# Factors influencing Maternal Health Care Delivery System in Mubi North and South Local Government Areas of Adamawa State, Nigeria.

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## ABSTRACT

The health of an individual is determined by various factors which may be intrinsic or extrinsic. In this paper, factors influencing Maternal Health Care Delivery System in Mubi North and South Local Government areas of Adamawa state have been examined. The data were collected from relevant primary and secondary sources through field surveys, interview schedules and the use of relevant literature and maps. 31 Maternal Health Care Delivery Centers were identified in the area and data were collected from 28 of them. Analyses involved the employment of Geographic Information System (GIS) software and manipulations as well as descriptive statistics tools. The results showed higher concentration of Maternal Health Care centers in Mubi Metropolis and fair dispersal among the surrounding rural settlements. Terrain influences on emergency maternal cases in term of prompt accessibility to some of the rural health care centers was also observed. The study also revealed sharp variations and general in adequacy of Maternal Health Care Delivery personnel and facilities in the area. Therefore, more interventions from Government and Non-Governmental Organizations are required.

**KEYWORDS:** Maternal Health Care Delivery, GIS, Health Care Personnel, Health Care Facilities.

## Introduction

During the Ottawa Charter for Health Promotion in 1986, the World Health Organization (WHO) asserted that health is a resource for everyday life, not the objective of living (Nordqvistm, 2015). This assertion was based on the 1948 non-amended definition of health by the organization as a positive concept emphasizing social and personal resources, as well as physical capacities (WHO, 2003). However, despite the challenges questioning the possible relevance of the definition in an era marked by new understandings of disease at molecular, individual, and societal levels as argued by The Lancet (2009), health still remains a vital component life, most especially the human health. This informs the need for standard and functioning healthcare delivery systems in the human cycles at both local regional and global scales.

Health Care Delivery System (HCDS) is a mechanism for providing services that meet the health related needs of an individual. Emphasizing the need for effective health care delivery in the United States of America, the Institute of Medicine – IOM (2001) reported that all health care organizations, professional groups, private and public purchasers should adopt as their explicit purpose to continually reduce the burden of illness, injury, and disability, and to improve the health and functioning of the people of the United States. In the Nigerian context of

HCDS, Osain (2011) noted that public health is an important element of national security, which does not only functions to provide adequate and timely medical care but also tracks, monitors, and controls diseases outbreak.

However, it has been widely acknowledged that HCDS, most especially in developing countries, suffers many setbacks at various scales over time and space (Argote, 2000; Chapman 2009). Smee, (2002) noted that in many developing countries, government do not have the financial and technical capacity to effectively exercise oversight and control functions, track and report on allocation, disbursement and use of financial resources. Low funding for community health workers has adverse effects the delivery of healthcare services, especially at the grassroots (Maureen, 2005). Adams and Colbourne, (1999). The state of Nigerian HCDS have also been diagnosed by Duru and Nwagbos, (2007), Osain (2011) and Akin and Delton (1995). This clearly implies that despite governments' efforts towards improving healthcare delivery services in Nigeria, much is yet to be achieved, most especially in the rural areas, owing to certain persistent factors. It is in this view that this paper examines the major factors influencing Maternal Health Care Delivery in Mubi North and South Local Government Areas of Adamawa State.

