WORKING PAPER

Family Planning Indicators Assessment and Data Quality Audit in Selected Health Facilities across Nigeria

November 2019

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MEASURE Evaluation

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November 2019

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This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. WP-19-237

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ACKNOWLEDGMENTS

We thank the United States Agency for International Development (USAID) for its support of this work.

We acknowledge and appreciate the effort of all the people who made this work a reality. We appreciate deeply the USAID-funded MEASURE Evaluation project for the opportunity to carry out this research project. Our appreciation and gratitude to our technical advisor at MEASURE Evaluation, Bridgit Adamou, and our African Field Epidemiology Network advisors, Dr. Shakir Balogun, Dr. Maureen Kamateeka, and Dr. Partick Nguku. We appreciate the approvals, cooperation, and support of the executive directors of the states' primary healthcare boards; directors of planning, research and statistics; family planning coordinators; monitoring and evaluation officers; health management information systems officers; local government monitoring and evaluation officers; reproductive health/family planning coordinators; all stakeholders; and health facility staff across Bauchi, Delta, Enugu, Kano, Osun, and Nasarawa states where this project was carried out.

We also acknowledge and thank Mr. Seni Pinheiro, our chief field coordinator, for seamlessly coordinating all field and logistics activities across the states; our field coordinators and the research assistants who worked in the six study states to ensure the success of this research project; and our data analyst/scientist, Mr. Kehinde Omisile, for the design and scripting of our survey questionnaire, maintenance of our back-end server, and data management of our survey findings.

Many thanks to Mr. Tosin Orhoramrheru who supported me to build the team and provided technical and logistics support at every stage of the proposal development and project execution. I am immensely grateful to my research coinvestigators, Ms. Oluwayemisi Ishola and Mr. Olusegun Ricketts, for their patience while we planned, their professionalism while we worked, and their leadership to the states' teams in both phases of the project. My appreciation also goes to the field coordinators and research assistants in the six states this research project was conducted.

The attention, cooperation, representation, and support of stakeholders from the Reproductive Health (Family Planning) Unit; and the Department of Planning, Research and Statistics of the Federal Ministry of Health—following advocacy to key officers in the ministry and the approval of a federal-level dissemination meeting of our research findings by the current Honourable Minister of Health, Dr. Osagie Emmanuel Ehanire—is most appreciated.

I'm grateful to all members of my family (siblings and parents) for their prayers and support during all stages of this research project.

Thanks to the MEASURE Evaluation Knowledge Management team, based at the University of North Carolina at Chapel Hill, for editorial, design, and production services.

Dr. Olukemi Titilope Olugbade

Principal Investigator

Suggested citation:

Olugbade, O., Ishola, O., Ricketts, O., Balogun, S., & Kamateeka, M. (2019). Family Planning Indicators Assessment and Data Quality Audit in Selected Health Facilities across Nigeria. Chapel Hill, NC, USA: MEASURE Evaluation, University of North Carolina at Chapel Hill

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ABBREVIATIONS

AFENET	African Field Epidemiology Network
BA	Breakthrough Action
CDRR	consumption daily requisitions register
CHEW	community health extension worker
CLMS	commodity logistics management system
CPR	contraceptive prevalence rate
DCR	daily consumption record
DHIS2	District Health Information Software, version 2
DPRS	Department of Planning, Research and Statistics
DQA	data quality audit
FP	family planning
FGD	focus group discussion
FMOH	Federal Ministry of Health
IUCD	intrauterine contraceptive device
HMIS	health management information system
KII	key informant interview
LARC	long-acting, reversible contraceptive
LGA	local government area
mCPR	modern contraceptive prevalence rate
M&E	monitoring and evaluation
MSF	monthly summary forms
NDHS	Nigeria Demographic and Health Survey
NHMIS	national health management information system
PPFP	postpartum family planning
RH	reproductive health
SP	service provider
SMOH	State Ministry of Health
TCI	The Challenge Initiative
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Background: Promoting family planning (FP) is an important strategy for preventing high-risk births and infant deaths, reducing unplanned pregnancies and unsafe abortions, and decreasing the burden of infant and maternal mortality globally. To be successful, FP programs must use information systems to accurately track FP use and trends. Though use of District Health Information Software, version 2 (DHIS2) to manage and aggregate health information is becoming the norm across Nigeria, issues still confound the operationalization, availability, accuracy, consistency, timeliness, completeness, and integrity of FP data at health facilities and in DHIS2 by extension. The purpose of this study was to assess FP data quality in select health facilities in Nigeria.

Methods: The study used a mixed-methods approach**.** A total of 114 (103 public and 11 private) health facilities in six states (namely Bauchi, Delta, Enugu, Kano, Osun, and Nasarawa) were selected across Nigeria. We administered a questionnaire to FP focal persons at the health facilities to collect quantitative data on FP indicators at the facility and assess data quality. The qualitative component of the study consisted of focus group discussions (FGDs) at selected health facilities and key informant interviews (KIIs) with reproductive health (RH) and FP implementing partners and stakeholders at various levels of the health system, to gather qualitative data on health system factors affecting FP data collection, quality, analysis, and use.

