International Journal of Science and Research Archive
eISSN: 2582-8185
Cross Ref DOI: 10.30574/ijsra
Journal homepage: https://ijsra.net/

(REVIEW ARTICLE)

Check for updates

Antenatal care services in Yobe state Nigeria: The determinants and interventions to increase utilization

Babagana Abba [1], Mohammed Lawan Gana [1], Abubakar Musa [2,*] and Usman Abba [3]

[1] *Department of Community Medicine, Yobe State University Damaturu, Yobe State, Nigeria.*
[2] *Department of Community Medicine, Abubakar Tafawa Balewa University and Abubakar Tafawa Balewa University Teaching Hospital, Bauchi Nigeria.*
[3] *State Specialist Hospital Damaturu, Yobe State, Nigeria.*

International Journal of Science and Research Archive, 2024, 11(02), 1316–1332

Publication history: Received on 26 February 2024; revised on 06 April 2024; accepted on 09 April 2024

Article DOI: https://doi.org/10.30574/ijsra.2024.11.2.0592

Abstract

Introduction: Maternal and perinatal mortality are global public health issues and Nigeria in particular carries a high burden as 33,000 women dies every year though significant decline in maternal mortality ratio has been observed; neonatal mortality rate is 37 per 100,000 livebirths against the 2015 MDGs target of 12 per 100, 000 and stillbirth is unbearably high. Yobe State remains one of the regions with high maternal and perinatal death in Nigeria most of which are preventable with quality Antenatal care (ANC) services yet the ANC coverage is only 49% against the Nigerian national figure of 68.9% (which is moderate) and more than 67% of the pregnant women did not receive atleast 4 ANC visits in Yobe as recommended by World Health Organization. The aimed of this study was to analyse and recommend interventions in ANC services in order to increase utilization to improve maternal and perinatal health in Yobe State, Nigeria.

Methods: This is an in-depth study on ANC service utilization from local and international literatures; databases used are PubMed, Medline and Global health. The conceptual framework is based on socio ecological model. The analytical tools used to analyse the proposed intervention strategies are based on the criteria of technical effectiveness, organisational feasibility, sociocultural feasibility, financial feasibility and equity consideration.

Results: Multilevel determinants are responsible for low Utilization of ANC services in Yobe State which include intrapersonal (women education and literacy), interpersonal (families, peers, relatives influence), community (culture and beliefs), health system (health services, human resources, and health policy) and structural determinants (conflicts and poverty). Effective and feasible strategies to increase ANC services Utilization identified and appraised include outreach and health and education; men involvement in ANC; community based health insurance scheme; improving the skills and supportive supervision of ANC providers; employment of CHW and task shifting to lower cadres.

Conclusion: ANC services requires multi-dimensional approach to increase Utilization, each intervention augment one another for the desired effects and better outcome of improving maternal and perinatal health. Further research is recommended on interventions of determinants like conflicts, poverty and women education which are beyond the scope of this dissertation and men involvement in ANC, community based health insurance scheme, improving the skills and supportive supervision of health ANC providers; task shifting to lower cadres and further research.

Keywords: Antenatal care services; Maternal health services; Utilization; Access; Yobe

* Corresponding author: Musa A

1. Introduction

Maternal and perinatal deaths are major public health issues around the globe (Vogel et al., 2014). An estimated 800 maternal deaths occur daily worldwide (Hurst et al., 2015) of which sub-Saharan Africa accounted for 62% of the global burden (WHO and UNICEF, 2014). Maternal health and perinatal survival depend on effective maternal care through quality antenatal care services (ANC). Globally, an estimated 2.6 million still births occur every year; and neonatal deaths account for 40% of all under five child death and mostly from developing countries which are preventable with effective ANC services (Vogel et al., 2014). Despite the burden of maternal and perinatal deaths and their linked to maternal care, about 45 million women in developing countries never get access to ANC services (Galadanci et al., 2006).

Globally, Nigeria has been recognised for its highest maternal mortality in sub-haran Africa as 33,000 maternal death occurs every year (PRRINN-MNCH, 2013). However, a significant decline in the trend has been observed from 1990 to 2015 due to then Millennium Development Goals (MDGs) intervention to reduce maternal death by 75% over 25 years (MDGs, 2015; WHO and UNICEF, 2014). The current maternal mortality ratio (MMR) in Nigeria is 243 per 100,000 live births (MDGs, 2015) which was beyond the MDGs target of 250 per 100,000 by 2015 and current global MMR of 210 (WHO and UNICEF, 2014). Neonatal mortality rate (NMR) in Nigeria is 37 per 100,000 live births and 2015 target was 12 per 100,000 live births; and stillbirth is unbearably high (NDHS, 2013). Most of the health statistics in Yobe State are not available to estimate the maternal and perinatal deaths (YMOH, 2010). However, it remains one of the regions with poor maternal and child health indicators (NDHS, 2013). ANC services enhance early detection and prompt treatment of pregnancy related complications especially when these services are provided by skilled attendants which may lead to improved maternal and perinatal health outcome (Fagbamigbe and Idemudia 2015). ANC coverage of at least one visit in Nigeria is 68.9% and four-visits is 60.6% (MDGs, 2015). Yobe State is the most backward compare to other states of the same geopolitical zone in Nigeria in terms of ANC services utilization (NDHS, 2013). The proportion of pregnant women who have at least one ANC in Yobe State was only 34.4% before 2008 (NDHS, 2008) but there was a little improvement to 49% as of 2013 when the state government expressed its commitment to support partnership for reviving routine immunization in northern Nigeria-maternal neonatal and child health (PRRINN-MNCH) to scale up to improve maternal and perinatal health in the state (PRRINN-MNCH, 2013) and yet more than 67% of pregnant women did not receive four ANC services in the state as recommended by World Health Organisation (Umar and Bawa, 2015). Antenatal care service is a component of maternal health services that is aimed at improving maternal and neonatal health when there is significant **Utilization** and increased coverage (Villar et al., 2001). Yobe State is one of the leading states in Nigeria in term of low ANC services **Utilization** and poor maternal and perinatal health outcome (NDHS, 2013). However, most of the health statistics in the state were scarce (YMOH, 2010) to estimate the maternal mortality but ANC coverage is less than 50% (PRRINN-MNCH, 2013). Antenatal care services if maximally utilised is strongly associated with good maternal and neonatal outcome and improved maternal and perinatal health (Vogel et al., 2014). The study aimed to analysed and recommended an interventions in ANC services in order to increase utilization to improve maternal and perinatal health in Yobe State, Nigeria.

2. Methods

This is cross-sectional study using secondary data from local and international literatures; databases used are PubMed, Medline and Global health. The conceptual framework is based on socio ecological model.

The analytical tools used to analysed the intervention strategies are based on the Walley and Wright, (2010) assessment of the set of criteria of technical effectiveness, organisational feasibility, sociocultural feasibility, financial feasibility and equity consideration.

- **Intrapersonal determinants**: These include individual's level of education, literacy, socioeconomic status and emotions.
- **Interpersonal determinants:** This describes the network of families and peers influence including social support, marital relations, decision making power, communication and their effect on maternal health.
- **Community level determinants**: These include the role of community leaders, health and traditional beliefs; cultural norms and misconceptions; Gender issues and their influence on ANC services.
- **Health system determinants**: These include health institutions and resources; including heath facilities, health policy health human resources, health services, access and Utilization of ANC services.
- **Structural determinants**: These include equity, conflicts, poverty and other political issues that could affect ANC services.

Articles related to developing countries and accessible in any year of publication were included in the study

3. Results

The findings explores the utilization of antenatal care (ANC) services in Yobe State and analyses the determinants of ANC services utilization right from influence of intrapersonal, interpersonal; community, health system and structural determinants and how they could have affected the Utilization of ANC service among pregnant women.

Yobe has been recognised as one of the less performing state in Nigeria when comes to ANC services utilization (NDHS, 2013). The proportion of pregnant women who currently have atleast one ANC visit in Yobe state is only 49% (PRRINN-MNCH, 2013) compare with the national figure of 68.9% (MDGs, 2015) and more than 67% of pregnant women in Yobe did not had atleast four ANC visits as recommended by World Health Organisation (Umar and Bawa, 2015).