**Materials and Methods**

The study area comprises Mubi North and Mubi South Local Government Areas of Adamawa State. It lies between latitudes 10°30′N and 10°15′N of the equator and between longitudes 13°15′E and 13°30′E of the Greenwich Meridian with Mubi town as the metropolitan settlement (Fig. 1). The study area shares common boundaries with Hong Local Government Area to the west, Michika to the North, and Republic of Cameroun to the East. Based on 2006 National Census figures, the area is characterized by a projected population of 414,413 persons for the year 2016, over a land area of about 321.8 kilometers (National Bureau of Statistics, 2006).
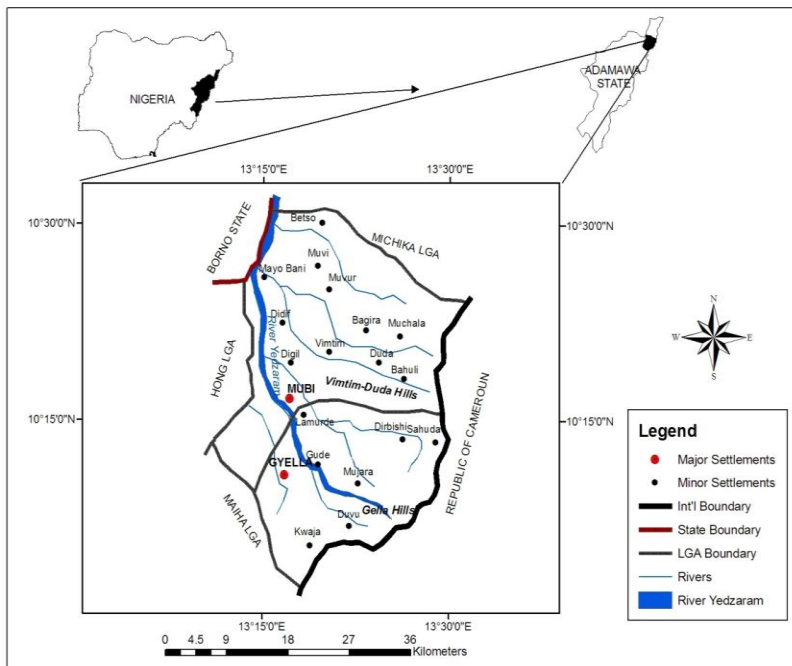
Figure 1: The Study Area
Source: ADSU GIS Laboratory, 2015

The relief of the area is categorized into High Plains and Highlands/Mountains Platforms (Fig 2). The High Plains Platform which dominates the western part of the Sub-region is an extensive pediment that originates from the sharp break of the slope of the Mandara Mountains and descends gradually westward to the Uba Plains (Bawden, 1972). In the sub-region, the pediment is generally narrow extends from Betso (Mubi North) to Gyella (Mubi South) with elevations ranging from 200m to 800m above sea level (Federal Surveys, 1972). The general uniformity of the high plains platform is broken in many places by numerous scattered hills (Isenberg's) with heights ranging between 300m and 900m above sea level (Bawden 1972). Prominent among the hills are among which are Betso (625m), Muva (747m), Mikerema (808m) and Lamurde (837m) hills.

The Highlands/Mountain Platform forms the core of Mandara Mountains. It dominates the eastern part of the area extending from Mujara to Kwaja and into the Camerouns (Fig 2). Prominent among the highlands are Muva-Vimtim (1052m), Duda (1067m), Dirbishi (975m) and the Gyella-Koja Ranges (Federal Surveys 1971).

Adding to the ruggedness of the area's relief is its hydrography. The area is dissected by deep valleys within the mountain masses and the adjacent pediment. Most of the valleys are ephemeral; starting as fine network of gullies and ending up as river channels which drain the area in form of two distinctive Drainage Basins; the Chad and the Benue Basins (Adebayo and Umar, 1999). The main drain of the Chad Basin in the area is River Yedzeram which takes its source from the Gyella

Mountains and cuts across Mubi North and South LGAs. It has rivers Digil, Bani and Muvur as its major tributaries.
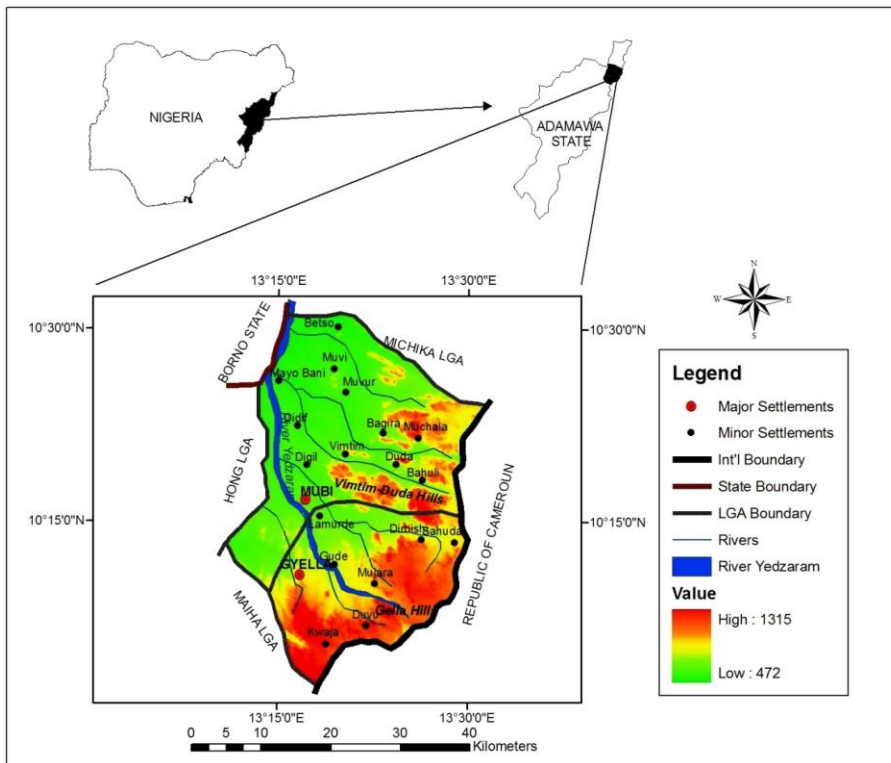


