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Factors associated with utilization of Antenatal Care in Zambia

A secondary analysis of 2018 Zambia Demographic Health Survey

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Abstract

Background

ANC comprises of trainings and treatments provided to promote a healthy pregnancy, labour and child delivery. Any complications or issues with pregnancy are identified during ANC visits. The aim of this study is to identify and analyse the factors which affect the basic antenatal care utilization by women in Zambia and to give an overall view of the status of women in the country with the 2018 Zambia Demographic Health Survey (ZDHS).

Method

After the correlations were found, bivariate logistic regression was done with all exposure variables against the dependent variable. A multivariate analysis was conducted with significant variable against the dependent variable, in order to find the association between the variables.

Result

The type of place of residence was significant as well as education which showed lower education was associated with lower basic ANC use. Wealth also demonstrated a negative association to basic ANC visits for poor and for the middle class. Working women had a higher likelihood of attending basic ANC along with those who attended ANC with a doctor and nurse or midwife. To not have a health insurance showed a lower likelihood to attend basic ANC visits

Conclusion

The study found that factors such as type of place of residence, education, wealth, occupation, health insurance coverage and ANC with doctor, midwife or nurse are associated with utilization of basic ANC in Zambia among women aged between 15-49.

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1.0. Introduction

Maternal health describes the health state of a woman during pregnancy, the delivery and during the period that follows the delivery (1). The health care services provided to the pregnant women before child delivery are referred to as antenatal care (ANC) while the services provided to the mother and after delivery are referred to as the postnatal health care (PNC) services (1). ANC comprises of health checks and treatments provided to promote a healthy pregnancy, labour and child delivery. Any complications or issues with pregnancy are identified during ANC visits. Lack of proper ANC may increase the chances of e.g. low birth weight and infant mortality (2). The visits should begin at least three months before the attempt to conceive. During that time, the pregnant woman is expected to avoid drinking alcohol or smoking, take iron supplements, avoid occupational and home hazards among other practices that may affect maternal and foetal health. PNC begins as soon as a baby is born and continues to a period of up to six or eight weeks. Postnatal care includes educating the mother in healthy eating, educating in infant care and checking both hers and the infant health after delivery (2).

ANC follow-up is also supposed to prepare women for assisted delivery. As such, prenatal consultation appears important in the sense that it can lead to greater awareness of the need for care and better familiarity with health establishments by encouraging women to go there to give birth (3). In addition to the ability to prevent risks and complications, prenatal follow-up is also educational and constitutes the ideal opportunity for women to benefit from the information and education necessary on good behaviour (good nutrition for example) to better outcome of pregnancy. In an urban locality in India, a study shows that women with a relatively high level of consultation (among the bottom quartile of the care seeking score) are four times more likely to be assisted at the time of care. childbirth than those of a low level (first quartile of the score), while controlling for the other factors (3). Also, it was observed that the existence of a lack of information on pregnancy complications in sub-Saharan Africa and show that women are more likely to give birth in a health center when they are better aware during prenatal visits (4).

In addition, the necessary information is also given on contraception, which is one of the important dimensions of maternal health. It helps reduce the frequency of pregnancy and childbirth and prevent unsafe abortions, which is a serious public health problem today, all of which can help reduce the risk of maternal death (4).

ANC and PNC are included in the continuum of care which entails a well-integrated system that provides proper guidance and tracking of maternal health. This care is done through collective modes of different health services and various levels of intensive care for every patient (5, 6). The continuum of care promotes the overall well-being of every human and has been concluded to contribute to good maternal health in wealthy countries particularly those that introduced government funded health care systems and that have universal health care coverage. Although, many of the low-income countries that have limited financial budgets and human resources including inadequate healthcare systems and lack good infrastructure, are confrontation with difficulties in the implementing the continuum of care. Nonetheless, these countries tirelessly work to reduce maternal, infant and child mortality (7). The continuum of care has become a center for interventions focusing on maternal, child and infant health and aims to reduce the number of maternal and infant mortality. The numbers that are targeted to get reduced are at 4 million neonatal deaths, 500 000 maternal deaths, and 6 million deaths worldwide (7).

Maternal and child health include various aspects that make them significant health issues across the world due to their role in the improvement of health care systems in the world. According to WHO, the maternal deaths mostly affected people who come from low and middle-income countries (LMIC), those who have middle to low income, and areas that are poverty-stricken (6). Maternal and child mortality are caused by different inequalities in the provision of health services in the world. These inequalities are caused by a wide gap between the rich and poor in these countries (6).

1.1. Global Maternal Mortality

According to the World Health Organization (WHO), maternal mortality refers to the death of a pregnant woman or death of a woman within 42 days following the termination of a pregnancy (10). According to WHO, nearly 810 maternal deaths occurred every day in 2017 due to preventable causes due to childbirth and pregnancy. It was reported that the ratio of maternal mortality reduced by approximately 38% between 2000 and 2017 worldwide. Around 94% of the total maternal deaths were recorded in LMIC. Southern Asia accounted for approximately 1/5 of the maternal deaths while Sub-Saharan Africa accounted for approximately 2/3 of the maternal deaths (11). Some of the factors, associated with the high maternal mortality rates, include excessive bleeding and infections after childbirth, eclampsia

and pre-eclampsia, unsafe abortion and complications that result from child delivery (11,12). As of 2017, the Fragile States Index revealed that fifteen countries, were ranked as high alert when looking at their high maternal mortalities. They included Zambia, Somalia, Ethiopia, Yemen, South Sudan and Nigeria among others (11).

Prevention with careful examination during antenatal care, is essential. Bleeding can occur at any time during pregnancy, childbirth, and postpartum. The causes differ and therefore the possibilities of prevention. A severe bleeding may start before or between routine antenatal visits and in principle requires an emergency consultation. Adequate ANC follow-up can lead to earlier diagnosis, and monitoring can reduce the maternal mortality. An example is puerperal infection which is more prevalent in places where maternal mortality is high. It is mainly due to poor home births hygiene, higher rates of genital tract infections, poor hygiene and delayed treatment after rupture of membranes. The main prevention effort is to ensure a childbirth in good hygienic conditions, as recommended in the Mother-Child package (13).

Among many the many factors that lead to maternal mortality, it is important to also look at the health care centers and the quality of care provided by them. Several qualitative studies clearly recognize that the quality of care plays an essential role in women's decisions to return or not to follow antenatal visits. Quality of care is defined by WHO as *“the extent to which health care services provided to individuals and patient populations improve desired health outcomes. In order to achieve this, health care must be safe, effective, timely, efficient, equitable and people-centred”* (14). Defined in this way, quality includes not only the perspective of providers, i.e. the delivery of safe and effective care and the resources and organization that determine it, but also the perspective of patients, i.e. of care. that address needs and concerns. As a result, the poor quality of care is likely to lead to low use of antenatal care. Many women have had bad experiences with health care services and are reluctant to return, even if it could jeopardize their health. It is generally recognized that women place a great importance on the quality of service. From the various statements made by women in studies, the quality of care involves several components at the same time. Among the main components of better quality are technical competence, rapid and adequate treatment, respect for the patient, discretion and tact, explanation or information on certain practices (14).