The low ANC Utilization is not unrelated to barriers such as low level of education and literacy; low socioeconomic status, poor means of transportation, lack of awareness about the importance of ANC services among pregnant women, cultural misconceptions and lack of women autonomy (NDHS, 2013). Others are insufficient workforce for ANC services and poor healthcare provider skill and attitudes (Umar and Bawa, 2015). Most of these factors have influence on health seeking behaviours of pregnant women including willingness to seek ANC services, accessing health facilities and quality ANC services from the healthcare providers (Rai et al., 2012). Figure 3 below shows the ANC service coverage in Yobe and Nigeria.

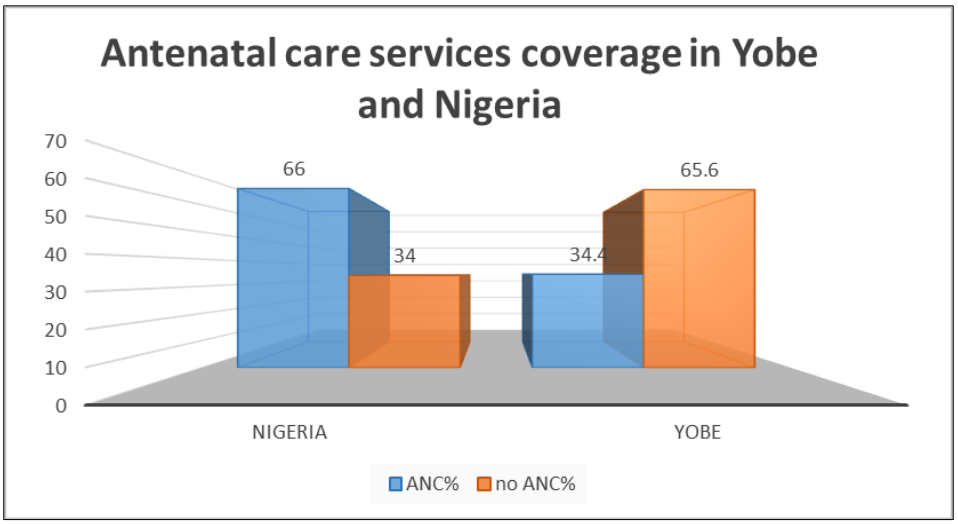

Figure 1 ANC services coverage in Nigeria and Yobe State. (Author, 2016)

3.1. Intrapersonal Determinants

3.1.1. Women education

The education level of women is a significant determinant of health seeking behaviour in ANC services (Singh et al., 2012). Yobe state is one of the poor region in terms of education in Nigeria, the proportion females with no formal education is 86% and only 2.7% among the women have formal education beyond secondary school (NDHS, 2013). As a result, greater proportion of the pregnant women do not know the importance of ANC and hence not utilise the ANC services especially those in rural areas where the proportion of women having no formal education is higher (NDHS, 2013).

3.1.2. Women Literacy

The higher level of literacy provides the basis for education which increases the knowledge of importance of ANC services and Utilization (Nisar and white, 2003). The proportion of women who cannot read is higher among women in Yobe state, especially in rural areas compare to their urban counterpart. The proportion of illiterate women in Yobe state is 87% which make the state with one of the highest proportion of illiterate women in Nigeria and carries the highest burden of illiteracy in the north-eastern Nigeria hence reducing their intrapersonal opportunity to seek and utilise the ANC services (NHDS, 2013).

3.1.3. Socioeconomic status

In developed worlds, maternal health care (MHC) is free at point of service, because health is considered as a part of the economy which is contrary to developing countries where low income and poverty as major barriers to access have decreased Utilization of ANC services (Akpomuvie, 2010). The employment rate among women in Yobe state is only 34% although chances of getting employed depend on the level of education, and predominant occupation among women are sale of goods and agricultural activities which accounts for 58% and 20% respectively (NDHS, 2003 and NDHS, 2013). Considering these as their means of income is not always feasible to afford the cost ANC services especially in private maternity care and some of the public health centres where the cost of maternity services is unbearably high.

3.2. Community and Interpersonal Determinants

3.2.1. Cultural misconceptions

Cultural misconceptions and religious beliefs in Nigeria including Yobe have a significant influence on ANC services Utilization (Babalola and Fatusi, 2009). In rural areas, where the greater proportion of the uneducated women lives, cultural misconceptions are predominant as women prefer to be attended by traditional birth attendant (TBAs) for their ANC services than modern healthcare (Falusi and Ijadumola, 2003). This is due to the beliefs that traditional healthcare provides better care than the modern healthcare. The practice is higher across northern states where Yobe is situated due to low level of education. For instance, they believed that first pregnancy shouldn't be attended to, talkless of attending ANC services and hence woman should deliver alone because of (kunya) shame (Walls, 1998) and TBAs are only called to cut the umbilicus (Okorjie, 1994).

Pregnant women are denied of their rights seek ANC services (Babalola and Fatusi, 2009) and barred from taking most of the nutritious food in some rural communities leading to malnutrition in pregnancy (Chukueze, 2010). For instance, taking milk may result in big baby and difficult delivery or taking cold water may cause chest infection to the child etcetera (Author's experience). ANC services could address the issues of nutrition in pregnancy by providing iron, folic Acid and multivitamin supplements. However, to my knowledge and my literature search, the evidence of knowledge of the women and their perception on ANC drugs in Yobe State is scarce.

3.2.2. Families and peers influence

The influence of family structure on women health is largely determined by the husband level of education and relationship with the wife, highly educated husbands may have a good relationship with their wives allowing them to decide for their MHC (UNDP, 2011). Men play an important role in ANC services Utilization but cultural beliefs (Mumtaz and Salway, 2007), low level of Education (Tann et al., 2007) and lack of time (Turan et al., 2001) are some contexts based barriers to men participation in ANC which are in keeping with Yobe context as 73% of the women reported husbands have the absolute right to decide for their maternal health (NDHS, 2003). The influence of families and peers on pregnant women in Yobe beside their husbands is evident especially in rural areas where grandmothers, mothers and other family members could decide on MHC of pregnant women. This is not unrelated to the low level of education, literacy, and cultural misconceptions in the communities toward ANC services and its Utilization (NDHS, 2008).

3.3. Health System Determinants

3.3.1. Access to maternal health services

As in other low middle income countries (LMIC), women access to MHS in Nigeria has been counteracted with various challenges; including financial constraints, transportation to seek healthcare and decision making power to seek MHC. In Yobe, 70% of the women have at least one of those challenges which make access to ANC services by pregnant women low in the state (NDHS, 2013). ANC services are delivered at health facilities throughout the state despite the challenges to access and no any outreach programme adopted as part of the health policy, this makes the disadvantaged pregnant women living in hard to reach areas to lack access to MHS.

Yobe State has more than 500 public and private health care centres including tertiary, secondary and primary health centres (YMOH, 2007) and almost all are delivering ANC services. However, the package may differ depending on the level of the health facility and cost of services. Yobe State government have shown commitment in strengthening the health system in terms of human resources, equipment and infrastructure; and above all declare free maternal and child health (MNCH) in all public health facilities in order to tackle the problems of the cost of service and transportation as barriers to access. Table 2 shows the summary of the healthcare facilities in Yobe State.

Table 1 Health care facilities in Yobe State (Geidam et al., 2014.)

Health care institutions	Present number
Tertiary hospitals	3
General Hospitals	12
Maternal and Child Health centres	102
Health clinics	97
Health posts and Dispensaries	290
Model primary health centres	13
Private health centres	20
Total	537

3.4. Human resource for health

In the last decade, Nigeria is only comparable with Egypt and south Africa in terms of human resources for health (HRH) especially doctors and nurses. There were 30 doctors and 100 nurses per 100, 000 populations which was beyond the sub Haran African average of 15 doctors and 72 nurses per 100,000 populations (WHO 2006 cited in NMOH, 2007). However, most of these health professionals have migrated out of the country for better job condition abroad (AHWO, 2008). Nigeria has adopted the HRH policy to ensure an adequate and skilled pool of health workforce but migration and low distribution across the country's health facilities had led to the poor provision of essential health services (WHO, 2008). Beside the emigration, there is an inequitable distribution of the remaining health workers and gross disparity among rural and urban dwellers which have affected the access and utilization of ANC services (NMOH, 2007).

Yobe State is one of the leading states in terms of health workforce constraints in Nigeria (NMOH, 2007), this is with respect to number, skill and capacity to perform health task (YMOH, 2010). ANC services are mostly delivered by nurses, midwives, community health extension workers (CHEWs) and occasionally doctors in Yobe State. The gross insufficiency of the health workforce in the state had led to the poor access and utilization of ANC services (YMOH, 2010). Figure 2 shows the summary of the ANC providers in Yobe as of 2013.

