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ASSESSMENT OF RMNCH FUNCTIONALITY IN HEALTH FACILITIES IN BAUCHI STATE, NIGERIA

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The Health Finance and Governance Project

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ACRONYMS

ACT	Artemisinin Combination Therapy
AMTSL	Active Management of Third Stage Labor
ANC	Antenatal Care
CHEW	Community Health Extension Worker
DHIS	District Health Information System
FBO	Faith-based Organization
HFG	Health Finance and Governance Project
HRH	Human Resources for Health
IMR	Infant Mortality Rate
IUD	Intrauterine Device
LGA	Local Government Authority
LARC	Long-acting reversible contraception
MNCH	Maternal, Neonatal, and Child Health
MMR	Maternal Mortality Ratio
NDHS	(Nigerian) Demographic and Health Survey
NHMIS	National Health Management Information System
ODK	Open Data Kit
PHC	Primary Health Care
PMTCT	Prevention of Mother-to-Child Transmission
RMNCH	Maternal, Neonatal, and Child Health
SARA	Service Availability and Readiness Assessment
SHW	Skilled Health Worker
SMoH	State Ministry of Health
USAID	United States Agency for International Development
WHO	World Health Organization

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EXECUTIVE SUMMARY

In 2017, the United States Agency for International Development (USAID) selected Bauchi state as one of now six states in Nigeria in which to conduct a reproductive, maternal, newborn, and child health (RMNCH) service availability and readiness assessment. The assessment will provide quantitative data that describe weaknesses in the state's capacity to provide accessible quality RMNCH services to its population equitably. The findings fill a critical gap in the state's capacity to accurately target its limited resources to strengthening its RMNCH delivery and to mobilize adequate resources towards that strengthening effort.

Assessment methods

HFG adapted and carried out the World Health Organization's Service Availability and Readiness Assessment (SARA) survey at 63 public and 22 private facilities across all 20 LGA's in the state from 7th January 2017 to 23rd January 2017. Through systematic random sampling methodology 17 General and Mission hospitals, 62 primary health care (PHC) centers, and 27 private facilities equaling 106 facilities were targeted for data collection. Of these, 88 were finally assessed in the study.

Data were aggregated and presented by facility type in terms of infrastructure; human resources for health availability, capacity, and practice; as well as commodity availability and community outreach efforts. Overall averages were calculated and the subsequent in-detail analysis focused on PHC facility findings as these are the most accessible facilities for majority of the state's population. Private sector facility findings are also described as well.

Health facility infrastructure findings

To assess the effect of infrastructure on RMNCH services, the assessment looked at indices such as leaking roof, availability of electricity, water, toilet facilities, and stand-alone maternity ward rooms. Some vital infrastructure in the state's public health facilities is generally poor such as presence of leaking roof which is present in over half of the facilities, more so in 73 percent of PHC. In addition, less than two-third of the facilities had electricity present. Most facilities had some form of water supply present and an on-site toilet. Private facilities in general are seen to have better infrastructure than public facilities. PHCs were seen to perform poorest on availability of most infrastructure variables which are essential for provision and delivery of quality RMNCH care.

Additional analysis suggests that there is a significant relationship between the availability of electricity and availability of round-the-clock (24 hours a day) labor and delivery services at the facilities, which is an essential core PHC function of facilities at all levels; the lack of electricity hinders the capacity to provide continuous quality care at all times. Earlier similar studies in Cross River, Kogi and Lagos found that 54 percent in Cross River, 65 percent of facilities in Kogi and 83 percent in Lagos had a source of water supply. Bauchi surpasses these states in that 87.1 percent of the facilities assessed had a source of water.

Human resources for health findings

To assess the current status of human resources for health (HRH) in Bauchi state, the study examined indicators such as staff availability across cadres as well as recent training and recommended practices to acquire or maintain skills critical to reducing maternal and child mortality.

Overall less than 34 percent of surveyed facilities have a skilled health worker¹ available, though this is predominantly a public sector shortage as all private hospitals had skilled staff available. Similarly, all facilities are poorly resourced with midwives, an important human resource vital to support safe labor and delivery services; less than a quarter of all facilities had midwives present. A slightly higher proportion of private facilities were seen to have midwives present compared to the public facilities. However, it was found that a high proportion of facilities (83.5 percent) offered 24 hours labor and delivery services.

Similar to infrastructure findings, PHC facilities appear to be more poorly resourced in terms of recent training experience compared to other facility types. On average, only a few facilities surveyed had recent training for their staff with only less than a quarter having any training related to prevention and management of newborn sepsis for example. Private facilities reported more recent training experiences. Across all facility types visited, the proportion of facilities practicing routine life-saving interventions varied. Active management of third stage labor (AMTSL), ANC, PNC, family planning and immunization services were widely available, (above 75 percent) while partograph use, PMTCT services, and HIV&AIDS treatment and care were not as widely available (below 50 percent). More private facilities were found to implement good RMNCH life-saving practices routinely than public facilities.

The results describe the gross inadequacy of health workers to provide skilled delivery services for a vast majority of the population regardless of whether they are urban or rurally located, or accessing public or private facilities. With very few facilities having staff armed with relevant training and translating those to practice, there is certainly a technical capacity gap in facilities.

Commodities and supplies

To assess the status of commodities and supplies, the study looked at the availability of a set of marker drugs and commodities considered essential to the delivery of quality RMNCH care. Specifically, the focus was on items required for antenatal care (ANC), deliveries, the treatment of basic infections, and family planning that are vital in reducing maternal and child mortality. Overall, commodity availability was generally low across facilities and this was more so at PHCs. Among PHC centers, iron, oxytocin, chlorhexidine, and malaria drugs were the only marker drugs available in at least half of the facilities. The other five commodities had very low availability (less than 50 percent) – and as low as 6 percent availability for phenobarbitone – in PHC facilities. The long-term family planning commodities such as contraceptive implants and intrauterine devices were also found to be very low across all facility types. Specifically for example, the emergency obstetric drug magnesium sulfate to treat preeclampsia was available in only 30 percent of PHCs and 42.9 percent overall. Basic antibiotics such as ciprofloxacin was present in about only a quarter of PHCs but just less than half of all facilities. Malaria (artemisinin combination therapy) drugs were available at 86.9 percent of all facilities visited. Overall the availability of basic, lifesaving commodities essential for quality RMNCH service delivery is very low.

¹ A skilled health worker is defined as being a medical officer, youth corps doctor, registered nurse, midwife, registered midwife, specialist in obstetrics and gynecology, specialist in pediatrics, or physician specialist in anesthesia.

Service protocol availability

While the availability of job aids and protocols does not automatically mean that higher-quality service delivery is also available, it does indicate areas which require, and are likely receiving additional support. Their availability may also reflect donor support as they are more likely to have provided for the printing of these materials and supported the related trainings on them than the government would.

Overall there was low availability of protocols related to birth and delivery, such as for obstetric hemorrhage (45 percent). Preeclampsia/Eclampsia protocols were available at a higher proportion of facilities (58 percent). The availability of protocols related to infection prevention and post abortion was found to be low with only a few facilities (less than 26 percent) having them. Overall availability of protocols tends to be poorer in private facilities, which could be the result of donors' predominant focus on public facilities.

A high proportion facilities had job aids available for ANC services and family planning services with more PHC facilities having job aids compared to the private facilities. Job aids on PMTCT services were seen to be very low (12.9 percent), in line with low proportion of facilities with PMTCT services.

Community outreach efforts While the availability of job aids and protocols does not automatically mean that higher-quality service delivery is also available, it does indicate areas which require, and are likely receiving additional support. Their availability may also reflect donor support as they are more likely to have provided for the printing of these materials and supported the related trainings on them than the government would.

Public facilities employ CHEWs whose mission is to improve access and delivery of PHC and prevention services, which typically lend itself to community outreach activities etc. Generally, community outreach for all services were found to be low, except child immunization conducted in almost all the facilities (92.6 percent). Curative child services outreach occurred in only about a third of facilities and maternal care outreach i.e. antimalarial drugs for pregnant women, provision of iron tablet for pregnant women, PNC and family planning was seen to be conducted in one-tenth of all facilities – both public and private. Overall the proportion of public facilities doing outreach were found to be higher than private facilities.

RMNCH continuum of care

The purpose of conducting this assessment was to identify weaknesses in the state's capacity to provide accessible quality RMNCH services to its population along the maternal continuum of care. The assessment looked at several components critical to delivering this care: family planning and female reproductive health services, ANC, facility-based deliveries, and treatment for malaria and simple infections.

ANC: This care can be delivered by relatively low-skilled staff in a basic facility with minimal commodity and equipment needs. While community outreach is being conducted to educate mothers that basic commodities like antimalarials and (low-skilled) staff are available to support ANC services, other basic requirements such as iron tablets were found to be available in only 64 percent of health facilities.

Facility-based delivery: This requires skilled staff, a suitable environment, the appropriate drugs, and equipment to ensure that monitoring for potential emergency conditions can be performed. While community outreach is being conducted to encourage facility-based deliveries, facilities themselves were found to be ill-equipped. PHC centers in particular, the predominant facility type, are not all ready to provide these needed RMNCH services. Less than a quarter of the facilities had a midwife on staff although 83% of all facilities reported providing 24 hour labor and delivery services. Seventy-five percent of facilities had a stand-alone maternity ward but only 44.3% percent

of those that did had any source of water in the facility at all. While reported AMTSL practice was as high as 86.9 percent of facilities, newborn resuscitation practice was 61.9 percent. Drug availability varied widely with 67 percent availability for oxytocin but less than 10 percent availability for phenobarbitone.

Malaria/infection management: this requires skilled staff for effective diagnosis and the necessary commodities at a minimum. Despite fever being the single most common symptom presenting at health facilities in Nigeria, only 44 percent of visited facilities had marker antibiotic ciprofloxacin available and approximately 59 percent had metronidazole available. Eighty-six percent of facilities visited in Bauchi state had artemisinin-based therapies.

Recommendations

Financing: Bauchi state needs to address the dire state of its health facility infrastructure which will require substantial capital expenditure. To obtain the required funding, the State Ministry of Health needs to:

- ▶ In partnership with the State Ministry of Works, conduct a costing and quantity survey assessment to determine infrastructure upgrade needs and develop an investment budget²;
- ▶ In partnership with the Ministry of Economic Planning and Budgeting, prioritize investment in health infrastructure based on population demographics, disease burden and existing infrastructure status;
- ▶ Build a valid investment case to justify its capital expenditure funding;
- ▶ Present findings of this assessment and investment case derived from it to development partners to encourage evidence-based investment; and
- ▶ Leverage the state's health care financing technical working group to track investment and accountability for value for money.

Staffing: The state needs to address its massive HRH gap by:

- ▶ Determining its current gap against the norms laid out by the National Primary Health Care Development Agency (NPHCDA);
- ▶ Implementing the Bauchi State HRH plan to mobilize the required HRH needed at PHCs ; and
- ▶ Developing and budgeting a human resources for health training plan to ensure that the RMNCH skills currently available in urban facilities are more widely available in rural areas and at the PHC level, particularly with regards to newborn life-saving interventions like AMTSL and newborn resuscitation

Regulation of private sector: According to multiple sources including the most recent National Health Care Development Policy, over 60 percent of Nigeria's health care is delivered by the private sector and according to National Health Accounts data over 70 percent of health expenditures occur in the private sector. The current study shows that even though significantly more private sector facilities have skilled health workers compared to public facilities, the practice in private facilities was not shown to be of significantly higher quality than in public facilities. This is evidenced by lower percentages practicing key life-saving practices of AMSTL, family planning, and immunization for example, and relative absence of standardized operating procedures suggesting similar gaps in capacity and therefore at least an equal need for oversight. Therefore, the state could make significant service delivery gains by regulating the private sector and enforcing reasonable minimum

² Author's note: At the time of finalizing this report, the HFG project had supported the Bauchi State government to carry out a bill of quantities (BOQ) and assessment survey of PHC facilities in the state, including costing of infrastructure and other gaps to inform evidence-based investments and budgetary appropriations. These findings are presented in a separate accompanying report.

standards and inspections (of infrastructure, staffing numbers, and practices) to ensure safe primary health care for its citizens as well as raise and maintain value for money.

Commodities: Availability of drugs and other commodities, particularly at the PHC level, is clearly a challenge that needs to be addressed centrally by the state government. This assessment did not include the higher-level systemic issues that would have contributed to the facility-level findings. Soled to the findings so a critical next step would be a review of the supply chain system functions (quantification, procurement and transportation) at each level of the system (state, local government authority, and facility) for the range of commodities required for RMNCH service delivery.

Conclusion

Few studies have been carried out in Bauchi state to document the infrastructure, HRH, and RMNCH services available at all the facilities. Therefore, this assessment's findings – by providing to state health decision makers quantitative evidence of shortcomings in the state health care delivery system's capacity to deliver RMNCH services – have programmatic implications to improve the RMNCH services at all levels of the system. This need is particularly acute at the PHC level, which is demonstrably the weakest, but the most accessible through for the vast majority of the state's population who rely on for RMNCH care.



I. INTRODUCTION

In 2017, Bauchi state was selected by the United States Agency for International Development (USAID) as one of six states in Nigeria in which to implement a reproductive, maternal, newborn, and child health (RMNCH) service availability and readiness assessment. This exercise aimed to inform further investments by the Bauchi State Government, as well as by other donors including USAID. USAID's Health Finance and Governance (HFG) project undertook this assessment in collaboration with the World Bank's Saving One Million Lives Initiative (SOML). The objectives of the service availability and readiness assessment were to determine the functionality of public health facilities in Bauchi state in terms of the adequacy of infrastructure, equipment and commodities, and health workforce available to carry out key MNCH, family planning, and reproductive health interventions. The findings fill a critical gap in the state's capacity to accurately target its limited resources to strengthening its RMNCH delivery and to mobilize adequate resources towards that strengthening effort.

This section presents a brief background description of Nigeria and Bauchi State more specifically, in terms of its health statistics, infrastructure, and human resources for health (HRH) capacity.

I.1 Nigeria

Worldwide, maternal deaths have declined by 43 percent from 1990, with 303,000 estimated in 2015. (WHO et al. 2015) The global maternal mortality ratio (MMR) in 2015 was estimated at 216 maternal deaths per 100,000 live births, down from 385 maternal deaths per 100,000 live births in 1990 (WHO Global Health Observatory 2015; WHO et al. 2015). However, there are huge disparities in MMR between developed and developing countries: As of 2015, 99 percent of all maternal deaths occur in developing countries, 66 percent in sub-Saharan Africa alone. Sub-Saharan Africa has the highest regional MMR (546). At the global level, two countries account for over one-third of all global maternal deaths: Nigeria for 9 percent (58,000 per year) and India for 15 percent (45,000 per year) and, (WHO et al. 2015). Complications during pregnancy and childbirth are a leading cause of death among women between the ages of 15 and 45 in many developing countries.

I.1.1 Maternal, neonatal, and child health statistics

As reported by the 2013 Nigeria Demographic and Health Survey (NDHS) (National Population Commission and ICF International 2014), Nigeria's population was about 140 million in the 2006 census and currently estimated at 198 million (NPC 2018). Women of childbearing age and children under five years constitute 22 percent and 20 percent of the population respectively. The country has a crude birth rate of 40.6 per 1,000 women and total fertility rate of 5.5 per woman.

The NDHS also reported Nigeria's MMR for 2013 to be 576 deaths per 100,000 live births. This is not statistically significantly different from the 2008 NDHS ratio of 545 deaths per 100,000 live births and is among the highest in the world (National Population Commission and ICF Macro 2009). The main causes of maternal mortality in Nigeria as indicated in the NMHIS data 2018 are: Malaria (25.6 percent), anemia (20 percent), post-partum hemorrhage (14.4 percent), pre-eclampsia (5.6 percent) abortion (5.6 percent) antepartum hemorrhage (5.6 percent), sepsis (3.2 percent), obstructed labor (2.4 percent), HIV (0.8 percent) and death from other causes (16.8 percent) (NHMIS)

Maternal mortality in Nigeria also varies significantly by region. The North East zone has the highest MMR, 1,549 per 100,000 live births, compared to 165 per 100,000 live births in the South West zone, an almost tenfold difference (UNICEF 2013).



Over the last decade, a marked reduction in global child mortality rates was observed i.e. global under-five mortality rate declined by 56 percent from 93 deaths per 1,000 live births to 41 deaths per 1,000 live births. (World Bank 2018) However, given that over almost half (46 percent) of under-5 (U5) deaths occur within the first month of life, progress is slower in reducing neonatal mortality rates with neonatal mortality rate falling by only 49 percent from 37 deaths per 1,000 live births in 1990 to 19 deaths per 1000 live births in 2016, still below the SDG target of 12 per 1,000 live births.

Nearly ten percent of newborn deaths in the world occurred in Nigeria. A report by UNICEF revealed that in Nigeria, both the neonatal mortality rate (NMR) (per 1,000 live births) and U5 mortality rate (120 per 1,000 live births) remain high. Around 700 000 children in Nigeria die every year before their fifth birthday (WHO 2018).³ The major causes of death among Nigerian children under-5 are: malaria (30 percent); diarrhea (19 percent); respiratory infections (16 percent); measles (5 percent); and HIV/AIDS (3 percent) (NHMIS 1999)

Case in point- At the time of the 2013 NDHS, only one in every four children age 12-23 months (25 percent) were fully vaccinated. This comprises of BCG vaccination against tuberculosis; three doses of vaccine to prevent diphtheria, pertussis, and tetanus; at least three doses of polio vaccine; and one dose of measles vaccine. This is 9 percent increase from 2008 NDHS. Only 21 percent of children age 12- 23 months had received all of the recommended vaccinations before their first birthday. Vaccine coverage in Nigeria is one of the lowest in sub-Saharan Africa with twenty-one percent of eligible children having received no vaccination. Urban children are nearly three times more likely than rural children to receive all basic vaccinations (43 percent versus 16 percent). Full vaccination coverage varies by zone, ranging from 10 percent of children in North West zone to 52 percent in South East and South South zones. (NDHS 2013).

Human resources for health

A joint federal government assessment found that Nigeria has one of the largest stocks of HRH in Africa, comparable only to Egypt and South Africa (Federal Ministry of Health 2006). There are about 35,000 doctors and 210,000 nurses registered in the country, which translates to 28 doctors and 170 nurses per 100,000 people. This compares favorably with a sub-Saharan average of 15 doctors and 72 nurses per 100,000 people. The number of pharmacists and community health officers/community health extension workers (CHEWs) per 100,000 people is 5 and 91, respectively. While the health staff numbers are comparatively more adequate in Nigeria, it is widely accepted that the allocation of staff across states and between rural and urban areas is skewed resulting in inequitable access to skilled health providers for a significant proportion of Nigerians.

Health infrastructure

A recent census of available health facilities in Nigeria showed a total of 34,173, of which 30,098 (88 percent) are primary health care (PHC) facilities, 3,992 (11 percent) are secondary, and 83 (0.2 percent) are tertiary (Federal Ministry of Health 2011). Although the private sector owns about 38 percent of these facilities, the sector provides over 60 percent of essential health care services in some states in Nigeria (Dutta et al. 2009). Infrastructure and health facilities, especially at the secondary and primary levels in particular are widely held to be inadequately resourced and poorly maintained.

³ http://www.who.int/gho/child_health/mortality/mortality_causes_text/en/

I.2 Bauchi State

Bauchi State is located in the North-East Geo-Political Zone of Nigeria with Bauchi as the capital. The State was created in 1976 and has Twenty (20) Local Government Areas with 323 political wards. Bauchi is a land-locked state sharing boundaries with seven (7) other states; Yobe, Jigawa, Kano, Kaduna, Gombe, Taraba and Plateau. The 2006 National Census puts its total population at 4,652,066 and projected at 6,000,000 in 2016. About 84 percent of the population live in rural areas with arable farming and animal husbandry as the predominant occupation while 16 percent reside in urban areas. Bauchi State has in recent time been affected by the Boko Haram sectarian insurgency in North-Eastern Nigeria resulting in about 77,276 of its population internally displaced (IOM Displacement Tracking Matrix- October 2015). Demographic data for Bauchi state show that women and U5 children who are the most vulnerable, and most likely to suffer from inequitable access to health services for many reasons, constitute 22 percent and 20 percent of the total population of the state, respectively.

In the North East zone where Bauchi state is located, the U5 mortality rate is estimated at 260 per 1000, infant mortality at 132 per 1000 and MMR 1549 per 100,000. This puts Bauchi among the states with the highest maternal and child death in Nigeria. Only 3.3 percent of children age 12-23 month are fully vaccinated for vaccine-preventable childhood disease, and only 59.8 percent of pregnant women obtain skilled antenatal care. Available data on disease-specific morbidities show a childhood malaria prevalence of 19.6 percent (microscopy, MIS 2015) and HIV prevalence of 3.1 percent. The common causes of the high maternal mortality include post-partum hemorrhages, pregnancy-induced hypertension, eclampsia, anemia, sepsis, and malaria in pregnancy. The common causes of infant mortality rates include preventable diseases such as malaria, measles, malnutrition, diarrhea, and pneumonia.

Regarding HRH, the state has 230 medical doctors, 14 pharmacists, 519 nurses/midwives, 47 lab technicians, 2 radiographers, 24 health records staff, 782 CHEWs, 108 community health officers, and 200 environmental health officers (Bauchi State Ministry of Health, service data 2015). This translates to about 4 doctors and 9 nurses/midwives per 100,000 population, respectively, grossly below the country average.

Chronic underinvestment in the state's health care system, particularly for HRH and basic infrastructure contributes to the poor health outcomes as presented above. In order to address this situation, the state and its partners need to have quantifiable information on these systemic weaknesses particularly at the Primary Health Care (PHC) level. This assessment aims to provide that data.

2. METHODOLOGY

The study focused on assessing the readiness of facilities to provide emergency obstetric and neonatal care (EMONC) services including availability of essential services, basic infrastructure, equipment, and drugs to deliver essential RMNCH services.

2.1 Study design

This was a cross-sectional study in which a sample of health facilities in the state was identified and incorporated into the design. Interviews were conducted with study participants to gather information and observations were conducted to confirm and validate interview responses. Study participants were required to have spent at least three months at the facility prior to the assessment. Participants were:

- ▶ Frontline health care administrators/managers;
- ▶ In-charges working in the selected health facilities, specifically MNCH in-charges and family planning services in-charges; and
- ▶ Administrative heads of the maternity units.

2.2 Sampling

Prior to this effort and as part of a separate assessment project as part of the Saving One Million Lives (SOML) Project, the World Bank (WB) carried out a prior phase of data collection in 77 Health facilities (71 public and 6 private) across all 20 LGA's in the state. Given the similarity and overlap in study purpose and methodology, and an agreement to obtain and incorporate the WB data at the analysis phase of this study, those 77 WB-surveyed facilities were excluded from the sampling frame.

Data collection for the HFG-only phase was also carried out in all the 20 LGA's. The main inclusion criterion is facilities at the level of at least PHC (for the purposes of this study this included maternity centers, health centers and health clinics) that had deliveries for the past one year. Excluded were health posts and dispensaries, and facilities that had no deliveries.

The study employed a multistage sampling approach and applied the following sampling method per stage and facility category in each State:

- ▶ **Selection of PHCs.** This was calculated using standard sample size methodologies (<https://www.surveysystem.com/sscalc.htm>) with the total number of PHCs fitting the criteria above used as population of interest.
 - The total number of functional PHCs- 389 were selected from the master facility list domiciled in the state. This list was updated following confirmation of facility status during the WB-only phase. A 5 percent margin of error and 95 percent confidence interval was applied to the population of PHCs to determine total sample size (N=133) (See worksheet Annex 2)
 - Proportionate sampling procedure was then applied to determine the number of PHCs to be sampled in each LGA-.
 - The 71 Functional PHCs randomly sampled for the WB phase was then be excluded.

