007 Zambia demographic and health survey. *The Pan African Medical Journal.* 2016; 25:109.
41. Lerebo WT, Kidanu A, Tsadik M. Magnitude and Associated Factors of Late Booking for Antenatal Care in Public Health Centers of Adigrat Town, Tigray, Ethiopia. *Semantic Scholar.* DOI:10.4172/2090-7214.1000171

## Tables

Table 1. Demographic factors and predisposing factors influencing the utilization of maternal health care services in HWSWD.

Variable	Category	Cases n=73		Controls n=73		p-value
		n	%	n	%	
Maternal age	<24	28	38.4	44	60.3	<0.01*
	≥24	45	61.6	29	39.7	
	Median	29(Q1=21; Q3=32)		22(Q1=22; Q3=29)		0.020
Place of residence	High density	73	100	73	100	
	Other	0	0	0	0	
Birth order	Below 2	13	17.8	43	58.9	<0.01*
	Above 2	60	82.2	30	41.1	
Marital Status	Single	1	1.4	2	2.7	0.31 (F)
	Married	72	98.6	71	97.3	
Maternal education	Primary	3	4.2	1	1.4	0.30 (F)
	Secondary	70	95.8	72	98.6	
Maternal occupation	Informal	63	86.3	69	94.5	0.05* (F)
	Formal	10	13.7	4	5.5	
Religion	Apostolic	39	53.5	10	13.7	<0.01*
	None	34	46.5	63	86.3	
	Apostolic					
Paternal education	Primary	9	12.3	11	15.1	0.32
	Secondary	64	87.7	62	84.9	
Paternal occupation	Informal	58	79.5	33	45.2	<0.01*
	Formal	15	15.5	40	54.8	

F= Fisher exact p-value; \*statistically significant

Table 2. Social characteristics: Enabling factors related to the utilization of maternal health care services in the HWSWD.

Variable	Category	Cases	Control	Crude OR (95%CI)	p-value
----------	----------	-------	---------	------------------	---------

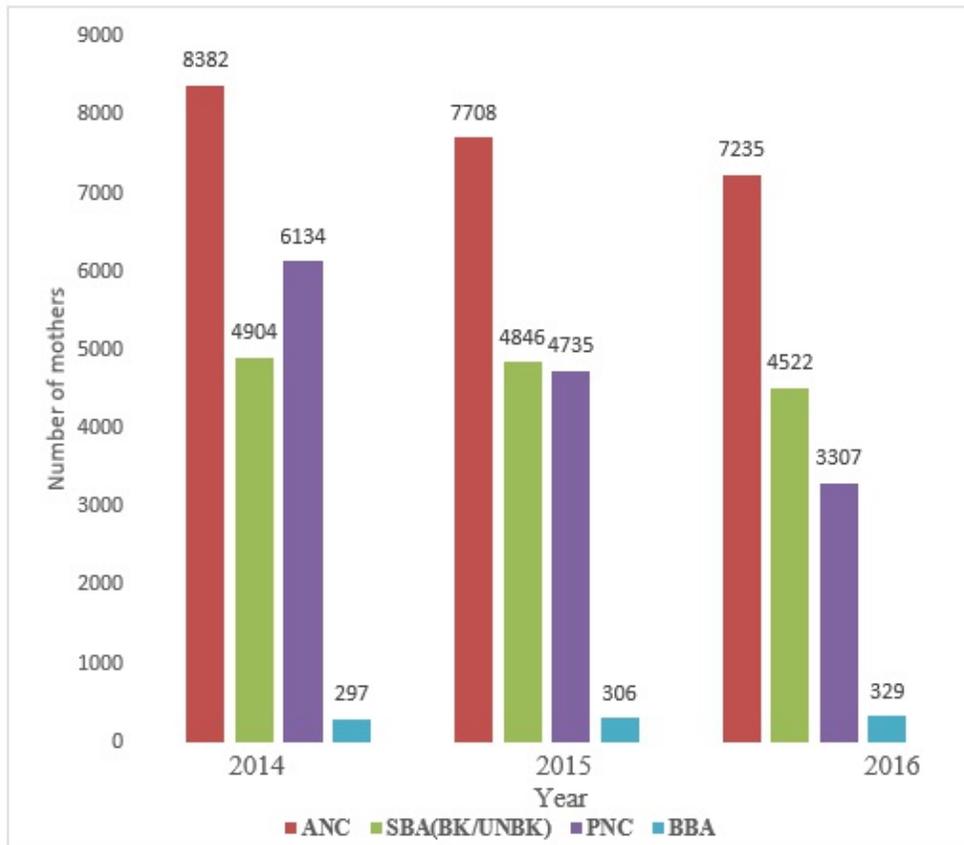
		n	%	n	%		
Permission to visit the health facility	Yes	46	63	4	5.5	29.4	<0.01* (F)
	No	27	37	69	94.5	(9.6-89.6)	
Had transport problems	Yes	10	13.7	3	4.1	3.7	0.02* (F)
	No	63	86.3	70	95.9	(1.0-14.1)	
Was accompanied to a health facility	Yes	64	87.7	67	91.8	0.64	0.21
	No	9	12.3	6	8.2	(0.2-1.9)	
Distance from a health facility	≤3km	44	60.3	62	91.8	0.64	<0.01*
	>3km	29	39.7	11	15.1	(0.12-0.6)	
Satisfied with health services during pregnancy	Yes	49	67.1	70	95.8	0.11	<0.01* (F)
	No	24	32.9	3	4.2	(0.03-0.4)	
Had a delivery plan	Yes	39	53.4	34	46.6	0.08	<0.01* (F)
	No	4	46.6	39	53.4	(0.03-0.2)	