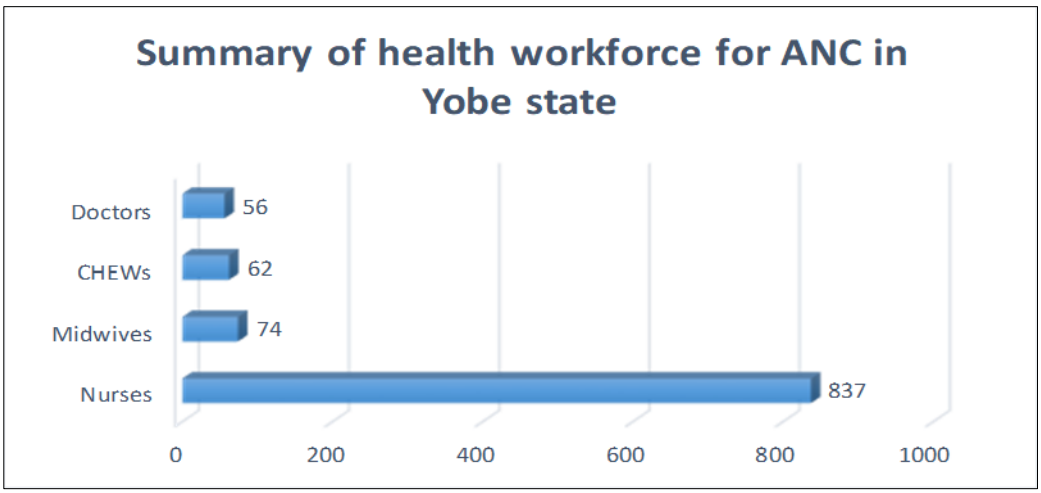

Figure 2 Health workforce for ANC services in Yobe State (Geidam et al., 2014)

3.5. Health policy

Nigerian national health policy formulated in 1988 was aimed at providing quality health care for all (NDHS, 2003). However, as a result of health sector reforms it was later reviewed to integrate and incorporate other missing components (NMOH, 2004). The overall objectives of the reviewed health policy were in line with and support the efforts of then millennium development goals MDGs (now sustainable development goals SDGs) to achieve its aims by the year 2015 through a framework of primary health care services (NDHS, 2013). The Yobe state health system has

adopted the national health policy and is organised in to primary, secondary and tertiary levels of health care (YMOH, 2010). In order to improve maternal health through the primary health care, Yobe State government have established state primary health care management board (SPHCMB) (YMOH, 2010) and has been functioning for the last 5 years. The state government further declared free MNCH across the state to minimise the pressure of cost of services to pregnant women and under-5 children and allow maximum utilization of ANC and other MHS across the state.

3.6. Inequity in maternal health services.

Health resources allocation in Nigeria is largely varied across the country regions and unevenly distributed depending on the geopolitical zone, an area of residence and level of development of a region (AHWO, 2008). The northern part of the country, for instance, has low health resources in terms of facilities, equipment and human resources compare to the southern part and rural areas compare to the urban (AHWO, 2008). Most of the ANC services providers in Yobe state are in urban areas where as the rural areas which need more MHS due to poverty, low level of education and cultural issues hence lagging behind except for CHEWs which are insufficient both in term of skills and number to deliver the ANC services.

3.7. Structural Determinants

3.7.1. Conflicts and insurgency

In Sahel Africa, about 2.8 million people have been displaced 2 years ago and north eastern Nigeria is one of the most affected regions (UNOHA, 2014). In the last four years, Yobe State has been under serious insurgency from boko haram sect, as a result, many health workers who are providing MHS have fled the state, some were killed while other were abducted (Ager et al., 2015). Some have abandoned their jobs (Lembani et al., 2014) and others were detained unnecessarily by military as suspects of insurgency. This had led to gross insufficiency in health workers that have compromised ANC services delivery. However, the situation is under control and most internally displaced persons (IDPs) have started returning back to their homes and health workers are returning gradually which may improve the access and utilization ANC services.

3.7.2. Poverty

United Nations human development report (1998) ranked Nigeria's poverty level as deteriorating (Obayelu and Obayemi, 2010). Yobe State is among the 3 poorest states in the country (Omideyi, 2007) with 83.3% of the population are living in poverty (Soludo, 2007). The poverty level among women in Yobe State is heavily contributed by the low level of the education, literacy, gender inequalities and unemployment (NDHS, 2013). This serve as a barrier to utilization of ANC services among pregnant women in the state. More than 50% the population are living on less than 1$ per day (Omideyi, 2007) and the situation is more in rural areas with 63.8% than urban areas with 43.1% as of 2004 according to National bureau of statistics NBS (2007) report (Omonona, 2009).

4. Discussion

Several important issues have been discussed in the previous chapter. However, the interventions of some issues like conflicts, poverty and women education are beyond the scope of this study and hence not discussed. The interventions below are subject to stability and return of peace to the Yobe State from the conflicts.

4.1. Outreach and health education programme

An outreach and health education programme is an activity which involves providing services to population who are underserved and have no access to those services through reaching out to their communities (Hardy et al., 2010). The community outreach programme is cost effective (Andrews et al., 2004 and Fedder et al., 2003) and increases access to healthcare and knowledge; and promote social and emotional support among women (Andrews et al., 2004). Low level of female education and literacy were some of the barriers to Utilization of ANC services especially in rural areas of Yobe state as discussed in the previous chapter. Reaching out and educating the pregnant women in their communities on matters related to ANC will increase their knowledge and awareness about the importance of ANC services, alleviate cost of transport to seek healthcare hence increase Utilization of ANC services according to studies.

Studies in Nepal (Acharya and Celand, 2000), India (Paul and Singh, 2004), Pakistan (Wajid et al., 2013) and Ethiopia (Afework et al., 2014 and Medhadniye et al., 2012) have shown that health education through outreach programmes is associated with increased ANC services utilization and coverage. In Pakistan; CHWs and TBAs are trained to visits pregnant women with aim of health education and awareness about ANC. This had resulted in increased utilization of ANC services by 44% (Wajid et al., 2013). In Ethiopia, CHEWs conducted home visits to pregnant women was found to

be associated with increased ANC utilization by 89% in one region (Afework, et al., 2014) and 54% in another rural setting (Medhadniye et al., 2012).

This strategy is generally acceptable by the communities in Yobe State and feasible to implement. Utility buses are available in YMOH for transportations, CHEWs and midwives would be trained to carry out the task under supervision, information, education and communication (IEC) materials and the ANC packages that are currently in use would be strengthen to meet the demand of the programme although health workforce and financial constraints might be some threats to sustainability. Health education is an effective strategy to promote health and improve health literacy. Outreach and health education programme is an effective way of promoting health to overcome barriers to MHS increase **Utilization** of ANC services in rural communities where lack of education, lack of access to media and inequity in access to healthcare do exist (Nutbeam, 2000).

4.2. Involvement of men in ANC services

Men involvement is a process by which male partners would participate in supporting their pregnant women to utilise ANC services. International conference on population and development held in Cairo 1994 and fourth women's international conference Beijing 1995 have recognised the importance of involving men in promoting sexual and reproductive health; and United Nations Population Fund (UNFPA) proposed post-Cairo and post-Beijing agenda to empower women through changing men behaviour (Sternberg and Hubley, 2004). The importance of men involvement in MHS has being increasingly recognised in women decision to seek ANC (Mullany et al., 2007). As mentioned in chapter 3, lack of women decision making power is one of the barriers for ANC **Utilization** in Yobe State, therefore involvement of men in maternal health services (MHS) brings about good understanding among couples, and men would support their pregnant women to seek and utilise ANC services according to studies in Indonesia and Nepal (Mullany et al., 2007); turkey (Turan et al., 2001), India (Mishra et al., 2004 and Bhalerao et al., 1984) and south Africa (Mullick et al., 2005).

The intervention would promote health seeking behaviour of pregnant women and ensures support to the female partners to access ANC services (Mullany et al., 2007). This strategy is feasible in Yobe State though cultural issues and low awareness are the barriers to men participation in ANC services. The available ANC providers would be train on the task; media, community leaders and volunteers would be involved for more awareness through health promotion strategies both at clinics and community levels. However, context based barriers such as low awareness and cultural issues has make the presence of men low during education sessions at ANC clinics (Tweheyo et al., 2010; Mullick et al., 2005 and Mishra et al., 2004).