- To make up the HFG-only phase sample size i.e. $133-71 = 62$ functional PHCs, the systematic random sampling procedure was employed to select the remainder of functional PHCs for data collection. The final selection was further guided by the office of the Director of Planning, Research, and Statistics (DPRS) of the State Primary Health Care Development Agency (SPHCDA) based on strategic planning goals and state priorities in terms of communities with poor markers, failing health indices and the larger population impact. Also factored-in were HF's on the list of State phase I PHC to model PHC conversion project (One-Health-Facility-Per-Ward)
- ▶ **Selection of General Hospitals and Mission Hospitals:** The census approach was employed to purposively select all existing General and Mission Hospitals in the state for data collection. The HFG-only phase included all 17 facilities in this category not hitherto sampled in the WB phase (6 general hospitals). The 2 federally-owned Tertiary hospitals located in the state were excluded from this study.
 - ▶ **Private Facilities:** After determination that 69 functional private facilities meet selection criteria, HFG-only phase employed same sample size calculation as with PHC facilities above and randomly selected 27 private facilities not hitherto sampled in the WB phase (6 private facilities).
- Thus, a total of 106 facilities were targeted for data collection. However, only 89 could be assessed during fieldwork, and finally included in this study

Table I: Summary of Health Facilities and Their Status

S/N0.	L.G.A	Name of Facility	Facility ID	Facility Type	Status
1	Alkaleri LGA	Gwaram Maternity	I0000007	Public	Facility Surveyed
2	Alkaleri LGA	Kundak HC	I0000009	Public	Facility Surveyed
3	Alkaleri LGA	Yalo Health Centre	I0000011	Public	Facility Surveyed
4	BauchiLGA	Town Maternity	I0000003	Public	Facility Surveyed
5	BauchiLGA	Kir Maternity	I0000001	Public	Facility Surveyed
6	BauchiLGA	Juwara Maternity	I0000005	Public	Facility Surveyed
7	Bogoro LGA	Ungwan Rimi HC	I0000013	Public	Facility Surveyed
8	Bogoro LGA	Gambar HC	I0000019	Public	Facility Surveyed
9	Bogoro LGA	Datsang HC	I0000025	Public	Facility Surveyed
10	Bogoro LGA	Lafiyar-Sara MCH	I0000014	Public	Facility Surveyed
11	Bogoro LGA	Bogoro MCH	I0000020	Public	Facility Surveyed
12	Bogoro LGA	Gobbiya MPCH	I0000026	Public	Facility Surveyed
13	Bogoro LGA	PHC BOI	I0000031	Public	Facility Surveyed
14	Dambam LGA	Fagam PHC	I0000067	Public	Facility Surveyed
15	Darazo LGA	Under five Clinic	I0000029	Public	Facility Surveyed
16	Darazo LGA	G. H. Darazo	I0000030	Public	Facility Surveyed
17	Darazo LGA	Gabarin H.C	I0000035	Public	Facility Surveyed
18	Darazo LGA	Konkiyal H.C	I0000036	Public	Facility Surveyed
19	Darazo LGA	Tauya Mat. H.C	I0000041	Public	Facility Surveyed
20	Ganjuwa LGA	Dabe maternity	I0000042	Public	Facility Surveyed
21	Giade LGA	Abunari Disp.	I0000015	Public	Facility Surveyed
22	Giade LGA	Zabi MPHC	I0000016	Public	Facility Surveyed

S/N0.	L.G.A	Name of Facility	Facility ID	Facility Type	Status
23	Itas\Gadua	Melandige D H.C	I0000045	Public	Facility Surveyed
24	Itas\Gadua	Kashuri H.C	I0000046	Public	Facility Surveyed
25	Itas\Gadua	Bambal PHC	I0000051	Public	Facility Surveyed
26	Itas\Gadua	Bilkicheri PHC	I0000052	Public	Facility Surveyed
27	Itas\Gadua	Magarya MPHC	I0000083	Public	Facility Surveyed
28	Itas\Gadua	Itas Town Maternity	I0000057	Public	Facility Surveyed
29	Itas\Gadua	Atafowa PHC	I0000058	Public	Facility Surveyed
30	Itas\Gadua	Nasarawo PHC	I0000063	Public	Facility Surveyed
31	Jama'are	Changanawa HC	I0000063	Public	Facility Surveyed
32	Katagum	Madangala Mat.	I0000034	Public	Facility Surveyed
33	Katagum	Yayu MPHC	I0000039	Public	Facility Surveyed
34	Katagum	Makarahuta Mat.	I0000040	Public	Facility Surveyed
35	Misau	Zadawa Maternity	I0000066	Public	Facility Surveyed
36	Ningi	Nasaru M.P.H.C.	I0000047	Public	Facility Surveyed
37	Ningi	Kurmi Maternity	I0000048	Public	Facility Surveyed
38	Ningi	Bashe Maternity	I0000053	Public	Facility Surveyed
39	Shira	Adamani PHC	I0000061	Public	Facility Surveyed
40	Shira	Faggo MPHC	I0000060	Public	Facility Surveyed
41	Shira	Beli maternity	I0000062	Public	Facility Surveyed
42	Shira	Disina PHC	I0000065	Public	Facility Surveyed
43	Tafawa Balewa	Katsinawa Disp.	I0000032	Public	Facility Surveyed
44	Tafawa Balewa	Boto General Hosp.	I0000037	Public	Facility Surveyed
45	Tafawa Balewa	Bununu Maternity	I0000038	Public	Facility Surveyed
46	Tafawa Balewa	Dajin Maternity	I0000043	Public	Facility Surveyed
47	Tafawa Balewa	Dull PHC	I0000044	Public	Facility Surveyed
48	Toro	Tulu maternity	I0000017	Public	Facility Surveyed
49	Toro	Buka tulai	I0000018	Public	Facility Surveyed
50	Toro	Toro maternity	I0000023	Public	Facility Surveyed
51	Toro	Magama maternity	I0000024	Public	Facility Surveyed
52	Warji	K/Bubuna Maternity	I0000049	Public	Facility Surveyed
53	Warji	Dagu Maternity	I0000050	Public	Facility Surveyed
54	Warji	Ranga Alaso Mat.	I0000054	Public	Facility Surveyed
55	Warji	Ganji Maternity	I0000055	Public	Facility Surveyed
56	Warji	Katanga Maternity	I0000056	Public	Facility Surveyed
57	Warji	Katanga PHC	I0000059	Public	Facility Surveyed
58	Zaki	Bursali PHC	I0000021	Public	Facility Surveyed during NHFS so it was replaced

S/N0.	L.G.A	Name of Facility	Facility ID	Facility Type	Status
59	Zaki	Gumai mat.	I0000022	Public	Facility Surveyed during NHFS so it was replaced
60	Zaki	K/larabawa	I0000027	Public	Facility Surveyed
61	Zaki	Makawa	I0000028	Public	Facility Surveyed
62	Zaki	Tashena	I0000033	Public	Facility Surveyed
63	Alkaleri	Duguri Clinic	I0000008	Private	Facility Surveyed
64	Bauchi	Ni'ima Consultant Hospital	I0000010	Private	Consent not given and replaced
65	Bauchi	Jama'a Clinic	I0000002	Private	Facility Surveyed
66	Bauchi	AL-Wadata Consultant Clinic	I0000012	Private	Facility Surveyed
67	Bauchi	Reemee Medicare Nig Ltd	I0000004	Private	Facility Surveyed
68	Bauchi	Amsad Hospital Clinic	I0000006	Private	Facility Surveyed
69	Bauchi	Albishir Clinic & Maternity	I0000068	Private	Facility Surveyed
70	Bauchi	AL-Amin H/Clinic	I0000069	Private	Facility Surveyed
71	Bauchi	Shifa Royal Hospital	I0000070	Private	Facility Surveyed
72	Bogoru	LCC Cocin Church Clinic	I0000071	Private	Facility Surveyed
73	Giade	Sauki Medical Clinic	I0000072	Private	Facility Surveyed
74	Jama'are	Amana Clinic Ja'ma'are	I0000073	Private	Facility Surveyed
75	Katagum	Amana Clinic & Maternity	I0000074	Private	Facility name changed to Mai Ni'ima HC
76	Tafawa Balewa	Bako Clinic	I0000075	Private	Facility Surveyed
77	Toro	Lah Tahzan Clinic	I0000076	Private	Facility Surveyed
78	Toro	Dan Albarka Clinic & Maternity	I0000077	Private	Facility Surveyed
79	Toro	AL-Huda Health Clinic	I0000078	Private	Facility Surveyed
80	Toro	Al-Ihsan Medical Health Clinic	I0000079	Private	Facility Surveyed
81	Toro	Yarima Clinic & Nursing Home	I0000080	Private	Facility Surveyed
82	Toro	New Age Health Clinic & Maternity	I0000081	Private	Facility not existing and replaced
83	Toro	Kowa Health Clinic	I0000082	Private	Facility not existing and replaced
84	Zaki	Sakwa PHC	I0000021	Public	Facility Surveyed as a replacement
85	Zaki	Murmur HC	I0000022	Public	Facility Surveyed as a replacement
86	Bauchi	Asalam Health Clinic	I0000082	Private	Facility Surveyed as a replacement
87	Bauchi	Zahra Health Clinic	I0000081	Private	Facility Surveyed as a replacement
89	Bauchi	Heritage Health Clinic	I0000010	Private	Facility Surveyed as a replacement

2.2.1 Inclusion criteria

Health facilities registered in the National District Health Information System (DHIS) 2 platform and validated by the state were included in sampling frame for the assessment. Primary and secondary health facilities, and private hospitals meeting these criteria were included in the sampling frame. Furthermore, as previously noted, only facilities that had conducted deliveries in the preceding year were included.

2.2.2 Study tools

The study tool was a deliberate harmonization of the World Health Organization's (WHO's) modified Service Availability and Readiness Assessment (SARA) tool and the World Bank Saving One Million Lives (SOML) project assessment tools. The study tool used in this assessment had two components: a health facility assessment (core questionnaire) and data extraction form. The tools were designed to assess:

- ▶ Basic management practices to support facility functioning.
- ▶ Services offered – with a focus on out-patient services.
- ▶ Facility infrastructure required to support quality services.
- ▶ General resources required for quality service provision (financial, human, equipment, diagnostics, pharmaceuticals and other commodities.
- ▶ Readiness to provide specific services, meeting minimum standards for quality (service setting, trained staff, equipment, pharmaceuticals and commodities, diagnostics, records and systems to support the service).
- ▶ Competency among service providers in assessing, patients diagnosing and treating specific conditions;
- ▶ Knowledge among service providers of National protocols for diagnosing and treating specific conditions.
- ▶ Review of records to identify the assessment and care process that is documented.

The electronic version of the SARA tool, which uses an electronic data collection device, was used. (See Annex A for an explanation of the electronic device.)

2.2.3 Data collector training

Selected data collectors underwent training on the process of data collection, sampling procedures, and administration of the tool. The WB-SOML assessment training of trainers was held on the 28th August 2016 at State Ministry of Health Bauchi, and a refresher training for state lead supervisors by HFG was held on the 18th of January, 2017. This period also was used to assemble relevant literature and secondary data sources, including government reports, policies, and plans and development partners' documents relevant to this assessment. Enumerators were selected from high-performing crop of enumerators who participated in the training and field data collection during the WB-phase.

Data collection

As described above in the sampling section, data collection was carried out by selected and pre-trained health care workers who were recruited from the state.

2.2.4 Pretesting and piloting

The data tools were pretested and piloted in non- study PHC centers within the state. This was done to determine the:

- ▶ Reaction of the respondents to the research procedure
- ▶ Acceptability of the questions asked
- ▶ Willingness of the respondents to answer and participate in the study
- ▶ Validity and reliability of the questionnaire
- ▶ Time needed to administer the questionnaire
- ▶ The feasibility of the sampling procedure
- ▶ Understanding of the questions

Pretesting and piloting showed that the tool was appropriate to the testing community in the time allotted, could capture the necessary information, and that two data collectors per visit would be adequate for the exercise. Also, it showed that the collectors could use the electronic data collection devices successfully.

2.2.5 Recruitment process

Study participants or key informants were recruited from the health facilities selected for the assessment. On arrival at the selected health facility, data collectors presented the letters of introduction from the State Ministry of Health (SMoH) to the health facility manager. The purpose of the study was explained to the facility manager, and written or oral permission was obtained from State MOH before proceeding with data collection.

2.2.6 Fieldwork, and facilities' data collection

There were 2 phases for the data collection process. The first phase was conducted by the World Bank and the field work lasted a period of 7 weeks. This was from 23rd September 2016 to 6th November 2016. The second phase was conducted by HFG. This phase lasted a period of 3 weeks, from 7th January 2017 to 23rd January 2017. Two data collectors constituted a team to a total of 4 teams. Each team had a lead enumerator, whose responsibility was to ensure that data was uploaded to the server on a daily basis. Questions were asked exactly the way they were written, and in situations where the questions needed to be interpreted for the respondent, enumerators ensured that the meaning of the questions was not altered. An average of 2 facilities were covered per team per day.

On arrival after permission was obtained, the lead/supervisor proceeded to conduct the key informant interview with the facility manager or his nominee. Each interviewee/facility was assigned a code as a means of identification and the codes were recorded/entered in the system. The name of the interviewee was not recorded to maintain confidentiality. The team also tried not to disrupt services at the facility during the exercise. Field data collection at health facilities was carried out using electronic tablet devices and data extraction forms to collect data from the 89 health facilities successfully accessed for this study.

Following field work data collection, daily meetings were held among data collectors and LGA supervisors to review completed tools, complete quality checks, and agree on strategies where necessary to facilitate quality data collection including reconciliation of facility names and descriptions. Examples of issues include the review and subsequent replacement of facilities where enumerators were refused access (one private facility), facilities operating under different names (adjustments made), non-existent facilities (skipped), etc.

Data uploads were made to a central cloud-based database daily to be reviewed by the central quality assurance team based in Bauchi capital, Abuja and Bethesda, Maryland USA.

2.2.7 Ethics approval

Initial internal review board registration was sought before the study began. Approval was granted by the National Health Research Ethics Committee of Nigeria, approval number NREC/12/05/2013/2016/48. Permission to carry out the study was also obtained from the Honorable Commissioner for Health, Bauchi state; the Chairman, Local Government Service Commission; and the PHC coordinators in the state.

2.2.8 Data analysis

Data entry and analysis was carried out using Excel and SPSS. Data generated were summarized and presented using, where relevant, frequency distributions, relevant means, standard deviation and proportions. Chi-square tests were for statistical significance at 5 percent level of significance.



3. RESULTS

A total of 85 health facilities were assessed to ascertain the availability and readiness of RMNCH services in Bauchi state (Table 2). The assessment was carried out in 95.3 percent of the health facilities designated as primary facilities and 4.7 percent designated as secondary health facilities. 74.1 percent of the facilities assessed were public while 25.9 percent were private. 70.6 percent of facilities assessed were PHC centers. The others were general hospitals (2.4 percent), comprehensive PHC centers (1.2 percent), and private clinic (25.9 percent).

Table 2: Number of facilities assessed by type

Type of facility	Number	Percent
General Hospital	2	2.4
Comprehensive PHC	1	1.2
PHC	60	70.6
Private Clinic	20	23.5
Private hospital	2	2.4
Total	85	100.0

Results are presented in summary for each variable followed by detailed results for each variable across each facility type. The summary tables focus on overall results for each variable, that is, the weighted average proportion across facility types, followed by the proportions for PHC (the most numerous facility type overall) and the proportion for private clinic (the most numerous type of private facility).

3.1 Health facility infrastructure

To assess the effect of infrastructure on RMNCH services, the assessment looked at indices such as leaking roof, power supply, water, toilet facilities, and labor/delivery room conditions. As indicated by the summary tables, overall, a high proportion (more than 60 percent) of health facilities have vital infrastructure such as a water source, on site toilet, and electricity present. The exception to this is leaking roof which was present in over half of the facilities assessed and at a high proportion in PHC (73.3 percent). Infrastructure findings are slightly better in the private clinic with the exception of stand-alone maternity clinic when compared with the PHC (Table 3). In the public facility, the General hospital tend to have better infrastructure. In particular, PHC centers perform more poorly than other facility types on most infrastructure variable including water availability, an essential input to quality RMNCH care.

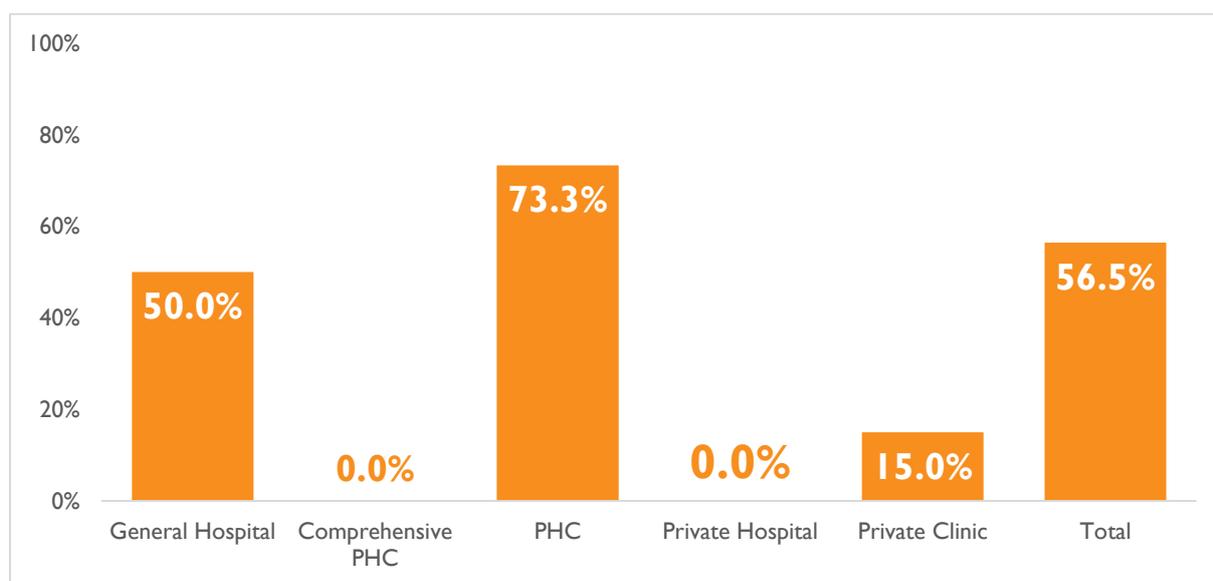
Table 3: Summary of health facility infrastructure findings (percent)

	All facility weighted average	PHC proportion	Private clinic
Leaking roof present	56.5	73.3	15

3.1.1 Leaking roof

As illustrated in Figure 1, over half of all the facilities visited had leaking roofs. By type of facility, 13.6 percent of private clinics, 50 percent of general hospitals and 73 percent of PHC centers had leaking roofs. The comprehensive PHC and private hospital assessed did not have a leaking roof.

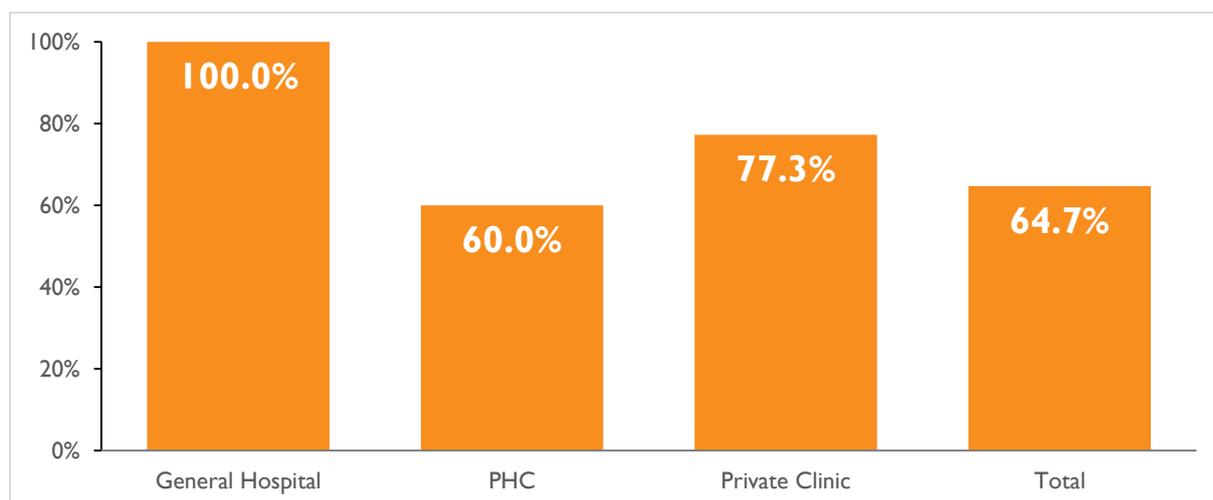
Figure 1: Percentage of facilities with leaking roofs



3.1.2 Availability of electricity

About a third of the facilities visited had electricity, as shown in Figure 2. The comprehensive PHC center had no electricity available, similarly, the PHC centers, which is the most numerous type of facility visited, had a low proportion of facilities with electricity, 60 percent. The situation is better for non-PHC facilities. 77.3 percent of private clinic and all the general hospitals assessed had available electricity.

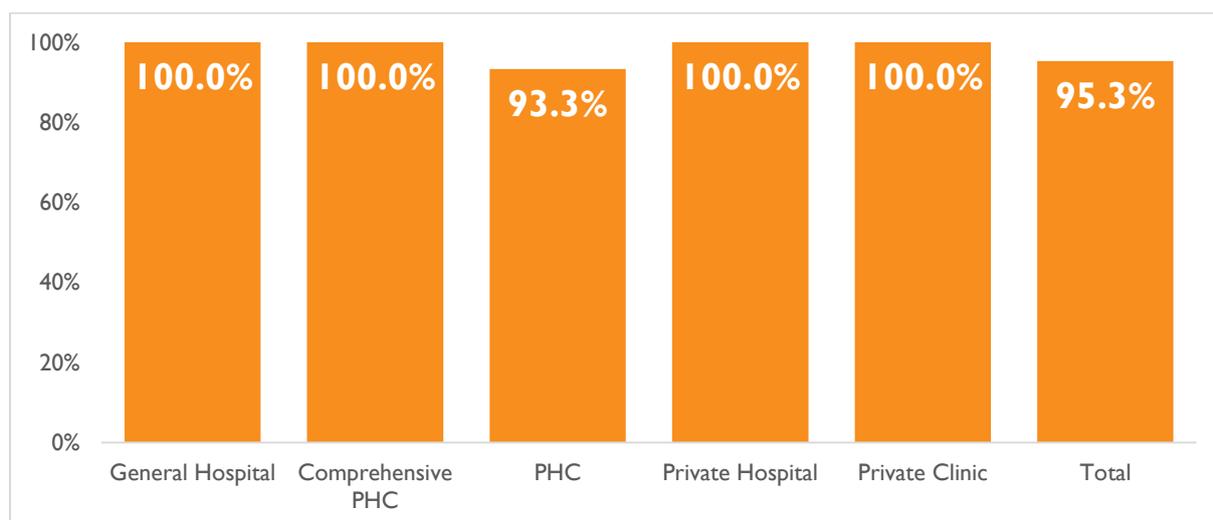
Figure 2: Percentage of facilities with electricity available



3.1.3 Water source present

A high proportion 95.3 percent of facilities visited had water source present at the time of the visit. However, 37% of these facilities had to go outside the facility grounds to access this primary source of water. Figure 3 indicates that all the General hospitals, comprehensive PHC, private hospital and private clinic have water source available while only 93 percent of PHC centers have water available.

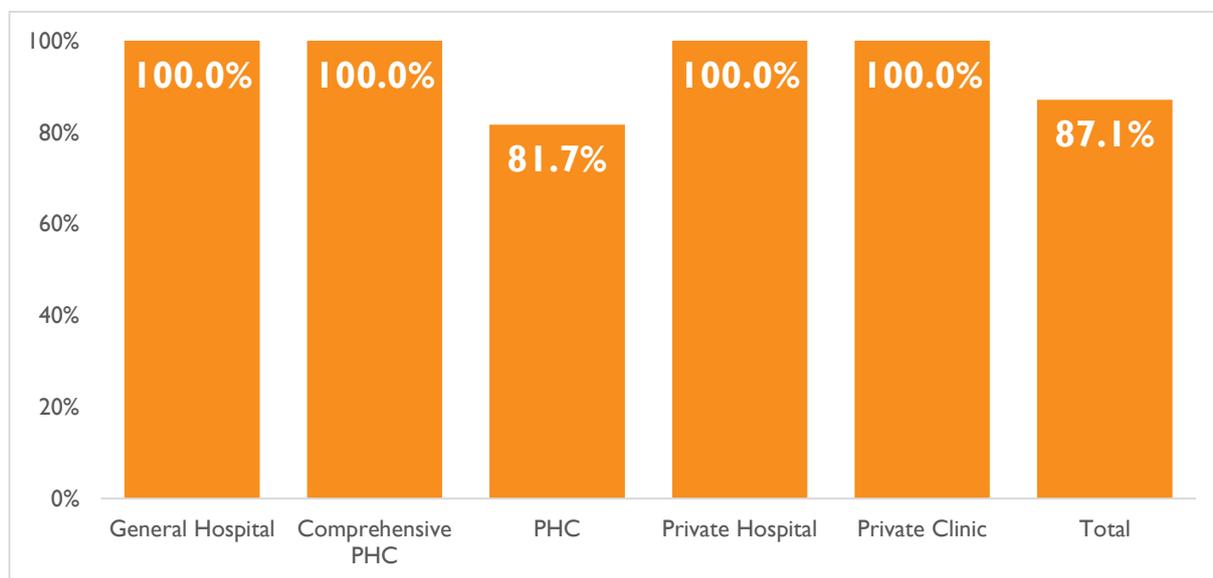
Figure 3: Percentage of facilities with water for patient and staff use



3.1.4 Availability of toilet facilities

Overall, 87.1 percent of facilities had toilet on the premises. Figure 5 shows that all the general hospital, comprehensive PHC, and private clinic and private hospitals assessed had staff and client toilets on the premises that were functioning. 18.3 percent of PHC centers did not have a functioning toilet for staff and client use.

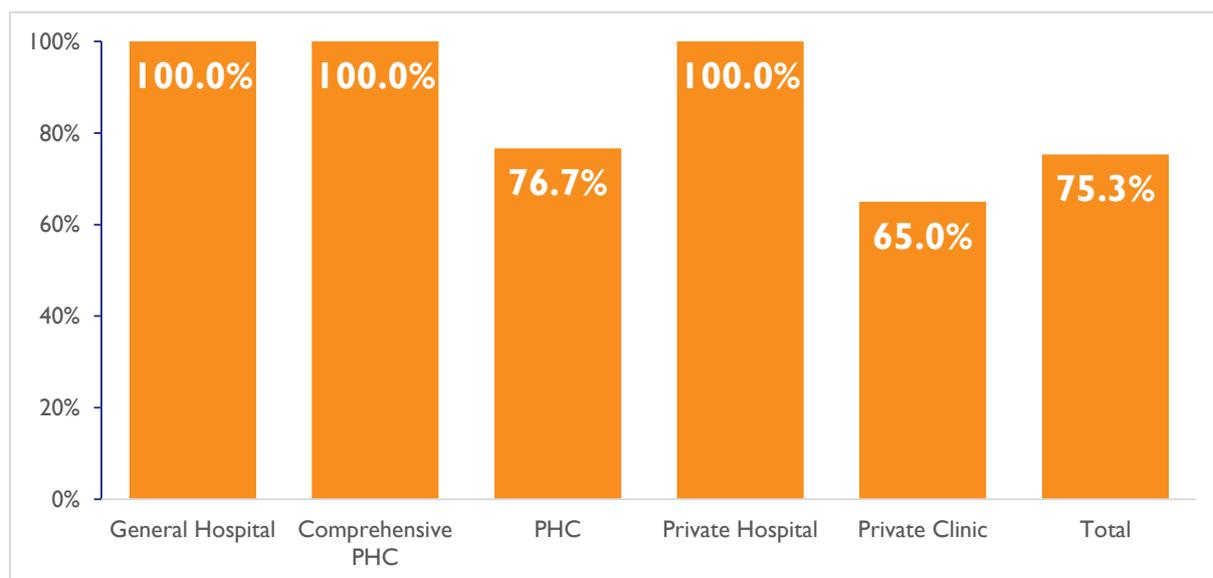
Figure 4: Percentage of facilities with functioning toilet



3.1.5 Availability of stand-alone maternity wards

Error! Reference source not found.6 shows that a quarter of the facilities have a stand-alone maternity ward. The General hospital, Comprehensive PHC and Private hospital all have stand-alone maternity wards. However, 6.7 percent of PHC, and 65 percent of private clinic have stand-alone maternity ward.

Figure 6: Percentage of facilities with stand-alone maternity ward



3.2 Human resources for health

To assess the current status of HRH in Bauchi state, the study looked at indicators such as staff availability as well as recent capacity building/training to maintain or acquire skills critical to reducing maternal and child mortality. As seen in Table 4, PHC centers don't appear to be as poorly resourced as other facility types as per the previous infrastructure findings. Majority private facilities have skilled staff and midwives available compared to PHC, but there is a generally low proportion of facilities with available midwives. The private facilities had a higher proportion of staffing plan with authorized allocated numbers as compared to the public facilities. On average, facilities visited had recent training for their staff, private facilities slightly more so for QA training and IMCI trainings, however training in newborn sepsis was seen to be higher in the PHC. In general, a higher proportion of private facilities had skilled staff available than public facilities. Partograph use is seen to be low across all facility types. Immunization service is seen to be offered more in public facilities compared to private facilities. This is also the case in providing service through outreach, more public facilities offer service through outreach. With Regards to HIV & AIDS treatment, care and support service, this is seen to be generally low across all types of facilities.