The health services are affordable	Yes	34	46.6	69	94.5	0.07	<0.01* (F)
	No	39	53.4	4	5.5	(0.02-0.2)	
Partner's monthly income (\$USD)	≤\$100	12	16.7	2	2.7	6.9	<0.01* (F)
	>\$100	61	83.6	71	97.3	(1.5-32.4)	
Own monthly income (\$USD)	≤\$100	37	50.7	61	83.6	0.2	<0.01*
	>\$100	36	49.3	12	16.4	(0.09-0.4)	
Exposure to radio and television maternal health education	Yes	60	82.1	65	89	0.57	0.24
	No	13	17.9	8	11	(0.2-1.47)	
Preferred a female health worker	Yes	16	21.9	20	27.4	0.74	0.22
	No	57	78.1	53	72.6	(0.3-1.6)	

---

F: Fisher exact p-value; \* statistically significant p-value.

## Figures



ANC: Antenatal care, SBA (BK/UNBK): Skilled birth attendance (Booked/unbooked), PNC: Postnatal care, BBA: Born before arrival at the clinic.

Figure 1

Maternal Health Care Utilization in the HWSWD 2014 to 2016. Source: The Harare Annual Report (2016).

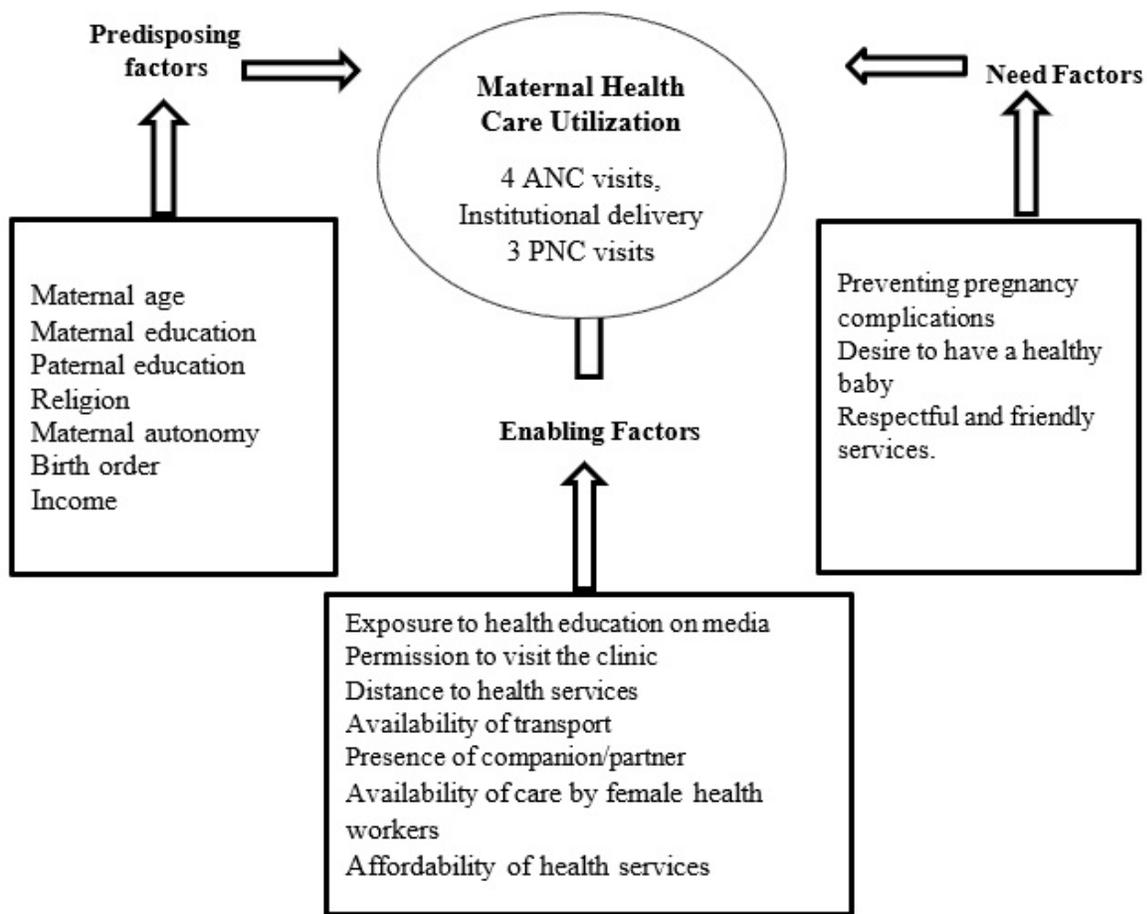


Figure 2

Conceptual framework: Andersen Model of Health Care Utilization Source [15].

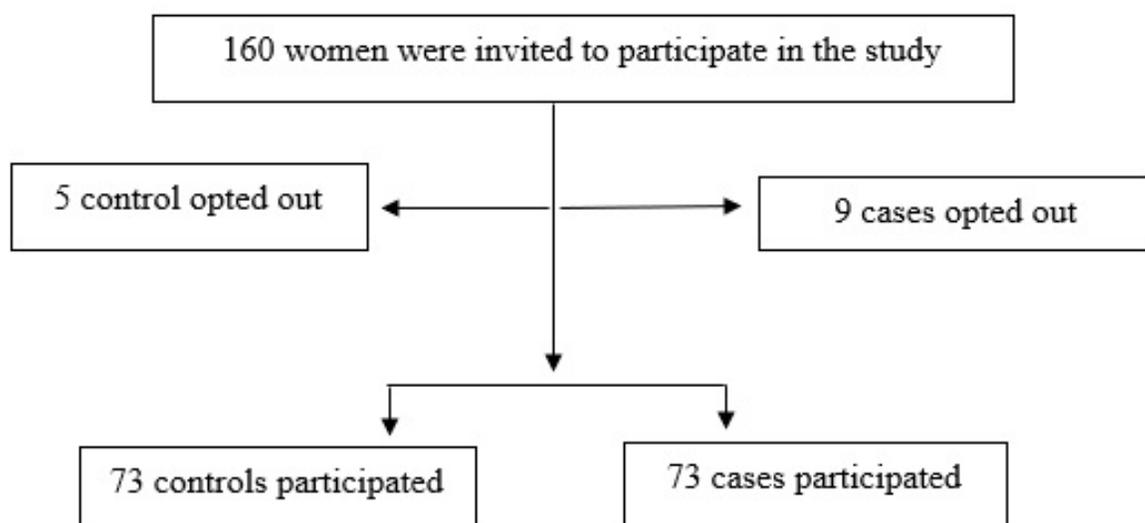


Figure 3

Flow diagram showing the study participant recruitment