4.3. Community based health insurance scheme

Health insurance scheme is a health financing system that aims at increasing health coverage and preventing citizens from catastrophic spending on medical care (Mohammed et al., 2011). Community health insurance scheme (CBHIS) targets the poor communities and individuals to access healthcare at an affordable cost (Mebratie et al., 2013). It is culturally, socially and politically acceptable (Criels and Kegels, 1997) and affordable (Ransom, 2002) if communities are voluntarily participated and payments are subsidized (WHO, 2007). Studies have shown CBHIS allow pregnant women to access MHS at any time hence increase ANC services utilization.

The scheme has led to increased utilization of ANC services in Ghana (Dixon et al., 2014; Owoo and Lambon-Quayefio, 2013), Mali (Smith and Sulzbachi, 2008); Bolivia (Borghi et al., 2006) and Taiwan (Chen et al., 2003). Despite the various successes of the scheme, it requires good health policy and government commitment for implementation (Obernmann et. al, 2006). Currently this strategy has been poorly implemented in Yobe State and participation is less from the community but YMOH has been making some efforts to scale up for better coverage by increasing membership and more public awareness at ANC clinics. In Yobe State, communities, Non-governmental organisations and donor agencies are making much impacts in healthcare, which are important in supporting the scheme in various capacities (Ekman, 2004; Criel and Kegels, 1997) as in case of South Africa and Cambodia (Jamison et al., 2006) in order to ensure sustainability. The media is currently involved in public awareness on health issues in Yobe; together with trained community volunteers would deliver more community enlightenment on CBHIS.

4.4. Promoting rights to access sexual and reproductive health

ANC service is an important component of reproductive health right (Glasier et al., 2006). International conference on population development (1994) agreed to improve sexual and reproductive health; and foster reproductive right by providing universal health coverage. These rights include gender equality, equity, women empowerment and violence free environment to all women (Glasier et al., 2006). Policies, laws and guidelines were formulated by international and

local organisations to ensure women access to sexual and reproductive health to improve maternal health based on the context (Cook and Ngwena, 2006). In Uganda, frequent meeting between the community members and health staff on issues related to rights to reproductive health and access to quality ANC services has led to increased ANC services utilization among pregnant women by 22% and ANC seeking behaviour by 19% (Svensson and Bjorkman, 2009). In Uttar Pradesh India, health outreach campaign to marginalised rural areas on awareness of and right to entitled health services has increased ANC services utilization by 30%, Tetanus toxoid injections during pregnancy by 27% and ANC drugs collection by 24% (Pandey et al., 2007). According to Ganju et al., (2014), weekly outreach visit to families during pregnancy through community participation has led to more awareness of health right among pregnant women and increased ANC utilization by 23% and 22% respectively in two different rural communities of India. (Ganju et al., 2014 cited in George et al., 2015).

Due to the low level of education and literacy among women in Yobe State especially those living in rural areas; they are not aware of their right to access health care as citizens. It is the responsibility of YMOH to define the law in simple language, make it clear and provide inform of guideline to health care providers and users to enhance the sociocultural feasibility as suggested by Cook and Ngwena, (2006) although cultural issues are prominent. However, with the current availability of transport means in YMOH, CHEWs in rural areas as mentioned in chapter 3 and government efforts to engage media and other health personnel in providing more public awareness in communities and clinics through health promotion strategies, it is feasible to implement and culturally acceptable.

4.5. Improving the skills and knowledge of ANC providers

Most of the healthcare providers are not well trained in their respective responsibilities which have led to poor quality of health care delivery (Mavalankar, 2001). Life-saving skills (LSS) training for midwives is one of the continuing medical education (CME) for increasing the skills and knowledge of the midwives in order to provide quality ANC with the aim of improving maternal and perinatal health (Taylor, 1992). The ANC providers are mostly nurse-midwives and CHEWs in Yobe State, hence re-training them to improve their knowledge and skills in providing quality ANC services to pregnant women is associated with increased quality of ANC service and utilization, and studies have shown.

Indonesia and Ghana have demonstrated and succeeded in improving the knowledge and performance of ANC services of midwives and CHW by CME on competency based live saving skills, this has led to increased skills, confidence and improved quality of ANC services (McDermott et al., 2001 and Taylor, 1992). Similarly, a two-year education and counselling programme for ANC providers in Istanbul Turkey has increased their knowledge and subsequent increased in utilization of ANC services and the knowledge of importance of ANC drugs among pregnant women (Coskun et al, 2009). Sri Lanka and Malaysia have both recorded a success in reducing maternal mortality and increasing ANC services Utilization when they have invested in improving skilled attendant in MHS (Pathmanathan and Liljestrand 2003).

This strategy has been poorly implemented in Yobe state to my experience, as currently YMOH in conjunction with NGOs use to organise LSS for maternal care providers but not on regular basis but is feasible to scale up for better improvement as the programme is funded by YMOH and the resources for the training such as health professionals (trainers) and training facilities are available. However, sustainability and clear guidelines and policy implementation remain the major challenge as in the case of low resource settings (Thairu and Schmidt, 2003).

4.6. Supportive supervision of ANC providers

"Supportive supervision is a process of helping staff to improve their own work performance continuously" (WHO, 2008). Supportive supervision is effective, motivate and retain staff (McAuliffe et al., 2013), and if conducted regularly would improve quality of ANC services delivery (Mubyazi et al., 2012). Insufficient skills and poor attitudes of ANC providers are barriers to Utilization of ANC services by pregnant women, these are not unrelated to the shortage of health workforce, poor motivation and staff workload as mentioned in previous chapter. In Malawi and Mozambique, supportive supervision of midwives resulted in increased staff motivation and job satisfaction (McAuliffe et al., 2013); with incentives has increased quality of care in Tanzania (Mubyazi et al., 2012); has enhanced clinical confidence and professional development in south Africa (Green et al., 2014); improved quality of care in Senegal (Suh et al., 2007); has increased productivity of nurses/midwives and CHWs in Ghana (Frimpong et al., 2011) and improved quality of services in Uganda (Agha et al., 2010).

Nurses, midwives and CHEWs are the ANC providers in Yobe State as discussed in the previous chapter, the level of supervisory visits by supervisors is quite negligible leading to low motivation which is a barrier to quality ANC services hence decreased ANC services Utilization. Supportive supervision has been poorly implemented in Yobe State due to issues of conflicts (Lembani et al., 2014). However, it is feasible to scale up as soon as conflicts is curtailed as resources

such as personnel (supervisors) and means of transport are available in addition to government commitment to provide funds logistics to ensure sustainability.

4.7. Employment of community health workers

Community health workers (CHWs) are the frontline contact of health professionals in rural and underserved communities (Love et al., 1997). They are not expensive to employ and easy to overcome cultural barriers to health being members of their communities (Andrews et al., 2004). They are cost effective in improving health of their community, they have the experience of cultural differences of their people toward health hence serve as a culture brokers (Love et al., 1997). As mentioned in chapter 3, most of the rural and marginalised population lack access to ANC services for several reasons including shortage of HRH, inequity in access and cultural issues. Studies have shown that one way of tackling such barrier is to employ, train and deploy community members as CHWs to rural areas where health workforce constraints and inequity in access to healthcare mostly exist.

In Indonesia, employment and training of community members as village midwives for home visits to educate, counsel and support pregnant women has improved access to skilled attendants and reduced inequity in access to MHS among the rural and marginalised pregnant women (Hatt et al., 2007); increased ANC services utilization in Uganda (Okuga et al., 2015); India (Baqui et al., 2008) and Bangladesh (Quayyum et al., 2013) irrespective of wealth quintiles. Among poorest in India, ANC utilization has increased from 10.7%-51.4% while among the least poor has increased from 20.8%-57.7% (Baqui et al., 2008) while in Bangladesh, first ANC visit increased from 76.5% to 93.2% and more than 4 ANC visits increased from 24.5% to 68.6% (Quayyum et al., 2013). This strategy is feasible in Yobe State, currently most of the ANC providers in the rural areas are CHEWs who have received formal training from school of health technology Nguru Yobe State (SOHT) and are well accepted by the communities. Yobe State government, by making it part of the health policy could scale up the employment of CHEWs upon graduation from SOHT and recruitment of community volunteers. However, financial constraints might be a challenge to pay and sustain the CHEWs.