Table 4: Summary of HRH (percent)

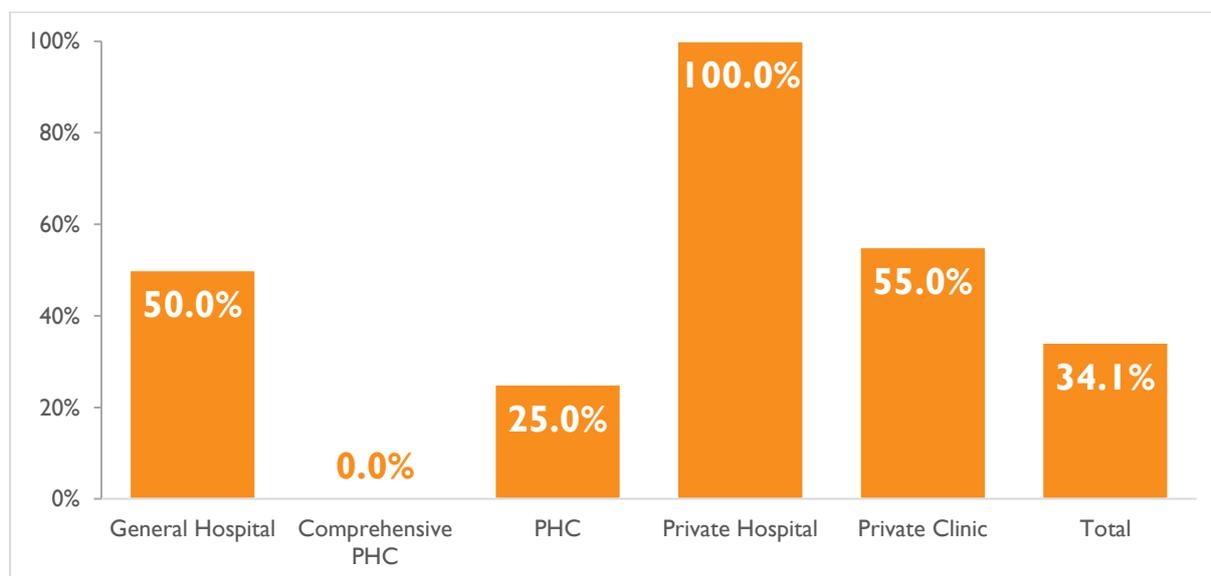
	All facility weighted average	PHC	Private Clinic
Skilled staff availability	34	25	55
Midwife availability	23	21	25
Health care waste training	24	30	10
HIV/AIDS treatment and care training	37	25	33
Staffing plan availability	45.9	43	55
QA Training	57.6	60	50
IMCI Training	43.8	41	47.4
Newborn sepsis Training	24.5	13.9	62.5
Availability of 24-hours labour and delivery services	83.5	83.3	80.0
AMTSL routine practise	86.9	88.3	84.2
Partograph use	23.8	20.0	26.3
Practice Newborn resuscitation	61.9	56.7	68.4
formal systems for linking with community base	78.5	96.7	25.0
Provision of services through outreach	80.0	98.3	25.0
Provision of Family Planning services	89.4	93.3	80.0
Provision of ANC services	94.1	96.7	85.0
PMTCT services	25.0	15.5	47.1
PNC as an outpatient service	85.0	66.7	100
Post-abortion care	30.0	17.2	52.9
Cervical cancer screening	9.4	1.7	30.0
Immunization services	78.8	98.3	25
Adolescent health services	81.2	78.3	85.0
HIV counselling and testing services	61.2	55.0	70.0

	All facility weighted average	PHC	Private Clinic
HIV & AIDS antiretroviral prescription or antiretroviral treatment	9.4	6.7	15.0
HIV & AIDS care and support services	9.4	6.7	10.0

3.2.1 Availability of skilled staff

A skilled health worker (SHW) is a medical officer, youth corps doctor, registered nurse, midwife, registered midwife, specialist in obstetrics and gynecology, specialist in pediatrics, or physician specialist in anesthesia. As **Error! Reference source not found.7** shows, an average of 34.1 percent of the facilities visited had available SHW, with the nonpublic facilities having a higher proportion of facilities with available SHW as compared to the public facilities. The comprehensive PHC and majority of PHC facilities visited (75 percent) did not have a SHW. This was not the case in the private hospital, which have SHW available in all their facilities. Also, about half of the General hospital (50 percent) and 55 percent of Private clinic also have SHW available.

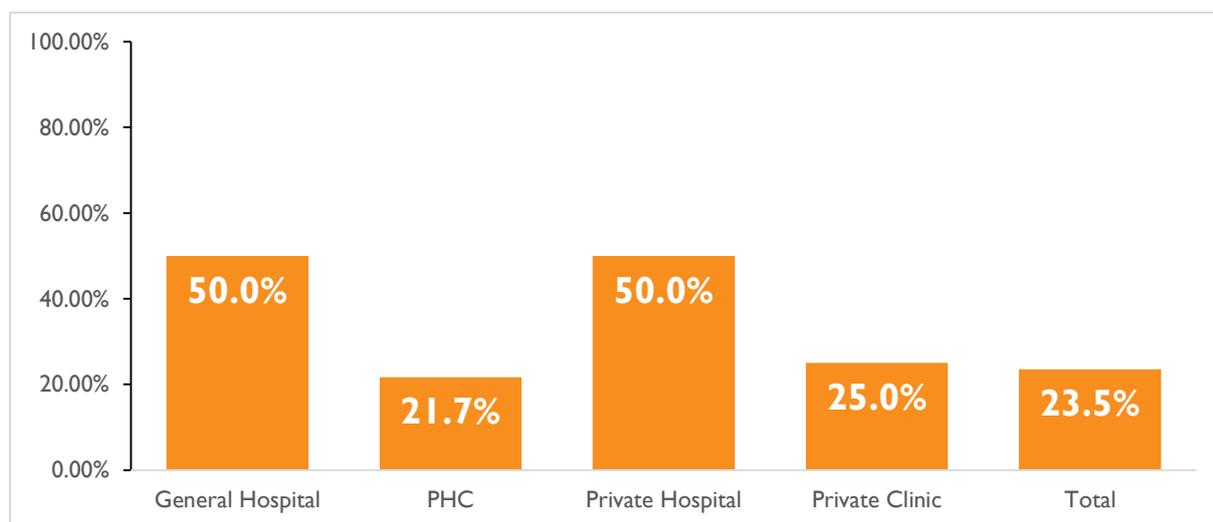
Figure 7: Percentage of facilities with skilled health worker available



3.2.2 Availability of midwives

Nearly 80 percent of facilities did not have the services of a midwife. The results shown in **Error! Reference source not found.**8 indicate that (50 percent) of the Private hospital and 50 percent of General hospital (have midwives available. Only a quarter of the private clinic (25 percent) and less than a quarter of PHC (21.7 percent) have midwives available. This an overall low proportion of facilities with available midwives

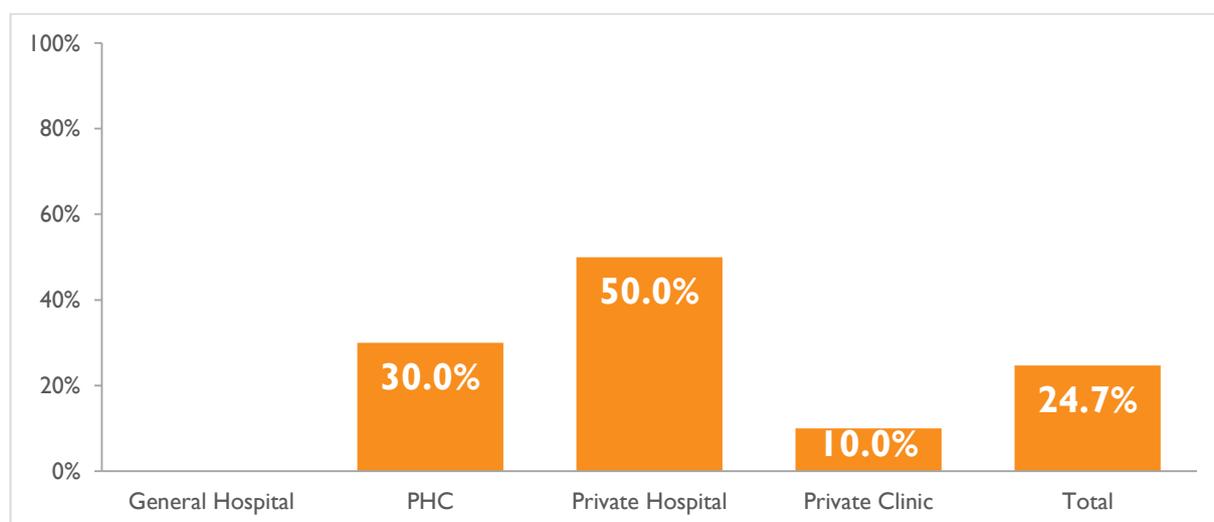
Figure 8: Percentage of facilities with midwives available



3.2.3 Availability of Staff with formal training in health care waste

As shown in Figure 9, overall, only about a quarter of facilities visited had providers trained in healthcare waste. Half of the Private hospital (50 percent), about a third of the PHC (30 percent) and a tenth of the private clinic had providers trained in healthcare waste. The comprehensive PHC had no provider trained in healthcare waste.

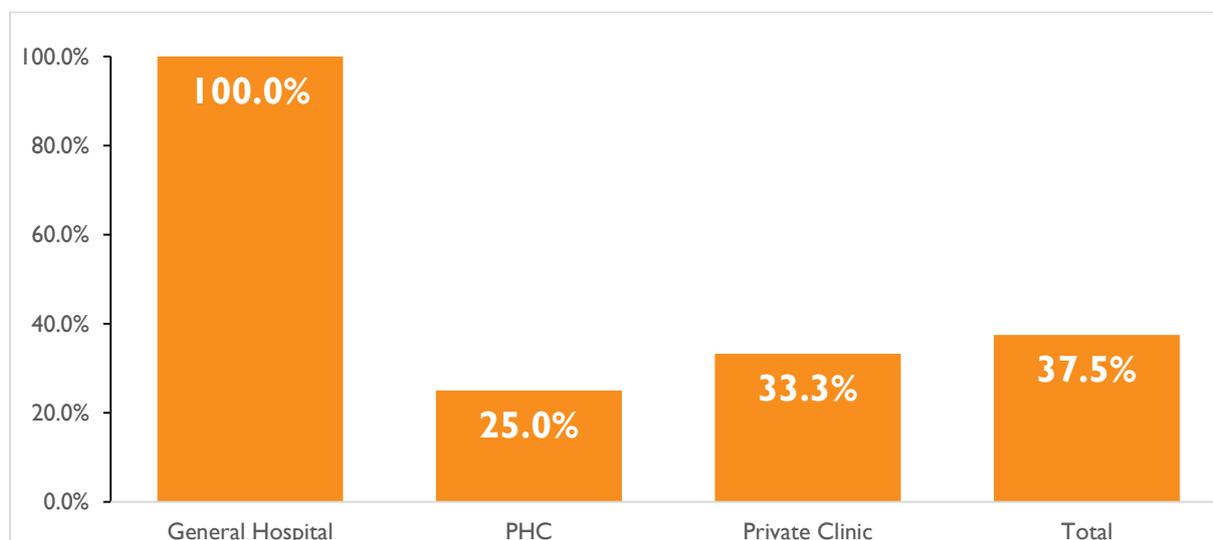
Figure 9: Percentage of facilities with providers trained in healthcare waste



3.2.4 Staff training in Adult and Pediatrics HIV/AIDS treatment and care.

As Figure 11 indicate, slightly over a third (37.5 percent) of the facilities visited had trained staff in Adult and Paediatric HIV/AIDS treatment and care in the last two years. All the General hospital (100 percent), a third of the Private Clinic (33,3 percent) and a quarter (25 percent) of the PHC facilities had staff trained in Adult and Paediatric HIV/AIDS treatment and care in the last two years.

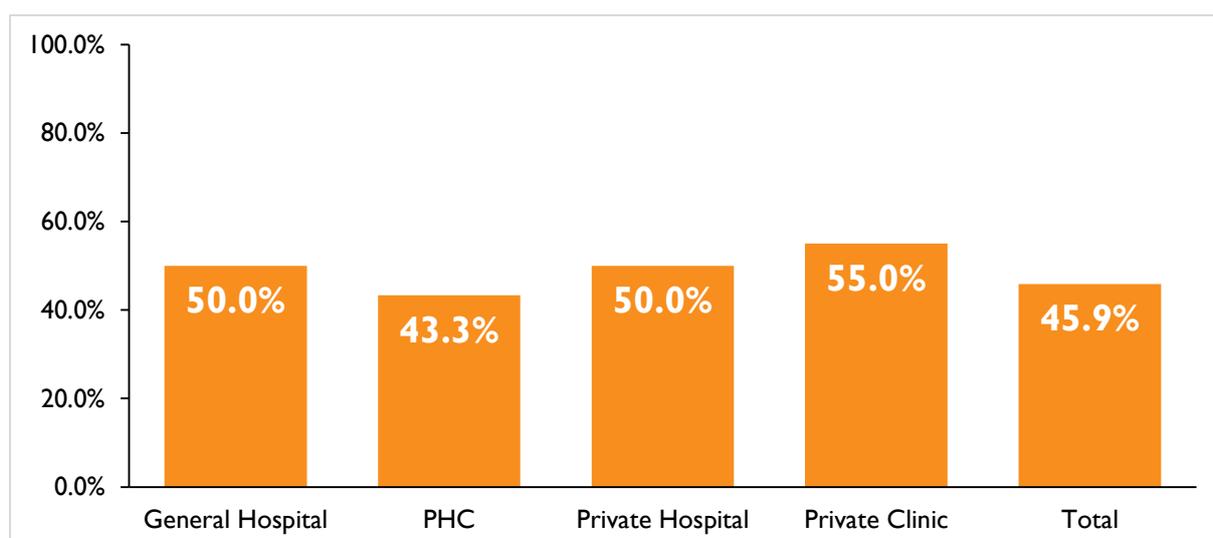
Figure 11: Percentage of facilities with staff trained in HIV/AIDS treatment and care



3.2.5 Availability of staffing plan with authorized allocated numbers

Almost half of all facilities (45.9 percent) had staffing plan with authorized allocated number. One out of two of the General hospital (50 percent) and 45.3 percent of the PHC had staffing plan with authorized allocated numbers. Also about half of the Private hospital (50 percent) and the Private Clinic (55 percent) had staffing plan with authorized allocated numbers as shown in Figure 12.

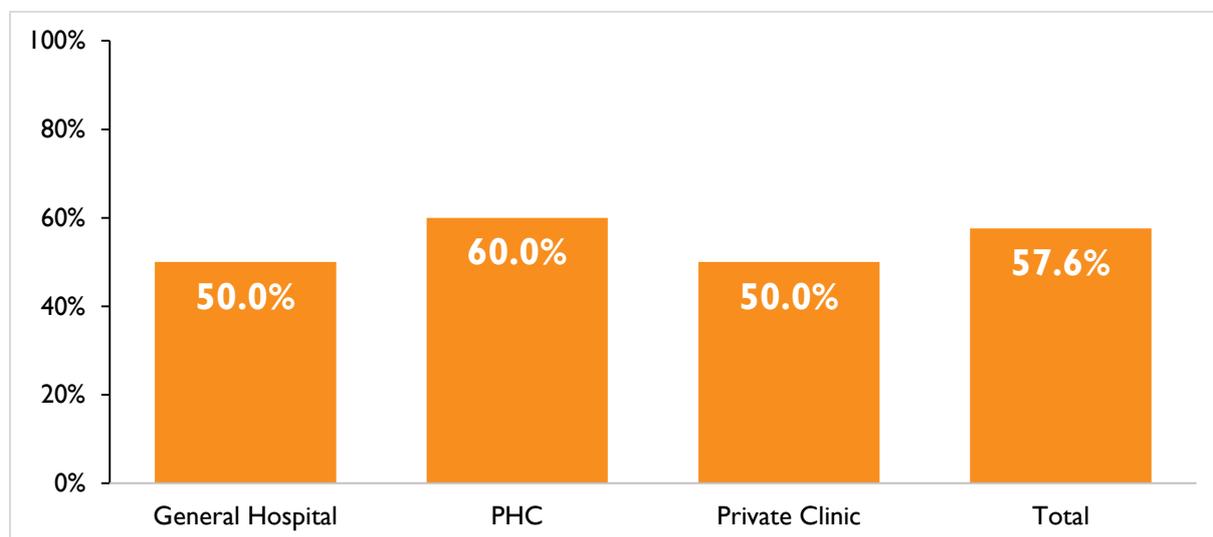
Figure 12: Percentage of facilities with staffing plan with authorized allocated numbers



3.2.6 Staff responsible for QA receiving QA training

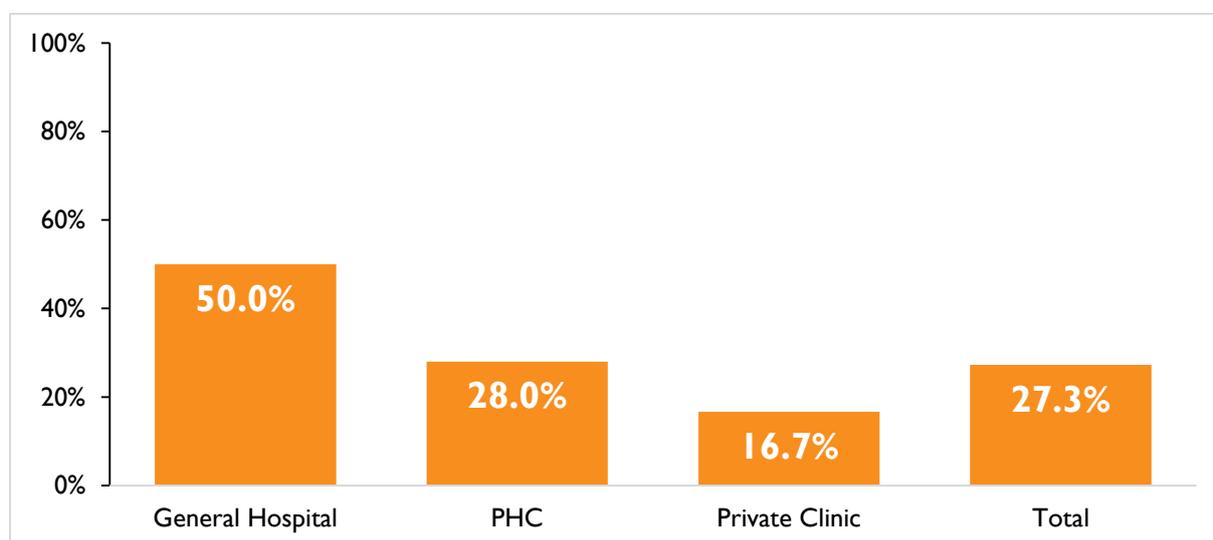
Generally, over half (57.6 percent) of the total facilities with staff responsible for Quality Assurance (QA) had their staff trained in QA. 50 percent of General hospital and 50 percent of Private Clinics had staff trained on QA who were responsible for QA. 60 percent of PHCs had staff who were responsible for QA trained on QA as shown in Figure 13a.

Figure 13a: Percentage of facilities with staff responsible for QA with qa training received



Half of the General hospital, about a quarter of the PHC (28 percent) and 16.7 percent of private clinic had other staff who received training in QA as shown below in Figure 13b.

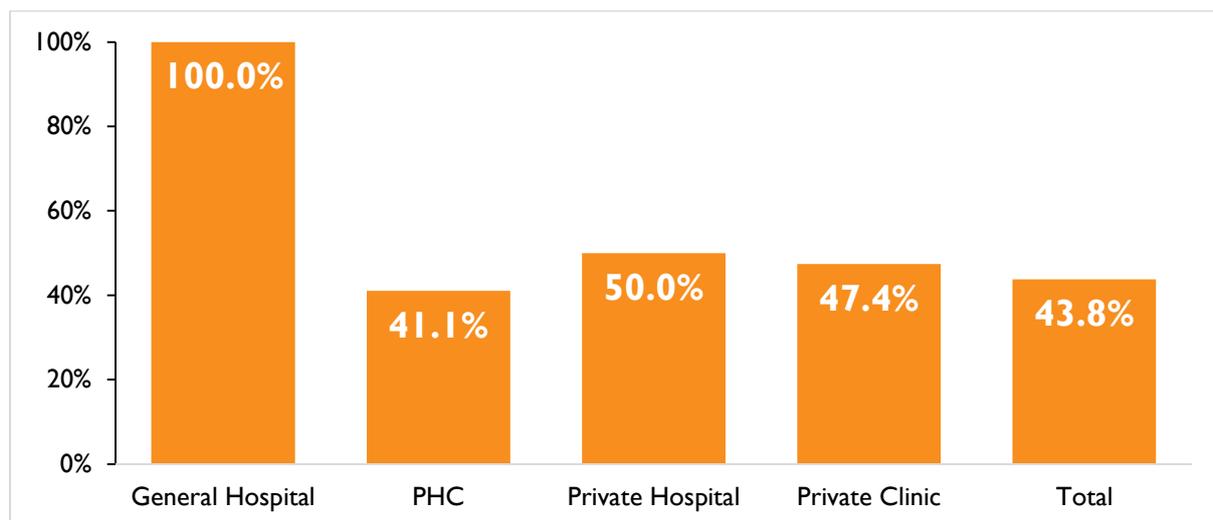
Figure 13b: Percentage of facilities with other staff trained with qa training



3.2.7 Staff training in the Integrated Management of Childhood Illnesses (IMCI)

Less than half (43.8 percent) of the facilities visited have providers of curative care services for sick children who were trained in the Integrated Management of Childhood Illnesses (IMCI) within the past two years. Both General hospital visited had staff who provided curative care services for sick children and were trained in IMCI. About four out of 10 PHC (41 percent), approximately half of the Private Clinic (47 percent) and half of the Private hospital (50 percent) also had staff who provided children curative care services trained in the IMCI within two years as shown in Figure 14.

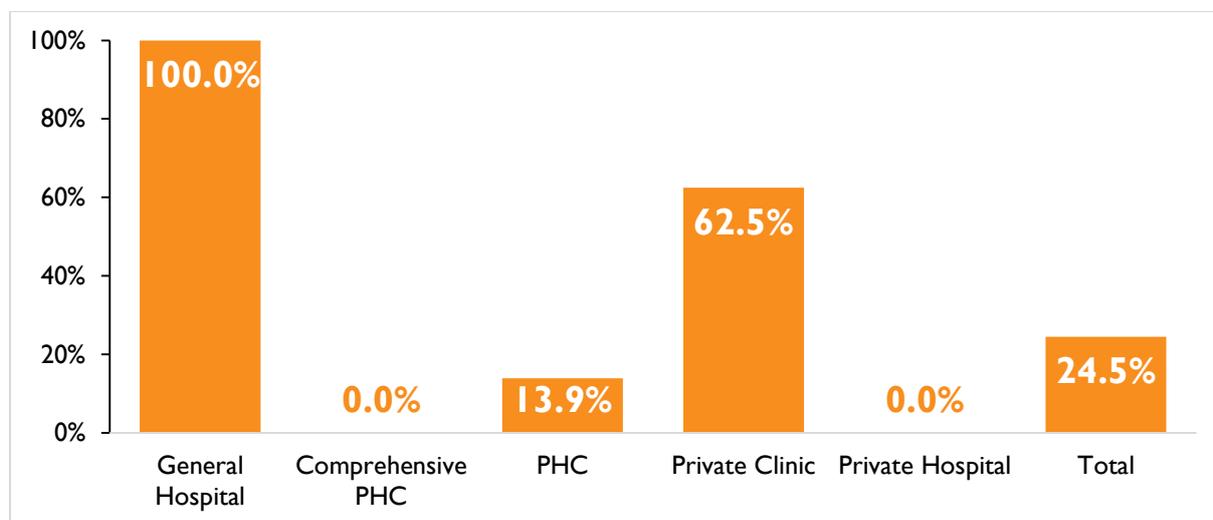
Figure 14: Percentage of facilities with staff trained in IMCI



3.2.8 Staff training related to newborn sepsis

Overall about a quarter (24.5 percent) of the facilities assessed had providers who have received training related to newborn sepsis during the past 2 years. The General hospital assessed both had staff who had received this training during the past 2 years. 62.5 percent and 13.9 percent of private clinic and PHC respectively also had staff trained in newborn sepsis during the past 2 years. The private Hospital and Comprehensive PHC did not have any staff with such training in past 2 years.

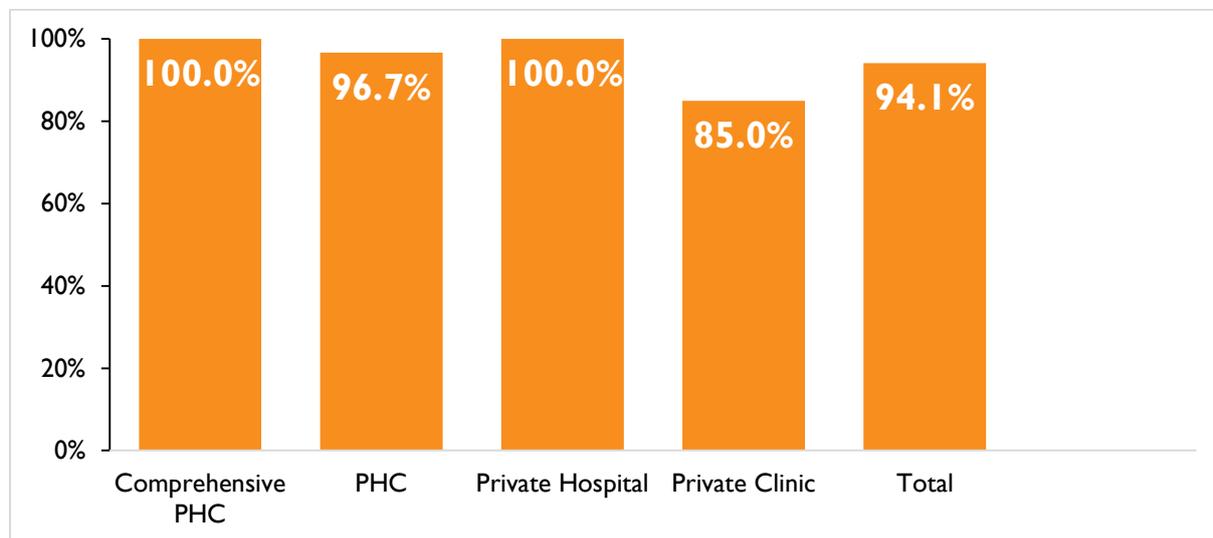
Figure 15: Percentage of facilities with staff trained in newborn sepsis



3.2.9 Provision of antenatal care (ANC) services

A high proportion of facilities surveyed (94.1 percent) provided family planning services as shown in Figure 16. All Comprehensive PHC (100 percent) and Private hospital (100 percent), almost all PHC (96.7 percent) and 85 percent of Private Clinic provided ANC services at the time of survey.