**Figure 2:** Relief of the study area
Source: ADSU GIS Laboratory, 2015

    A reconnaissance survey was carried out for identification of the Maternal Health Care Centers of the study area. Data on location, personnel and facilities status, of the centers were obtained through field survey (observation) and oral interview Schedules. This involved picking the geographical coordinates of the centers using eTrex Germin-X20 Global Positioning System (GPS), observation of facilities and oral interview with heads of 23 out of the 31Maternal Health Care Delivery Centers (MHCDCs) identified. The field coordinates obtained were manually inputted into Microsoft excel worksheet and then exported in Text Tab delimited format onto the ArcGIS 10.1 environment where the Spatial Distribution Map of Maternal Health Care Delivery Centers in the study area was prepared by Geographic Information System (GIS) manipulations (Fig. 3). In addition, a terrain map of the study area was prepared using the Shuttle Radar Thematic Map (SRTM) of the study area in the same ArcGIS 10.1 environment (Fig. 4). Information on personnel status and facilities were analyzed by descriptive statistics using Bar Graph (Fig. 4) and Frequency Table (Table 1)

**Result and Discussion**

The information on spatial distribution of MHCDCs in Mubi North and South (Fig. 3) revealed higher concentration of the centers within Mubi metropolis, owing to urbanization factors such as high population figure and density as well as availability of infrastructural facilities and social amenities. It was also observed that MHCDCs are established in almost all large rural settlements of the study area. This distribution, as shown in Fig. 3 could be regarded as fairly considerate in spatial context.