4.8. Task shifting to lower cadres

World health organisation (WHO) defines task shifting as training an available cadre to acquire an additional skills and knowledge for a short period to carry out a new task and recommended by WHO as a mechanism of improving maternal and perinatal health especially in developing countries (Lewis et al., 2012). It is associated with increased productive efficiency such as increase in patients' access, overcoming health workforce challenges, less training time and low cost; and decreased staff workload (Fulton et al., 2011). However, community acceptability in Yobe State may varies because of the belief by the educated individuals that the trained cadres are not professionals to provide the designated health services but the poor rural population considers all healthcare providers are same in service provision. Although my dissertation mainly focused on ANC services Utilization, most studies discussed task shifting in emergency and basic obstetric care rather than ANC services, the trained cadres could carry out obstetric surgical procedures. For instance, emergency caesarean section is conducted non-physician clinicians in Ethiopia (Gessessew et al., 2011), assistant medical officer in Tanzania and clinical officer in Malawi (Dawson et al., 2013); district health team in Senegal (Brouwere et al., 2009) and medical officers as obstetric care anaesthetists in India (Mavalankar and Sriram, 2009).

This strategy is feasible though has never been practice in Yobe based on my experience but currently under certain circumstances other cadres of health professionals are taking over doctors' responsibilities. With the available health professionals (as trainers) and training facilities; other cadres of healthcare could be trained for such purpose and generally acceptable by the health professionals. In spite of my limitation in finding studies that relates task shifting to ANC services directly, I felt the same cadre that were trained to take over other obstetrics responsibility may also provide ANC services in Yobe state due health workforce shortage and staff workload.

4.9. Financial incentive programmes

Financial incentives programme is a financial support (in cash or voucher) to poor rural and marginalised population to motivate them to utilise particular health services by reducing or removing financial barrier to that service (Obare et al., 2013 and jehan et al., 2012). Financial incentives programme is effective (Berker et al., 2007) and many developing countries have implemented the programme to increase utilization of ANC services. These include Nepal (Berker et al., 2007), Bangladesh (jehan et al., 2012), Kenya (Obare et al., 2013), Rwanda (Basinga et al., 2010), Mexico (Gertler and Boyce, 2011) and Honduras (Morris et al., 2004). Government of Nepal and Kenya have implemented financial incentives scheme (FIS) for poor pregnant women has resulted in increased ANC services utilization and birth preparedness (Obare et al., 2013 and Berker et al., 2007). Studies also shows that conditional cash transfer (CCT) by after attending atleast 4 ANC in two different regions in Bangladesh and Honduras has succeeded in increased utilization of ANC services (Jehan et al., 2012, Schmidt, 2010 and Morris et al., 2004).

Yobe State has implemented free MNCH currently as discussed in chapter 3, so this strategy serves as an alternative to the free MNCH especially when the free MNCH has not been progressing well after evaluation as both strategies are more or less have same objective and acceptable by the communities. The challenges encountered by this programme include corruption and hard to reach information in farthest rural population (Berker et al., 2007); lack of trust and transparency among beneficiaries, health providers and managers (Ahmed and Khan, 2011 and Nguyen et al., 2012) and poor sustainability (Pearson, 2004).

Table 2 Option Appraisal of proposed Strategies to Increase Utilization of Antenatal Care Services in Yobe State Nigeria

Strategy Options	**Technical Effectiveness**	**Organisational Feasibility**	**Sociocultural and Gender Feasibility**	**Financial Feasibility**	**Equity Consideration**
Outreach and Health education programme	High: shown to increase ANC services utilisation	High: Resources are available (Transport, personnel, IEC)	High: Acceptable	Moderate: Requires allowances to outreach workers	High: Equitable access to ANC services
Involvement of men in ANC services	High: shown to increase support to pregnant women to seek and utilises ANC services	Moderate: Need to train ANC providers and involve media and communities	Low: Cultural and religious issues are strong, needs more public awareness	Moderate: Requires cost of paying media and training the awareness campaigners	High: Equitable bear of responsibilities of pregnancy by couple.
Community based health insurance scheme	High: shown to increase ANC services utilisation	High: Already poorly implemented, needs more public awareness and involvement of other sectors	High: Acceptable with more awareness and subsidised premiums	Moderate: Requires cost paying incentives to public awareness campaigners	High: Equitable access to ANC services
Improving skills and knowledge of ANC providers	High: shown to increase quality and utilisation of ANC services	High: Has been poorly implemented, needs to be strengthened	High: Acceptable	Moderate: Requires cost of training materials and allowances to training team	High: Equitable access to skilled attendants
Supportive supervision of ANC providers	High: Shown to increase quality and utilisation of ANC services and staff motivation	High: Resources are available (transport, and supervisors)	High: Acceptable	Moderate: Requires allowance to supervisors and incentives for supervisees	High: Equitable access to quality ANC services
Employment of CHWs	High: Shown to increase access and utilisation of ANC services; reduce inequity in access to MHS	Moderate: Automatic employment of CHEWs might be adapted as health policy	High: Acceptable as CHEWs are mostly community members	Low: Requires huge cost of paying salaries/allowances to CHEWs	High: Equitable access to ANC services
Task shifting to lower cadres	High: Shown to improve basic obstetrics care	High: Trainers, trainees and training facilities are available	Moderate: Acceptable in rural areas and need public awareness in urban areas	Moderate: Requires cost of training and allowances to training team	High: Equitable access to ANC services

Many interventions in ANC have been discussed so far from the study, some have been implemented while others have never been implemented in Yobe state. The options appraisal table 2 below shows not all interventions but prioritised some interventions that need much attention in current situation of ANC services in Yobe State.

5. Conclusion

Antenatal care has been recognised as the most important component of maternal health services to identify and treat pregnancy related complications earlier with the aim of improving maternal and perinatal health. Several determinants have been identified that have contributed to low Utilization of ANC services in Yobe State. These include low socioeconomic status, low education, cultural misconceptions, health beliefs, health services, human resource issues, poverty and conflicts among others. Many interventions have been identified and appraised from the literature that are effective to increase ANC Utilization such as men involvement in ANC, outreach and health education; employment and improving the skills of ANC providers; task shifting, supportive supervision among others. Some interventions have been implemented while others have never been implemented. Recommendations are made to stakeholders based on effectiveness and feasibility in Yobe context to implement the new interventions and to review and improve the fairly or poorly implemented ones in order to increase Utilization of ANC services. Some determinants such as conflicts, poverty and women education are beyond the scope of this dissertation hence further studies are hereby suggested to be conducted by the primary stakeholders.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Acharya, L.B. and Cleland, J. 2000. Maternal and child health services in rural Nepal: does access or quality matter more? Health Policy and Planning. 15(2), pp.223-229.

[2] Adamu, Y.M. and Salihu, H.M. 2002. Barriers to the use of antenatal and obstetric care services in rural Kano, Nigeria. Journal of obstetrics and gynaecology. 22(6), pp. 600-603.

[3] Afework, M.F., Admassu, K., Mekonnen, A., Hagos, S., Asegid, M. and Ahmed, S. 2014. Effect of an innovative community based health program on maternal health service utilization in north and south central Ethiopia: a community based cross sectional study. Reproductive Health. 11, p.28

[4] Africa health workforce observatory. 2008. Human Resources for Health. Country Profile Nigeria. AHWO. Nigeria. Available from: http://www.hrh-observatory.afro.who.int/en/country-monitoring/81-nigeria.html

[5] Ager, A.K., Lembani, M., Mohammed, A., Ashir, G.M., Abdulwahab, A., Pinho, H., Delobelle, P. and Zarowsky, C. 2015. Health service resilience in Yobe state, Nigeria in the context of the Boko Haram insurgency: a systems dynamics analysis using group model building. Conflict and health. 9(1), p.1.

[6] Agha, S. 2010. The Impact of a Quality-improvement Package on Reproductive Health Services Delivered by Private Providers in Uganda. Studies in family planning. 41(3), pp.205-215.

[7] Ahmed, S. and Khan, M.M. 2011. A maternal health voucher scheme: what have we learned from the demand-side financing scheme in Bangladesh? Health policy and planning. 26(1), pp.25-32.

[8] Akpomuvie, O. B. 2010. Poverty, access to health care services and human capital development in Nigeria. African Research Review. 4.