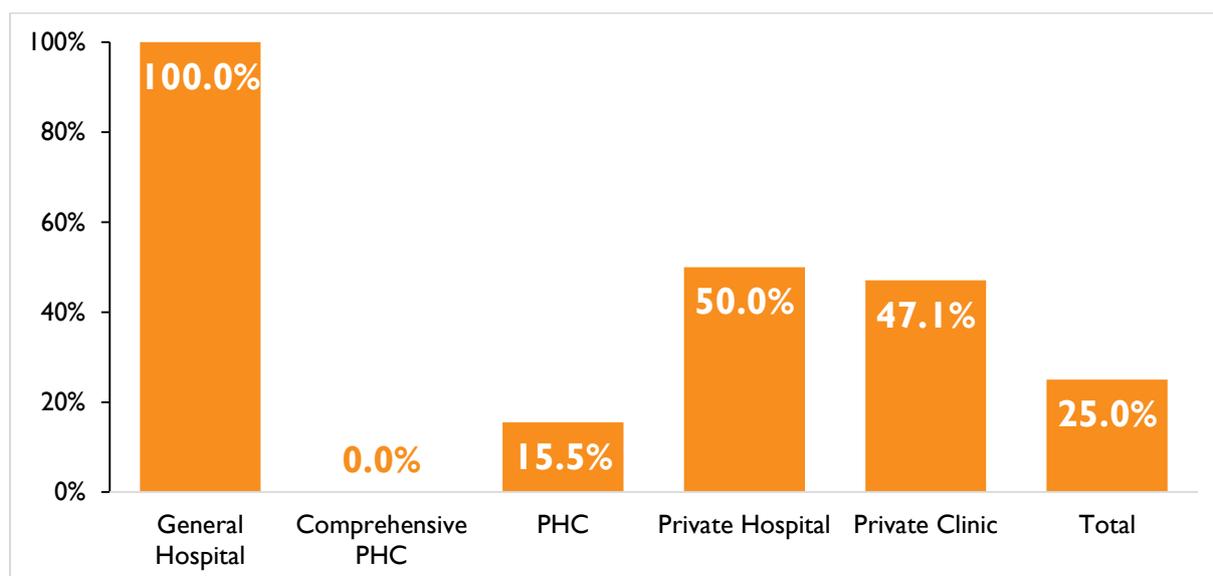
Figure 16: Percentage of facilities Providing antenatal care (ANC) services



3.2.10 Provision of services for PMTCT

As shown in Figure 17, only a quarter of the total facilities surveyed offered services for prevention of mother-to-child transmission of HIV (PMTCT). Both General hospitals assed provided PMTCT services, however, only half of the private hospital (50 percent) less than half of the private clinic (47.1 percent) and less than a fifth of the PHC (15.5 percent) provided services for PMTCT. The only comprehensive PHC did not offer services for PMTCT

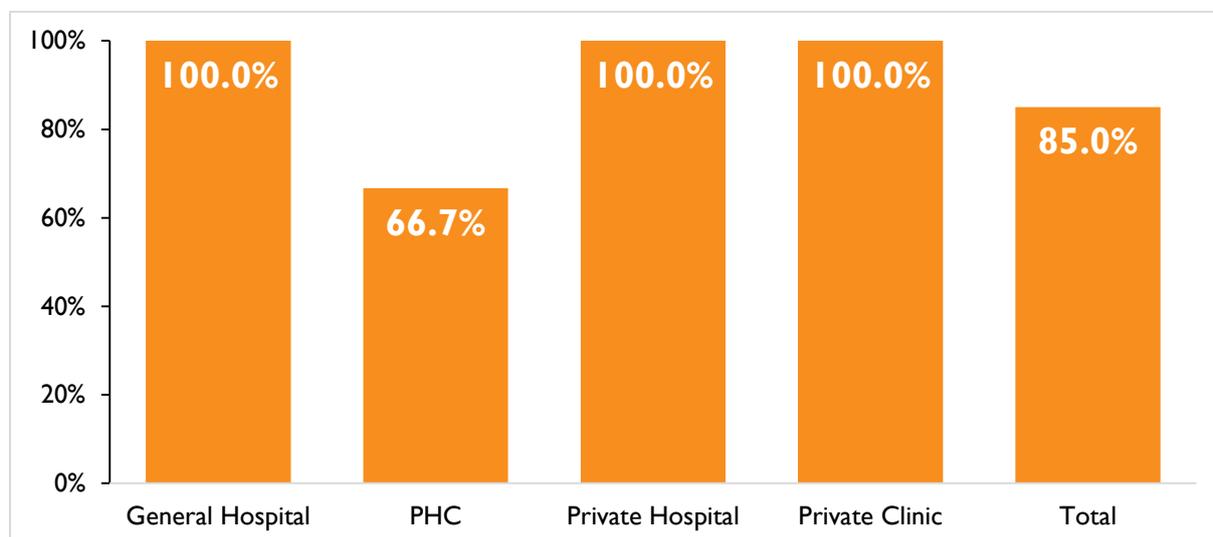
Figure 17: Percentage of facilities Providing services for PTMTC



3.2.11 Provision of PNC as an outpatient service

Overall, 85 percent of the total facilities visited had Post Natal Care as an outpatient service. All the private facilities which include all private hospitals (100 percent) and all private clinic (100 percent) offered PNC as an outpatient service. Both General hospital assessed also offered PNC services. Only two-thirds of the PHC facilities (66.7 percent) provided PNC as an outpatient service.

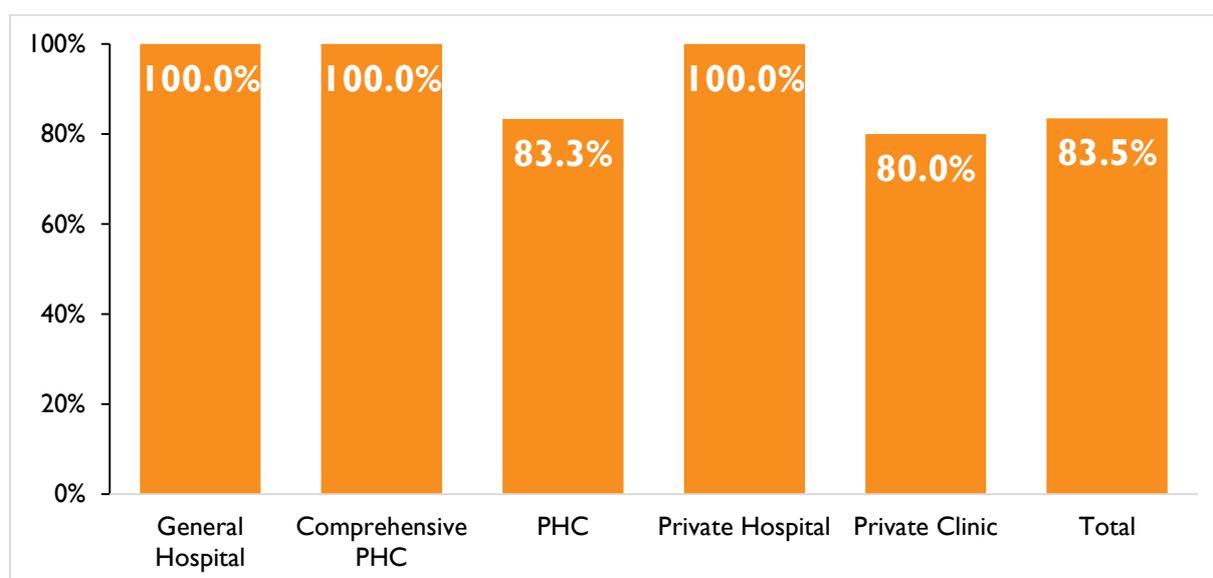
Figure 18: Percentage of facilities with PNC as an outpatient service



3.2.12 Availability of 24-hours labor and delivery services

Overall, 83.5 percent of all the facilities visited had 24 hours labor and delivery services. As Figure 16 shows, all General hospitals assessed and the comprehensive PHC visited had 24 hours labour and delivery service available (100 percent). 83.3 percent of the PHC also had 24 hours labour and delivery service available. All private hospital (100 percent) and 80 percent of private clinics had 24 hours labour and delivery service available

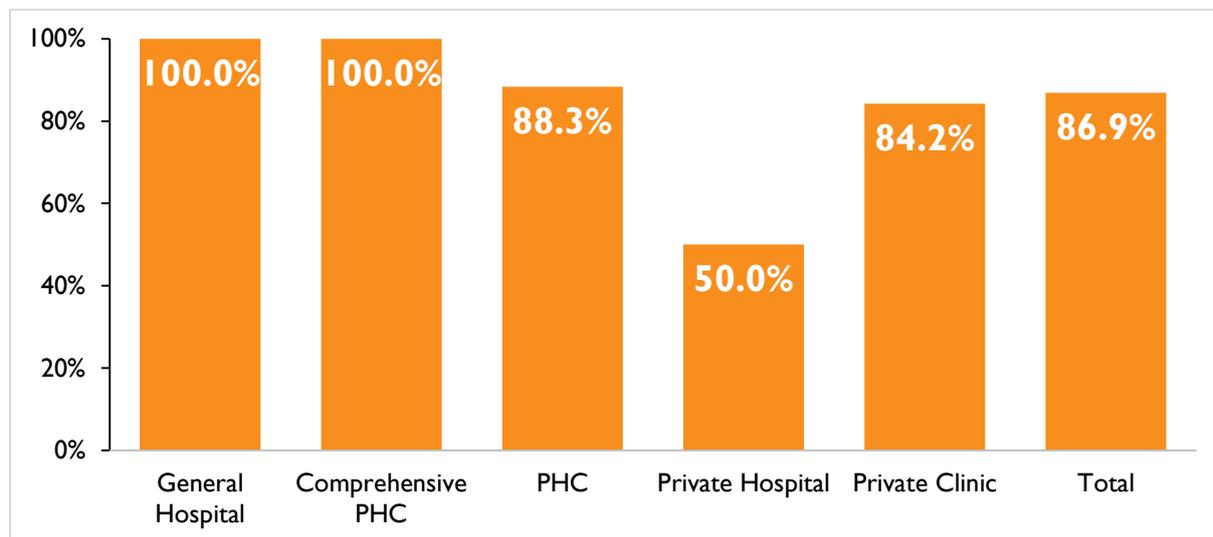
Figure 16: Percentage of facilities with available 24 hours labour and deliver services



3.2.13 Staff routine practice of AMTSL

As Figure 17 shows, nearly 87 percent percent of surveyed facilities had staff who routinely practised Active Management of Third Stage of Labor (AMTSL). The General hospitals (100 percent) and Comprehensive PHC (100 percent) had staff who routinely practised AMTSL. More than 4 out 5 PHC (88.3 percent) and private clinic (86.9 percent), and only half (50 percent) of the private hospitals had staff who routinely practised AMTSL.

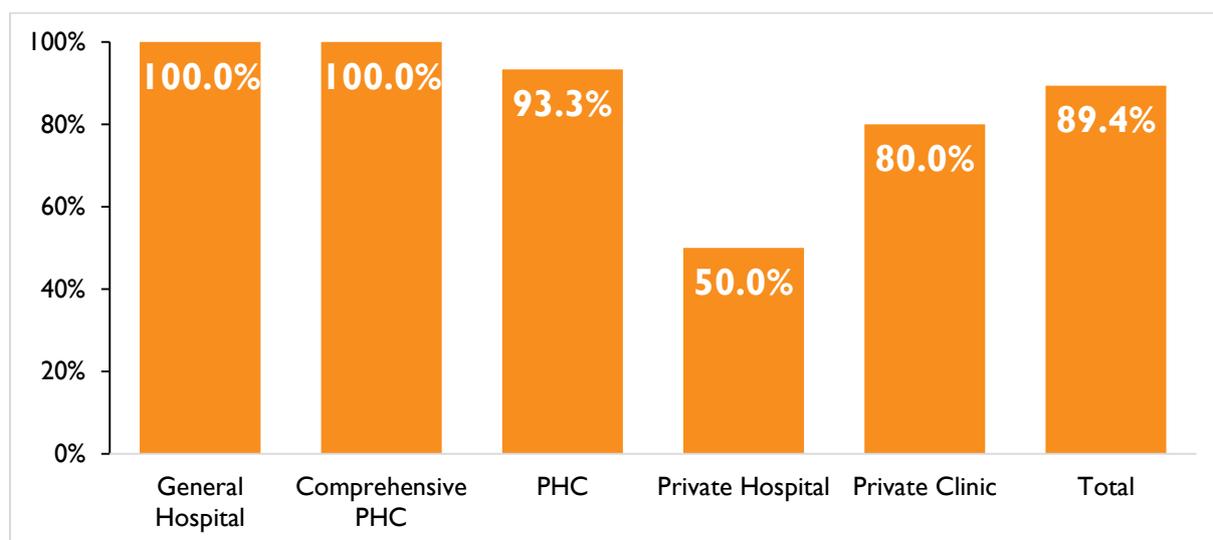
Figure 17: Percentage of facilities with routine practise of AMTSL by staff



3.2.14 Provision of Family Planning services

Almost 90 percent of the total facility surveyed provided family planning services. As shown in Figure 18, all the General hospital (100 percent), the Comprehensive PHC (100 percent), 93.3 percent of PHC, 80 percent of private clinic and half of the private hospital (50 percent) provided family planning services.

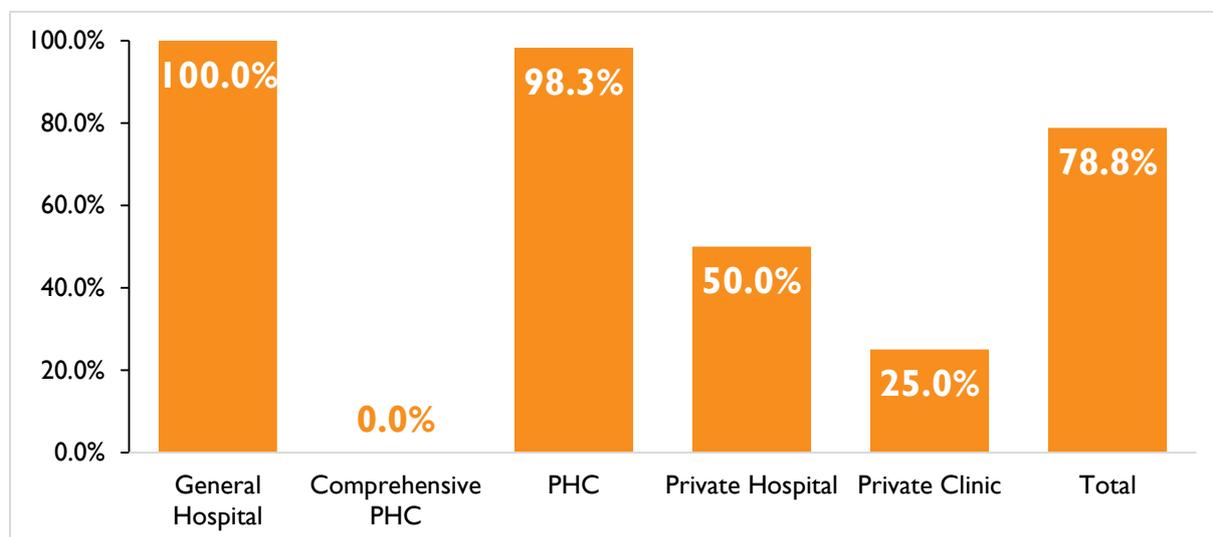
Figure 18: Percentage of facilities with Family planning services



3.2.15 Immunization services

In general, 78.8 percent of all facilities surveyed provided immunization services. All General Hospital (100 percent) and a high proportion of PHC (98.3 percent) offered immunization services. Only half of the Private Hospitals (50 percent) a quarter of Private Clinic (25 percent) offered any immunization service. The only Comprehensive PHC assessed did not offer any immunization services

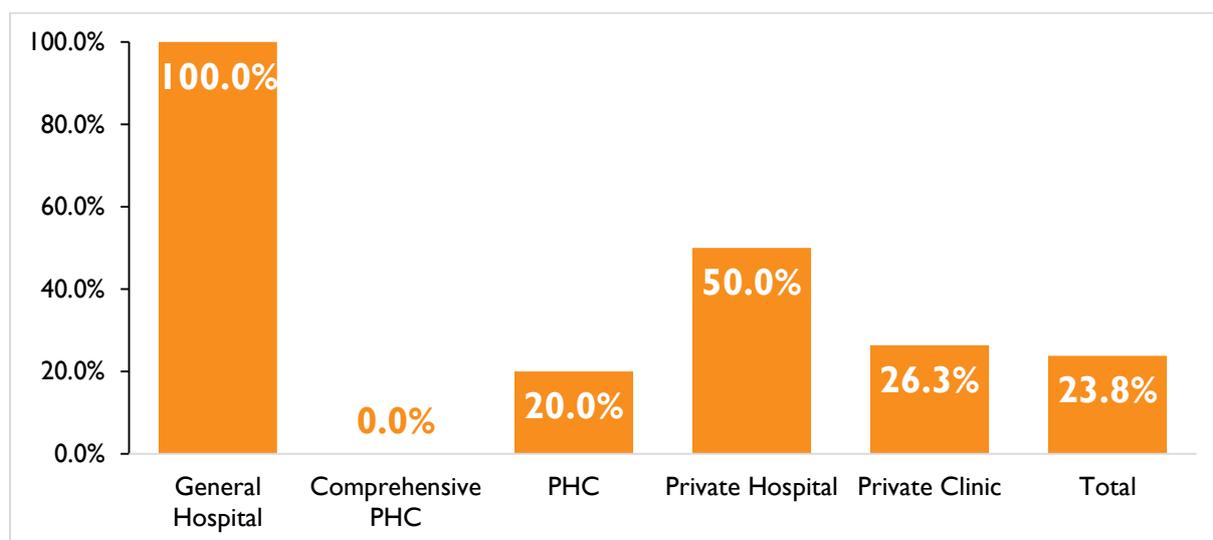
Figure 19: Percentage of facilities with immunization services



3.2.16 Partograph use

Figure 20 indicates that less than a quarter of the facilities (23.8 percent) used a partograph to manage labor. Only half of the private hospital (50 percent), about a quarter of private clinic (26.3 percent) and 1 out of 4 PHC (20 percent) assessed had staff routinely use a partograph to manage labor. Both General hospitals visited had staffs using partograph in the management of labor. Only the comprehensive PHC that was assessed did not utilize partograph to manage labor.

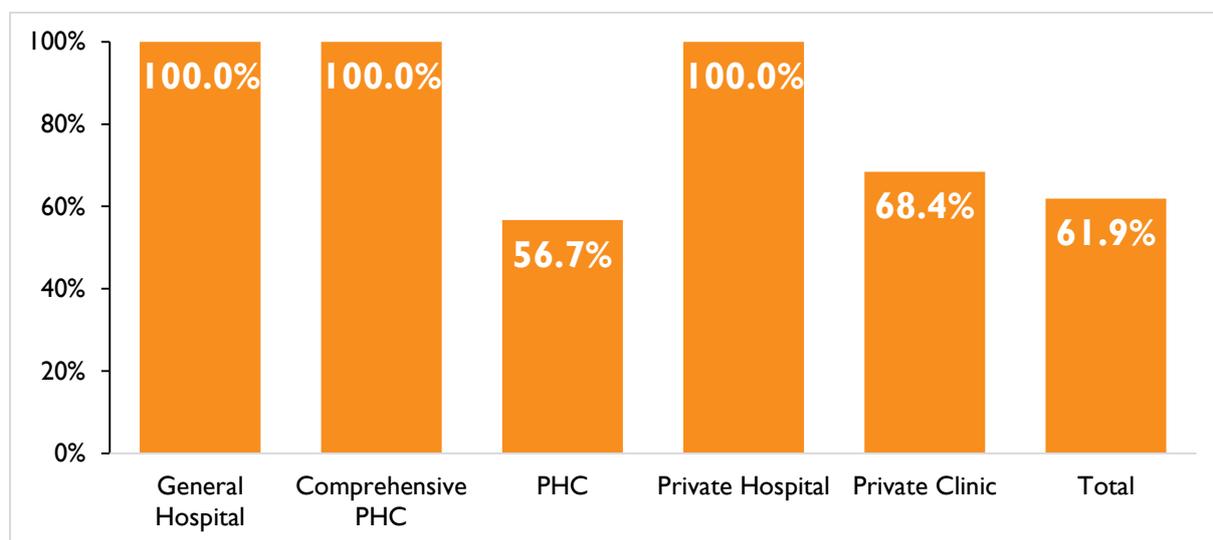
Figure 20; percentage of facilities using partographs



3.2.17 Newborn resuscitation

As Figure 21 shows, over 60 percent of the surveyed facilities were practicing newborn resuscitation when needed. Specifically, all the General hospital (100 percent), comprehensive PHC (100 percent) and private hospital practiced newborn resuscitation as and when needed. More than half or the PHC (56.7 percent) and above two-thirds of the private clinic (68.4 percent) also practiced newborn resuscitation.

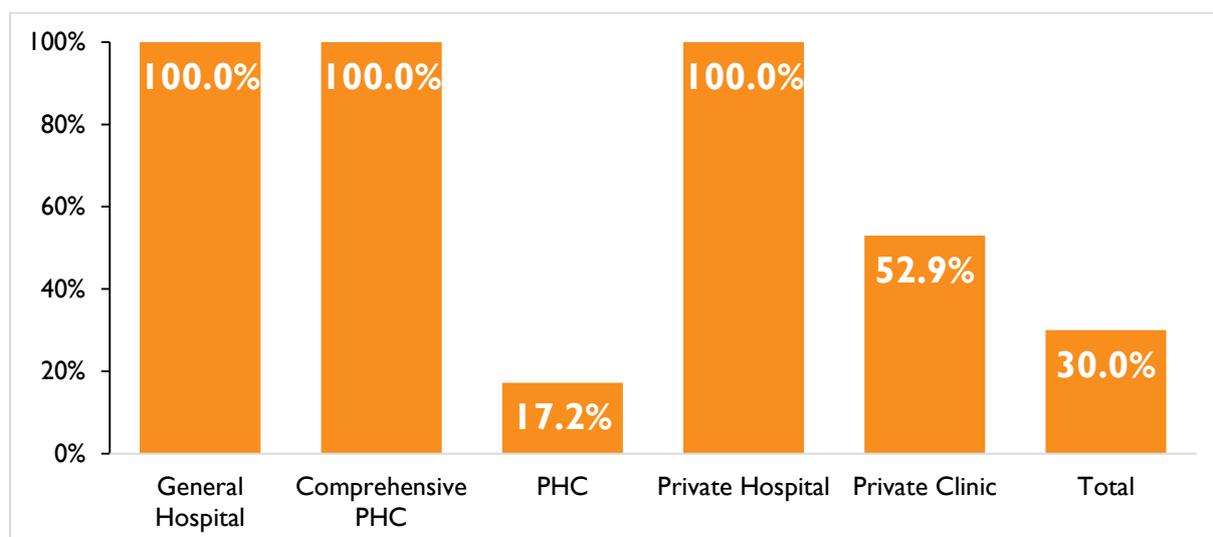
Figure 21: Percentage of facilities practicing newborn resuscitation



3.2.18 Provision of Post-abortion care

As shown in Figure 22, less than a third of all facilities surveyed provided any post abortion care services such as vacuum aspiration or D&C services to remove retained products of conception, or treatment of infections. All General Hospitals (100 percent), the comprehensive PHC (100 percent), and Private Hospital (100 percent) visited offered post abortion care. Close to half of the private clinic (47.1 percent) and 82.8 percent of the PHC did not offer any post abortion care.

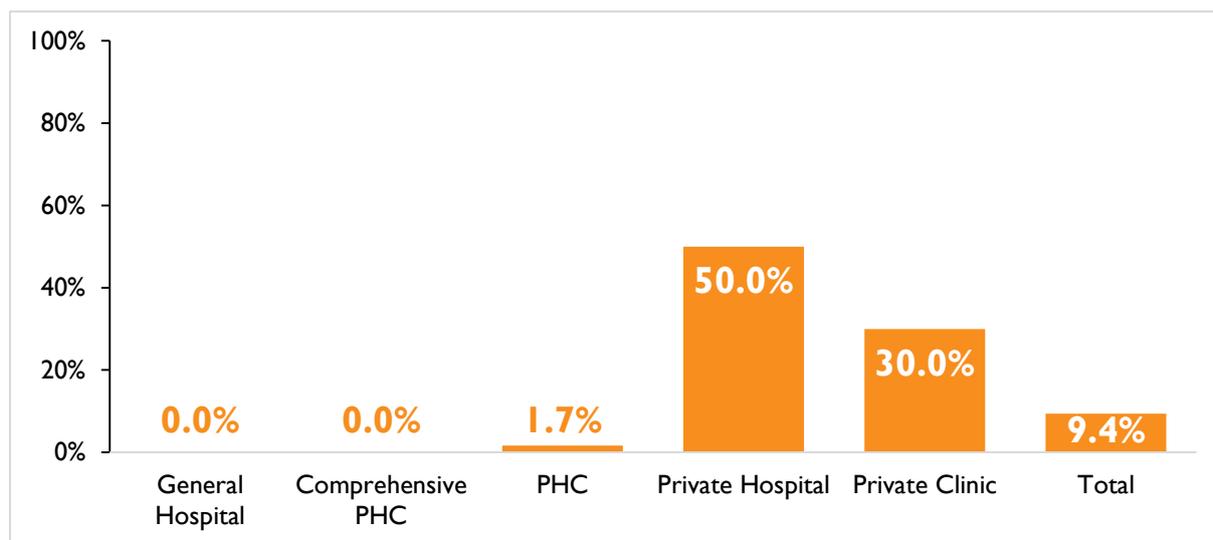
Figure 22: Percentage of facilities providing post-abortion care



3.2.19 Screening Cervical Cancer

Overall, less than one-tenth of the facilities visited took specimen for screening cervical cancer in patients i.e., PAP smears. Half of the Private Hospitals (50 percent) and about a third of the private clinic (30 percent) had providers who took Pap smear for screening of cervical cancer. The only type of public facility which had providers who took PAP smears were PHC, and that was only 1.7 percent of the PHC. As shown in Figure 23, none of the General hospital or the comprehensive PHC took specimen for screening cervical cancer in patients

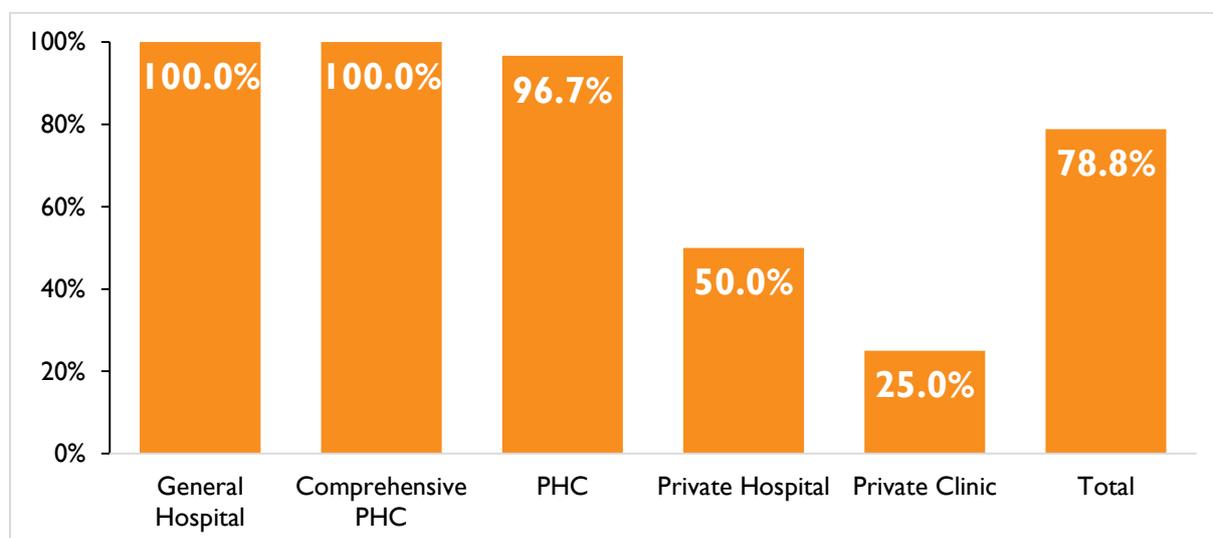
Figure 23: Percentage of facilities that take a specimen for screening cervical cancer in patient



3.2.20 Facility with formal systems for linking with community base

Over three-quarters of the total facilities assessed had a formal system for linking with community base (78.8 percent) as depicted in Figure 24. 100 percent of the General hospital and Comprehensive PHC had a formal system for linking with community base. Almost all the PHC (96.7 percent) half of the private hospital (50 percent) and a quarter of the private clinics (25 percent) had a formal system for linking with community base.