However, further map analysis using the GIS tool revealed that effective Maternal Health Care services in some of the rural health Care centers could be affected by rugged terrain influences such as relief and hydrography of the area (Fig 4). Ground-truthing survey and interview schedule confirmed that, in hilly areas like Mukta, Sahuda, Dirbishi, Burha Vango, Duvu and Kwaja, road network connectivity of the Health Care Centers with surrounding smaller villages are generally poor, most especially in rainy seasons owing to topographic ruggedness of the terrain. This poses accessibility difficulties in conveyance of emergency maternal labour cases from the surrounding villages to the nearest MHCDCs as well as difficulties in conducting effective antenatal and other primary health care services such as Children immunization programmes, vaccination and distribution of drugs. Besides, the terrain influence is also strongly responsible for selective establishment and the dispersed distribution of MHCDCs among the rural settlements of the study area. This conforms to the assertions of Whitworth and Stephenson (2002) that owing health care facilities are widely dispersed, many patients have to travel long distances in order to receive treatment.
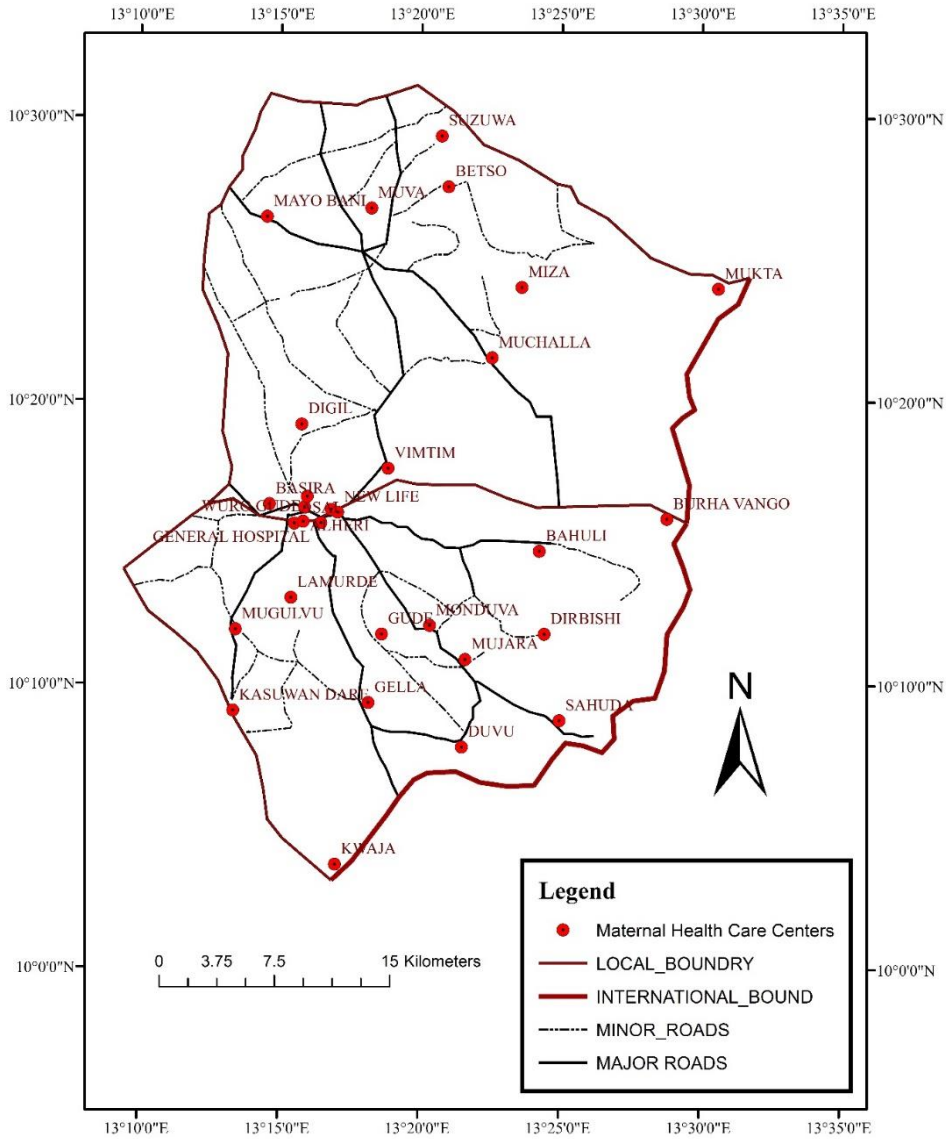
**Figure 3:** Spatial Distributions of Health Centers in the study area.
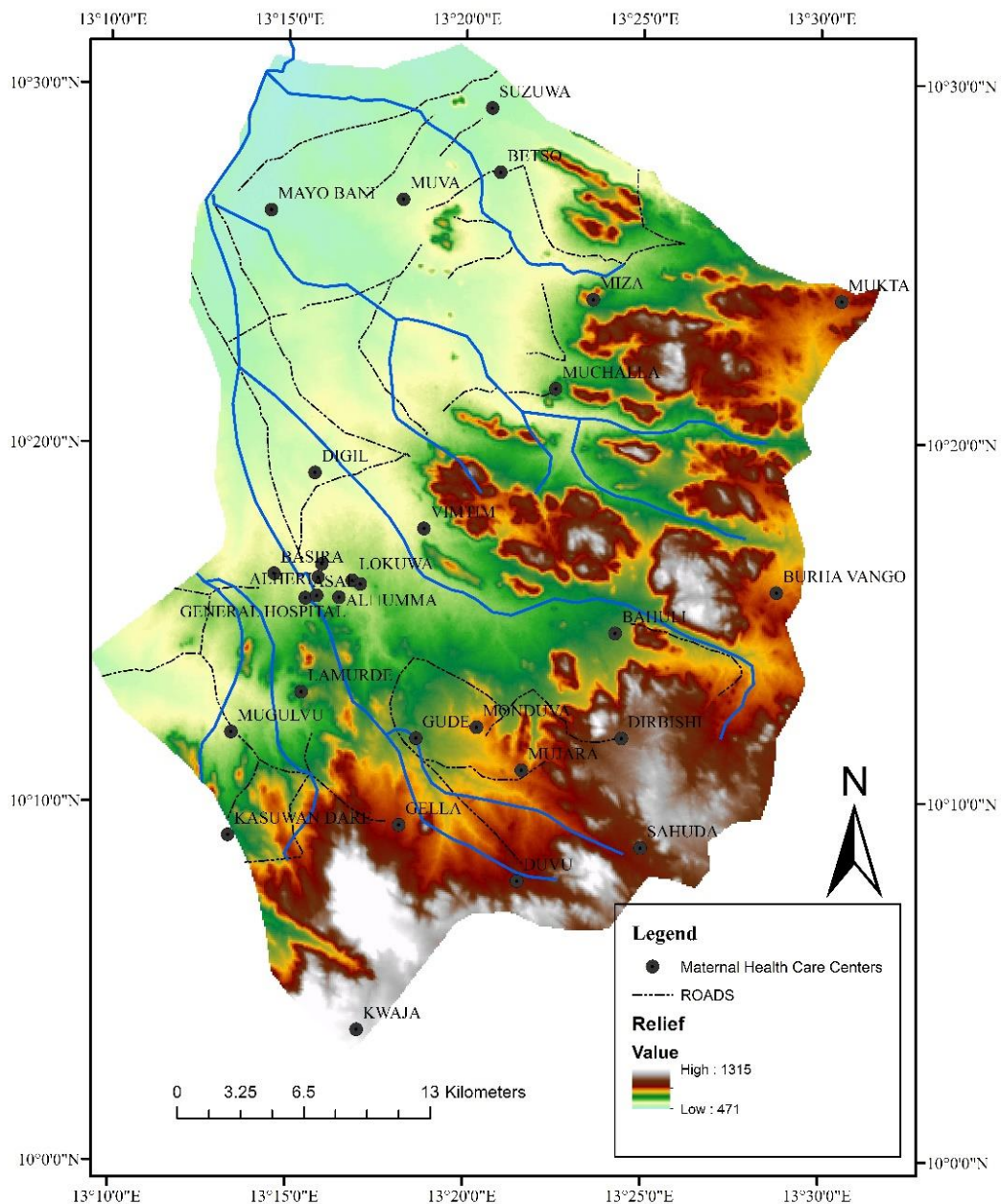**Source**: Field and GIS Laboratory works 2016.