[9] Alaska Department of Health and Social Services (ADHSS). 2015. Division of Public Health: Section of Women's, Children's and Family Health. [Online]. [accessed 3 July 2016]. Available from: http://dhss.alaska.gov/dph/wcfh/Pages/perinatal/default.aspx

[10] Andrews, J.O., Felton, G., Wewers, M.E. and Heath, J. 2004. Use of community health workers in research with ethnic minority women. Journal of Nursing Scholarship. 36(4), pp.358-365.

[11] Babalola, S. and Fatusi, A. 2009. Determinants of use of maternal health services in Nigeria-looking beyond individual and household factors. Biomed Central. Pregnancy and childbirth. 9(1), p 1.

[12] Baqui AH, Rosecrans AM, Williams EK, Agrawal PK, Ahmed S, Darmstadt GL, Kumar V, Kiran U, Panwar D, Ahuja RC, Srivastava VK, Black RE, and Santosham, M. 2008. NGO facilitation of a government community-based maternal and neonatal health programme in rural India: improvements in equity. Health Policy Plan. 23(4), pp. 234–243

[13] Barker, C.E., Bird, C.E., Pradhan, A. and Shakya, G. 2007. Support to the Safe Motherhood Programme in Nepal: an integrated approach. Reproductive health matters. 15(30), pp.81-90.

[14] Basinga, P., Gertler, P.J., Binagwaho, A., Soucat, A.L., Sturdy, J.R. and Vermeersch, C. 2010. Paying primary health care centers for performance in Rwanda. World Bank Policy Research Working Paper Series. Vol

[15] Bhalerao, V. R., Galwankar, M. M., Kowli, S. S., Kumar, R. R., and Chaturvedi, R. M. 1984. Contribution of the education of the prospective fathers to the success of maternal health care programme. Journal of Postgraduate Medicine [Online] [Accessed 19 Mar 2016]. Available from: http://www.jpgmonline.com/text.asp?1984/30/1/10/5493

[16] Borghi, J.O., Ensor, T., Somanathan, A., Lissner, C., Mills, A. and Lancet Maternal Survival Series steering group. 2006. Mobilising financial resources for maternal health. The Lancet. 368(9545), pp.1457-1465.

[17] Chen, C.S., Liu, T.C. and Chen, L.M. 2003. National Health Insurance and the antenatal care use: a case in Taiwan. Health policy. 64(1), pp.99-112.

[18] Chukuezi, C. 2010. Socio-cultural factors associated with maternal mortality in Nigeria. Research journal of social sciences. 1(5), pp. 22-26.

[19] Cook, R.J. and Ngwena, C.G. 2006. Women's access to health care: the legal framework. International Journal of Gynecology and Obstetrics. 94(3), pp.216-225.

[20] Coşkun, A.M., Karakaya, E. and Yaşer, Y. 2009. A safe motherhood education and counselling programme in Istanbul. The European Journal of Contraception and Reproductive Health Care. 14(6), pp.424-436.

[21] Criel, B. and Kegels, G. 1997. A health insurance scheme for hospital care in Bwamanda district, Zaire: lessons and questions after 10 years of functioning. Tropical Medicine and International Health. 2(7), pp.654-672.

[22] Dawson, A.J., Buchan, J., Duffield, C., Homer, C.S. and Wijewardena, K. 2013. Task shifting and sharing in maternal and reproductive health in low-income countries: a narrative synthesis of current evidence. Health policy and planning. p. czt026.

[23] Dixon, J., Tenkorang, E.Y., Luginaah, I.N., Kuuire, V.Z. and Boateng, G.O. 2014. National health insurance scheme enrolment and antenatal care among women in Ghana: is there any relationship? Tropical Medicine and International Health. 19(1), pp.98-106.

[24] Ekman, B. 2004. Community-based health insurance in low-income countries: a systematic review of the evidence. Health policy and planning. 19(5), pp.249-270.

[25] Fagbamigbe, A.F. and Idemudia, E.S. 2015. Barriers to antenatal care use in Nigeria: evidences from non-users and implications for maternal health programming. Biomed central pregnancy and childbirth. 15(1), p.1.

[26] Fatusi A.O. and Ijadunola K.T. 2003. National Study on Essential Obstetric Care Facilities in Nigeria Abuja, Federal Ministry of Health and United Nations Population Fund (UNFPA).

[27] Fedder, D.O., Chang, R.J., Curry, S. and Nichols, G. 2003. The effectiveness of a community health worker outreach program on healthcare utilization of west Baltimore city Medicaid patients with diabetes with or without hypertension. Ethnicity and Disease. 13(1), pp.22-27.

[28] Frimpong, J.A., Helleringer, S., Awoonor-Williams, J.K., Yeji, F. and Phillips, J.F. 2011. Does supervision improve health worker productivity? Evidence from the Upper East Region of Ghana. Tropical Medicine and International Health. 16(10), pp.1225-1233.

[29] Fulton, B.D., Scheffler, R.M., Sparkes, S.P., Auh, E.Y., Vujicic, M. and Soucat, A. 2011. Health workforce skill mix and task shifting in low income countries: a review of recent evidence. Human Resource Health. 9(1), p.1.

[30] Galadanci, H.S., Ejembi, C.L., Iliyasu, Z., Alagh, B. and Umar, U.S. 2007. Maternal health in Northern Nigeria—a far cry from ideal. British Journal of Obstetrics and Gynaecology. An International Journal of Obstetrics and Gynaecology. 114(4), pp. 448-452.

[31] Geidam A.J., Prasad, R. and Bello, A.I. 2014. Child and maternal health care using telemedicine: A case study of Yobe state, Nigeria. International Journal of Computer Engineering and Applications. 8(1), pp. 1-11

[32] George, A. S., Branchini, C., and Portela, A. 2015. Do Interventions that Promote Awareness of Rights Increase Use of Maternity Care Services? A Systematic Review. PLoS ONE. 10(10), e0138116.

[33] Gertler, P. and Boyce, S. 2001. An Experiment in Incentive-based Welfare: The impact of Progresa on health in Mexico. University of California, Berkeley. pp. 30-37.

[34] Gessessew, A., Ab Barnabas, G., Prata, N. and Weidert, K. 2011. Task shifting and sharing in Tigray, Ethiopia, to achieve comprehensive emergency obstetric care. International Journal of Gynecology and Obstetrics. 113(1), pp.28-31.

[35] Glasier, A., Gülmezoglu, A.M., Schmid, G.P., Moreno, C.G. and Van Look, P.F. 2006. Sexual and reproductive health: a matter of life and death. The Lancet. 368(9547), pp.1595-1607.

[36] Green, A., de Azevedo, V., Patten, G., Davies, M.A., Ibeto, M. and Cox, V. 2014. Clinical mentorship of nurse initiated antiretroviral therapy in Khayelitsha, South Africa: A quality of care assessment. PLoS one. 9(6), p. e98389.

[37] Gulliford, M., Figueroa-Munoz, J., Morgan, M., Hughes, D., Gibson, B., Beech, R. and Hudson, M. 2002. What does 'access to health care' mean? Journal of health services research and policy. 7(3), pp.186-188. Available from: http://www.ncbi.nlm.nih.gov/pubmed/12171751

[38] Hardy, K., Kingston, S., and Sanders T. 2010. New Sociologies of Sex Work. [Online] [Accessed 13 July 2016]. Available from: https://www.dawsonera.com/abstract/9780754699682

[39] Hatt L, Stanton C, Makowiecka K, Adisasmita A, Achadi E, Ronsmans, C. 2007. Did the strategy of skilled attendance at birth reach the poor in Indonesia? Bull World Health Organ. 85(10), pp. 774–782.

[40] Hurst, T.E., Semrau, K., Gawande, A. and Hirschhorn, L.R. 2015. Demand-side interventions for maternal care: evidence of more use, not better outcomes. Biomed Central Pregnancy and childbirth. 15(1), p.1.

[41] Jamison, D.T., Breman, J.G., Measham, A.R., Alleyne, G., Claeson, M., Evans, D.B., Jha, P., Mills, A. and Musgrove, P. 2006. Pillars of the Health System.

[42] Jehan, K., Sidney, K., Smith, H. and De Costa, A. 2012. Improving access to maternity services: an overview of cash transfer and voucher schemes in South Asia. Reproductive health matters. 20(39), pp.142-154.

[43] Kaufman, M.R., Cornish, F., Zimmerman, R.S. and Johnson, B.T. 2014. Health behavior change models for HIV prevention and AIDS care: practical recommendations for a multi-level approach. Journal of acquired immune deficiency syndromes (1999). 66(Suppl 3), p. S250.