1.2. Antenatal Care guidelines

When it comes to the usage of antenatal care by many nations, it is considered as an essential factor. There are a series of recommendations outlined by WHO to deal with the issue. The recommendation was a minimum of four visits also known as Basic ANC (BANC) or Focused ANC (FANC). The model includes visits occurring during the 8th and 12th weeks of gestation, between 24th and 26th week, as well as the 32th week, and during 36th and 38th week. Guidance on each visit contains specific evidence-based interventions, also referred as “goal-oriented”. WHO changed BANC and presented new guidelines regarding antenatal care, which ensure that women have a healthy pregnancy and an effective transition to motherhood. The visits have been changed to a minimum of eight visits. (12,15)

With the new ANC guidelines, a total of 49 recommendations were put together in five groups. These are maternal and foetal assessment, preventive measures, interventions for common psychological symptoms nutritional interventions, and health system interventions to increase the utilization and quality of ANC (16).

The new WHO guidelines are debated for the very reason that very few achieve so many visits. UNICEF data showed that in 2019 only 61% of women between the age of 15-49 years had at least four ANC and 54% in Sub-Saharan Africa. This shows that despite continuous efforts four ANC is still a challenge in many parts of the world and the likelihood of more than eight visits seems unattainable (17).

1.3. Millennium Development Goals and Sustainable Development Goals

The issue of reducing maternal mortality dates back to the International Conference on "Safe Motherhood" convened in Nairobi in 1987, when the goal of halving maternal mortality rates between 1990 and 2000 was adopted. This objective was subsequently taken up in the conferences which followed, in particular, the world summit for children held in New York in 1990, the international conference on *population and development in Cairo in 1994* and the 4th world conference on women Beijing in 1995 (18). However, the deadline set for this goal had instead been marked by the persistence of high levels of maternal mortality in some regions of the world, and this ambitious program has not been able to eliminate the long-standing divide between developing countries. and developed regions in terms of maternal

mortality. It goes without saying that in developing countries, maternal mortality rates are still the high in many countries.

Indeed, as a means to tackle this global health issue, during the Millennium summit, 189 United Nations member states signed the United Nations Millennium declaration which resulted in the millennium development goals (MDGs). MDG 5 targeted maternal mortality and the aim was to reduce MMR by 75% and to achieve universal access to reproductive health (19). Later came the newly developed sustainable development goals (SDGs) which has 17 goals. Goal number 3, has 13 targets which primarily with core aim on ensuring good health, promoting well-being for all at all ages and reaching universal health coverage. The goal includes a specific target for maternal mortality which is to reduce the maternal death to less than 70 per 100,000 live births (20).

1.4. Zambia Context

In Zambia, most of their health care resolutions are determined by regulations provided by the World Health Organization (21). When it comes to the health status of Zambia as a nation, various things are used in determining their level in terms of performance. They all range from the population, gross national income per capita income for every person, life expectancy at birth, probability of children under five dying, the likelihood of death cases of people between 15 to 60 years old, possibility of GDP on health, and total health expenditure (22). All these factors help in analysing the status of the Zambian health system. In the end, they will all come to affect the health of every expectant woman and children (23).

Crude Death Rates. The crude death rate that generally determines the performance of the health sector. It entails mortality rates from various causes of death in a given population. As of 2017, it was 6.63 per 1000 individuals in Zambia. The number is lower than what they experienced in their previous year, which was at 6.86 per 1000 people (23).

Maternal Mortality Rates. In the year 2018, Zambia had reported 674 maternal death cases (24). In 2017, the recorded MMR was 213 deaths per 100 000 live births (24). Seemingly, the leading causes of these maternal deaths were obstetric haemorrhage and other indirect health causes like poor handling of women (25). The primary reason of death of women aged between 30 to 49 years was due to obstetric haemorrhage. While those aged between 15 to 29 died due to indirect causes (24). A study on maternal deaths in the Eastern province of Zambia found that the leading factor of maternal mortality and complications were due to retardation of access to care (26).

1.5. The Healthcare System and the GDP (Gross Domestic Product)

The Zambian healthcare system is structured in such manner that the government owns 79% of the health facilities, private-for-profit count for 19% and 2% are owned by faith-based organisations (27).

In 2017, the total health expenditure (CHE) as part of the GDP was at 4.5%, compared to 2003 which was 7.19%. Their spending on health services per capita income was at 195 USD in the year 2014. These numbers show that their contribution to the health sector is declining and that they are not investing a lot of finances in the health sector (28).

As from the year 2011 to 2016, the Zambian government contributed 41% of total health expenditure (27). These numbers were almost the same as the average contribution by the donors, which was at 42% per year from 2011 to 2016 (27). Seemingly, this percentage shows that the financial contribution to the health sector from donors is on a higher level as compared to how much the government contributes from their GDP (27).

1.6. Payment for primary healthcare in Zambia

When it comes to how the population Zambia pays for their health services, different people have various ways of payment. It all depends on the socio-economic class and financial ability of each (27). As mentioned earlier the government offers access to primary healthcare services to every citizen. The out-of-pocket expenditure of the health status of individuals is at 12.8% of the total health expenditure. A study done in 2019 to examine the hardship of out-of-pocket payment in Zambia showed that even though the government removed the fees, approximately 11% of households reported to have taken loans, or sold things or even asked relatives to pay for health care services. Poor households and those living far from health care centres had a higher risk of financial hardship (27).