**Figure 4:** Influence of terrain on MHCDCs, in the study area
Source: Field and GIS Laboratory works 2016.

The proper functioning of the established MHCDCs, to a large extent still depends on adequacy of personnel in terms of number and qualification as well as on adequacy of quality facilities. Figure 5 Presents the distributions of Maternal Health care personnel in categories of Doctors, Nurses/Midwives, Community Health Extension Workers (CHEW)/Junior Community Health Extension Workers (JCHEW) and others comprising of Laboratory Technologists, Administrative staff, Attendants, Cleaners and Securities.

The Bar Graph information in Fig. 5 shows an acute shortage of Maternal Health Doctors in the entire study area with only a total of 5; all of which are within Mubi Metropolis (Two at General Hospital Mubi; Two at New Life Clinic and one at Alheri Clinic). This clearly shows that none of the rural MHCDCs has a qualified Doctor, an indication that serious maternal health services requiring the attention of qualified doctors have to be referred to Mubi or other possible places. Coupled with the terrain factor earlier discussed, there are more possibilities of recording fatal or serious emergency cases in the rural areas. Such challenges could further be aggravated by the non-availability or low number of qualified Nurses/Midwives in the rural MHCDCs as portrayed in figure 5.

The CHEWs and JCHEWs make up the work force of almost all the MHCDCs in the study area. These are just community based trained health workers that cannot adequately perform the duties of Nurses let alone the roles of Medical Doctors, yet they are major life-savers of most maternal health cases in the study area. Other category of personnel made up of Laboratory Technologists, Administrative staff, Attendants, Cleaners alike form the major bulk of staff of the MHCDCs in terms of number (Fig. 5).

However, no information was obtained from some of the MHCDCs (Monduva, Sahuda, Dirbishi, Al'umma, Basira, Betso, Bahuli and Mayo Bani) due to administrative challenges and industrial action which also serve as factors affecting the smooth operation of the MHCDCs. The study further revealed inadequacies in modern and standard Maternal Health Care Facilities in the study area. Presented on Table1 is a distribution of Maternal Health Care Facilities in the various MHCDCs based on field survey conducted in July 2016. The data showed that none of the MHCDCs has a Baby Warmer/Incubator. It was also found that there are only six (6) wheel Chairs and 11 Stretchers in the entire study area. The data also showed that Five (5) of the MHCDCs do not have access to electrical power of any kind. It was also gathered from oral interview that Government effort in funding, management, periodic supervision, and maintenance of the MHCDCs has not been very satisfactory. The supply of both drugs and relevant facilities has been irregular and inadequate. This is in conformity with the assertion of Smee (2002) on the state of HCDS in developing countries.
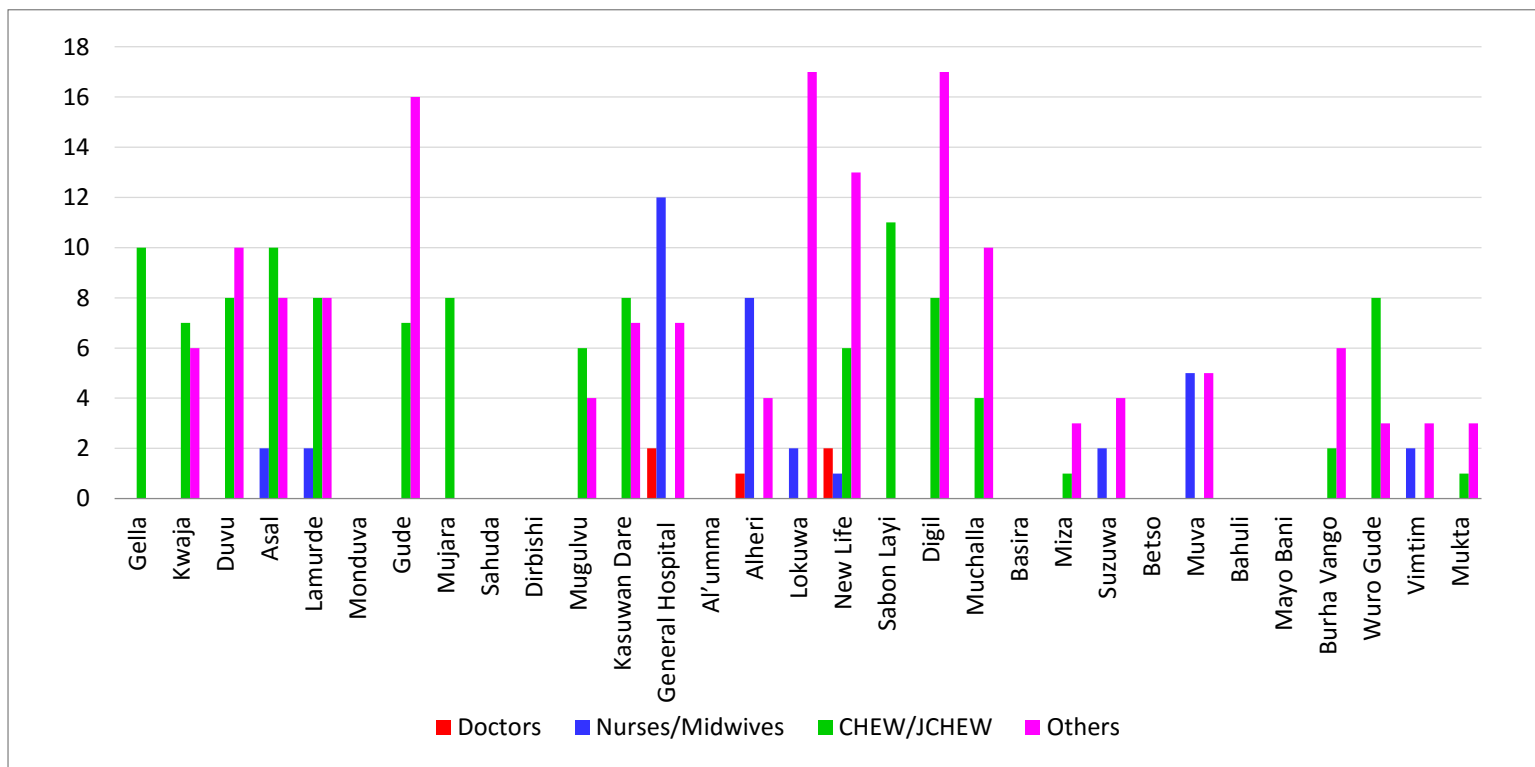
**Figure 5:** Distribution of Maternal health Care Personnel in the Study Area