Using an Android device-based data quality audit (DQA) questionnaire, quantitative information on availability of FP reporting tools and FP data completeness, consistency, accuracy/validity, and training were collected. The questionnaire was administered to 114 RH or FP focal persons in the selected facilities. As a reference, we used the information from the FP dashboard in DHIS2 to look at coverage indicators, commodities consumption, and training for each of the selected facilities. We conducted a one-year document review of data registers available in the facilities, from January through December 2018.

Results: The study sites in Kano had the highest support from implementing partners (90%), and the facilities in Enugu had the lowest support (15%). More than one-half (60; 53%) of the health facilities had providers trained in postpartum family planning (PPFP); long-acting, reversible contraceptives (LARCs) (77; 68%); and commodity logistics management system (CLMS) (64; 56%).

Most health facilities (79–100%) had daily FP attendance registers. The national health management information system (NHMIS) monthly summary forms (MSFs) were available in 68 percent of the facilities. However, fewer than 50 percent of the facilities in most states had the consumption daily requisitions register (CDRR), and as few as 7 percent of the health facilities had a commodities bin and storage cards available. Just over half (57%) of the health facilities assessed had all the necessary FP client information documented. Client cards were missing in 30 percent of the facilities. Nasarawa scored the highest in data completeness (75%), and Bauchi scored the lowest (37%). Fewer than 60 percent of the facilities had the total number of FP visits recorded in the FP register corresponding to the MSF and DHIS2 (57%); contraceptives dispensed accurate across all data tools (50%); and total number of FP revisits reported the same on the daily consumption register (DCR), MSF, and DHIS2 (59%). Only 11 facilities (10%) had total number of clients counselled documented.

The data validity indicator scored the lowest (38%). Poor data quality, mostly in the form of overreporting, was reflected in the huge variance between the primary source documents, FP daily register, and DHIS2. We set a target of ≥ 80 percent for the data quality scores, but only seven (6%) of the facilities of all facilities assessed scored above 80 percent, all located in Nasarawa.

When assessing the variance between DHIS2 and the FP daily register across all service areas in 2018, the scores ranged from zero to 100 percent; however, actual scores from this study ranged from 5 to 92 percent. Most of the variances clustered between 100 percent (underreporting) and -100 percent

(overreporting) with Enugu and Osun showing significant outliers as high as -800 percent to -900 percent overreporting.

Most of the facilities had reported at least 10 out of 12 months (80%) to DHIS2 within the period under review. Kano had the highest reporting rate (89%) and the facilities in the southern region of the country (Osun, Delta, and Enugu) had the lowest reporting rates.

The average variance percentage between data in the FP daily register and data in DHIS2 across the study states showed overreporting of service statistics with FP counselling data as high as -559 percent overreported. Implants and sterilization were underreported across the states. The Kano facilities had the most overreporting (-336%), and Delta generally had underreported data across all FP service areas.

Many of the key informants in Nasarawa mentioned percentage of new acceptors as the most important indicator to key stakeholders (government) and supporting partners. Other key informants mentioned number of intrauterine contraceptive devices (IUCDs) and implants inserted FP services with highest uptake, commodities consumption, number of female condoms distributed, and LARC uptake as indicators of interest. In all states, 100 percent of the respondents were familiar with the data collection tools used in health facilities.

Conclusion: FP data quality is dependent on an interplay of elements which include human, financial, and organizational factors. A weak link in any of these factors ultimately leads to compromised data quality. The study revealed a number of data quality concerns including service providers' (SPs) poor data collection and analysis capacity in the private sector, multiplicity of SPs' roles at the facility level, and shortages of well-trained SPs and data managers leading to FP service data inconsistencies, inaccuracies, and overreporting and underreporting. There is a need to expand the NHMIS tools and DHIS2 platform to incorporate service and consumption data to improve availability of FP data for informed decisions.

INTRODUCTION

Nigeria is the most populous nation in Africa and the eighth most populous globally. In the past four decades, the population more than tripled, from 56 million in 1970 to over 186 million in 2016, with an annual growth rate of 3.2 percent. At this exponential rate, the country's population is projected to be 441 million by 2050 (National Population Commission of Nigeria & ICF International, 2013).

The estimated subnational total fertility rate ranges from 4.3 in the South South zone to 6.7 in the North West zone. The national total fertility rate has been consistently high at 5.5 since 2013. An estimated 8.3 percent of births are unplanned, and the adolescent birth rate is estimated to be 23 percent for females 15–19 years of age (National Population Commission of Nigeria & ICF International, 2013).

These findings present challenges to providing universal health coverage and sustainable healthcare delivery in Nigeria. Promoting FP has been identified as an important strategy to prevent high-risk births, infant deaths, and maternal mortality. According to the 2013 Nigeria Demographic and Health Survey (NDHS), the overall contraceptive prevalence rate (CPR) among all women in the country is 15 percent and unmet need is 16 percent (Federal Ministry of Health [FMOH], 2014).