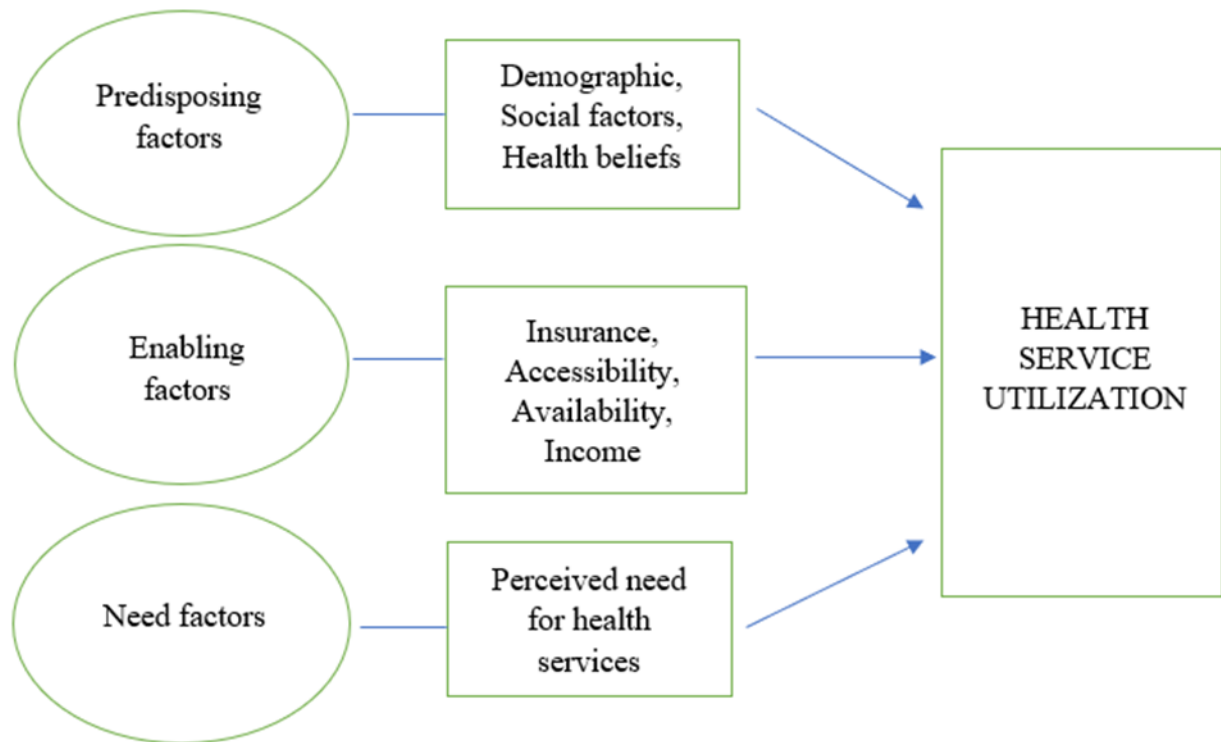
2.0. Conceptual Framework

The root causes of maternal mortality find their origin in the weakness of the public health policy, the insufficiency of resources and infrastructure for the implementation, the monitoring of the reproductive health policy, and even in the wars and armed conflicts (29).

It is important to understand the obstacles faced by women which has been discussed in many theories and models. Andersen's behavioural Model will be used to further analyse the research question and will be the base for the selection of variables in the analysis.

Andersen's Behavioural Model

The factors influencing the use or frequentation of services in general have been described by certain authors including Ronald M. Andersen. He summarizes these factors into 3 major groups, namely predisposing factors, enabling factors and need factors (30) As for predisposing factors, they include demographic characteristics including age and gender; social characteristics such as occupation, level of education and ethnicity. There are also beliefs, attitudes, values, knowledge. Regarding the enabling factors, there is income, insurance, geographic accessibility, availability of services at the place of residence and the relationship between staff and patient. As for the need factors, they include the perception of health benefit, the quality of diagnosis, the treatment as well as confidence which is seen in the picture below (30). The three factors' objectives aim to improve the health of the target population, meeting the expectations of the population and ensuring protection against health-related financial risk while ensuring fairness and efficient use of available resources.



The Andersen health behaviour model is broadly accepted as a acknowledge framework for studying the utilization of health services. According to the model, the utilization of health services is a subsequent and dependent on the above-mentioned factors. The predisposing factors displays the person’s inclination to use health services, the enabling factors are the assets that might further help access the services, and the need factors portrays the need of health service use (31).

Studies revealed that, based on the model, to reach equity in health service, the need factor and health care use needs to have a positive association. While, enabling factors can lead to the opposite (32).

The need factor can be influenced by socio-economic determinants. Studies showed that predisposing factors and enabling factors primarily affected preventive care utilization (e.g. antenatal) and other care such as hospitalization was predicted to be affected by the need factor (33).

2.1. Justification/ Rationale

It is now established that most of these direct causes of maternal mortality are preventable, in part through proper monitoring of pregnancy. The follow-up helps prevent direct medical problems but also certain risks and complications during childbirth (except complications following unsafe abortions). Antenatal visits can facilitate early diagnosis of health problems, which is why they are one of the "four pillars " of safe motherhood (13). The four pillars of safe motherhood are family planning, antenatal care, safe and hygienic childbirth, and essential obstetric care as formulated by the Safe Maternity and Maternity Program, WHO Division of Family Health (13).

In addition, the risk of maternal morbidity and mortality are also linked to infectious diseases (malaria, anaemia, syphilis, etc.) which can be exacerbated by pregnancy and childbirth. Prenatal consultations can prove to be very effective in preventing these indirect medical causes of mortality, particularly through preventive treatments before childbirth. They can for example allow early diagnosis and treatment of anaemia and syphilis (34). Several studies have shown the positive effect of antenatal consultation on the outcome of pregnancy and the health of the child at birth in different settings. Insufficient prenatal care is associated with a high level of premature birth in Hungary (35), low birth weight is associated with poor consultation. prenatal (35) and new-born morbidity and perinatal death is high in women who have received little or no care (35). Moreover, taking iron and folic acid supplements during pregnancy contributes to a reduction in the risk of early neonatal death in Nepal and Pakistan (36), and of high birth weight in India (37).

The use of basic health services is one of the key factors promoting better population health. The literature indicates that the analysis of the determinants of demand for care is extremely important for the formulation of policies and strategies in the health sector. In addition, the analysis is also to ensure effective use of services and to improve the quality of services. It is also important for designing strategies capable of ensuring the sustainability of the financing of a health program. Several initiatives have been taken internationally to reduce maternal mortality in developing countries (14).

Maternal and child health comes with many factors that make them significant health issues across the world. One needs to understand those factors because they need to be considered when determining the health of women and children in many nations. Although, factors associated with the use of ANC in sub-Saharan Africa and Asia, such as women's education,

income, employment, ANC availability, and cultural beliefs are well-researched and available it is still important to consider each country. This allows future interventions to be more precise and suited for each country and context they are applied in.

According to ZDHS, approximately 2% had 8 or more antenatal care visits. Therefore, this study is focused on basic ANC (at least four ANC) (38). The results of this study will provide some possible solutions for improving the use of antenatal care, the use of health services in general. Also, help develop further empirical data for future intervention in Zambia and hopefully, help to achieve the new WHO ANC guidelines.

2.2. Aim

The aim of this study is to identify and analyse the factors which affect the basic antenatal care utilization by women in Zambia and to give an overall view of the use of ANC by women aged between 15-49 years in the country with the 2018 Zambia Demographic Health Survey (ZDHS)

2.3. Research Question

What factors are associated with the use of basic antenatal care in Zambia?

3.0. Methodology

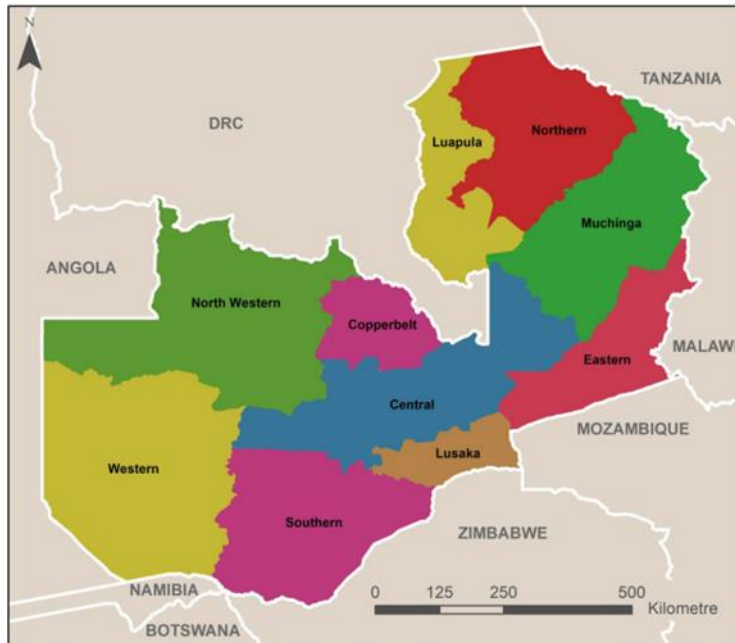
3.1. Study design

After knowing the purpose of the study, the suitable type of design needs to be determined. Research design is a strategy that includes data collection and analysis requirements needed to fulfil the research objectives. There are several study designs types. Cross-sectional design utilizes data collection of a relatively large number of observations. As a rule, it involves the use of a sampling method for representing the general population. The data is collected once at a time and is quantitative. (38).