[44] Lembani, M., Mohammed, A., Abdulwahab, A., Garba, A., De Pinho, H., Delobelle, P., Zarowsky, C. and Ager, A. 2014. A case study of health service provision in Yobe State. Nigeria in the context of the Boko Haram insurgency. Columbia University of public health

[45] Lewin, S., Glenton, C., Gulmezoglu, A.M., Lavis, J. and Alvarez, E. 2012. WHO recommendations. Optimizing health worker roles to improve access to key maternal and newborn health interventions through task shifting.

[46] Love, M.B., Gardner, K. and Legion, V. 1997. Community health workers: who they are and what they do. Health Education and Behavior. 24(4), pp.510-522.

[47] Manitoba Centre for Health Policy (MCHP). 2010. Community Health Sciences. Term: Health Care Utilization. [Online]. [Accessed 3 July 2016]. Available from: http://mchp-appserv.cpe.umanitoba.ca/viewDefinition.php?definitionID=102752

[48] Mavalankar, D.V. 2001. Policy and management constraints on access to and use of life-saving emergency obstetric care in India. Journal of the American Medical Women's Association (1972). 57(3), pp.165-6.

[49] Mavalankar, D. and Sriram, V. 2009. Provision of anaesthesia services for emergency obstetric care through task shifting in South Asia. Reproductive Health Matters. 17(33), pp.21-31.

[50] McAuliffe, E., Daly, M., Kamwendo, F., Masanja, H., Sidat, M. and de Pinho, H. 2013. The critical role of supervision in retaining staff in obstetric services: a three country study. PLoS one. 8(3), p. e58415.

[51] McDermott, J., Beck, D., Buffington, S.T., Annas, J., Supratikto, G., Prenggono, D., Sri, M.F. and Achadi, E. 2001. Two Models of In-Service Training to Improve Midwifery Skills: How Well do They Work? Journal of midwifery and women's health. 46(4), pp.217-225.

[52] McLeroy, K.R., Bibeau, D., Steckler, A. and Glanz, K. 1988. An ecological perspective on health promotion programs. Health Education and Behavior. 15(4), pp.351-377.

[53] Mebratie, A.D., Sparrow, R., Yilma, Z., Abebaw, D., Alemu, G. and Bedi, A. 2013. Impact of Ethiopian pilot community-based health insurance scheme on health-care Utilization: a household panel data analysis. The Lancet. 381, p. S92.

[54] Medhanyie, A., Spigt, M., Kifle, Y., Schaay, N., Sanders, D., Blanco, R., GeertJan, D. and Berhane, Y. 2012. The role of health extension workers in improving utilization of maternal health services in rural areas in Ethiopia: a cross sectional study. Biomed Central health services research. 12(1), p.1.

[55] Millennium Development Goals (MDGs). 2015. Nigerian End-point Report 2015. Available from UNDP Nigeria website: www.ng.undp.org

[56] Mishra, A., Das, A., Ottolenghi, E., Huntington, D., Adamchak, S., Khan, M.E. and Homan, F. 2004. Involving men in maternity care in India. Frontiers in Reproductive Health, Population Council.

[57] Mohammed, S., Sambo, M.N. and Dong, H. 2011. Understanding client satisfaction with a health insurance scheme in Nigeria: factors and enrollees experiences. Health Research Policy System. 9(1), p.20.

[58] Morris, S.S., Flores, R., Olinto, P. and Medina, J.M. 2004. Monetary incentives in primary health care and effects on use and coverage of preventive health care interventions in rural Honduras: cluster randomised trial. The Lancet. 364(9450), pp. 2030-2037.

[59] Mubyazi, G.M., Bloch, P., Byskov, J., Magnussen, P., Bygbjerg, I.C. and Hansen, K.S. 2012. Supply-related drivers of staff motivation for providing intermittent preventive treatment of malaria during pregnancy in Tanzania: evidence from two rural districts. Malaria Journal. 11(48), pp.1-14.

[60] Mullany, B.C., Becker, S. and Hindin, M.J. 2007. The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: results from a randomized controlled trial. Health education research. 22(2), pp.166-176

[61] Mullick, S., Kunene, B. and Wanjiru, M. 2005. Involving men in maternity care: health service delivery issues. Agenda Special Focus. 6, pp.124-35.

[62] Mumtaz, Z. and Salway, S.M. 2007. Gender, pregnancy and the uptake of antenatal care services in Pakistan. Sociology of health and illness. 29(1), pp.1-26.

[63] National Population Commission (NPC) [Nigeria] and ICF International. 2014. Nigeria Demographic and Health Survey 2013. Abuja, Nigeria, and Rockville, Maryland, USA: NPC and ICF International.

[64] National Population Commission (NPC) [Nigeria] and ICF Macro. 2009. Nigeria Demographic and Health Survey 2008. Abuja, Nigeria: National Population Commission and ICF Macro.

[65] National Population Commission (NPC) [Nigeria] and ORC Macro. 2004. Nigeria Demographic and Health Survey 2003. Calverton, Maryland: National Population Commission and ORC Macro.

[66] Nguyen, H.T., Hatt, L., Islam, M., Sloan, N.L., Chowdhury, J., Schmidt, J.O., Hossain, A. and Wang, H. 2012. Encouraging maternal health service utilization: an evaluation of the Bangladesh voucher program. Social science and medicine. 74(7), pp. 989-996.

[67] Nigerian Ministry of Health [NMOH]. 2004. Revised national health policy. NMOH. Abuja.

[68] Nigerian Ministry of Health [NMOH]. 2007. National human resources for health strategic plan (2008 to 2012). NMOH. Abuja.

[69] Nisar, N. and White, F. 2003. Factors affecting utilization of antenatal care among reproductive age group women (15-49 years) in an urban squatter settlement of Karachi. JPMA. The Journal of the Pakistan Medical Association. 53(2), pp.47-53.

[70] Nutbeam, D. 2000. Health literacy as a public health goal: a challenge for contemporary health education and communication strategies into the 21st century. Health promotion international. 15(3), pp.259-267.

[71] Obare, F., Warren, C., Njuki, R., Abuya, T., Sunday, J., Askew, I. and Bellows, B. 2013. Community-level impact of the reproductive health vouchers programme on service utilization in Kenya. Health Policy and Planning. 28(2), pp.165-175.

[72] Obayelu, O.A. and Awoyemi, T.T. 2010. Spatial dimension of poverty in rural Nigeria. Journal of Development and Agricultural Economics. 2(6), pp. 231-244.

[73] Obermann, K., Jowett, M.R., Alcantara, M.O.O., Banzon, E.P. and Bodart, C. 2006. Social health insurance in a developing country: the case of the Philippines. Social Science and Medicine. 62(12), pp. 3177-3185.

[74] Okojie, C.E. 1994. Gender inequalities of health in the Third World. Social science and medicine. 39(9), pp.1237-1247.

[75] Omideyi, A.K., 2007. Poverty and development in Nigeria: trailing the MDGs? African Journal of Infectious Diseases. 1(1), pp. 3-17.

[76] Omonona, B.T. 2009. Knowledge review on poverty and rural development in Nigeria. International Food Policy Research Institute (IFPRI). Abuja.

[77] Pandey, P., Sehgal, A.R., Riboud, M., Levine, D. and Goyal, M. 2007. Informing resource-poor populations and the delivery of entitled health and social services in rural India: a cluster randomized controlled trial. Journal of the American Medical Association. 298(16), pp.1

[78] Partnership for reviving routine immunization in northern Nigeria; Maternal Neonatal and Child Health Initiatives 2013. Better Maternal, Newborn and Child Health in Northern Nigeria: Final Report 2013. Available from http//: www.prrinn-mnch.org

[79] Pathmanathan, I. and Liljestrand, J. 2003. Investing in maternal health: learning from Malaysia and Sri Lanka. World Bank Publications.

[80] Paul, V.K. and Singh, M. 2004. Regionalized perinatal care in developing countries. In Seminars in neonatology. 9(2), pp. 117-124.

[81] Pearson, M. 2004. Issues Paper: The case for abolition of user fees for primary health services. London: Department for international development (DFID). Health Systems Resource Centre.

[82] Quayyum, Z., Khan, M. N. U., Quayyum, T., Nasreen, H. E., Chowdhury, M., and Ensor, T. 2013. "Can community level interventions have an impact on equity and utilization of maternal health care" – Evidence from rural Bangladesh. *International Journal for Equity in Health.* **12**(22).