The 2013 NDHS shows the trend in use of specific contraceptive methods among currently married women from 1990 to 2013. Over the 23-year period, the CPR increased from 6 percent to 16 percent while the modern contraceptive prevalence rate (mCPR) increased from 4 percent to 10 percent during the same period. Primary healthcare centres are the cornerstone of FP service delivery in Nigeria, yet the private sector (including faith-based organizations) provide up to 60 percent of modern contraceptive methods, with fewer than one-third (29%) of current modern contraceptive users obtaining their method from the public sector, mostly public government hospitals (17%) (NDHS, 2013). Nine percent of users of modern FP methods use other SPs. This shows a gap in FP service delivery between the public and private sectors.

Study Rationale

Using information systems to accurately track FP use and trends is essential for a successful FP program (Mitoko, et al., 2017). At the national level, Nigeria's routine health information system is synonymous with its HMIS; it is the management tool through which health information across different programmatic areas (routine immunization, HIV, malaria, and FP) are aggregated into DHIS2, an open-source platform for collating, reporting, analysing, and disseminating aggregated and event-based data elements and indicators for health programs. There are 15 FP data elements in DHIS2 and three FP indicators. The software is currently in use and operational in 34 of Nigeria's 36 states. In 2017, 80.9 percent of the 34,524 public health facilities in Nigeria reported their data to DHIS2.

Nationally, as projected in the FP Blueprint for Nigeria in 2014, US$183 million, or 30.3 percent of the FP blueprint budget, is for commodities, including contraceptives and consumables; 22.1 percent is for supervision, including research and monitoring and evaluation (M&E); another 22.1 percent is for demand creation; and 21.7 percent is for service delivery and access. Procurement and supply chain management account for the remaining 3.8 percent of the total (FMOH, 2014).

The Nigerian government set a target of reaching a 27 percent mCPR by 2020. To achieve this goal, the government pledged additional funding ($8.35 million annually) to be provided over a four-year period from 2016 for RH commodity provision. Additional commitments include trainings for over 3,000 community health workers to deliver the range of contraceptives, particularly long-acting and reversible methods and support task shifting so community health workers in rural areas can provide a wide range of FP methods. Despite the majority of health facilities reporting their FP data and huge investments and

expenditures in health, relatively little progress has been made in improving the FP program in the past five years (Family Planning 2020 Global, 2014).

Research shows that expanding FP services and creating demand for contraception undoubtedly leads to reductions in unplanned pregnancies, unsafe abortions, high-risk births, and associated infant and maternal mortality (FMOH, 2014). Currently, there are huge state and regional differences in FP supply. Although demand for modern contraception is increasing, this demand is poorly reflected in the HMIS and DHIS2 at the national level.

The FP information system was harmonized with the NHMIS in 2013 to minimize multiple, parallel data reporting systems. Although some FP SPs use only DHIS2 for reporting, others use specific data collection tools, paper-based data collection tools, or a combination of the three. Challenges in implementing DHIS2 software include health system factors, such as poor funding owing to low resource allocation to the health sector for training, mentorship, and supervision; low staff capacity at service delivery points, especially at the primary healthcare level; facility-based electronic medical reporting not yet to scale; and lack of human resources and equipment (laptops, tablets, or Android phones). Other challenges include health staffs' poor attitude toward collecting and reporting electronic data, owing to resistance to change and parallel reporting systems.

Although the health facility reporting rate reflects that DHIS2 use is becoming institutionalized, it doesn't show the factors responsible for how the current mCPR is calculated. While DHIS2 is used to validate and confirm *trends* in mCPR, it is not expected to replace other sources for calculating an annual estimate of mCPR, such as household surveys (i.e., the Demographic and Health Surveys Program [DHS], PMA2020, or UNICEF's Multiple Indicator Cluster Survey). The significant variation in mCPR in DHIS2 (7%) versus the NDHS 2013 (15%) suggests there are issues related to the operation, availability, accuracy, consistency, timeliness, completeness, and integrity of FP data at the health facilities.

Different implementing partners fund FP activities in Nigeria, each with their own interests based on sector (public or private) and area of focus (e.g., demand generation, data quality, FP coverage, logistics and commodities, training SPs). Not only do FP implementing partners use different reporting platforms and tools, FP indicators also vary across partners. Lack of integration and harmonization of FP data from the facility level to the national level may be responsible for the poor FP performance indicators. Furthermore, some of the FP 2020 indicators are not captured in DHIS2 (Family Planning 2020 Global, 2014).

Research Objectives and Questions

With financial and technical support from MEASURE Evaluation, which is funded by the United States Agency for International Development (USAID), researchers at the African Field Epidemiology Network (AFENET) conducted a study to assess FP data quality (availability, accuracy, consistency, timeliness, completeness, and integrity) in select health facilities in Nigeria. The study's objectives were to estimate FP indicator performance at the health facility level from the HMIS not reflected in DHIS2 to determine the quality of FP data at the facility level and identify challenges to FP program implementation in sampled health facilities in Nigeria.

The study answered the following research questions:

1. Which stakeholders or partners are involved in collecting FP data? Which data tools are used and what information is collected?
2. Who is involved in the information chain at each level of data management? What is the data quality at each of these levels? Is the data collection, collation, and validation process incentivized?