A viable option for this study is a cross-sectional design, as it allows researchers to work with respondents, whose data is selected and operated at one particular moment of time, without considering the effect of time variable. The data is collected for health characteristics and is aimed to describe the population of Zambia, who are exposed to antenatal care. Also, the

selection of cross-sectional design allows to examine respondents, who meet the selection criteria, which is women who had at least one birth in the last 5 years (38).

3.2. Study setting



Source: ZDHS 2018

Zambia, officially called the Republic of Zambia, is a landlocked subtropical African country between Congo-Kinshasa to the northwest, Tanzania to the northeast, Malawi to the east, Mozambique to the southwest, the Zimbabwe, Botswana and the Caprivi strip belonging to Namibia to the south and Angola to the west. Zambia is located at the junction of French, Portuguese and English-speaking countries. Its area is 752,614 km² and its capital is Lusaka (39).

The Zambian population was estimated at 17 million in 2019. The settlements are concentrated in the center, i.e. the provinces of Lusaka, Copperbelt, East, South and North. Over 50% of the population lives in urban areas, with Zambia being the African country with the highest rate of urbanization. The provinces of Muchinga, West and North-West are the least populated in the country (39).

Zambia has more than 50 ethnic communities. The Bemba represent 21% of the country's population; they live in the North-East (Northern Province and Luapula Province), but they also dominate the Copperbelt provinces and part of the Center Province with the Lala-Bisa (9%) and the Lamba (2%) with which they have in common. Tonga (13.4%) is well

established in the southern and western provinces. The Nyanja (10.1%) in the Eastern province, the Lozi (6%) in the Western province, the Nyanja (4.1%) in the Eastern province, the Nsenga (4.1%) in Lusaka province, etc (39).

3.4. Study population

The original sample size included 13,683 Zambia women (38). Of those, only 7,372 women fitted the selection criteria, meaning that they had at least one birth the last five years. The data was then weighted by dividing it by 1000000 which gave the final sample of 7,325 women. These women accounted for 53.5% of the initial sample. Since the respondents sampled were already aged 15 – 49 years, and were only women, no other exclusion criteria were used. The study excluded 6,358 individuals from the sample. Since there were no much missing data (1.1%), no respondents were excluded and there was no need for further imputation due to excess of missing information. In agreement with previous literature stating that if the missing data is below 5% it provides negligible benefit while they suggest that more than 10% of missing data may result in bias in the analysis (40).

3.5. Sample size

The sampling blueprint used for the 2018 ZDHS is the Census of Population and Housing (CPH) of the Republic of Zambia. The country was separated in 10 provinces. Each one was then divided in districts. Moreover, these were divided into enumeration areas (EAs). An enumeration area is a geographical area appointed to an enumerator in order to conduct. Every EA had about 110 households. In the questioned household, 14,189 women age 15-49 were recognized as qualified for being interviewed; 13,683 women were talked with, resulted in a response rate of 96%. While, 13,251 men were qualified for interviews; 12,132 of these men were met, resulting in a response rate of 92% (38).

3.6. Data collection

The data was collected on the basis of the 2018 Zambia Demographic and Health Survey (2018 ZDHS). The data collection was done with the authorization of the Zambia Statistics Agency in partnership with the Ministry of Health; and carried out by the University Teaching Hospital Virology Laboratory (UTH-VL) and the Department of Population Studies at the University of Zambia (UNZA) under the general counselling of the National Steering Committee. The period of the data collection was from July 2018 to January 2019. The data

collection procedure used four questionnaires: The Household Questionnaire, the Woman's Questionnaire, the Man's Questionnaire, and the Biomarker Questionnaire. According to the DHS Program's Model Questionnaires, these questionnaires were adapted to reflect the health and population issues relevant to Zambia. A research team that included supervisor, field editors, and interviewers processed data collection (38).

3.7. Measurements

Dependent variable:

The dependent variable is number of antenatal care visits (coded as 0-3 visits as being *Not Sufficient* and 4-12 visits as being *sufficient* and *more than sufficient*, according to the previous WHO guidelines). This is the binary variable with two possible options.

Independent Variables:

There are fifteen major independent variables, which were used as potential determinants of the number of antenatal care visits. These variables were selected as independent variables through the consultation of past literature and in accordance with Andersen's behavioural model. The variables were divided into three categories:

1. Sociodemographic characteristics:

Age - classified into three groups 15-24, 25-34 and 35-49.

Type of place of residence – classified as rural and urban.

Region – classified as Central, Copperbelt, Eastern, Luapula, Lusaka, Muchinga, Northern, North Western, Southern and Western.

Religion – classified as catholic, Muslim, protestant and other

Education – classified as No education, primary, secondary and higher

Wealth – classified as poor, middle and rich.

Marital status – classified as never in union, married/living with partner and widowed/divorced/separated.

Occupation – classified as not working and working.

2. Antenatal care characteristics:

It included WHO performed the checks during the visits and WHERE it took place which is coded as “yes” or “no”.

3. Health insurance:

This is included the health insurance coverage and what type of health insurance which is coded as “yes” or “no”.

3.8. Statistical analysis

The analysis of data was conducted with the use of SPSS (the statistical package for social sciences), version 24. The study starts with descriptive statistics and moves forward to inferential statistics, thus, to provide clear understanding of the characteristics of respondents included in the final data sample. The first step included descriptive analysis, which was performed to describe frequency distribution of the independent factors in the form of percentages for each category of each variable.

A Chi-square test for independence along with cross-tabulation was used to determine whether the above-mentioned factors may have a correlation with the number of antenatal care visits. After the correlations were found, bivariate logistic regression was done with all exposure variables against the dependent variable. Lastly a multivariate analysis was conducted with significant variable against the dependent variable, in order to find the association between the independent variables and dependent variable. The strength of the associations was presented as odds ratios (OR) and 95% confidence intervals (CI).

3.9. Ethical Approval

The survey used in this case study, as well as protocols, biomarker measurements, and all other instruments were approved by IRBs (institutional review boards) at ICF and the Tropical Diseases Research Centre (TDRC) in Zambia. Both regulatory bodies approved the protocols before the data collection activities. DHS program is persistent with the standard of safeguarding the privacy and well-being of participants. Before each interview, an informed consent is read to respondents, and the participants may accept or decline participation. The author of this study received permission to use ZDHS by sending in a request containing information on how the data will be used to DHS.

4.0. Results

In this section, the statistical analysis of the 2018 Zambian DHS is provided, in order to evaluate the aim and research question presented above.

Sociodemographic characteristics:

As presented in table 1, 2,611 (35.9%) of the respondents attended 0-3 ANC visits and 4,651 (64.1%) attended 4-12 visits under pregnancy. It means that the majority had a received basic ANC. Additionally, as seen in table 1, the largest age group were the young adults which counted for 41.6% of the same and they were aged between 25-34. The result shows that were youth between ages 15-24 were 35.6% of the sample and lastly the adults aged between 25-49 years counted for 23.2% of the sample. When looking at the region in the sample, 16.6% were in Lusaka, 13.4% in Eastern, 13.2% in Copperbelt, 12.9% in Southern, 8.7% in Central, 8.7% in Luapula, 5.9% in Muchinga, 8.4% in Northern, 5.5% in North Western, and 6.5% in Western.