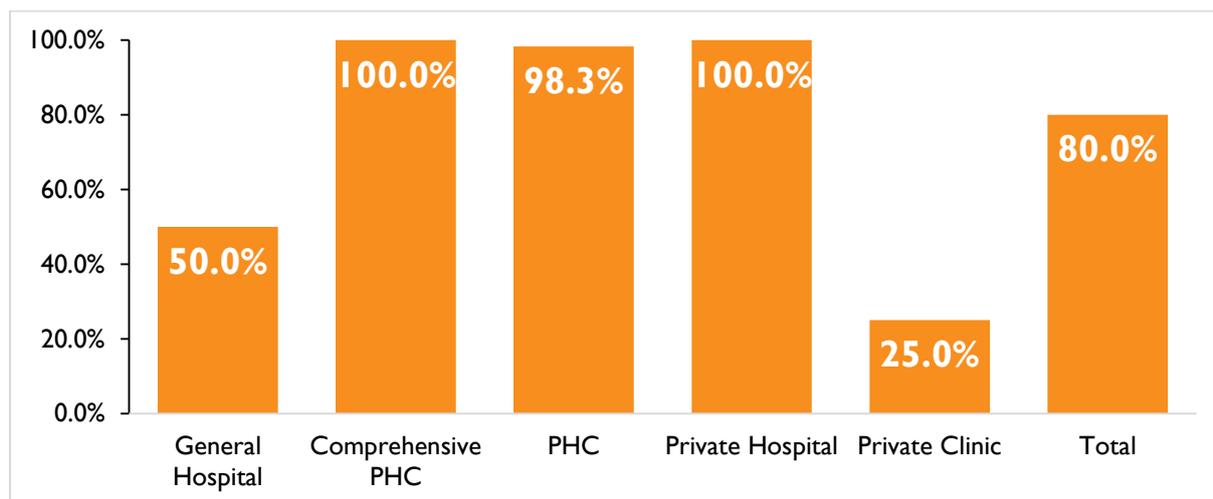
Figure 24: Percentage of facilities with formal systems for linking with community base



3.2.21 Provision of services through extension or outreach into the community

Overall, 80 percent of the total facilities visited had staff who routinely provided services through extension or outreach into the community. The Comprehensive PHC (100 percent), all the private hospitals (100 percent), almost all the PHC (98.3 percent), half of the general hospital (50 percent) and a quarter of the private clinic (25 percent) routinely provided services through extension or outreach into the community as shown in Figure 25.

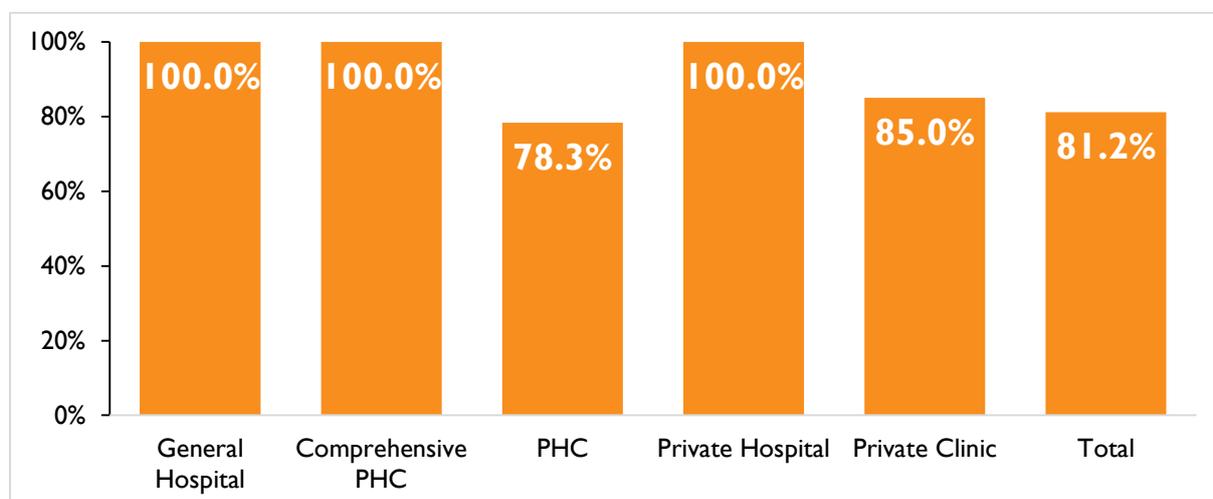
Figure 25: Percentage of facilities providing services through extension or outreach into the community



3.2.22 Provision of Adolescent health services for children 13-18 years of age.

Overall, a high proportion of facilities (82.2 percent) provided adolescent health services for children 13-18 years of age. As shown in Figure 26, all (100 percent) General hospital, Comprehensive PHC and Private Hospitals offered adolescent services. 85 percent of Private Clinic and 78.3 percent of PHC also offered adolescent health services for children aged 13-18 years as shown in Figure 26.

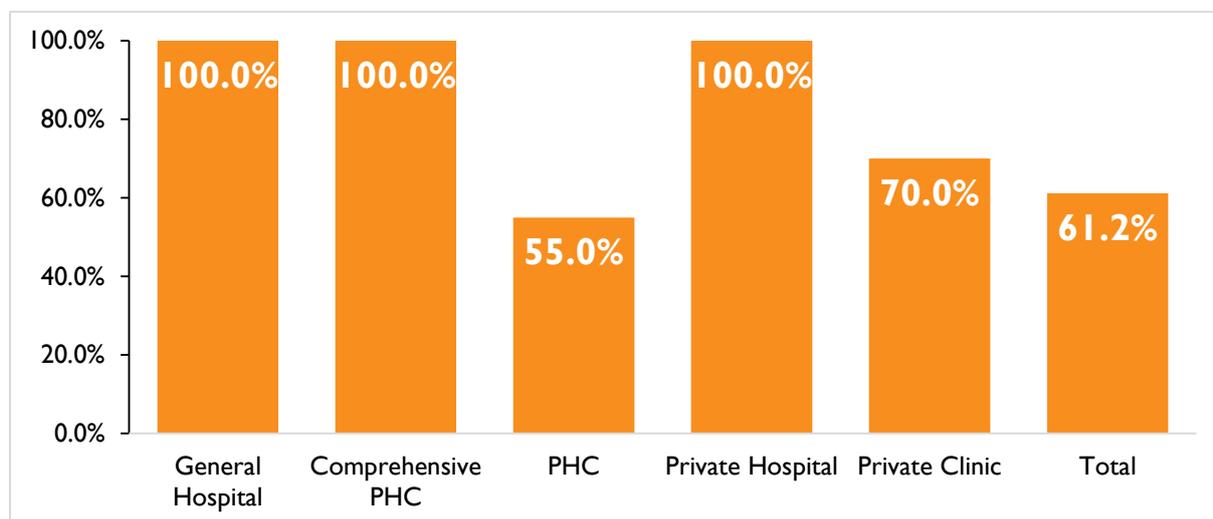
Figure 26: Percentage of facilities providing adolescent health services for children 13-18 years of age



3.2.23 Provision of HIV counselling and testing services

As shown in Figure 27, less than two-thirds (61.2 percent) of all facilities surveyed offered HIV counselling and testing services. All the General hospital, Comprehensive PHC and Private Clinic offered HIV counselling and testing services. 70 percent of Private Clinic and 55 percent of PHC offered HIV counselling and testing services

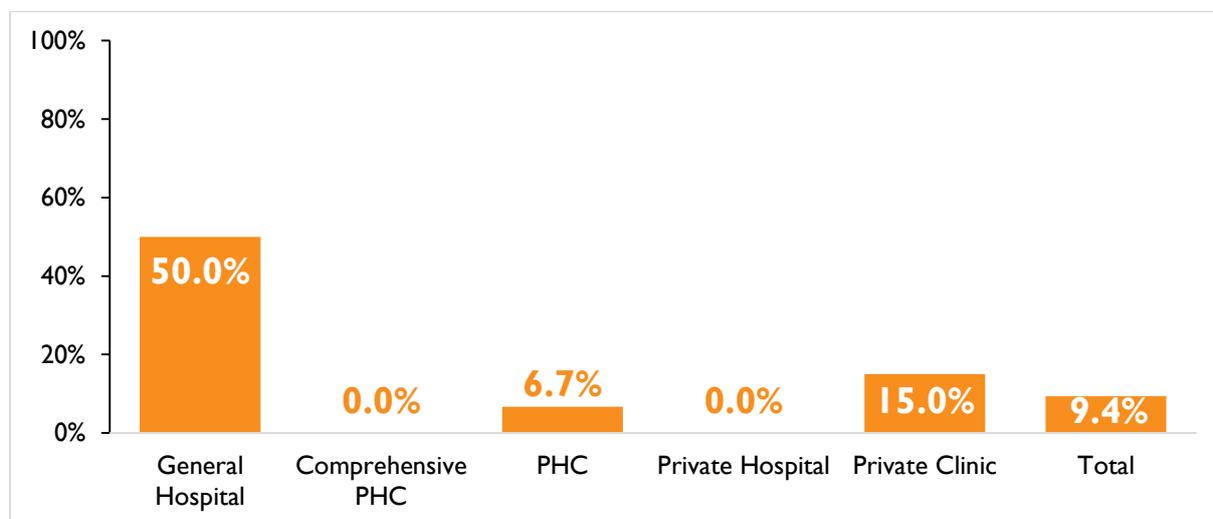
Figure 27: Percentage of facilities providing HIV counselling and testing services



3.2.24 Provision of HIV & AIDS antiretroviral prescription or antiretroviral treatment follow-up services

Overall, a low proportion(9.4 percent) of facilities offered HIV & AIDS antiretroviral prescription or antiretroviral treatment follow-up services as seen in Figure 28. Half of the General hospital (50 percent), 15 percent of private clinic and 6.7 percent of PHC provided HIV & AIDS antiretroviral prescription or treatment follow-up services. The Comprehensive PHC and Private Hospitals did not offer this follow up services

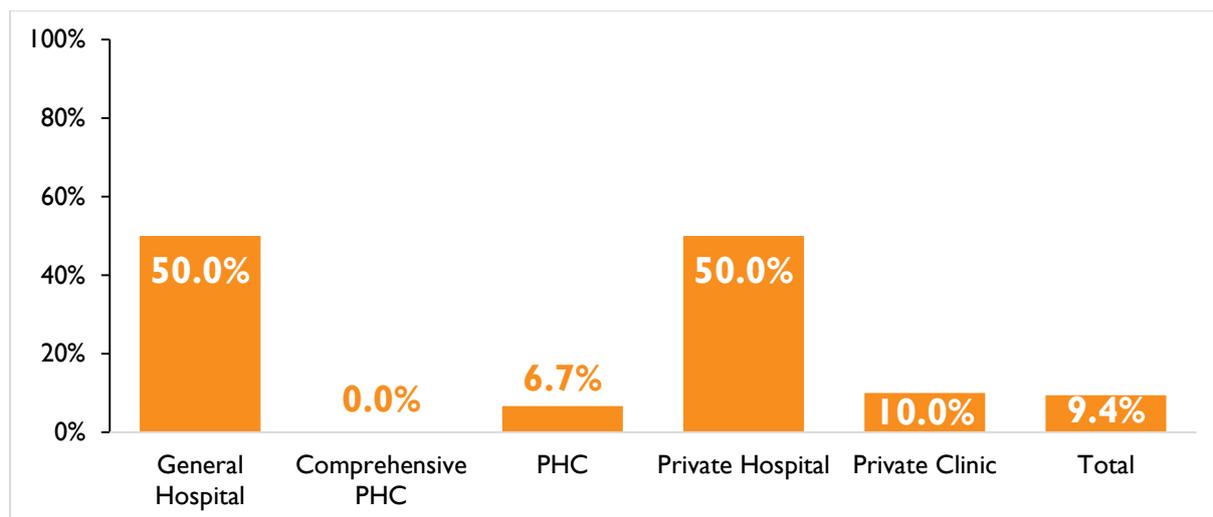
Figure 28: Percentage of facilities providing HIV & AIDS antiretroviral prescription or antiretroviral treatment follow-up services



3.2.25 Provision of HIV & AIDS care and support services

Overall, the provision of facilities with HIV & AIDS care and support services is as low as that of the facilities which offered HIV & AIDS antiretroviral prescription or antiretroviral treatment follow-up services. Less than one-tenth (9.4 percent) of all facilities surveyed offered HIV & AIDS care and support services. Half of the General Hospital (50 percent) and Private hospitals (50 percent) provide HIV & AIDS care and support services. Only one-tenth of the Private Clinic (10 percent) and 6.7 percent of the PHC offered any HIV & AIDS care and support services. The Comprehensive PHC did not offer any HIV & AIDS care and support services as shown in Figure 29.

Figure 29: Percentage of facilities WITH HIV & AIDS care and support services



3.3 Commodities and supplies

To assess the status of commodities and supplies in Bauchi state, the study looked at the availability of drugs and commodities that would be considered essential to the delivery of quality RMNCH care (Table 5). Specifically, the focus was on items required for ANC, deliveries, and the treatment of basic infections that are critical to reducing maternal and child mortality. On average, commodities were available in a higher proportion in private facilities visited than in public ones. Iron, Oxytocin, Chlorhexidine, and Malaria drugs were the only drugs available in at least half of the facilities as well as among half of the PHC. The other commodities had very low availability – as low as 6 percent for Phenobarbitone among PHC facilities

Table 5: Summary of commodities and supplies

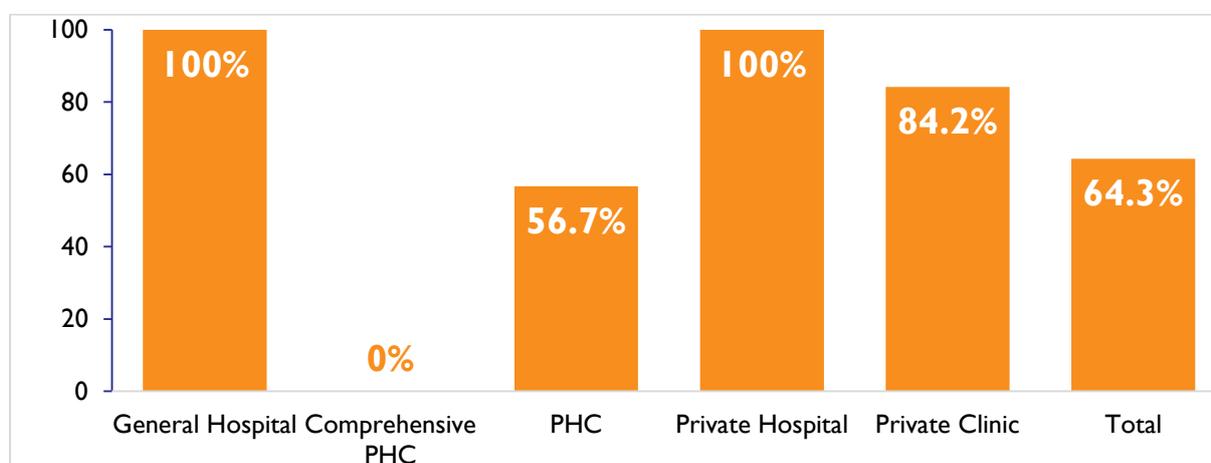
Commodity Available	All Facility Weighted Average	PHC Proportion	Private Clinic
Ferrous sulfate or Fumarate	64	56	85
Oxytocin	67	58	95
Magnesium sulfate	42	30	76
Chlorhexidine	64	58	81
Phenobarbitone	22	6	66
Metronidazole (for mothers)	59	46	95
Metronidazole (Injection form for newborns)	41	30	95

Commodity Available	All Facility Weighted Average	PHC Proportion	Private Clinic
Ciprofloxacin	44	30	71
Malaria ACTs	86	85	95
Contraceptive implants	24	25	18
IUD	28	27	25

3.3.1 Availability of ferrous sulfate

Ferrous sulfate or fumarate is seen to be available in about two-thirds (64.3 percent) of health facilities assessed. Both the General Hospitals and Private Hospitals (100 percent) had Ferrous sulfate or fumarate drug available. However, only half (56.7 percent) of the PHC and 84.2 percent of the Private Clinics had the drug available. The comprehensive PHC did not have the drug as shown in Figure 30.

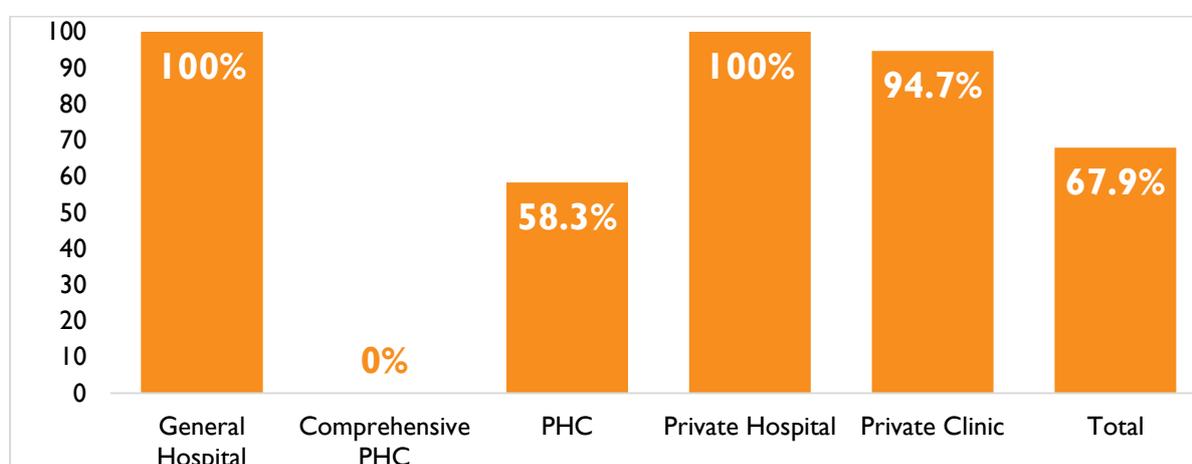
Figure 30: Percentage of facilities with ferrous sulfate



3.3.2 Availability of emergency obstetric medicines

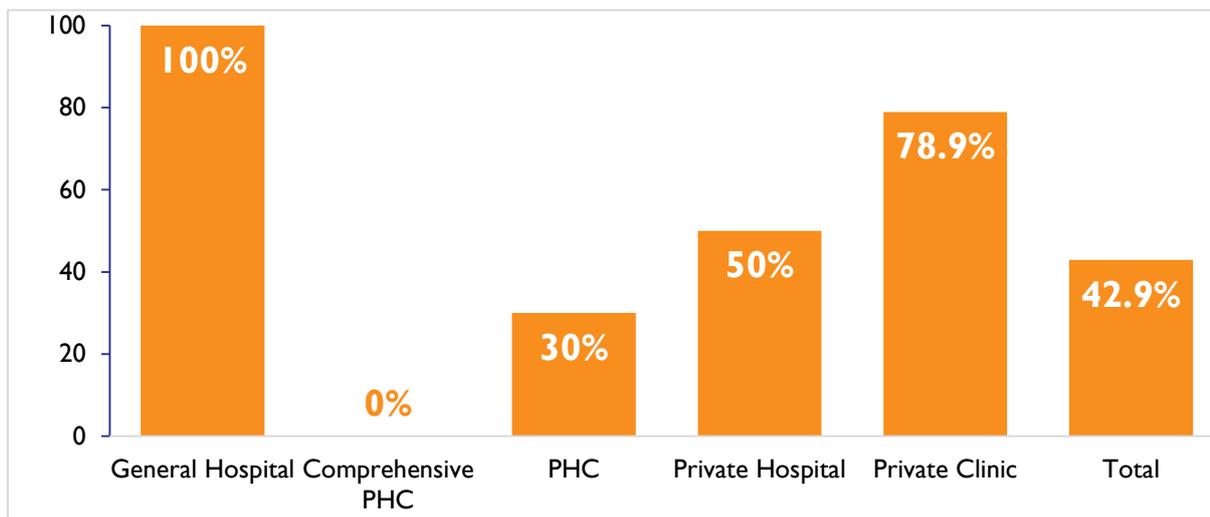
As shown in Figure 31a, Oxytocin, an uterotonic Obstetric emergency medicine was available in 2 of 3 facilities (67.9 percent). All the General Hospitals and Private Hospitals (100 percent) as well as 94.7 percent of private clinic had Oxytocin available in their facilities. The drug was unavailable in the Comprehensive PHC and 41.7 percent of the PHC facilities.

Figure 31a: Percentage of facilities with oxytocin



Overall, less than half of the facilities (42.9 percent) had Magnesium sulfate (injection) 50 percent concentration available. All the General hospitals (100 percent) and 78.9 percent of the private clinic had this anticonvulsants available As shown in Figure 31b below, the Comprehensive PHC did not have the drug, less than a third (30.0 percent) of the PHC and half (50 percent) of the private clinic had the drug available for the use of the Mothers that visit the Hospital. This demonstrate the overall low coverage in the availability of Magnesium sulfate in the facilities.

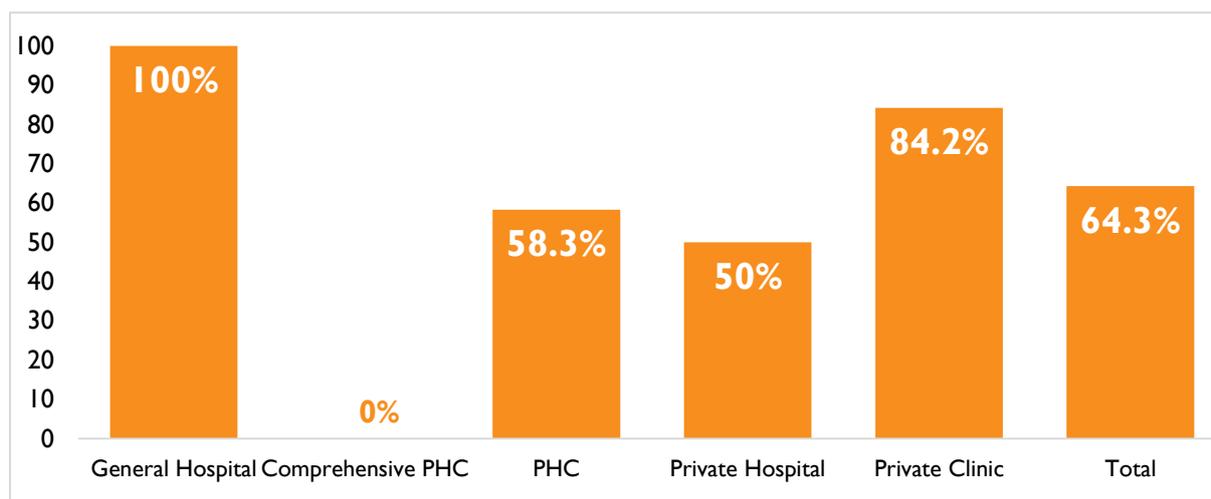
Figure 31b: Percentage of facilities with magnesium sulfate



3.3.3 Availability of chlorhexidine for umbilical cord care

On an average, Chlorhexidine is available in less than two-thirds (64.3 percent) of the facilities. All the General Hospitals and 84.2 percent of Private clinics had Chlorhexidine available in their facilities. Only half (50 percent) of the private hospitals and 58.3 percent of PHC had this drug. Comprehensive PHC facilities did not have chlorhexidine.