3. How adequate is the FP HMIS, using DHIS2 in particular, to inform FP decisions?
4. How and at what level are the data analysed, interpreted, and communicated?
5. What is the data quality status for FP services in Nigeria? What can be done to address existing data elements, indicators, and data quality gaps in the public and private sector to influence decisions for FP services?

METHODS

Study Design

The study was conducted using a mixed-methods (quantitative and qualitative) approach**.** To examine the accuracy of selected indicators, we reviewed source documents and assessed the FP reporting system to determine how well health data are collected, compiled, transmitted, and analysed in the HMIS/DHIS2**.** For the quantitative component, we used an electronic Open Data Kit questionnaire to assess FP indicators at the facility and conduct a DQA. To gather qualitative data to assess health system factors affecting FP data collection, quality, analysis, and use to inform policy, we conducted FGDs at the sampled health facilities. We also conducted KIIs with RH and FP implementing partners and stakeholders at various levels of the health system. The research team recruited twelve research assistants across six states: Bauchi, Delta, Enugu, Kano, Osun, and Nasarawa.

Sampling

Public and private health facilities in six states were selected across the six geopolitical zones in Nigeria: North Central, North East, North West, South East, South-South, and South West. The study's inclusion criteria called for health facilities offering FP and RH in Nigeria. The study excluded health facilities offering neither FP nor RH services and facilities with no data on DHIS in the past two years.

To determine the sample size for this cross-sectional study, we used the formula for single proportions ($n = Z^2\ pq/d^2$) with the following assumptions:

- Z = normal standard deviate corresponding to a 5-percent level of significance (two-sided) = 1.96
- p = proportion of public health facilities with good data quality = 50 percent (The proportion was estimated because no prior value was available.)
- q = 1 - p = 1 - 0.50 = 0.50
- d = level of precision = 0.10

Thus, 1.96^2 x 0.50 x 0.50/(0.1)2 = 0.9604/0.01 = 96.04. Adjusting for a 10-percent nonresponse rate, the sample size was calculated as N/1 - f = 96.04/1 - 0.1 = 96.04/0.9 = 106.7. The sample size was rounded up to 110 health facilities.

All facilities in Nigeria are expected to report routine health information, including FP data, to DHIS2. The data are aggregated from the facilities at the local government or district level and forwarded to the state. At the state level, the data are further aggregated from all the local government areas (LGAs), validated, and uploaded to the DHIS2 platform.

The following multistage sampling technique was used:

- Stage 1: Public and private health facilities were selected by balloting one state from each geopolitical zone of the country and two LGAs within each state using simple random sampling. Selections were stratified based on predominantly rural and urban classifications.
- Stage 2: Three wards were selected from each of the 12 LGAs using simple random sampling for a total of 36 wards.
- Stage 3: Eligible health facilities were identified using the sampling frame from DHIS2.
- Stage 4: Health facilities were stratified per LGA, and their functionality was assessed. This systematic random sampling was conducted until the sample size was achieved.

Data Description and Collection

Questionnaire

To conduct the DQA, we administered a questionnaire via interviews with 114 RH/FP focal persons in the selected facilities for the purpose of collecting the following information: type of health facility, FP services offered, health workers available for FP services, number of FP visits to the facility, demand for FP services, FP tools used, availability of paper-based tools, partner(s) supporting facilities (if any), FP coverage indicators in use, commodities consumption, training on FP programmatic deliverables, and training on DHIS2.

Using Open Data Kit software, the questionnaire/data quality checklist was designed and titled as the FP Program Data Quality Audit and Indicators Assessment Questionnaire. The questionnaire was adapted for use with an Android device. It was divided into sections based on our research questions and what we considered data elements and tools used for data collection, data analysis, data interpretation, and data action.

Based on the different sections in the questionnaire, we assigned scores to each of the following criteria: availability of FP reporting tools (4), FP data completeness (22), FP data consistency (21), data accuracy/validity (50), and training (3), for a total score of 100. Good data quality (based on data availability, consistency, accuracy, and completeness, with an aggregate score of ≥ 80%) was our outcome/dependent variable. We conducted a multivariate analysis, at a 0.05-percent level of significance and with a 95-percent confidence interval, to identify factors associated with data quality.

As a reference, we used information from DHIS2's FP dashboard to look at coverage indicators, commodities consumption, and training for each of the selected facilities and conducted a one-year document review of data registers available in the facilities, from January through December 2018.

KIIs

We conducted 42 KIIs with FP stakeholders and key decision makers in the RH/FP units at the LGA and state levels in the selected states. We interviewed directors in the Department of Planning, Research and Statistics (DPRS) at the State Ministry of Health (SMOH), staff at the State Primary Healthcare Development Agency, directors of the Primary Healthcare Board, state FP coordinators, state M&E officers, state HMIS officers, LGA M&E officers, LGA FP/RH coordinators, the LGA-level medical officers of health, and staff of implementing partners to identify the following:

- Which stakeholders or partners are involved in FP data collection?
- What/which data tools are used and what information is collected?
- How adequate and reliable is the FP HMIS, using DHIS2, to inform decisions for FP?
- What can be done to address existing data elements/indicators and data quality gaps in the public and private sectors to influence decisions for FP services?
- What could improve data use?