Furthermore, 61.6% lived in rural places, compared to 38.4% that lived in urban areas. The majority of the respondents 82.2% were Christian protestant, 16.1% were Catholic and Muslims counted for (0.5%) of the sample. For education, nearly half, 49.1% had a primary education, 37.2% had a secondary education, only 4.3% had higher and 9.4% did not have an education. The distribution in wealth wasn't either even, 43.7% were poor, while 37.3% were rich and 19% were middle.

For marital status, the majority of the respondents were married or/ and living with their partner counted for 75.2% of the sample, while 13.5% have never been in a union and 11.3% were widowed/divorced/ separated. In occupation, 44.6% of the respondents were not working and 55.3% were working.

Antenatal care characteristics:

The results show that 94.5% of the respondents had ANC with a nurse or midwife and 2.7% had ANC with a Doctor. Followed by, 1.5% received it from a traditional birth attendant (TBA) and remaining 1.5% receive care with the community village health assistant.

As for where the respondents when for ANC, the numbers shown in table 1, there is a clear preference for the public sector among the women. The highest numbers of ANC visits in the

public sector were performed in government health centers and in government health post, respectively 73.1% and 12.2%.

Health insurance:

Only 137 respondents answered that they had access to health insurance which was only 1.9%.

Association between antenatal care visits and sociodemographic, health insurance and antenatal factors

Bivariate analysis was conducted by the means of Chi-square test for independence. According to Table 1, the following results were obtained. The number of ANC visits is associated with such factors as religion ($p < .01$), type of place of residence ($p < .01$), education level ($p < .01$), wealth level ($p < .012$), prenatal doctor care ($p < .01$), prenatal nurse or midwife care ($p < .01$), coverage by health insurance ($p < .01$), current marital status ($p = .002$), and respondent's occupation ($p < .001$). Other variables did not cause any significant disproportion in the number of antenatal care visits in terms of not sufficient or sufficient categories.

It was found that there was no significant difference in the sufficiency of antenatal care visits number by such factors as region ($p = .478$), age group ($p = .128$), prenatal care by traditional birth attendant ($p = .113$), prenatal care by community village health assistant ($p = .521$), antenatal care at respondent's home ($p = .563$), antenatal care at government hospital ($p = .636$), antenatal care by government health center ($p = .116$), antenatal care by government health post ($p = .242$), antenatal care by mobile hospital clinic ($p = .652$), antenatal care by other public health facility ($p = .153$), antenatal care by private hospital or clinic ($p = .104$), antenatal care by mission hospital or clinic ($p = .339$), antenatal care by other private medical ($p = .297$), and antenatal care by other facility ($p = .753$).

Table 1: below shows the descriptive statistics on sociodemographic characteristics, ANC characteristics and health insurance among women between the age of 15-49 in Zambia (total $n=7,325$) as well as the results of the bivariate analysis for the association between the characteristics and ANC visits.

| Variables | Total sample N=7,325 | N= 2,611 (35.9%) Not Sufficient | N= 4,651 (64.1%) Sufficient | P-Value |
|-----------------------------------|-------------------------|---------------------------------------|-----------------------------------|-----------|
| Socio-demographic characteristics | | | | |
| Age | | | | |
| 15-24 Youth | 2605 (35.6) | 961 (36.8) | 1618 (34.8) | P=0.128 |
| 25-34 Young adults | 3020 (41.2) | 1072 (41.1) | 1925 (41.4) | |
| 35-49 Adults | 1699 (23.2) | 577 (22.1) | 1108 (23.8) | |
| Type of place of residence | | | | |
| Urban | 2811 (38.4) | 1094 (41.9) | 1706 (36.7) | P <0.01* |
| Rural | 4513 (61.6) | 1517 (58.1) | 2945 (63.3) | |
| Region | | | | |
| Central | 640 (8.7) | 254 (9.7) | 384 (8.3) | P = .478 |
| Copperbelt | 969 (13.2) | 383 (14.7) | 584 (12.6) | |
| Eastern | 983 (13.4) | 320 (12.2) | 639 (13.7) | |
| Luapula | 640 (8.7) | 215 (8.3) | 414 (8.9) | |
| Lusaka | 1219 (16.6) | 496 (19.0) | 714 (15.3) | |
| Muchinga | 433 (5.9) | 135 (5.2) | 298 (6.4) | |
| Northern | 615 (8.4) | 204 (7.8) | 411 (8.8) | |
| North Western | 404 (5.5) | 121 (4.6) | 282 (6.1) | |
| Southern | 946 (12.9) | 301 (11.5) | 643 (13.8) | |
| Western | 477 (6.5) | 181 (6.9) | 282 (6.1) | |
| Religion | | | | P<0.01* |
| Catholic | 1180 (16.1) | 416 (15.9) | 752 (16.2) | P <0.01* |
| Protestant | 6019 (82.2) | 2157 (82.6) | 3815 (82.0) | |
| Muslim | 38 (0.5) | 9 (0.3) | 28 (0.6) | |
| Other | 87 (1.2) | 29 (1.1) | 56 (1.2) | |
| Education | | | | P <0.01* |
| No education | 689 (9.4) | 278 (10.7) | 406 (8.7) | P <0.01* |
| Primary | 3595 (49.1) | 1258 (48.2) | 2294 (49.3) | |
| Secondary | 2726 (37.2) | 1013 (38.8) | 1700 (36.6) | |
| Higher | 316 (4.3) | 63 (2.4) | 251 (5.4) | |
| Wealth | | | | P = .012* |
| Poor | 3202 (43.7) | 1092 (41.5) | 2080 (44.7) | P = .012* |
| Middle | 1390 (19) | 497 (19.0) | 885 (19.0) | |
| Rich | 2733 (37.3) | 1032 (39.5) | 1686 (36.3) | |
| Current Marital Status | | | | P < 0.01* |
| Never in Union | 991 (13.5) | 383 (14.7) | 601 (12.9) | P < 0.01* |
| Married/Living with partner | 5506 (75.2) | 1901 (72.8) | 3559 (76.5) | |
| Widowed/Divorced/Separated | 828 (11.3) | 326 (12.5) | 491 (10.6) | |
| Occupation | | | | P < 0.01* |
| Not Working | 3264 (44.6) | 1281 (49.1) | 1955 (42) | P < 0.01* |
| Working | 4049 (55.3) | 1328 (50.9) | 2686 (57.7) | |
| Antenatal care characteristics | | | | |