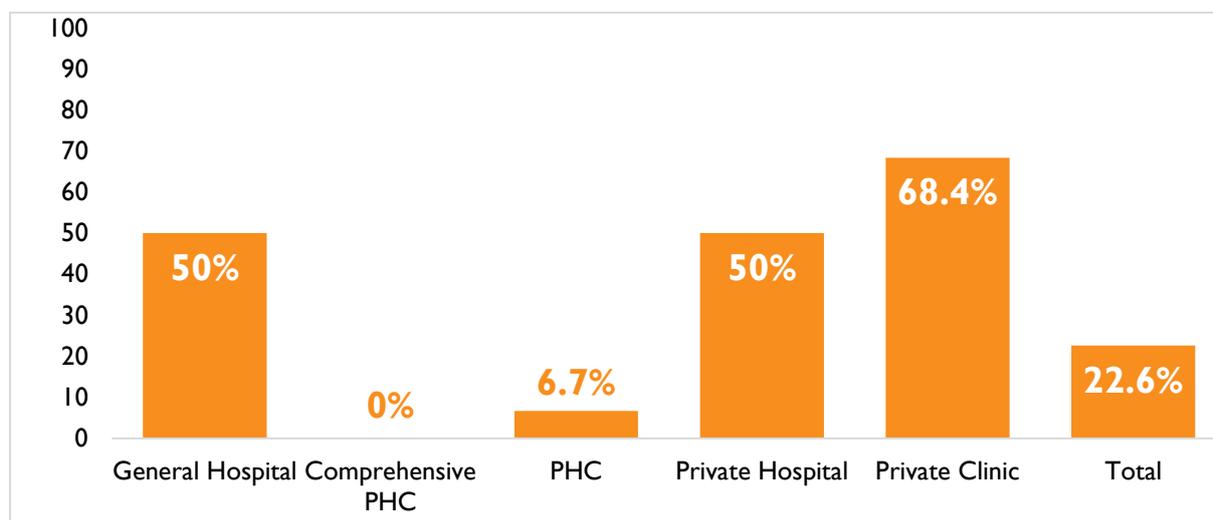
Figure 32: Percentage of facilities with chlorhexidine



3.3.4 Availability of Phenobarbitone

Overall, less than a quarter of the facilities (22.6 percent) had Phenobarbitone (injection for newborn) available for Newborns that visit the Facilities on the day of visit. The drug was only available in half of the General hospitals and the 50 percent of Private hospitals and 68.4 percent of the Private Clinics. As shown in **Figure 33**, the drug was unavailable in the Comprehensive PHC facilities and majority of the PHC facilities (93.3 percent).

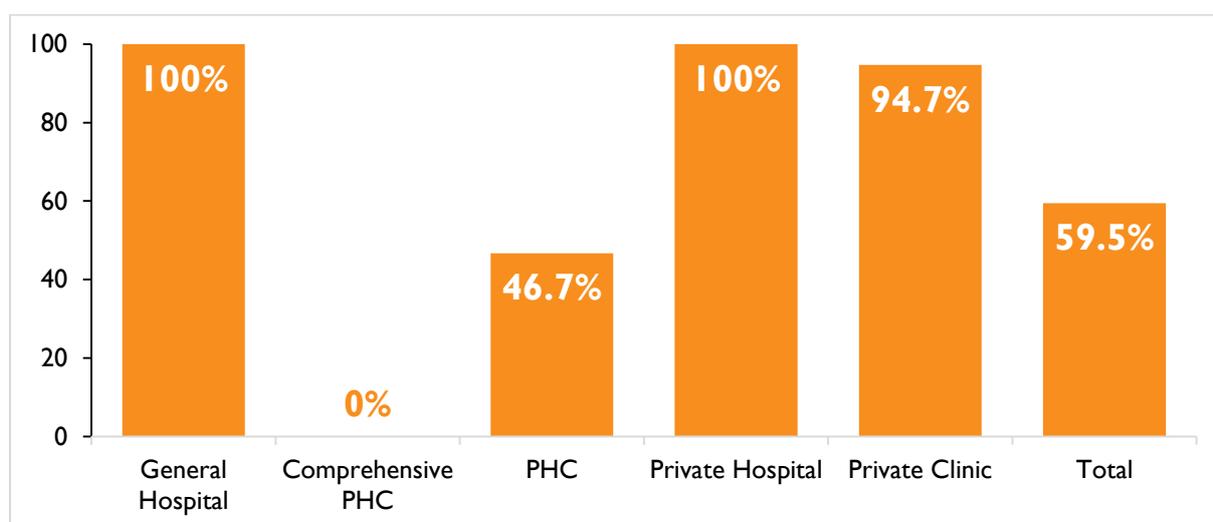
Figure 33: Percentage of facilities with phenobarbitone



3.3.5 Availability of Metronidazole

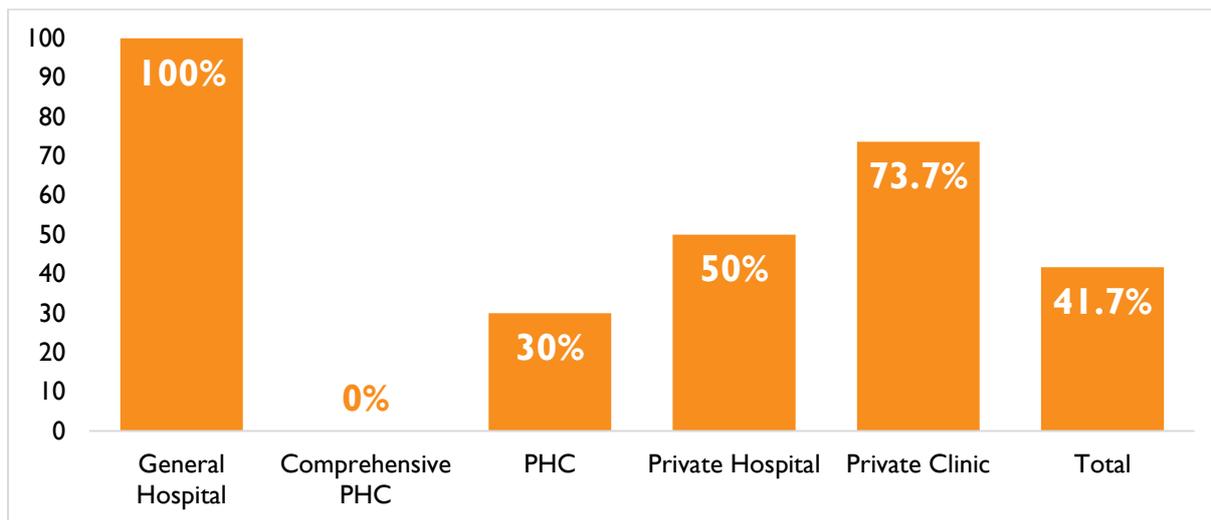
Only about sixty percent of the facilities visited had Metronidazole for Mothers on the day of visit as shown in Figure 34. All the General hospitals and Private hospitals (100 percent) had the drug available for Mothers use. The availability of this drug was much lower in the comprehensive PHC and PHC facility. The Comprehensive PHC facilities had 0 percent and over half (53.3 percent) of the PHC facilities did not have metronidazole available for the use of the Mothers that visit the Hospital

Figure 34: Percentage of facilities with Metronidazole for Mothers on day of Visit



On an average, less than half of the facilities (41.7 percent) visited have Metronidazole (injection form) for Newborns on the day of Visit. All the General hospitals (100 percent) had the drug available for the Newborn babies. The Comprehensive PHC facilities and 70 percent of the PHC facilities did not have the drug available for the use of the Newborn babies. Only half (50 percent) of the Private Hospitals and 73.7 percent of the Private Clinics had Metronidazole injection for the Newborn babies at the facilities as shown in **Figure 35**.

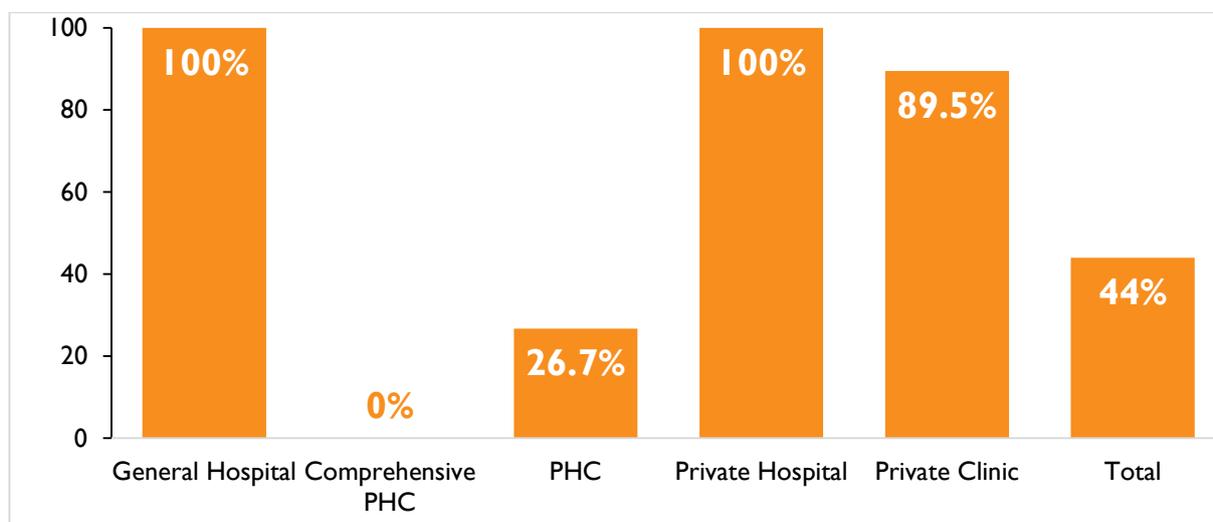
Figure 35: Percentage of facilities with Metronidazole (Injection Form) for Newborns on day of Visit



3.3.6 Availability of ciprofloxacin

The drug was generally more available in the nonpublic facilities. All the private hospitals (100 percent) and 84 percent of the Private Clinic had the drug as shown in **Figure 36**. General hospitals (100 percent) had the drug while the Comprehensive PHC facilities and 73.7 percent of PHC facilities did not have the drug available for the use of the Mothers that visit the facility bringing the average availability of the drug at facilities low, at only Four of every Ten (40.5 percent) of the facilities visited. This is also the trend seen with availability of ciprofloxacin injection in facilities for Mothers on day of visit.

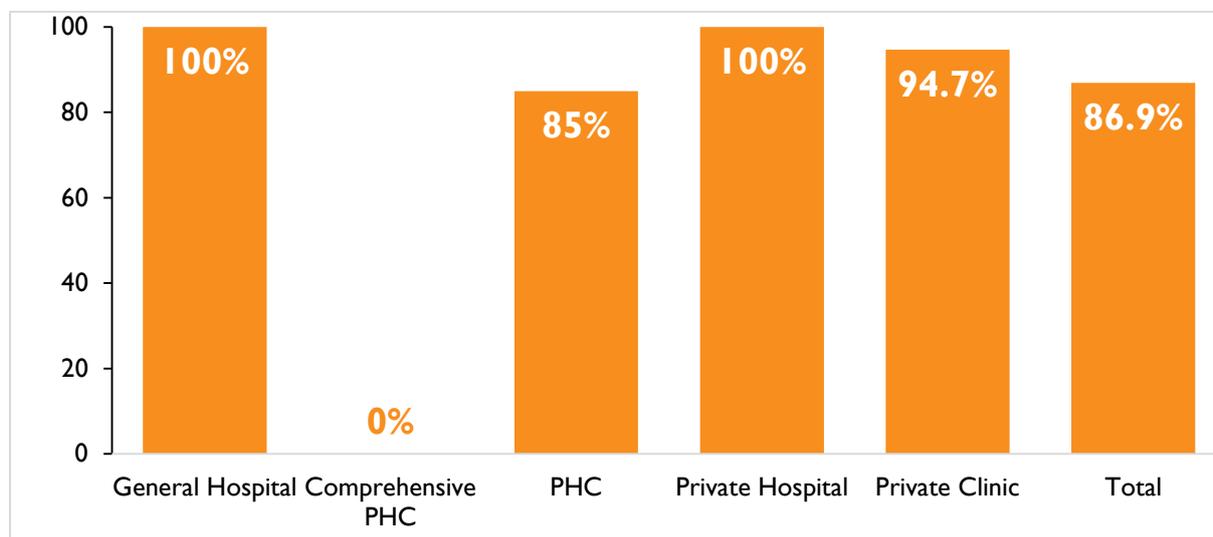
Figure 36: Percentage of facilities with ciprofloxacin



3.3.7 Availability of ACTs for malaria

As shown in Figure 37, majority of the facilities visited had Artemisinin-based combination therapy (ACT) available (86.9 percent). All the General Hospitals and Private Hospitals (100 percent) had ACT drug available in their facilities. About 95 percent of the Private Clinics and up to 85 percent of the PHC facilities had the drug available. The Comprehensive PHC facilities did not have the drug.

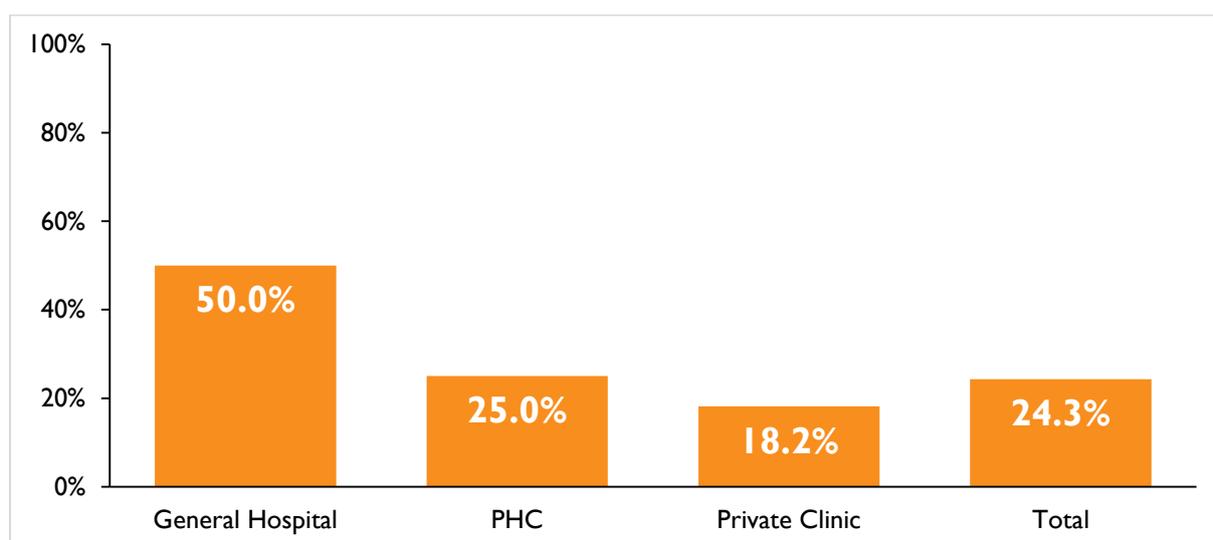
Figure 37: Percentage of facilities with malaria ACTs



3.3.8 Availability of family planning implants

Less than a quarter (24.3 percent) of the facilities visited had family planning implant available. Half of the General hospital (50 percent) and a quarter of the PHC (25 percent) had family planning implants available. Only 18.2 percent of private clinics had the implants available.

Figure 38: Percentage of facilities with family planning implants



3.3.9 Availability of IUDs

About 31 percent of the Facilities reported having unexpired IUDs available during the Survey. As shown in Figure 39a, the interviewers were able to confirm availability (by sighting) of the commodity in 25 percent of the facilities and in 5.9 percent of the facilities it was reported available but not sighted by the interviewers. All the General Hospitals (100 percent) reported having the commodity available but interviewers were not able to sight them in any of the facilities. In contrast, all the Private Hospitals (100 percent) reported having the commodity available and in all these facilities the interviewers were able to sight them. The Comprehensive PHC did not have the commodity, only 22.0 Percent of the PHC had the commodity available and half (50 percent) of the Private Clinic had the commodity.

Figure 39a: Percentage of facility reporting unexpired IUDs

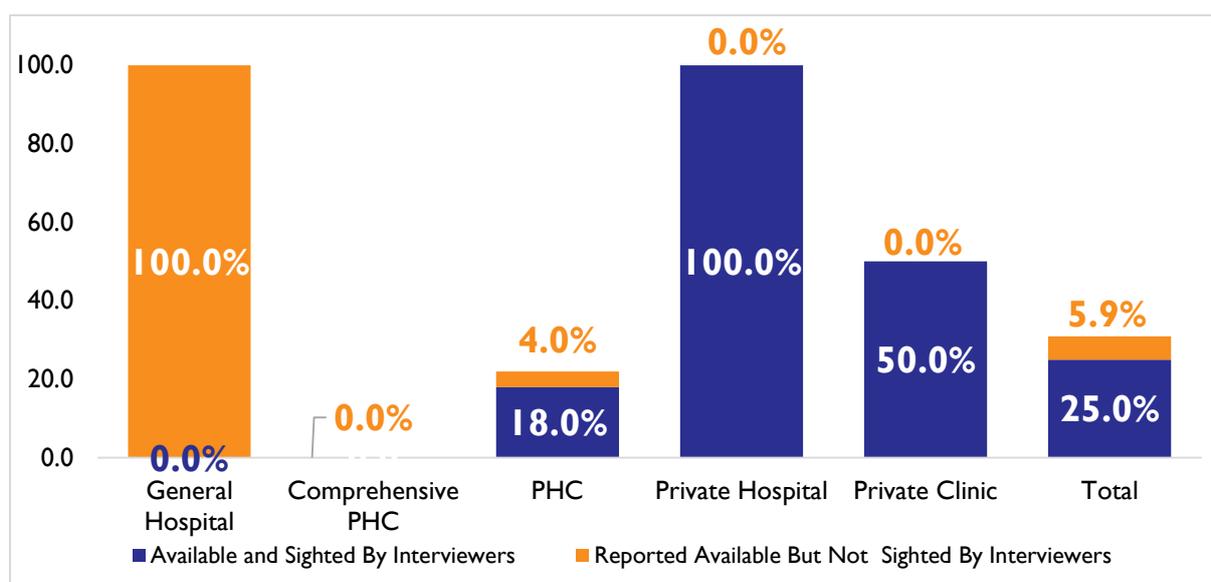
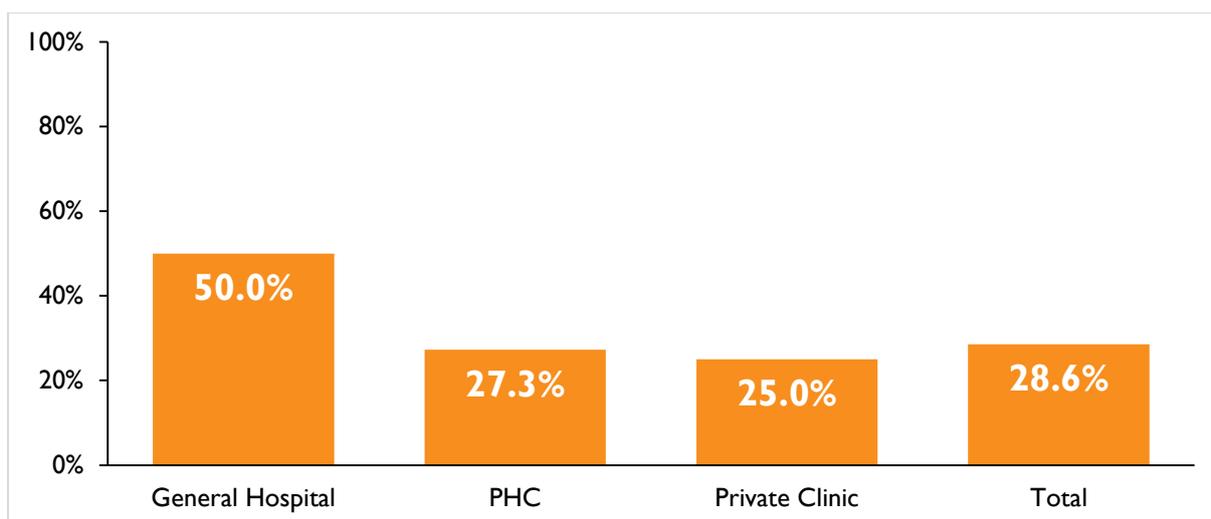


Figure 39b shows an overall low coverage (28.6 percent) of IUDs for family planning available in the facilities visited. Only half of the General hospitals (50 percent), a quarter of the private clinics (25 percent) and PHC (27.3 percent) had the IUDs available. The Comprehensive PHC facilities did not have the IUD available at the time of visit.

Figure 39b: Percentage of facilities with IUDs



3.4 Protocols/guidelines availability

While having job aids and protocols available doesn't necessary translate to better service delivery, it might identify areas where additional support is needed. Availability of the materials usually indicates areas which have had more donor support, as donors are more likely than government sources to have paid for trainings and printing of these items.

Overall, we see low availability of protocols and guideline especially for infection control and post abortion care. This is seen across most facilities, with the few which report to have them mostly not accessible or within reach to service provider. Protocols related to delivery such as on obstetric hemorrhage and eclampsia tend to be slightly more available in facilities. It is also noted that availability of protocols tends to be higher in private clinic than in PHC facilities which have been found to be more poorly resourced than other facilities in terms of commodity and HRH availability. This is seen even with the focus of donors on public facilities.

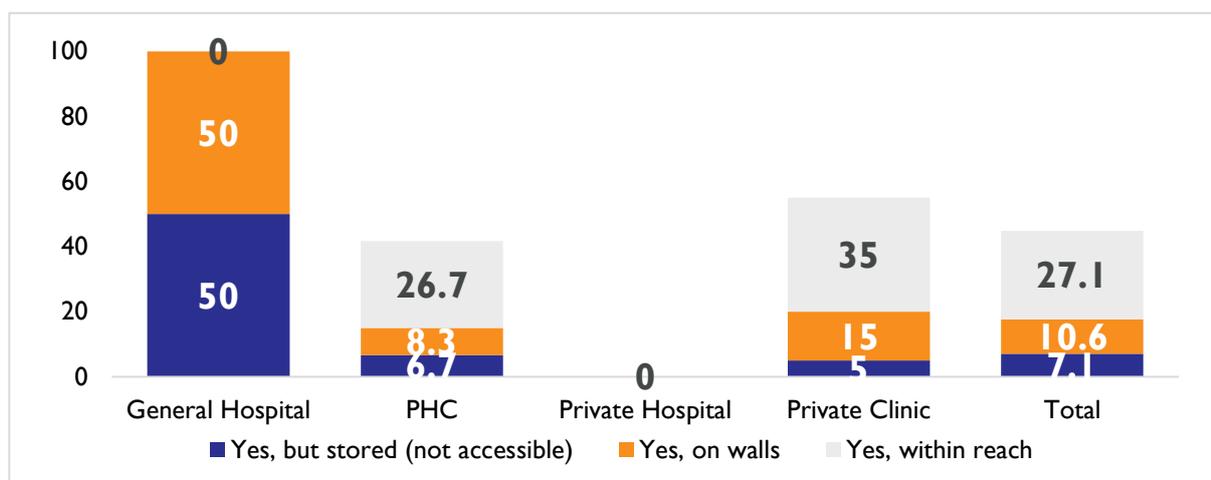
Table 6: Summary of protocol/guidelines findings (percent)

Protocols Available	All Facility Weighted Average	PHC Proportion	Private Clinic
Obstetric hemorrhage	45	41	55
Pre-eclampsia/eclampsia	58	60	60
Infection control	21	18.3	25
Post-abortion care	25.8	18.4	50

3.4.1 Availability of protocol/guidelines for managing obstetric hemorrhage

Only about 45 percent of the facilities reported having a Guideline or Protocol for the management of obstetric hemorrhage. The comprehensive PHC facilities and private hospitals did not have it. However, it was available in all the general hospital, 41.7 percent of the PHC facilities and 55 percent of the private clinics. A total of 27.1 percent of the facilities had the document within reach of the service provider, 10.6 percent had it on the wall and 7.1 percent had it stored and not accessible during the visit. Although, the General Hospital reported having the Guidelines but none of them had it within reach of the service providers; 50 percent had it stored and not accessible on day of visit while the other 50 percent had it on the wall but not within reach of the service providers. Only about a quarter (26.7 percent) of the PHC facilities and 35 percent of private clinics had the guidelines within reach of the service providers.

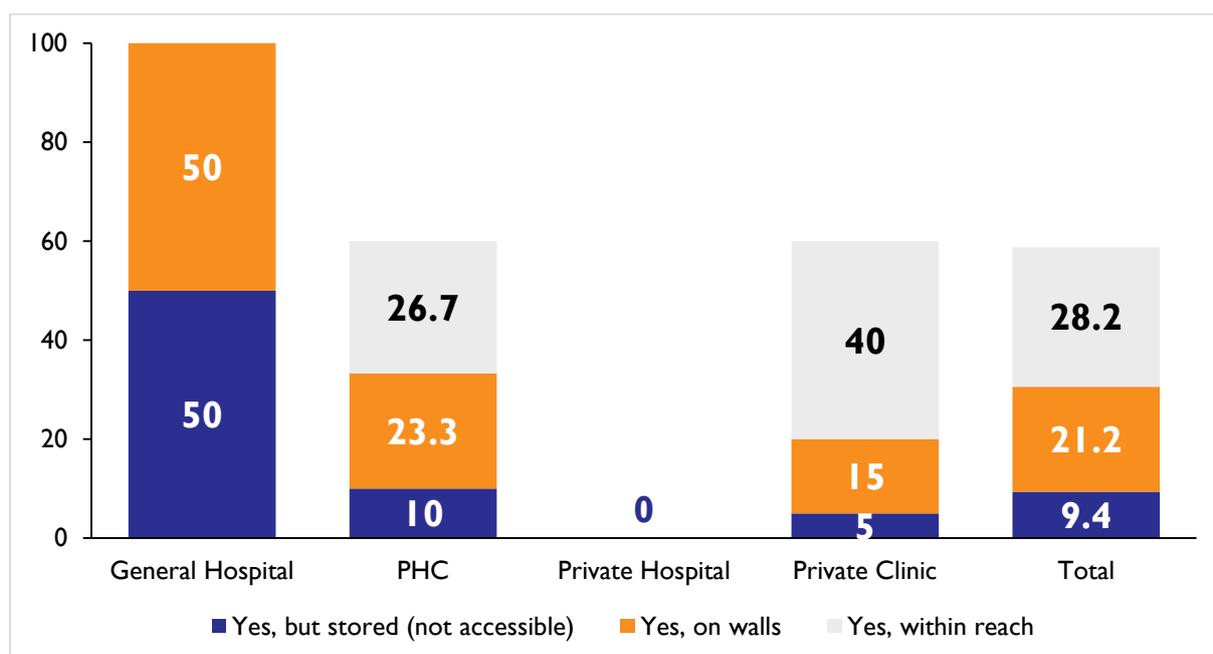
Figure 40: Availability of protocol/guidelines for managing obstetric hemorrhage



3.4.2 Availability of protocol/guidelines for managing pre-eclampsia/eclampsia

Slightly above half (58.8 percent) of the facilities reported having a Guideline or Protocol for the management of Pre-eclampsia/eclampsia. None of the private hospital and Comprehensive PHC facilities reported to have this. However, it was available in all the general hospitals, 60 percent of the PHC facilities and 60 percent of the private clinics. A total of 28.2 percent of the facilities had the document within reach, 21.2 percent had it on the wall and 9.4 percent had it stored and not accessible during the visit. The General Hospital did not have this protocol within reach of the service providers; 50 percent had it stored and not accessible on day of visit while the other 50 percent had it on the wall but not within reach of the service providers. Only about a quarter each of PHC had it within reach (26.7 percent) and also on the wall (23.3 percent). 10 percent had it stored and not accessible. A higher proportion of available guidelines is seen with private clinics, 40 percent have the guidelines within reach, 15 percent had it on the wall and 5 percent had it stored and not accessible.