FGDs

We conducted six FGDs with a mix of health workers/SPs (clinicians, nurses, facility in-charges, RH/FP focal persons, and health records information officers at the LGA level) to answer the following questions:

- Who is involved in the information chain at each level of data management?
- What is the data quality at each of these levels?

- Is the data collection process incentivized?
- Are incentives being given for data management activities?
- What are the factors that affect data quality, including how and at what level the data are analysed, interpreted, and communicated?
- What can be done to address data elements/indicators and data quality gaps in the public and private sectors to influence decisions for FP services?

Each of the FGDs had eight to 17 participants for a total of 65 discussants.

Table 1. Study sites and participants

Geopolitical zones	States	LGAs	Public facilities	Private facilities	Key informants	Focus group discussants	Questionnaire respondents
North Central	Nasarawa	2	17	3	10	15	20
North East	Bauchi	2	20	0	9	15	20
North West	Kano	2	18	2	5	10	20
South East	Enugu	2	18	2	6	17	20
South South	Delta	2	14	1	6	-	15
South West	Osun	2	16	3	6	8	19
Totals	**6**	**12**	**103**	**11**	**42**	**65**	**114**

Data Analysis

We used descriptive statistics to compute the components of data quality based on data quality values below 80 percent. A linear regression model was used to identify predictors of data quality. The outcome variable for the model is the numeric continuous variable: the data quality score. The score ranges between zero and 100 percent; however, actual scores from this study ranged between five and 92 percent. A Shapiro-Wilk test of normality shows that the data can assume a normal distribution (Shapiro-Wilk Statistic = 0.991, $p = 0.661$), hence the use of a linear regression model for this analysis at a 0.05 level of significance and 95 percent confidence interval. Each variable was entered into the model as an indicator for ease of analysis and interpretation.

Stakeholder Meetings

We held meetings with the Family Planning Technical Working Group and other stakeholders in each state to brief the state teams on the aims and objectives of the project, gather official support letters approving access to the health facilities, and schedule appointments to carry out the KIIs and FGDs. The meetings were attended by leadership officers from the State Primary Healthcare Development Agency; the executive secretary; the directors of Planning, Research and Statistics; the HMIS officer at the SMOH; the state M&E officers; the state RH/FP focal persons; and the M&E officers at the Local Government Primary Healthcare Board.

Trainings

The research team conducted concurrent week-long trainings in the six states on February 11, 2019 for the research assistants engaged in fieldwork. The training involved reviewing the NHMIS tools and the data downloaded from DHIS2 from January to December 2018. The research assistants were assigned health facilities in their respective states. The research team guided the research assistants through the

Android-based electronic questionnaire. The research assistants signed a contractual agreement before proceeding with fieldwork.

Ethical Considerations

The study protocol was reviewed and approved by the Nigeria National Health Research Ethical Committee of the FMOH with ethical approval number National Health Research Ethics Committee 01/01/2007–22/10/2018.

We obtained verbal informed consent from the respondents for the electronic questionnaire administration and written consent from the KII and FGD participants. Participants' names were not recorded for purposes of anonymity. Respondents were told they could withdraw from the study at any time. Interviews and discussions were held in a quiet, private location, without distractions. All benefits, including baseline findings, were shared with the participants.

RESULTS

Quantitative Findings

Background Information on the Health Facilities

A total of 114 health facilities were assessed during the study with a fairly even distribution in rural and urban areas (Table 2).

Table 2. Distribution of health facilities by state and rural or urban location

State	Urban		Rural		Total
	LGA	Freq (n)	LGA	Freq (n)	
Bauchi	Bauchi	10	Ganjuwa	10	20
Delta	Oshimili South	8	Oshimili North	7	15
Enugu	Enugu South	9	Nkanu West	11	20
Kano	Kano Municipal	10	Gezawa	10	20
Nasarawa	Lafia	10	Doma	10	20
Osun	Olorunda	12	Ife North	7	19
Total		**59**		**55**	**114**

Most of the health facilities (77%) were PHCs with secondary health facilities the least (5%). The majority (108; 95%) were at the PHC level and were public facilities (103; 90%) (Table 3). The distribution of facility categories was similar across the states. All the facilities assessed in Bauchi, Delta, and Kano were government-owned primary healthcare facilities.

Table 3. Distribution of facilities by health facility type, level, and ownership

	Bauchi (n=20) n (%)	Delta (n=15) n (%)	Enugu (n=20) n (%)	Kano (n=20) n (%)	Nasarawa (n=20) n (%)	Osun (n=19) n (%)	Total (n=114) n (%)
Type of facility							
PHC	19 (95)	14 (93)	16 (80)	9 (45)	16 (80)	14 (74)	88 (77)
Health post	0 (0)	0 (0)	0 (0)	9 (45)	0 (0)	0 (0)	9 (8)
Secondary health facility	1 (5)	0 (0)	2 (10)	0 (0)	1 (5)	2 (11)	6 (5)
Private hospital	0 (0)	1 (7)	2 (10)	2 (10)	3 (15)	3 (16)	11 (10)
Level of facility							
Secondary	1 (5)	0 (0)	2 (10)	0 (0)	1 (5)	2 (11)	6 (5)
Primary	19 (95)	15 (100)	18 (90)	20 (100)	19 (95)	17 (89)	108 (95)
Facility ownership							
Private	0 (0)	1 (7)	2 (10)	2 (10)	3 (15)	3 (16)	11 (10)
Public	20 (100)	14 (93)	18 (90)	18 (90)	17 (85)	16 (84)	103 (90)

For the DQA questionnaire, most of the respondents were senior community health extension workers (CHEWs) (86; 75%) followed by junior CHEWs (65; 57%). Both junior and senior health workers were well-represented, with a little more than one-half of the respondents in the senior cadre (54%) (Table 4).