| | | | | |
|--|-------------|-------------|-------------|-------------------|
| Prenatal Doctor | | | | P<0.01* |
| No | 7125 (97.3) | 2565 (98.3) | 4500 (96.7) | |
| Yes | 200 (2.7) | 46 (1.7) | 151 (3.3) | |
| Prenatal Nurse/Midwife | | | | P<0.01* |
| No | 399 (5.5) | 176 (6.8) | 221 (4.7) | |
| Yes | 6925 (94.5) | 2434 (93.2) | 4431 (95.3) | |
| Prenatal Traditional Birth attendant | | | | P = .113 |
| No | 7216 (98.5) | 2580 (98.8) | 4576 (98.4) | |
| Yes | 109 (1.5) | 30 (1.2) | 75 (1.6) | |
| | | | | P = .521 |
| Prenatal Community village health assistant | | | | |
| No | 7215 (98.5) | 2575 (98.6) | 4578 (98.4) | |
| Yes | 110 (1.5) | 36 (1.4) | 73 (1.6) | |
| Respondent's Home | | | | P = .563 |
| No | 7235 (98.8) | 2527 (96.8) | 4646 (99.9) | |
| Yes | 9 (0.1) | 4 (0.2) | 5 (0.1) | |
| Government Hospital | | | | P = .636 |
| No | 6556 (89.5) | 2284 (87.5) | 4214 (90.6) | |
| Yes | 689 (9.4) | 247 (9.4) | 438 (9.4) | |
| Government Health Center | | | | P = .116 |
| No | 1892 (25.8) | 632 (24.2) | 1241 (26.7) | |
| Yes | 5353 (73.1) | 1899 (72.7) | 3411 (73.3) | |
| Government health post | | | | P = .242 |
| No | 6348 (86.7) | 2234 (85.6) | 4061 (87.3) | |
| Yes | 897 (12.2) | 297 (11.4) | 590 (12.7) | |
| Mobile Hospital/Clinic | | | | P = .652 |
| No | 7179 (98.0) | 2506 (96.0) | 4610 (99.1) | |
| Yes | 66 (0.9) | 25 (0.9) | 41 (0.9) | |
| Other Public Health | | | | P = .153 |
| No | 7224 (98.6) | 2526 (96.8) | 4635 (99.7) | |
| Yes | 20 (0.3) | 4 (0.2) | 16 (0.3) | |
| Private Hospital/Clinic | | | | P = .104 |
| No | 7130 (97.3) | 2500 (95.8) | 4571 (98.3) | |
| Yes | 115 (1.6) | 31 (1.2) | 80 (1.7) | |
| Mission Hospital Clinic | | | | P = .339 |
| No | 7087 (97.8) | 2482 (95.1) | 4545 (97.7) | |
| Yes | 157 (2.2) | 49 (1.9) | 106 (2.3) | |
| Other Private Medical | | | | P = .297 |
| No | 7242 (98.9) | 2531 (96.9) | 4649 (99.9) | |
| Yes | 2 (<0.1) | 0 | 2 (0.1) | |

| | | | | |
|------------------------------------|-------------|-------------|-------------|---------------------|
| Other | | | | P = .753 |
| No | 7235 (98.8) | 2527 (96.8) | 4645 (99.9) | |
| Yes | 10 (0.1) | 4 (0.2) | 6 (0.1) | |
| Health Insurance | | | | |
| Covered by Health Insurance | | | | P < 0.01* |
| No | 7188 (98.1) | 2586 (99.1) | 4538 (97.6) | |
| Yes | 137 (1.9) | 24 (0.9) | 113 (2.4) | |

4.1. Bivariate logistic regression

The bivariate logistic regression, as presented in table 2, shows that the respondents in urban areas have a higher likelihood of attending 4-12 ANC visits (sufficient amount) with OR (1.26) and has a significant p-value of 0.01. When examining religion beliefs respondents who were Protestant and those who had other religious belief, the OR shows a positive relation with sufficient ANC, also the p-value showed significance. Another positive relation was with the respondents who worked (OR 1.28; CI [1.16-1.41]) with a significant p-value of 0.01.

Those with no education (OR 0.47), primary education (OR 0.66) and secondary education (OR 0.81) were less likely to attend the recommended number of ANC. Furthermore, the respondents in poor and middle wealth class were also less likely to attend the sufficient number of ANC. For married/ living with partner and never in a union the OR (respectively 0.81 and 0.89) with a p-value of 0.05.

As for the antenatal care characteristics, ANC without a doctor and nurse or midwife demonstrates that it is less likely for the respondents to attend 4-12 visits. To not have a health insurance (OR 0.89) shows that they are also less likely to have sufficient ANC visits.

4.2. Multiple logistic regression

The multivariate analysis found that type of residence, education, wealth, respondent's occupation, prenatal by doctor, nurse or midwife and coverage of health insurance had a significant value ($p < 0.05$) on sufficient ANC use. All other variables had no longer any

association. The predictors which continued to had significance are described below and shown in Table 2.

Socio-demographic characteristics:

The type of place of residence was still significant with a OR of 1.26 and a p-value of .01. As well as education which showed an OR of 0.50 [CI 0.40-0.65] for no education. Primary education had a p-value of 0.05 and an OR of 0.67 and the OR of secondary education was 0.88 [CI 0.76-0.97]. These show a significant associated with lower likelihood of having sufficient ANC visits. The OR for wealth also demonstrated a negative association to sufficient ANC visits. The OR for poor was 0.80 [CI 0.61- 0.87] with a p-value of 0.05 and for the middle class the OR was 0.81. While working respondents have a higher likelihood. However, in the multivariate analysis, the results for religion and marital status were not no longer significant.

Antenatal care characteristics and Health Insurance:

The results were significant, with an OR of 0.73 and 0.81 for ANC without a doctor and nurse or midwife demonstrates that it is less likely for the respondents to attend a sufficient number of ANC visits. Furthermore, to not have a health insurance was still significant (OR 0.86; CI [0.70-0.97]; p-value .01) and shows a less likelihood to attend sufficient ANC visits

Table 2: This table illustrates the association between sufficient use of ANC and sociodemographic characteristics, ANC characteristics and health insurance (variables included in the Adjusted Analysis model were those who had a p-value of <0.05) ***Bold** text indicates values that are statistically significant at p<0.05

| Variables | Unadjusted OR (95% CI) | P-value | Adjusted OR (95% CI) | P-value |
|--|-----------------------------------|---------------------|---------------------------------|------------------|
| Socio-demographic characteristics | | | | |
| Type of place of residence | | | | |
| Rural | Ref | | Ref | |
| Urban | 1.267 (1.111 – 1.445) | P <0 .01* | 1.226 (1.041 – 1.445) | P = 0.01* |
| Religion | | | | |
| Catholic | Ref | | Ref | |
| Protestant | 1.102 (0.590 – 1.486) | P<0.05* | 1.085 (0.678 – 1.737) | P=0.733 |

| | | | | |
|--------|------------------------------|-------------------|-----------------------|---------|
| Muslim | 1.630 (0.514 – 4.025) | P=0.781 | 1.117 (0.707 – 1.764) | P=0.636 |
| Other | 1.879 (1.481 – 2.731) | P<0.05* | 0.688 (0.283 – 1.674) | P=0.410 |

Education

| | | | | |
|--------------|------------------------------|-------------------|------------------------------|-------------------|
| Higher | Ref | | Ref | |
| No education | 0.477 (0.358 – 0.590) | P<0.01* | 0.502 (0.460 – 0.657) | P<0.05* |
| Primary | 0.665 (0.514 – 0.715) | P<0.01* | 0.674 (0.511 – 0.748) | P<0.05* |
| Secondary | 0.811 (0.751 – 0.931) | P<0.01* | 0.888 (0.760 – 0.972) | P<0.05* |