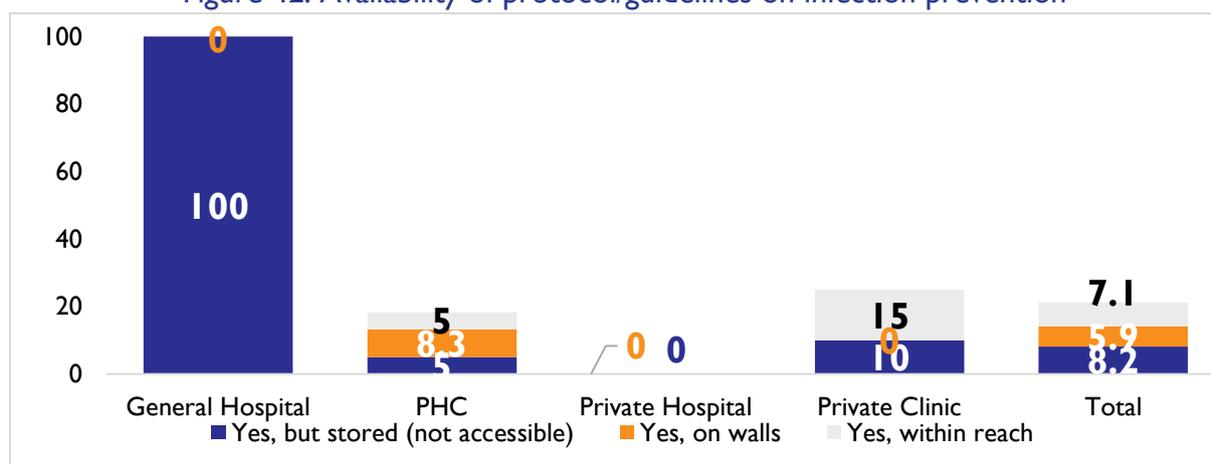
Figure 41: Availability of protocol/guidelines for managing pre-eclampsia/eclampsia



3.4.3 Availability of protocol/guidelines on infection prevention

Figure 42 shows that generally, a low proportion (21.2 percent) of the facilities reported have a Guideline or Protocol for infection prevention for HIV/AIDS (universal precautions). Only 7.1 percent of the facilities had the document within reach of the service provider, 5.9 percent had it on the wall and 9.4 percent had it stored and not accessible during the visit. All the General Hospital reported having the Guideline but all had it stored and not accessible on day of visit. Only 18.3 percent of the PHC facilities reported having the Guideline, of which the guidelines were not accessible in almost half (45.3 percent) of them. The Comprehensive PHC facilities and Private Hospital did not have the guideline or protocol available, and only a quarter (25 percent) of the private clinics had it available on the day of visit.

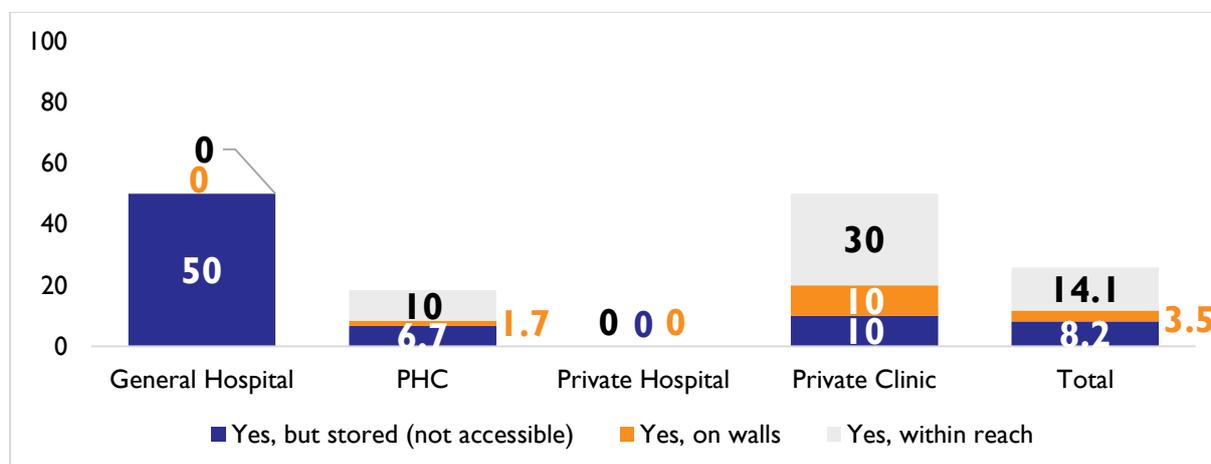
Figure 42: Availability of protocol/guidelines on infection prevention



3.4.4 Availability of protocol/guidelines on post-abortion care

Only a quarter (25.8 percent) of the facilities reported having a Guideline or Protocol for Post abortion care as shown in Figure 43. Only 14.1 percent of the facilities had the document within reach, just 3.5 percent had it on the wall but not within reach of the service provider and 8.2 percent had it stored and not accessible during the visit. Half (50 percent) of the General Hospital reported having the Guideline but not accessible on day of visit. Only 18.4 percent of the PHC reported having the Guideline with only slight above half (54 percent) having it within reach of the service provider. None of the Private Hospitals and Complementary PHC facilities had the guidelines/protocol. Only half (50 percent) of the private clinics had the guideline on the day of visit of which 60 percent of them had it within reach of a service provider

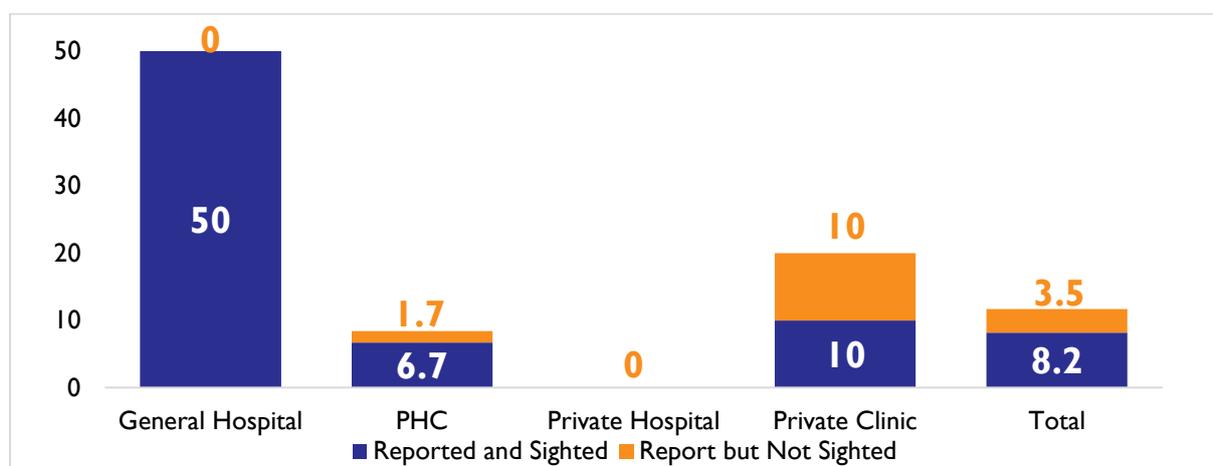
Figure 43: Availability of protocol/guidelines on post-abortion care



3.4.5 Availability of job aids about practices for standard precautions the outpatient service

Only 11.7 percent of the facilities reported to have Job Aids about Practices for Standard Precautions in the Outpatient Service and only 8.2 percent of the facilities had Job Aids observed by the data collectors on the day of visit. In half of the General hospitals the job Aids was reported to be available and they were all observed. Less than ten percent (8.4 percent) of the PHC facilities reported having the Job Aids, they were only observed in only 6.7 percent of the PHC facilities. None of the Private Hospital had this Job Aids, a fifth of the Private Clinics (20 percent) reported having the job Aids of which only half of those had Job Aids which were observed.

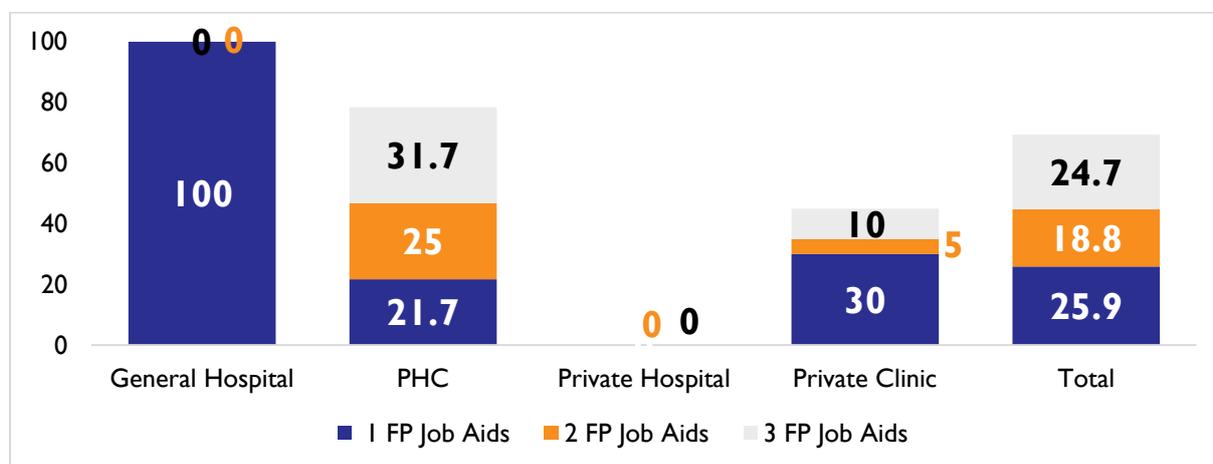
Figure 44: Percentage of facilities with availability of job aids about practices for standard precautions in the outpatient service



3.4.6 Availability of Number of available job aids on FP services

In all, 69.4 percent of the facilities had one or more Job Aids on FP Services, 25.9 of the Facilities had 1 FP services Job Aids, 18.8 percent had two of the Job Aids while 24.7 of the facilities surveyed had 3 Job Aids on FP Services available on the day of visit. All the General Hospitals had only 1 Job Aids on FP services. A total of 78.4 percent of the PHC facilities had Job Aids available, 21.7 percent of the PHC facilities had 1 Job Aids while 25 percent had 2 and 31.7 percent had 3 Job Aids. None of the Private Hospitals had job Aids on FP services. A Total of 45 percent of the Private clinics had the Job Aids on FP services. 30 percent had 1 Job Aid, 5 percent had 2 and 10 percent had 3 on the FP services at the time of visit. See Figure 45 below.

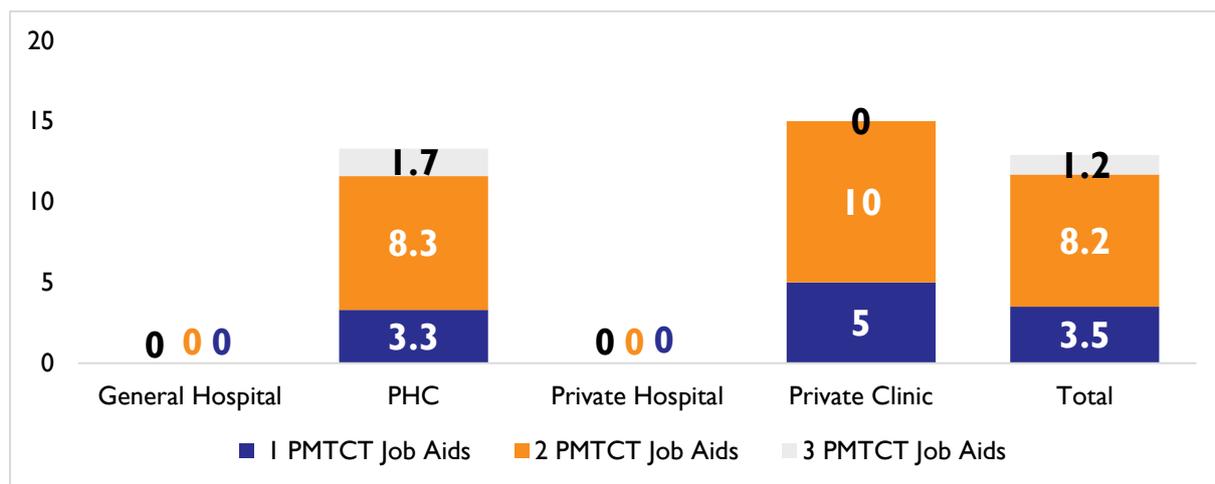
Figure 45: Percentage of facilities by Number of available job aids on FP services.



3.4.7 Availability of job aids on PMTCT services

Only about thirteen percent (12.9 percent) of the facilities had one or more Job Aids on PMTCT Services. 3.5 percent of the Facilities had only 1 PMTCT services Job Aids, 8.2 percent had 2 Job Aids while 1.2 of the facilities surveyed had 3 Job Aids on PMTCT Services available on the day of visit. All the General Hospitals and all Private Hospitals did not have any. At the PHC facilities, 1 Job Aid was available in 3.3 percent of the facilities, 8.3 percent of the PHC facilities s had 2 of the PMTCT job Aids, and 1.7 percent of the PHC facilities had 3 job Aids available. At the Private Clinics, 15 percent of them had PMTCT Job Aids available. 5 percent of the Private Clinic had only 1 job Aid available and 10 percent had 2 Job Aids available. No Private Clinics had up to 3 PMTCT Job Aids.

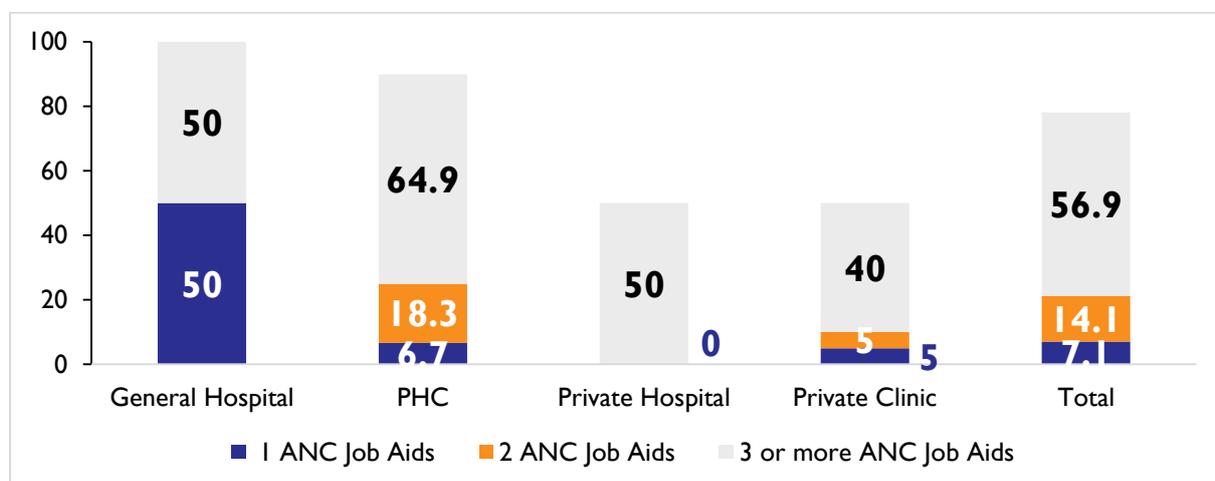
Figure 46: Percentage of facilities by Number of available job aids on PMTCT services.



3.4.8 Availability of Number of available job aids on ANC services

Up to 78 percent of the facilities had one or more Job Aids on ANC Services. 7.1 percent of the Facilities had 1 ANC services Job Aids, 14.1 percent had 2 of the Job Aids while more half (56.9 percent) of the facilities surveyed had 3 Job Aids on ANC Services on the day of visit. All the General Hospitals had the ANC job Aids, of which half of them (50 percent) had 1 Job Aids while the other half (50 percent) had 3 or more of the Job Aids. About 89.9 percent of the PHC facilities had a job Aid on ANC while half of Private hospitals had 3 job Aids and 40 percent of the Private Clinics had 3 job aids available.

Figure 47: Percentage of facilities by Number of available job aids on ANC services.



3.5 Community outreach

One would expect that public facilities are more likely to be conducting community outreach given that they employ CHEWs and their mission is to improve access and delivery of PHC and prevention services, which typically lend themselves to outreach. Generally, community outreach for maternal care including outreach for Antimalarial drugs for pregnant women, provision of iron tablet for pregnant women, PNC and family planning is seen to be conducted in very few facilities. The proportion of facilities which provide these outreach services is seen to be low in both public and private facilities (20 percent or less), more so in private facilities. This is not the case for outreach providing child care such as childhood immunization which is conducted in almost all the facilities (92.6 percent) and curative child care outreach conducted in a third of the facilities.

Overall the proportion of public facilities doing outreach tended to be higher than private facilities.

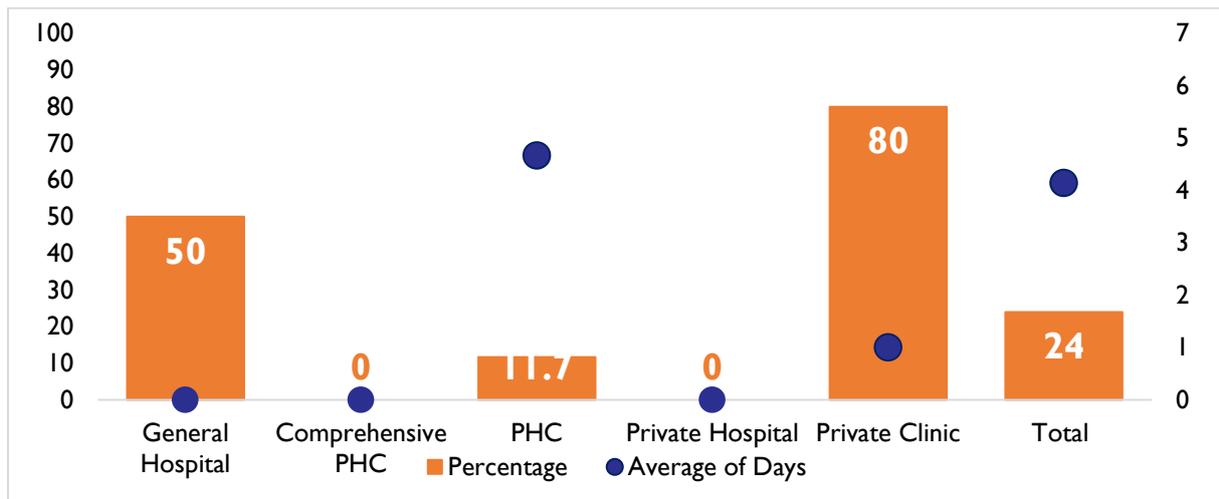
Table 7: Summary of community outreach findings

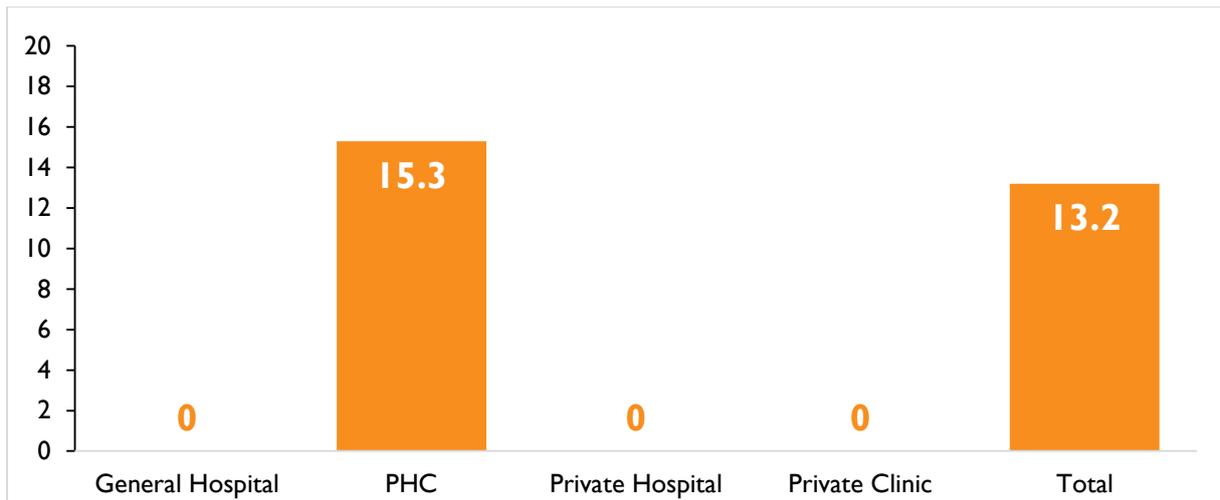
Community outreach provide	All facility weighted average	PHC proportion	Private clinic
PNC	10.3	10.2	20
Child Immunization	92.6	98.3	40
Curative Child Care	33.8	30.5	60
Family Planning	13.2	15.3	0

3.5.1 Conduct community outreach on Postnatal care PNC

In general, there are 24 percent of the facilities visited conducted Postnatal care (PNC) Services through outreach in the past month preceding the visit of the data collectors. 80 percent of private clinics, 50 percent of general hospitals and 12 percent of PHC conducted community outreach on PNC. PHC facilities provided 4.6 days of PNC services through outreach while private clinics provided 1 day of PNC services through outreach on average. It is noted the visited general hospital didn't provide the number of PNC service conducted through outreach.

Figure 49: Percentage of facilities with PNC outreach

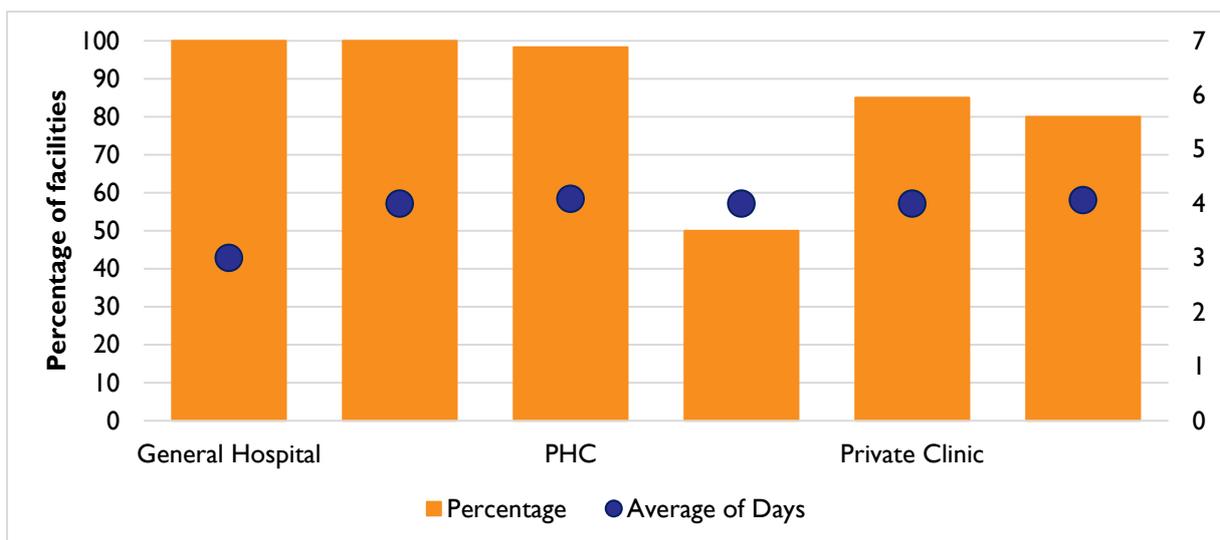




3.5.2 Conduct community outreach on Child Immunization

As much as 92.6 percent of the facilities visited for the survey conducted Child immunization through outreach in the Past month preceding the visit of the data collectors. Almost all the public facilities conducted Child Immunization through outreach in the past month. All the General Hospitals and 98.3 percent of PHC facilities conducted Child immunization through outreach. Only 50 percent and 40 percent of the Private Hospitals and Private Clinics respectively conducted this. In addition, the number of days child immunization were offered through outreach varied largely, with PHC offering child immunization most frequently with over 90 percent offering this outreach for up to 24 days, 5.1 percent up to 45 days and 1.7 percent up to 72 days. The comprehensive PHC facilities and General hospital visited also both offered outreach for 24 days. Only half of the private hospital (50 percent) and a fifth of the private clinic (20 percent) offered this outreach for up to 24 days in the Past month preceding the visit of the data collectors.