Table 4. Distribution of health workers (respondents) interviewed for the DQA in selected facilities

		Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
		n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Health workers	Doctor	0 (0)	1 (7)	3 (15)	9 (45)	3 (15)	4 (21)	20 (18)
	RN/RM	12 (60)	14 (93)	2 (10)	9 (45)	5 (25)	9 (47)	51 (45)
	Nurse	5 (25)	5 (33)	6 (30)	6 (30)	4 (20)	7 (37)	33 (29)
	CHO	7 (35)	3 (20)	10 (50)	9 (45)	7 (35)	11 (58)	47 (41)
	Senior CHEW	12 (60)	12 (80)	16 (80)	16 (80)	18 (90)	12 (63)	86 (75)
	Junior CHEW	12 (60)	6 (40)	15 (75)	15 (75)	13 (65)	4 (21)	65 (57)
Cadre	Junior	6 (30)	1 (7)	16 (80)	9 (45)	13 (65)	8 (42)	53 (46)
	Senior	14 (70)	14 (93)	4 (20)	11 (55)	7 (35)	11 (58)	61 (54)

*RN/RM: registered nurse/registered midwife *CHO: community health officer

Presence of Implementing Partners

In all states except Enugu, the majority of selected facilities were receiving external partner support for their FP and RH activities (Table 5). The study sites in Kano had the highest support from implementing partners (90%), and the facilities in Enugu had the lowest support (15%). Marie Stopes International supported the highest share of facilities (46%). Other partners and donors were USAID, Amazon, Breakthrough Action (BA) Nigeria, UNICEF, Jhpiego, Lottery Club, Nigeria States Health Investment Project, Plan International, Planned Parenthood Federation of Nigeria, and The Challenge Initiative (TCI). For the full list of implementing partners, by state, see Appendix 1.

Table 5. Distribution of health facilities by presence of implementing partners

	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
No	6 (30)	6 (40)	17 (85)	2 (10)	9 (45)	6 (31.6)	46 (40.4)
Yes	14 (70)	9 (60)	3 (15)	18 (90)	11 (55)	13 (68.4)	68 (59.6)
Total	20 (100)	15 (100)	20 (100)	20 (100)	20 (100)	19 (100)	114 (100)

Training

More than one-half (60; 53%) of the health facilities had providers trained in PPFP, LARCs (77; 68%), and CLMS (64; 56%). About a quarter of all facilities (26%) had providers who had not been trained in at least one of the service provision areas. All 20 of the facilities in Bauchi had providers trained in at least one area of FP service provision, whereas the same can be said for only 5 percent of the facilities in Enugu (Table 6).

Table 6. Distribution of facilities with trained FP providers

	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Has trained PPFP provider	12 (60)	8 (53)	1 (5)	18 (90)	10 (50)	11 (58)	60 (53)
Has trained LARC provider	18 (90)	12 (80)	0 (0)	18 (90)	18 (90)	11 (58)	77 (68)
Has trained CLMS provider	18 (90)	5 (33)	0 (0)	19 (95)	11 (55)	11 (58)	64 (56)
Trained in at least one area of FP service provision	20 (100)	12 (80)	1 (5)	19 (95)	18 (90)	14 (74)	84 (74)
Total*	20 (100)	15 (100)	20 (100)	20 (100)	20 (100)	19 (100)	114 (100)

*Respondents could provide multiple responses.

Availability of Tools

Most health facilities (79–100%) had daily FP attendance registers. The national NHMIS MSFs were available in 68 percent of the facilities. However, fewer than one-half of the facilities in most states had the CDRR (or DCR) and as few as 7 percent of the health facilities had a commodities bin/storage cards available. The daily FP attendance register was the most available tool among all facilities (Table 7).

Table 7. Availability of reporting tools in selected health facilities

	Bauchi (n=20) n (%)	Delta (n=15) n (%)	Enugu (n=20) n (%)	Kano (n=20) n (%)	Nasarawa (n=20) n (%)	Osun (n=19) n (%)	Total (n=114) n (%)
NHMIS MSFs	11 (55)	14 (93)	13 (65)	16 (80)	9 (45)	15 (79)	78 (68)
CDRR forms	7 (35)	7 (47)	8 (40)	10 (50)	9 (45)	7 (37)	48 (42)
Bin cards	3 (15)	1 (7)	3 (15)	9 (45)	8 (40)	11 (58)	35 (31)
Daily FP attendance register	19 (95)	15 (100)	19 (95)	17 (85)	18 (90)	15 (79)	103 (90)
HMIS referral forms	2 (10)	3 (20)	6 (30)	9 (45)	15 (75)	4 (21)	39 (34)