Wealth

| | | | | |
|--------|------------------------------|--------------------|------------------------------|-------------------|
| Rich | Ref | | Ref | |
| Middle | 0.894 (0.781 – 0.974) | P <0.01* | 0.813 (0.745 – 0.962) | P<0.01* |
| Poor | 0.804 (0.721 – 0.987) | P<0.01* | 0.795 (0.613 – 0.874) | P<0.05* |

Current marital status

| | | | | |
|-----------------------------|------------------------------|--------------------|-----------------------|----------|
| Widowed/Divorced/Separated | Ref | | Ref | |
| Never in Union | 0.898 (0.716 – 0.995) | P <0.05* | 0.920 (0.755 – 1.121) | P = .407 |
| Married/Living with partner | 0.812 (0.698 – 0.945) | P<0.05* | 1.129 (0.989 – 1.531) | P = .007 |

Respondent's occupation

| | | | | |
|-------------|------------------------------|--------------------|------------------------------|--------------------|
| Not Working | Ref | P <0.01* | Ref | P <0.01* |
| Working | 1.282 (1.160 – 1.416) | | 1.288 (1.165 – 1.425) | |

Antenatal care characteristics

Prenatal doctor care

| | | | | |
|-----|------------------------------|--------------------|------------------------------|-------------------|
| Yes | Ref | Ref | Ref | |
| No | 0.759 (0.574 – 0.944) | P <0.01* | 0.739 (0.611 – 0.996) | P<0.01* |

Prenatal nurse or midwife care

| | | | | |
|-----|------------------------------|--------------------|------------------------------|--------------------|
| Yes | Ref | | Ref | |
| No | 0.688 (0.561 – 0.844) | P <0.01* | 0.816 (0.650 – 0.973) | P <0.01* |

Health Insurance

Coverage by Health Insurance

| | | | | |
|-----|------------------------------|------------------|------------------------------|----------------|
| Yes | Ref | | Ref | |
| No | 0.896 (0.719 – 0.982) | P = 0.01* | 0.866 (0.702 – 0.977) | P=0.05* |

5.0. Discussion

This quantitative study focused on the factors that are associated with antenatal care among women aged between 15-49 years in Zambia. To accomplish such thesis Andersen's behavioural model was used as a tool to collect important variable that can be used in the study, together with previous literature. The data originated from ZDHS. The results of this research enable us to establish the different knowledge drawn from the study that would explain the reasons for the utilization of antenatal care. Thus, this section aims to interpret and discuss the results of this research and propose recommendations.

5.1. The study findings

Zambia reported one of the highest maternal mortality rates in the world. Their crude mortality rate was at 6.63 per 1000 people as of the year 2017. They had a very high maternal mortality rate standing at 213 deaths per 100000 live births that same year. The leading cause of these deaths was excessive bleeding and indirect causes, which led to the development of indirect health complications that ended in death (25).

The study found that factors such as type of place of residence, education, wealth, occupation, health insurance coverage and prenatal with doctor, midwife or nurse are associated with utilization of basic ANC in Zambia among women aged between 15-49.

Socio-economic factors:

Women in urban areas of Zambia were more likely to attend Basic ANC as well as working women. As well as education which showed that lower education was significantly associated with lower likelihood of having basic ANC visits. The OR for wealth also demonstrated a negative association to sufficient ANC visits while working respondents have a higher likelihood. In accordance with Andersen's behavioural model, those factors were predisposing and enabling factors which has shown to have an impact on Zambia's woman use of health care. The dynamics entail every predisposing factor, enabling factor, and need for the improvement of health services. Predisposing factors of maternal health in Zambia involves place of residence, education, wealth and occupation. Under enabling and need factors besides having predisposing factors of maternal health Zambia. Indeed, possible enabling factors include in this study health insurance coverage and prenatal with doctor, midwife or nurse.

According to a case study conducted in Ethiopia on the factors that determine the utilization of maternal health service, were the level of education, economic status, and place of residence proved to be playing an important role. In agreement with the findings in Zambia, the study in Ethiopia argued that women living in rural areas seldom sought conventional maternal health care and depended on the cultural practices to deal with pregnancy complications and the process of delivering (41). By educating women, their health-seeking behaviour are improved, and thereby enhancing the utilization of ANC.

Furthermore, a study in Ghana found that the maternal health services were primarily used by women living in urban areas, with higher education compared to those in rural areas with lower or no education (42).

People with lower education levels had little knowledge of the importance of seeking maternal health services at the right time. A study in India stated that women with low education have limited knowledge about ANC and conventional maternity services. Also, most women living in the lower social class said that maternal health services are expensive, and thus, they are unable to access them even when they are aware of their existence (43).

In the case of respondent's occupation, this study demonstrated that working women had a higher likelihood of having at least four ANC. According to systematic review focusing on the woman of Uganda, they found the same result. Woman who didn't working were less likely to attend ANC (44).

Antenatal care factors:

As result showed, ANC without a doctor and nurse or midwife demonstrates that it is less likely for the respondents to attend a sufficient number of ANC visits. Seeking ANC depends on many factors such as transport, access, education, resources available at the health care center. In a qualitative study in Malawi, despite the above-mentioned factors they also found the patient-provider relationship has a great impact on women who attend recommended number of ANC visits. They argued that by bettering that relationship, ANC attendance increases significantly. The overall health of expecting mothers depended on them having a good contact and perception of the health care workers. The study's results displayed that women felt worried, tense even refused to seek help due to being mistreated and humiliated by health care workers. The same study showed health care workers' perspective and they explained it was hard to keep up a positive approach due to the lack of staff and this led to them over-working (45).

In Bangladesh, a similar trend of low maternal health care utilization was evident. The average number of antenatal visits was at 2.7, way much below the recommended number of recommended rates and above during the gestation period. This is contrary to the fact that at least 49% of women have had access to maternal health information through social and mass media. However, it is commendable that at least 68% of women in Bangladesh are attended by qualified medical personnel (46).

With a retrospective analysis of prenatal coverage in Brazil during the period from 2003 to 2009, significant an increase was noticed in the number of consultations offered to pregnant women. The number of prenatal consultations reached 19.4 million in 2009 - an increase of 125% about 2003 when 8.6 million were registered. Despite the rise in talks, the quality of this assistance arterial hypertension is the most frequent cause of maternal death in Brazil, inadequate or late referrals to high-risk prenatal services and the fact that Brazilian maternal mortality is still ten times higher than that of developed countries (47).

Health insurance coverage

The result from the study showed that health insurance coverage was an important factor that influence the attendance to basic ANC. Those who didn't have it were less likely to have basic ANC. Although, the government removed the fees for primary health care a study done in Zambia concluded that approximately 11% of households reported to have taken loans, or sold things asked relatives to pay for health care services. Poor households and those living far from health care centers had a higher risk of financial hardship (27).

Similar to this study, a study in Ghana has shown that health insurance coverage boosts the likelihood of children, infants and pregnant women accessing health care services. This indeed leads to a decrease deaths cause by preventable measures and hospitalization among others. The studies also argued that those with private insurance have access to adequate care compared to those without which don't receive the same adequate care. This lack has shown that women without insurance got less ANC in comparison to insured women, consequently those studies claimed that there is a significant difference in those groups (48).