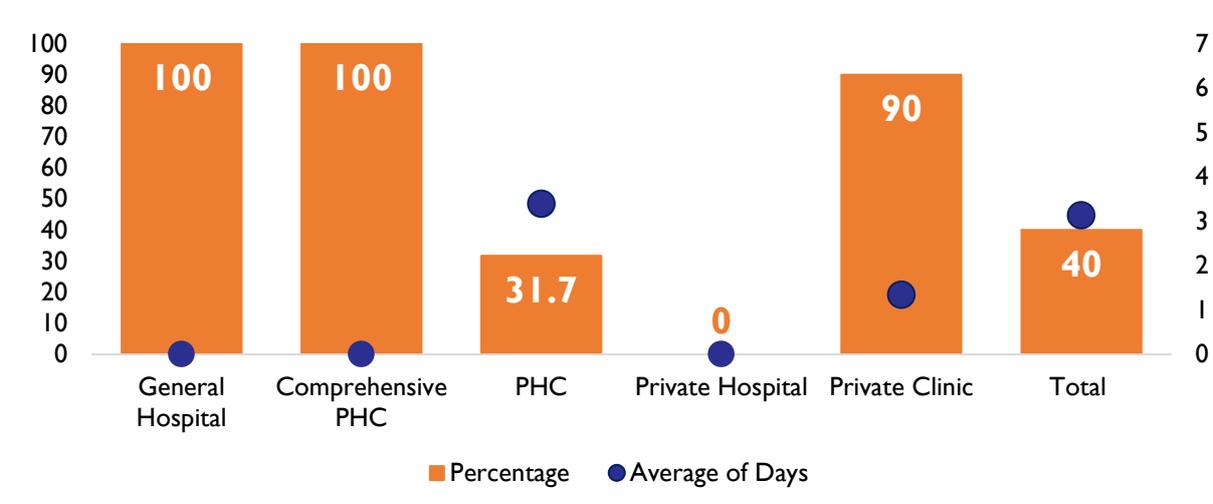
Figure 51: Percentage of facilities with Child immunization



3.5.3 Conduct community outreach on Curative Child care

Around one third (30.5 percent of the facilities conducted curative care for the child through outreach in the past month preceding the visit of the data collectors. 100 percent of general hospitals and comprehensive PHC, 90 percent of private clinics and 31.7 percent of PHC provided curative child care through outreach activities. In general, 40 percent of Bauchi health facilities conducted outreach on curative child care. The average days of services offered in the past full month was 3.1 days among all the health facilities, PHC facilities offered an average of 3.4 days of outreach services in the past full month and private clinics offered on an average of 1.3 days of outreach services in the past full month. It was observed that the data on the average number of days providing services was missing for general hospitals and comprehensive PHC facilities and, it created an underestimate of general days of services provided in the state,

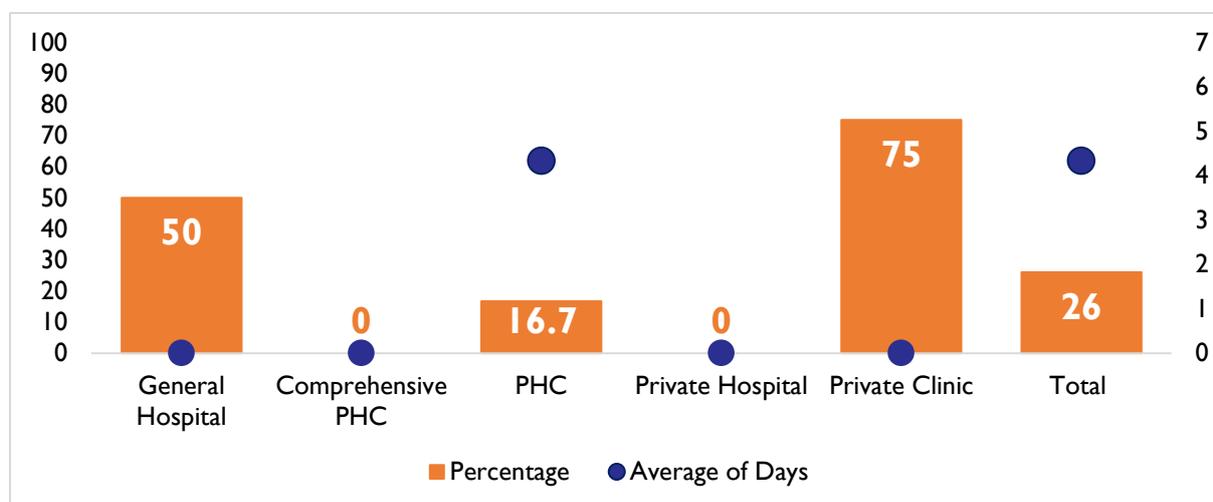
Figure 52: Percentage of facilities that conduct curative child outreach



3.5.4 Conduct community outreach on family planning

Only the PHC facilities among all the types of facilities surveyed made provision to offer family planning commodities through outreach in the past month preceding the visit of the data collectors. About 16.7 percent of the PHC facilities which represent about 13.2 of all facilities surveyed provided family planning commodities through community outreach. The average days that PHC provided family planning commodities through community outreach was 4.3 days.

Figure 53: Percentage of facilities with family planning outreach



3.6 Infrastructure, staffing, and practices' correlations

Table 8: Is infrastructure associated with labour and delivery services availability at facilities 24 hours a day?

	Pearson correlation coefficient	P value (2-tailed)
Availability of 24-hour Labour and Delivery services		
Availability of electricity	.269*	.013
Availability of Staff Quarters near facility	.167	.127

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

From Table 8 above, there is an established association between availability of infrastructure and availability of 24 hours a day Labor and Delivery services at the facilities, however, proximal staff quarters near the facility is not associated with provision of 24 hours Labor & Delivery services

Table 9: Is availability of skilled health worker associated with selected routine RMNCH life-saving practices?

	Pearson correlation coefficient	P value (2-tailed)
Availability of Skill health worker at Facility		
Staff routinely practice Active Management of Third Stage of Labor (AMS)AMTSL	-.198	.072
Has a breech delivery been performed in the last 3 months?	-.286**	.008
Do staff routinely practice the Newborn resuscitation when needed?	-.295**	.007
Do mothers with preterm births and LBW babies routinely practice Kangaroo Mother Care?	-.240*	.028
Availability of Partograph at facility	-.241*	.027

* Correlation is significant at the 0.05 level (2-tailed)

**Correlation is significant at the 0.01 level (2-tailed)

From Table 9 above shows that with the exception for the routine practice of AMTSL, all other selected routine RMNCH life-saving practices are significantly associated with has the availability of skilled birth attendants at the facility.

Table 10: Is availability of equipment or guidelines associated with some selected expected routine practices?

	Pearson correlation coefficient	P value (2-tailed)
Availability of Partograph Vs staff routinely use a Partograph to manage labor	.285**	.009
Availability of Guideline Management of obstetric hemorrhage vs staff routinely use a Partograph to manage labor	-.230*	.035
Availability of Guideline Management of obstetric hemorrhage vs staff routinely practice Active Management of Third Stage of Labor	-.326**	.002

* Correlation is significant at the 0.05 level (2-tailed)
**Correlation is significant at the 0.01 level (2-tailed)

From Table 10 above shows that all the selected routine practices were statistically associated with the availability of the corresponding selected Equipment and Guideline.

4. DISCUSSION

This chapter discusses the implications of the results attained in this assessment with regards to infrastructure of the health facilities visited, availability and quality of HRH, and commodities and supplies for RMNCH service delivery.

4.1 Health facility infrastructure

The suboptimal infrastructure of Bauchi state health system as depicted by this survey is seen across all facility type or category. The poor infrastructure state of some variables in the health facilities hinders its capacity to adequately support the provision of RMNCH services. This is seen more so in the PHC facilities, which is the healthcare level closest to the grassroots. This serves as a particularly disadvantage as most of the Nigerian population dwell in the rural areas.⁴

Over half (56.5 percent) of all the health facilities, including the higher-level General facilities, have leaking roofs. Comparing these findings to an assessment carried out in Cross River which revealed 46.6 percent of the facilities had leaking roof⁵ or assessment conducted in Anambra, Benue, Kaduna, Plateau states, and the Federal Capital Territory (Okafor 2015), which found 58 percent with leaking roofs, suggests that the poor state of infrastructure found in Bauchi state is similar to other states weak health infrastructure findings.

Electricity has an immense role to play in the impact of provision of healthcare on service delivery, especially at night. More so, electricity was recognized by the UK Department of Health as the most vital of all infrastructure services' because 'without it most other services will not function'. Over a third (35.3 percent) of the facilities assessed had no electricity available. This is of importance for provision of 24 hours services in areas such as obstetric and neonatal care. Again, in this respect, findings in Bauchi state appears to be similar to other states: a survey found that in CRS over half of the facilities (51.6 percent) assessed did not have electricity, in a similar manner, a survey revealed in Anambra and other states (Okafor 2015), only 38 percent of the facilities were connected to the national grid. This finding is important, as a significant association exists between availability of electricity in facilities and availability of 24 hours labor and delivery services as shown above and in similar exercise carried out in Cross River⁶. Although, electrical infrastructure is not a task for the SMOH but rather is a Ministry of Power responsibility, the gaps in multi-sectoral collaboration can be seen which directly affects the health of citizens of the state.

Access to basic water, sanitation, and hygiene in health care facilities is critical to delivering quality services and reducing infection. The crucial link between access to WASH services and RMNCH has been clearly established and the impact of WASH on pregnant women and young children is clear from all available research. Yet, when poor maternal and child health are observed, the link to WASH is often overlooked.⁷ With ideal hygiene practices among health care workers around the world still unacceptably low,⁸ even more so where basic water supply is unavailable. A recent UNICEF reports that about 70 million people lacked access to safe drinking water, and over 110 million lacked access

⁴Oluwaseun T. Esan I and Adesegun O.Fatus (2014)i. Performance Needs Assessment of Maternal and Newborn Health Service Delivery in Urban and Rural areas of Osun State, SouthWest, Nigeria African Journal of Reproductive Health June 2014; 18(2): 113

⁵ Health Finance and Governance Project. March 2016. *Assessment of MNCH Functionality in Health Facilities in Cross River State, Nigeria*. Bethesda, MD: Health Finance and Governance Project, Abt Associates Inc.

⁶ Health Finance and Governance Project. March 2016. *Assessment of MNCH Functionality in Health Facilities in Cross River State, Nigeria*. Bethesda, MD: Health Finance and Governance Project, Abt Associates Inc.

⁷ https://www.cawst.org/images/stories/CAWST_WASH-MNCH_Article_Sept_2014.pdf

⁸ http://www.wateraid.org/~media/Publications/Hand_hygiene_in_health_care_facilities.pdf

to improved sanitation⁹. This is in accordance with the recent Multiple Indicator Cluster Survey (MICS) which indicates about 40 per cent of households in Nigeria do not have access to clean water sources.

The readily availability of this basic amenity is especially important during delivery. Findings of this study showed that 87.1 percent of the facilities assessed in Bauchi state had water source for patient and staff use; of these facilities, only 64.7 percent had piped water source, or a bore hole in the facility premise. Earlier studies found that only 5 percent of facilities in Kogi, 54.5 percent in Cross River and 83 percent in Lagos had a source of water supply. The impact of the absence of this crucial amenity is evident from a study in Nigeria by Ezeh et al. (2014),¹⁰ which pooled data from three editions of the NDHS (2003–2013). The study revealed that children under five years old without access to improved water and sanitation facilities are at 38 percent higher risk of death in Nigeria.

4.2 Human resources for health: Availability

According to interviews with facility staff, national and state HRH policies are not adhered to in Bauchi state especially in the recruitment of staff. Much of this is done based on state approval. Staff promotion, training, and staffing projections are based on the Public Service Rules and Schemes of Service of Federal Republic of Nigeria as opposed to HRH need.

Only the private facilities have a skilled health worker (SHW) available. More importantly, about two-thirds (65.9 percent) of all the facilities assessed, made up of mostly public facilities did not have a SHW available to provide 24-hour services. As the study findings also show, the presence of SHWs in a facility, regardless of type and location, is significantly associated with provision of best practices including Partograph use, resuscitation of newborn when needed. This finding is part

These results show the gross inadequacy of health workers to provide skilled delivery services for a vast majority of the population, given that PHC centers are the nearest health facilities for the approximately 75 percent of the population that is rural. As the NDHS 2013 shows, SHWs attend only 38.1 percent of births in the country (National Population Commission and ICF International 2014). Skilled midwifery functions is crucial to PHC for maternal and child health and are particularly scarce in the state, as only 23.5 percent of facilities have a midwife available. This finding can be compared to data from the NDHS 2013 that show that a skilled provider assisted 16.3 percent of births in the state and 16.9 percent of births were delivered in a health facility.

4.3 Human resources for health: Quality

Over half (57.6 percent) of all the assessed facility types had a staff trained in Quality Assurance, however, most facilities – including higher-level facilities such as the general hospital – did not have a staff trained in newborn sepsis training, HIV/AIDS treatment and care training, and Health care waste training. These findings suggest that there may be some HRH capacity gaps to adequately deliver RMNCH services vital to improve care of contributors to maternal morbidity and mortality, i.e., malaria in pregnancy, prolonged labor, and post-partum hemorrhage.

Although on average a high proportion of all the various health facilities (86.9 percent in total) practiced AMTSL, which could contribute significantly to reducing maternal deaths due to post-partum hemorrhage in Bauchi state, it is critical to note that 80 percent of PHC centers did not practice AMTSL, accounting for over half of the public facilities in the state, so there remains a significant skills gap. With respect to partograph use in the monitoring stages of labor, a low proportion of facilities (23.8 percent) used it routinely. This highlights the absence of this simple but important tool in

⁹ <https://www.unicef.org/nigeria/wes.html>

¹⁰ Ezeh OK, Agho KE, Dibley MJ, Hall I, Page AN. The Impact of Water and Sanitation on Childhood Mortality in Nigeria: Evidence from Demographic and Health Surveys, 2003–2013. *International Journal of Environmental Research and Public Health*. 2014;11(9):9256–9272. doi:10.3390/ijerph110909256.

preventing morbidities due to prolonged and obstructed labor. With respect to newborn care, newborn resuscitation was practiced in all general hospitals, the comprehensive PHC and most of the private facilities visited but again only about half of the PHC centers practiced this newborn life-saving intervention. Thus, the basic skills that could reduce maternal and neonatal mortality in Bauchi state are inaccessible to well over half the state's population given their availability in urban areas and highly limited availability at PHC centers in rural areas.

4.4 Commodities and supplies

The availability of commodities is essential to the delivery of quality RMNCH care. Specifically, the focus in this study was on items required for ANC, deliveries, and the treatment of basic infections that is considered vital in delivering quality RMNCH services and reducing morbidity and mortality in maternal and child care. There was a relative lack of medicines important for emergency obstetric care (magnesium sulfate and phenobarbitone), infection prevention (ciprofloxacin) in the comprehensive PHC centers and PHC facilities compared to all other facility types. Noted exceptions were of ferrous sulfate, metronidazole, and ACTs, which were available in most of the facilities although, again, less so in PHC centers and absent in the comprehensive PHC.

Oxytocin, though largely available in most facilities, was particularly not available in the comprehensive PHC centers and more than a third of the PHC centers, which cater to a higher proportion of people in rural areas. As a critical component of AMTSL – the “gold standard” strategy for reducing the incidence of post-partum hemorrhage,¹¹ this commodity is, essential in management of postpartum hemorrhage, if unavailable increases the danger expectant mothers and newborns face in the immediate post-partum period, and increases tendency to hemorrhage, or other morbidities. Similar to this is the low proportion of facilities with antibiotics for infection treatment. Antibiotic are important in post abortion care- a service which is also seen to be delivered in very few facilities. Its availability and use significantly prevents further post abortion complication.

Protocols and job aids are useful to improve quality of RMNCH services in resource-poor settings especially where visibly displayed for easy reference. While the availability of job aids and protocols doesn't necessarily imply that a higher quality level of service delivery is also available, the materials are indicative of areas where additional support may be necessary. In addition, they usually indicate where donor support may have been focused as donors are more likely than government sources to have paid for training and printing related to these items.

Most facilities had protocols and guidelines for obstetric hemorrhage and pre-eclampsia/eclampsia, but not for infection control and post-abortion care. The relative absence of a protocol/guidelines for infection control may be a contributing factor (in addition to poor supplies) for the low percentage of facilities that adhere to infection prevention and control procedures in Nigeria.^{12,13} In addition, obstetric hemorrhage is the leading cause of maternal mortality in Nigeria¹⁴, the low proportion of facilities, with protocol and guidelines goes against WHO recommendation of which all Health care facilities delivering maternity services should adopt a formal protocol for the management of PPH¹⁵.

¹¹ Prata N, Bell S, Weidert K. Prevention of postpartum hemorrhage in low-resource settings: current perspectives. *International Journal of Women's Health*. 2013;5:737-752. doi:10.2147/IJWH.S51661.

¹² Amoran O, Onwube O. Infection Control and Practice of Standard Precautions Among Healthcare Workers in Northern Nigeria. *Journal of Global Infectious Diseases*. 2013;5(4):156-163. doi:10.4103/0974-777X.122010.

¹³ National HIV/AIDS Division, Federal Ministry of Health (FMOH) [Nigeria] and MEASURE Evaluation (2014). Assessment of Primary Health Care Facilities for Decentralization of HIV/AIDS Services in Nigeria 2012. Federal Ministry of Health, Abuja, Nigeria. http://www.cpc.unc.edu/measure/resources/publications/tr-13-93/at_download/document

¹⁴ Adenifuja K. O, Adepiti C. A, and Ogunniyi S. O: Post-partum haemorrhage in a teaching Hospital in Nigeria: A 5 years' experience. *African Health Sciences* 2010; 10(1): 71-74.

¹⁵ World Health Organization. WHO Recommendations for the prevention of post-partum haemorrhage: World Health Organization, 2007. Geneva.

However, a recent study (Bialit et al. AJOG 2015) showed that merely the presence of PPH-protocols does not indicate a better outcome¹⁶.

Overall, we see availability of protocols related to delivery, such as obstetric hemorrhage and eclampsia, are widely not available even at PHC centers which have been poorly resourced than other facilities in terms of commodity and HRH availability. It is also noted that availability of protocols tends to be lower in private facilities than in public facilities, which could again be a result of donors' tendency to focus on public facilities rather than private ones. The availability of protocols for post-abortion care was extremely low and found mostly at General hospitals and private clinics.

4.5 Community outreach

The poor RMNCH outcomes observed in Nigeria are partly attributable to the low coverage and uptake of basic health interventions that would be effective in preventing maternal and neonatal deaths.¹⁷ Demand-creation is often a less-emphasized link in improving utilization of key RMNCH services, and facilities that provide these services can play a crucial role. The community has been described as the most important link in health care delivery¹⁸ and it forms the support structure for the implementation of PHC services. Community-based ward development committees have been established in many communities in Nigeria, which have improved the use of PHC centers and accountability of these facilities to the communities they serve.

Our study shows that only two-thirds – conduct community outreach on a variety of RMNCH topics including utilization of ANC, facility-based delivery, newborn care, and family planning. This proportion is even lower for private facilities and hospitals. With the exception of outreach on child immunization which is seen to be conducted in high proportion across all facility types. The proportion of facilities conducting outreach tend to be higher in public facilities than in private ones. This finding is in harmony with the largely commercial and profit-driven characteristic of private facilities, and the historical role of the private sector in community outreach, which has largely been as a form of corporate social responsibility, and provision of health care to the communities they are located in.

4.6 Study limitations and challenges

Generally, record-keeping systems in the state are very poor whether for staffing, commodity logistics, or service delivery. In some PHC facilities, records for 2014 could not be found; the Officers in Charge stated they were newly posted to the facility and had received no records from their predecessors. Where available, records had most of the columns empty or improperly filled.

Almost all the health facilities assessed submitted monthly data to the DHIS2 platform using National Health Management Information System (NHMIS) summary forms; however, data submitted were incomplete. Some departments in general hospitals that provide services like family planning, immunization, and malaria in pregnancy do not submit monthly data to the records department for compilation into the NHMIS summary form. In private facilities, the health services provided are recorded in general outpatient register of the hospital. This makes it difficult to extract more discrete information when populating the NHMIS summary form. There is therefore an urgent need to undertake a HMIS assessment and provide capacity building on data collection, record keeping, and utilization of record/data for improving RMNCH services.

¹⁶ Bailit JL, Grobman WA, McGee P, et al. Does the presence of a condition-specific obstetric protocol lead to detectable improvements in pregnancy outcomes? *American Journal of Obstetrics and Gynecology*. 2015;213(1):86-e1. doi: 10.1016/j.ajog.2015.01.055.

¹⁷ Okoli U, Morris L, Oshin A, Pate MA, Aigbe C, Muhammad A. Conditional cash transfer schemes in Nigeria: potential gains for maternal and child health service uptake in a national pilot programme. *BMC Pregnancy and Childbirth*. 2014;14:408. doi:10.1186/s12884-014-0408-9.

¹⁸ <http://www.who.int/pmnch/countries/nigeria-plan-chapter-3.pdf>

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

Few studies have been carried out in Bauchi state to document the infrastructure, HRH, and RMNCH services available at all the facilities. Therefore, this assessment's findings – by providing to state health decision makers quantitative evidence of shortcomings in the state health care delivery system's capacity to deliver RMNCH services – have programmatic implications to improve the RMNCH services at all levels of the system. Interventions need to span both public and private sectors as well primary, secondary and tertiary levels along the RMNCH continuum of care. This need is particularly acute at the PHC level, which is demonstrably the weakest, but the most accessible through for the vast majority of the state's population who rely on for RMNCH care.

5.2 Recommendations

Financing: Bauchi state needs to address the dire state of its health facility infrastructure which will require substantial capital expenditure. To obtain the required funding, the State Ministry of Health needs to:

- ▶ In partnership with the State Ministry of Works, conduct a costing and quantity survey assessment to determine infrastructure upgrade needs and develop an investment budget¹⁹;
- ▶ In partnership with the Ministry of Economic Planning and Budgeting, prioritize investment in health infrastructure based on population demographics, disease burden and existing infrastructure status;
- ▶ Build a valid investment case to justify its capital expenditure funding;
- ▶ Present findings of this assessment and investment case derived from it to development partners to encourage evidence-based investment; and
- ▶ Leverage the state's health care financing technical working group to track investment and accountability for value for money.

Staffing: The state needs to address its massive HRH gap by:

- ▶ Determining its current gap against the norms laid out by the National Primary Health Care Development Agency (NPHCDA);
- ▶ Implementing the Bauchi State HRH plan to mobilize the required HRH needed at PHCs ; and
- ▶ Developing and budgeting a human resources for health training plan to ensure that the RMNCH skills currently available in urban facilities are more widely available in rural areas and at the PHC level, particularly with regards to newborn life-saving interventions like AMTSL and newborn resuscitation

Regulation of private sector: According to multiple sources including the most recent National Health Care Development Policy, over 60 percent of Nigeria's health care is delivered by the private sector and according to National Health Accounts data over 70 percent of health expenditures occur in the private sector. The current study shows that even though significantly more private sector

¹⁹ Author's note: At the time of finalizing this report, the HFG project had supported the Bauchi State government to carry out a bill of quantities (BOQ) and assessment survey of PHC facilities in the state, including costing of infrastructure and other gaps to inform evidence-based investments and budgetary appropriations. These findings are presented in a separate accompanying report.

facilities have skilled health workers compared to public facilities, the practice in private facilities was not shown to be of significantly higher quality than in public facilities. This is evidenced by lower percentages practicing key life-saving practices of AMSTL, family planning, and immunization for example, and relative absence of standardized operating procedures suggesting similar gaps in capacity and therefore at least an equal need for oversight. Therefore, the state could make significant service delivery gains by regulating the private sector and enforcing reasonable minimum standards and inspections (of infrastructure, staffing numbers, and practices) to ensure safe primary health care for its citizens as well as raise and maintain value for money.

Commodities: Availability of drugs and other commodities, particularly at the PHC level, is clearly a challenge that needs to be addressed centrally by the state government. This assessment did not include the higher-level systemic issues that would have contributed to the facility-level findings, Soled to the findings so a critical next step would be a review of the supply chain system functions (quantification, procurement and transportation) at each level of the system (state, local government authority, and facility) for the range of commodities required for RMNCH service delivery.

ANNEX A: ELECTRONIC DATA COLLECTION

Electronic data collection instructions

Introduction: The electronic filing system created by the Securities and Exchange Commission for the purpose of increasing efficiency of and accessibility to corporate filings is used by almost all research organizations. It replaces paper registers, and is geared toward making research easier, thereby ensuring the best quality and authenticity of information gathered.

Real-Time/Online Data Gathering: In the past, collecting data from the target community involved designing, printing, and posting papers forms, chasing up those who had not responded, getting the data entry done, and manually preparing reports while checking for inaccuracies.

Fortunately, those painful days can now be over because electronic data gathering does away with forms and collects data electronically. This means a faster response, real-time feedback, and, if needed, data can be validated online in real time.

The electronic data gathering is GIS enabled. Location recording is required to make the information gathered more acceptable.

Use of Android smart phones/tablets to collect data: The use of Android tablets is based on direct manipulation, using touch inputs that loosely correspond to real-world actions, like swiping, tapping, pinching, and reverse pinching to manipulate on-screen objects.

Getting started with electronic data gathering/ ODK collection

- ▶ Open Data Kit (ODK) is a free Android app found in the Google play store.
- ▶ You need to download and install the app on your smart Android phone.
- ▶ After installation, get blank forms of your questionnaire, which you will use to gather data with the help of GIS.
- ▶ To gather data, locate and tab on the ODK collect app in the menu of your smart phone.
- ▶ Locate the folder 'fill blank form' and tab on it to view your tools.
- ▶ Once the form is filled with the available information from your respondent, it should be saved.
- ▶ After successfully completing an interview, make sure to save the record and go to the next respondent.

View, edit saved responses

View/cross check: After saving the interview/record, cross check to make sure there is no error before submitting the form. While cross checking, always remember to tap on a tick-slant arrow at the top-most left side of the saved responses to go back to the previously viewed responses. To cross check:

- ▶ Tap on the EDIT tab at the front of the saved record and wait for two seconds to bring up your saved record.
- ▶ Scroll gently up and down to view the saved responses.
- ▶ After checking and entering all the questions, sets, and groups available, tap the SAVE tab to save.

Edit saved responses

- ▶ As you are cross checking/viewing, tap on any question you noticed an error in the response. It will allow you to edit.
- ▶ Correct the error and swipe the screen of the device to the right side of the tablet to go back to the saved responses.

Submitting records

Having cross checked and certified there is no error in the record, you can now save.

ANNEX B: SAMPLE SIZE DETERMINATION

			LGA	Total PHCs	Proportion needed	Allocation (n=133)	WB facilities No.	HFG Balance
Total number of PHCs (Includes category- PHC, Maternity and health centres/clinics)	390		1 Alkaleri LGA	26	0.066666667	9	7	2
Total PHCs to be sampled (Sample size calculation)	194		2 Bauchi	40	0.102564103	14	13	1
Excluding PHCs in WB- only phase (71)	123		3 Bogoro	22	0.056410256	8	1	7
Minimum no. PHCs to be randomly selected for HFG-Only phase (Half)	62		4 Dambam	7	0.017948718	2	1	1
Total PHCs in the Study	133		5 Darazo	20	0.051282051	7	2	5
			6 Dass	16	0.041025641	5	6	0
Total number in State	22		7 Gamawa	16	0.041025641	5	5	0
Total Gen sampled in the WB-only phase	6		8 Ganjuwa	21	0.053846154	7	6	1
GHs left to be sampled in HFG-only phase	16		9 Giade	7	0.017948718	2	0	2
			10 Itas-Gadau	30	0.076923077	10	2	8
Total number in State	2	Federal-owned	11 Jama'are	13	0.033333333	4	3	1
Total tert. sampled in the WB-only phase	0		12 Katagum	16	0.041025641	5	2	3
Tert. left to be sampled in HFG-only phase	0		13 Kirfi	18	0.046153846	6	6	0
			14 Misau	8	0.020512821	3	2	1
Total number of facilities to be	78		15 Ningi	22	0.056410256	8	5	3

sampled in HFG-only phase								
		16	Shira	13	0.033333333	4	0	4
		17	T/Balewa	17	0.043589744	6	1	5
Total LGAs in Bauchi	20	18	Toro	37	0.094871795	13	9	4
		19	Warji	26	0.066666667	9	0	9
		20	Zaki	14	0.035897436	5	0	5
			Total	390	0.997435897	133	71	62

ANNEX C: BIBLIOGRAPHY

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