**Table 1:** Distribution of Maternal Health care Facilities in the Study Area

| Name | Examination Table | Delivery Table | Sterilization Facility | Stretcher | Wheelchair | Forceps | Baby Warmer/ Incubator | Family Planning Unit | Deep Freezer | Cold Box | Lightening System |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Digil | - | 2 | 1 | - | - | 4 | - | 1 | - | 1 | Generator |
| Gella | 1 | 1 | 1 | - | - | 1 | - | 1 | - | 1 | - |
| Kwaja | 1 | 2 | 1 | - | - | 1 | - | 1 | - | 1 | - |
| Duvu | 1 | 1 | 1 | - | - | 1 | - | 1 | 1 | 1 | - |
| Asal | - | 1 | 1 | 1 | 1 | 1 | - | - | - | - | YEDC/Generator |
| Lamurde | 2 | 2 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | Solar |
| Gude | 1 | 1 | 1 | - | - | 1 | - | 1 | - | 1 | - |
| Mujara | 1 | 1 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | Solar |
| Lokuwa | 1 | 2 | 1 | 1 | - | 4 | - | 1 | 1 | 1 | YEDC |
| Alumna | - | 1 | - | - | - | - | - | - | - | - | YEDC/Generator |
| General Hospital | 1 | 3 | 1 | 1 | 1 | 5 | - | 2 | 1 | 1 | YEDC/Generator |
| Alheri | 1 | 1 | 1 | 1 | - | 3 | - | 1 | 1 | - | YEDC/Generator |
| Wuro-Gude | - | 1 | 1 | - | 1 | 1 | - | 1 | - | 1 | YEDC |
| Sabon Layi | 1 | 1 | 1 | 1 | 1 | 2 | - | 1 | - | 3 | YEDC |
| Kasuwan Dare | 1 | 2 | 1 | - | 1 | 2 | - | 1 | 1 | 1 | Solar |
| Mugulbu | 1 | 1 | 1 | - | - | 2 | - | 1 | 1 | 1 | YEDC |
| Muva | 1 | 1 | 1 | - | 1 | 1 | - | 1 | 1 | 1 | Solar |
| Vimtim | - | 1 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | Generator |
| Muchalla | 1 | 1 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | Solar |
| Miza | - | 1 | 1 | 1 | - | 1 | - | 1 | 1 | 1 | Solar |
| Suzuwa | - | 1 | 1 | 1 | - | - | - | 1 | - | 1 | Generator |
| Mukta | - | - | - | - | - | - | - | - | - | - | - |
| Burha V. | 1 | 1 | 1 | - | - | - | - | 1 | 1 | 1 | Generator |

YEDC=Yola Electricity Distrbution Company

**Conclusion**
Inadequacy of personnel in terms of number and qualification, poor standard and inadequate facilities, topographic influences and poor responses by the government, political and bureaucratic obstacles were identified as the major factors affecting the effective performances of the MHCDCs in the study area. In view of these, policy review, training and employment more qualified hands by both Government and private MHCDC owners are urgently required. Rural roads rehabilitation is also recommended to enhance accessibility between the MHCDCs and their surrounding settlements. There is need to increase the number of health centers in the study area, most especially in the rural parts of the study area.

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