Health insurance, for policyholders and their beneficiaries, covers of the risks and health care costs inherent in illness or accident and maternity. Thus, it entitles the holder to cover the costs of curative, preventive and rehabilitation care medically required by the beneficiary's state of health. Health insurance coverage has become a requirement due to the unpredictable nature of health care expenses. In fact, as people get older, the more likely they are to have a

disease. Thus, individuals have a general idea of their need for future medical services. However, the exact amount they spend on health care remains largely uncertain (49).

Health spending also remains heavily biased. In such a situation, having health insurance helps protect individuals against possible damage to health care. The link between health insurance coverage and health status is a cause and effect relationship. In fact, health insurance significantly reduces the cost of treatment borne by the patient. Thus, the use of health care will be higher among people with health insurance than those without. Most research in health microeconomics approves that the extension of medical coverage has a positive impact on access to care, use of services, affordability of care and the financial security of the population, in particular for low-income households. Thus, there is generally a positive relationship between access to health insurance and consumption of health care as it increases the amount of health care consumed (50).

Further factors from literature

The results in this study showed that age, religion and marital status were not significant in the case of Zambia. However, other studies such as one done in Ghana, has shown that these factors were indeed significant and important for ANC use (51). A study in Nepal concluded that age was statistically significant and younger expecting mother had a higher likelihood of attending ANC. Another significant factor they found was the exposure to TV which increased the likelihood of women attending basic ANC (52). Religion has an impact on the use of antenatal health care in rural areas. The link identified between religion and the use of antenatal care could be linked to differences in living standards between religious groups, rather than to religion. It is possible that people belonging to a given religion are economically weaker and therefore have a low standard of living (53).

The observation is precise on the fact that the socioeconomic status also affects the quality of maternal service one can access. Women from the lower socioeconomic class were more likely to seek Traditional, complementary, and alternative medicine (TCAM). The users in the urban and semi-urban settings are more likely to be aged between 20-50 years, while the rural environment users are likely to be above 55 years. (54). The users disclosed that they usually withhold the use of TCAM when they seek conventional care because the health care workers are likely to have a negative attitude towards them due to their negative attitude

towards TCAM. The lack of disclosure of information usually leads to incorrect treatment and worsens health complications (54).

In another study, nurses widely commented on the delay in the tests' results in the prenatal consultations. In many situations, these results take up to three months to reach pregnant women's hands and are therefore outdated. The main problem would be the late detection of any complication, which could already be treated if there were agility in the results of the exams. Another obstacle described by nurses and pregnant women was the absence of reference and counter-reference. Pregnant women report dissatisfaction for not having a maternity service linked to the user to be referred at the time of delivery. They complain about having to leave the hospital after the vacancy. This only increases the anxiety, worry, and fear of pregnant women before the child's birth (55).

5.2. Strengths and limitation

There are many benefits to cross-sectional studies, one of the most notable being the low cost. Due to the random search of potential target group candidates, no costly analyses are required to shake off a particular individual. The production of materials for the collection and storage of results also does not raise any large sums, and a reward does not necessarily have to be given to the person participating in the cross-sectional study. In addition, based on a relatively small sample, results and statistics can be obtained that can certainly be assumed to apply to a target group of much larger proportions, again thanks to the random selection. At the same time, in a random selection, one must still take into account external factors such as time and place of study. The researcher in this case accessed the data which was already collected by DHS and therefore saving time and money to do the study. Another benefit is that the data is from 2018 which makes it current and relevant. Also, the percentage of missing data is a very strong aspect of this study. Furthermore, the great quality of DHS, gives a good national representation. Additionally, the results of this study agree with studies done in other countries which concludes that the findings can be used as a representation of the Zambian women.

The limitations in this study are firstly the recall bias and reporting especially for age or different retrospective information which relies on remembering things that happened. Even though, the people performing the interviews are trained, the interviewees may fail to give important information which is hard to remember. Since the inclusion criteria was women

who had at least one birth 5 years prior to the interview, the variables may be different now 2 years after published results. Further variables could have been included such as the perceived distance to health center.

5.3. Validity

The concept of validity is extremely important in research studies. High level of validity ensures credibility, dependability and accuracy of a study (56). The questionnaires used in the current research were validated by repeatedly reading. The constructs measured and questions used were deleted based on face validity and appropriateness of question item. The data was restructured by conducting critical self-justification and reflection over the essentiality of the questions to be removed. The instrument was shared with the supervisor to conduct content and face validity. The comments of supervisor were taken into considerations and the data were adjusted as per their recommendation and presented for approval.

5.4. Reliability

Reliability is another important characteristic of every case study. This indicator measures the degree to which an instrument created by the researcher provides reliable results after repeated use of this instrument (57). Study reliability is usually influenced by the effect of random error, and high errors are associated with low reliability of the study. There were no reliability tests conducted, but the data collection and operation processes included editing, coding, data screening and cleaning by data editors, and supervisor control with questionnaires administration.

6.0 Conclusion

The purpose of this study was to identify the factors that affect the utilization of basic ANC by Zambian women. While focusing on the question, it was found that type of place of residence, education, wealth, occupation, health insurance coverage and prenatal with doctor, midwife or nurse are associated with utilization of basic ANC in Zambia among women aged between 15-49. Maternal care is a significant health practice because it involves safeguarding the health of a pregnant woman and that of her unborn child. Every pregnancy is unique on

its own and has several potential risks that accompany it. Maternal deaths can be avoided by providing a good quality of care to mothers meaning antenatal and postnatal services that are provided by skilled health care workers.

6.1. Recommendations

The government needs to increase investment in the health sector specially for those in rural areas. Investing in education and making sure that the women do not suffer from economic hardship is also important. Moreover, increasing knowledge on ANC visits for women on timing and other information is essential. This will indeed empower and hopefully make sure that more women attend ANC as recommended.

Seemingly, the government, under the ministry of health, has to develop ways that will help them realize the SDGs regarding maternal and infant health care. As a nation, they must ensure that they keep on having comprehensive surveillance of every case of maternal and infant death in hospitals and any other place where the case gets to be reported. With this move, it will assist them in assessing the areas of weakness in their health system and know precisely where to improve as a nation so that they achieve the SDGs that care for maternal health. Once they know their areas to grow in terms of maternal and child health provision, the number of mortality and morbidity cases will be on the decline, and they will have realized the health care SDGs set out by the United Nations

Apart from constant surveillance, they should ensure that they increase services regarding family planning, prenatal care, postnatal care, and antenatal care. Besides that, they should ensure that they have enough trained personnel in their hospitals to help in managing such situations and handling expectant mothers. They also need to have people to handle any possible cases of women who need obstetric health care in hospitals. In the end, all these will only be successful if the government invests highly in improving the state of the ministry of health in the nation. Once they can observe how the services related to maternal care operate, it will help ensure that people, especially women, have access to quality healthcare services in Zambia. These actions will require the government to invest more finances from its budget because it will require more health care providers. The funds will also be essential in the provision of health education among every health care provider and citizen so that they could be aware of everything that needs to get done.

6.2. Future research

Qualitative research is needed in the rural areas. This will help further understand the barriers faced by women and help guide future interventions. Specially knowing that the new WHO ANC guidelines are far from being met.

Furthermore, the studies in quality of care giving in the country could be an important addition. Studies focusing on the attitudes and perception of health care workers are also important. All of these studies compiled will show valuable information on both pregnant women, health care center and also health care workers.

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