[83] Rai, R. K., Singh, P. K. and Singh, L. 2012. Utilization of maternal health care services among married adolescent women: insights from the Nigeria Demographic and Health Survey, 2008. *Women's Health Issues*. **22**(4), e407-e414.

[84] Ranson, M.K. 2002. Reduction of catastrophic health care expenditures by a community-based health insurance scheme in Gujarat, India: current experiences and challenges. *Bulletin of the World Health Organization*. **80**(8), pp.613-621.

[85] Rooney, C. 1992. Antenatal care and maternal health: how effective is it? A review of the evidence. World health Organisation. Geneva.

[86] Schmidt, J.O., Ensor, T., Hossain, A. and Khan, S. 2010. Vouchers as demand side financing instruments for health care: a review of the Bangladesh maternal voucher scheme. *Health policy*. **96**(2), pp. 98-107.

[87] Simkhada, B., Teijlingen, E.R.V., Porter, M. and Simkhada, P. 2008. Factors affecting the utilization of antenatal care in developing countries: systematic review of the literature. *Journal of advanced nursing.* **61**(3), pp. 244-260.

[88] Singh, P.K., Rai, R.K., Alagarajan, M. and Singh, L. 2012. Determinants of maternity care services utilization among married adolescents in rural India. PLoS one. 7(2), p. e31666.

[89] Smith, K.V. and Sulzbach, S. 2008. Community-based health insurance and access to maternal health services: evidence from three West African countries. Social science and medicine 66(12), pp.2460-2473.

[90] Soludo, C.C. 2007. Nigerian economy: Can we achieve the vision 20: 2020? Central Bank of Nigeria. Abuja.

[91] Sternberg, P. and Hubley, J. 2004. Evaluating men's involvement as a strategy in sexual and reproductive health promotion. Health promotion international. 19(3), pp.389-396.

[92] Suh, S., Moreira, P. and Ly, M. 2007. Improving quality of reproductive health care in Senegal through formative supervision: results from four districts. Human resources for health. 5(1), pp.1-12.

[93] Svensson, J. and Björkman, M. 2009. Power to the People: Evidence from a Randomized Field Experiment of a Community-Based Monitoring Project in Uganda. Quarterly Journal of Economics. 124(2), pp.735-769.

[94] Tann, C.J., Kizza, M., Morison, L., Mabey, D., Muwanga, M., Grosskurth, H. and Elliott, A.M. 2007. Use of antenatal services and delivery care in Entebbe, Uganda: a community survey. BMC pregnancy and childbirth. 7(1), p.1.

[95] Taylor, J.E. 1992. Life-saving skills training for midwives: report on the Ghanaian experience. International Journal of Gynecology and Obstetrics. 38, pp. S41-S43.

[96] Thairu, A. and Schmidt, K. 2003. Training and Authorizing Mid-Level Providers in Life-Saving Skills in Kenya. Shaping policy. p.69.

[97] Theuring, S., Mbezi, P., Luvanda, H., Jordan-Harder, B., Kunz, A. and Harms, G. 2009. Male involvement in PMTCT services in Mbeya Region, Tanzania. AIDS and Behavior. 13(1), pp.92-102.

[98] Turan, J.M., Nalbant, H., Bulut, A. and Sahip, Y. 2001. Including expectant fathers in antenatal education programmes in Istanbul, Turkey. Reproductive health matters. 9(18), pp.114-125.

[99] Tweheyo, R., Konde-Lule, J., Tumwesigye, N.M. and Sekandi, J.N. 2010. Male partner attendance of skilled antenatal care in peri-urban Gulu district, Northern Uganda. Biomed Central pregnancy and childbirth. 10(1), p.1.

[100] Umar, A.S., MHPM, F. and Bawa, S.B. 2015. Antenatal Care Services Utilization in Yobe State, Nigeria: Examining Predictors and Barriers. International Journal of Maternal and child health and Acquired immunodeficiency syndrome (IJMA). 4(1), pp. 35-46.

[101] United Nations development programmes. 2011. Discussion Paper. A Social Determinants Approach to Maternal Health: Roles for Development Actors. UNDP: New York.

[102] United Nations office for the coordination of humanitarian affairs. 2014. Humanitarian needs overview. Sahel region: Burkina Faso, Cameroon, chad, Gambia, Mauritania, Mali Niger, Nigeria and Senegal. UNOHA.

[103] Villar, J., Ba'aqeel, H., Piaggio, G., Lumbiganon, P., Belizán, J.M., Farnot, U., Al-Mazrou, Y., Carroli, G., Pinol, A., Donner, A. and Langer, A. 2001. WHO antenatal care randomised trial for the evaluation of a new model of routine antenatal care. The Lancet. 357(9268), pp.1551-1564.

[104] Vogel, J.P., Souza, J.P., Mori, R., Morisaki, N., Lumbiganon, P., Laopaiboon, M., Ortiz-Panozo, E., Hernandez, B., Pérez-Cuevas, R., Roy, M. and Mittal, S. 2014. Maternal complications and perinatal mortality: findings of the World Health Organization Multicountry Survey on Maternal and Newborn Health. BJOG: An International Journal of Obstetrics and Gynaecology. 121(s1), pp.76-88.

[105] Wajid A, White F, Karim M.S. 2013. Community Health Workers and Health Care Delivery: Evaluation of a Women's Reproductive Health Care Project in a Developing Country. PLoS ONE. 8(9): e75476.

[106] Wall, L.L. 1998. Dead Mothers and injured wives: the social context of maternal morbidity and mortality among the Hausa of Northern Nigeria. Studies in Family Planning. 29(4), pp. 341-359.

[107] Walley, J. and Wright, J. 2010. Public health: an action guide to improving health. 2nd Ed. New York: Oxford University Press.

[108] Wilkinson, D., Gouws, E., Sach, M. and Karim, S.S.A. 2001. Effect of removing user fees on attendance for curative and preventive primary health care services in rural South Africa. Bulletin of the World Health Organization. 79(7), pp.665-671.

[109] World Health Organisation. 2016a. Global Health Observatory (GHO) data. Available from: http://www.who.int/gho/maternal_health/reproductive_health/antenatal_care_text/en/

[110] World Health Organisation. 2016b. Health topic: maternal health). Available from: www.who.int/topics/maternal_health/en/

[111] World Health Organisation. 2016c. Maternal, newborn, child and adolescent health: Data, statistics and epidemiology. Available from http://www.who.int/maternal_child_adolescent/epidemiology/stillbirth/en/

[112] World Health Organization. 2014. Global Reference List of 100 Core Health Indicators. Working Version 5. [Online]. [Accessed 3 July 2016]. Available from: http://www.who.int/healthinfo/country_monitoring_evaluation/GlobalRefListCoreIndicators_V5_17Nov2014_WithoutAnnexes.pdf?ua=1

[113] World Health Organization. 2013. Achieving the health related Millennium Development Goals. In the South-East Asia Region: Measuring Indicators 2012. [Online]. [Accessed 3 July 2016]. Available from: http://apps.searo.who.int/pds_DOCS/B4929.pdf?ua=1

[114] World Health Organization. 2012. The WHO Application of ICD-10 to deaths during pregnancy, childbirth and the puerperium: ICD-MM. [Online]. [Accessed 3 July 2016]. Available from:

[115] http://www.who.int/entity/reproductivehealth/publications/monitoring/Chapter15_ICD_MM2012.xlsx?ua=1

[116] World Health Organisation. 2011. Closing the Gap: policy into practice on Social Determinants of Health. Discussion documents for the World Conference on Social Determinants of Health. Geneva: World Health Organisation.

[117] World Health Organisation. 2007. Everybody's business strengthening health systems to improve health outcomes-WHO'S Framework for Action. Geneva: WHO.

[118] World Health Organisation. 2008. Training for mid-level managers (MLM). Module 4: supportive supervision. Geneva: WHO.

[119] World Health Organization and UNICEF. 2014. Trends in maternal mortality: 1990 to 2013: estimates by WHO, UNICEF, UNFPA, The World Bank and the United Nations Population Division: Executive summary.

[120] Yobe State Ministry of Health. 2010. Strategic health development plan (2010-2015). YMOH. Damaturu.

[121] Yobe State Ministry of Health. 2007. Department of Planning Research and Statistics. YMOH. Damaturu.