Data Consistency

Measures of data consistency are important to assess the quality of FP counselling and service delivery at the health facilities. Three client cards were randomly selected and traced from the daily FP register in each of the 114 health facilities to assess the FP indicators for data consistency. We used client cards as a proxy tool to assess data consistency, comparing FP information entered in the client cards to information entered per client in the FP daily attendance register. Each card should contain the following information: biodata, address, phone number, client number, client age, and current FP method. Of the 114 health facilities assessed, 65 (57%) had all the above FP client information documented. Less than two-thirds (62%) of the health facilities contained FP client records with all data fields completed. Client cards were missing in 30 percent of the facilities, and in 20 percent of the facilities none of the client cards had complete information (Table 8).

Table 8. Distribution of data consistency indicators across all facilities by FP client records

FP client cards with the following information correctly entered	None of the client cards	One client card	Two client cards	All three client cards	Total
	n (%)	n (%)	n (%)	n (%)	n (%)
Client number	25 (22)	9 (7.9)	15 (13.2)	65 (57)	114 (100)
Client age	17 (15)	1 (0.9)	17 (14.9)	79 (69.3)	114 (100)
FP method	19 (17)	2 (1.8)	16 (14)	77 (67.5)	114 (100)
Biodata, address, and phone number	35 (31)	9 (7.9)	10 (8.8)	60 (52.6)	114 (100)
All data fields completed	23 (20)	4 (3.5)	16 (14)	71 (62.3)	114 (100)
FP clients with client cards	34 (30)	6 (5.3)	9 (7.9)	65 (57)	114 (100)

Data Availability and Completeness

Data completeness was assessed by reviewing the information collected using the NHMIS data tools to verify if all fields, data, and entries were filled in completely, duly signed, and up-to-date. We reviewed 22 questions to evaluate data availability and completeness. The total scores for each facility were computed to give a mean score. Facilities in Bauchi had a data completeness score of 37 percent, Enugu 50 percent, and Nasarawa had the highest at 75 percent.

The distribution of FP data availability revealed that 91 (80%) of the health facilities had the NHMIS MSF available; 72 (63%) had the NHMIS MSF appropriately signed; 79 (69%) had all the required and relevant fields in the facility NHMIS completely filled out; 43 (38%) had corresponding data in the NHMIS MSF and DHIS2 (for new and revisit clients); 76 (67%) had entries on the commodities received; 70 (61%) had entries on commodities dispensed completely filled out; 75 (66%) had the balance brought forward for each contraceptive method equivalent to the balance on hand in the DCR; 41 (36%) of the facilities had all the records in the bin/storage cards completely filled out; and the same number had up-to-date data on the bin/storage cards.

Half (50%) of the facilities had the CDRR MSF available, but fewer than one-half (50; 44%) had all the required and relevant forms on the CDRR completely filled and the CDRR MSF signed (47; 41%).

Of the 107 (94%) health facilities that had an FP daily register available, 68 (60%) were signed, 82 (72%) had dates filled out, and 93 (82%) started each month on a fresh page, with all the data fields within the reporting period reviewed completely and correctly filled out.

Approximately one-third of the facilities (39, 34%) had the booklets with HMIS referral forms available, of which only 33 (29%) had them filled out correctly and 27 (24%) had the forms signed. Only 33 (29%) of the facilities had the column for FP counselling activity ticked and all the data fields completely filled out up to the FP counselling column (Appendix 2).

Data Validity

To determine data validity, we conducted a desk review and compared data from the FP daily register with data in the MSF, DCR, and DHIS2 over a 12-month period, equivalent to one reporting year. Of the 114 facilities, 64 (57%) had the total number of FP visits recorded in the FP register corresponding to the MSF and DHIS2; 56 (50%) had total contraceptives dispensed accurate across all data tools; 66 (59%) had total number of FP revisits reported the same on the DCR, MSF and DHIS2; 11 facilities (10%) had total number of clients counselled; and 34 facilities (30%) had number of implants the same on the FP register and DHIS2. Number of sterilizations was the indicator most accurately captured across facilities, with 75 percent accuracy or higher (Table 9) (Appendix 3).

Table 9. Data validity of FP indicators by state

FP Indicators Corresponding to Data in the FP Daily Register, MSF, DCR, and DHIS2	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
Indicator 1: Number of FP visits (new acceptors)	11 (55)	10 (66.7)	11 (55)	15 (75)	12 (60)	5 (29.4)	64 (57.1)
Indicator 2: Number of contraceptives dispensed	8 (40)	7 (46.7)	10 (50)	12 (60)	12 (60)	7 (41.2)	56 (50)
Indicator 3: Number of revisits	10 (50)	10 (66.7)	14 (70)	14 (70)	13 (65)	5 (29.4)	66 (58.9)
Indicator 4: Number of clients counselled on FP	0 (0)	3 (20)	0 (0)	1 (5)	5 (25)	2 (11.8)	11 (9.8)
Indicator 5: Patients given implants	3 (15)	4 (26.7)	11 (55)	2 (10)	8 (40)	6 (35.3)	34 (30.4)
Indicator 6: Patients given IUCD	13 (65)	2 (13.3)	10 (50)	8 (40)	10 (50)	6 (35.3)	49 (43.8)
Indicator 7: Patients given injectables	0 (0)	1 (6.7)	2 (10)	0 (0)	8 (40)	3 (17.6)	14 (12.5)
Indicator 8: Patients given pills	2 (10)	0 (0)	1 (5)	0 (0)	7 (35)	4 (23.5)	14 (12.5)
Indicator 9: Patients given condoms	4 (20)	1 (6.7)	1 (5)	4 (20)	8 (40)	4 (23.5)	22 (19.6)
Indicator 10: Number of sterilizations performed	20 (100)	14 (93.3)	20 (100)	15 (75)	18 (90)	13 (76.5)	100 (89.3)

Data Quality Scores

For each of the five data quality indicators discussed in the previous sections, scores were estimated as follows:

Availability of tools: Each variable with a "yes" response was assigned a score of 1; the aggregate gives the total data availability score with a total obtainable score of four.

Data consistency: Each variable was assigned a value based on the information assessed from three randomly sampled clients. Each variable had an obtainable score of three, and with six variables, each facility had an obtainable score of 18. The total score was then calibrated to 21 (i.e., $[Score \div 18] \times 21$).

Data availability: Among 22 total variables for this indicator, each variable with a "yes" response was assigned a value of 1 for a total obtainable score of 22.

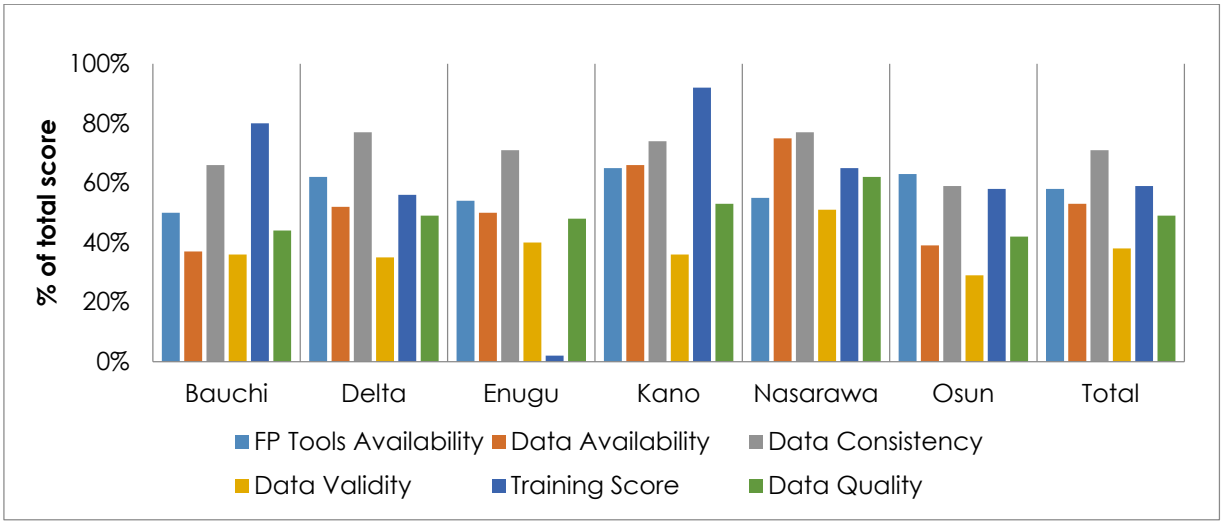
Data validity: Each variable in this indicator was assigned a value of 5 when the response was "yes," and 0 for "no." With 10 variables in the measure, the total obtainable score was 50.

Training: There were three variables measuring training in each facility. When a trained provider was available in the facility for each area, the facility obtained a value of 1. The total obtainable score was 3.

Thus, a perfect data quality score would have been calculated by adding tool availability (4), data consistency (21), data availability (22), data validity (50), and training (3), for a total score of 100.

Most of the facilities' average data quality scores were below 50 percent. The health facilities in Nasarawa had the highest data quality scores, and the facilities in Osun had the lowest data quality scores (Figure 1).

Figure 1. Distribution of data quality indicator scores in the FP Indicator Assessment Questionnaire and FP DQA across selected facilities



Analysis of Data Quality across States

The average data quality indicator scores and percentage of total obtainable score for each indicator by state shows the mean score for FP tools availability was 2.3 (58%) out of a possible score of four. The mean score was highest in Kano (2.6; 65%) and lowest in Bauchi (2.0; 50%). Nasarawa had the highest average score for data availability, data validity, and data consistency. The average score for training was two (59%) out of a possible high score of three, with the highest score for training in Kano (3; 92%) and the lowest in Enugu (0.1, 2%). The estimated average score for overall data quality was 49.5 (49%), with the highest in Nasarawa (62; 62%) and the lowest in Osun (39.8; 42%). Overall, the data validity indicator scored the least (38%) in the data quality index. Poor data quality, mostly in the form of overreporting, was reflected in the huge variance between the primary source documents, FP daily register, and DHIS2. For instance, the service numbers verified in the FP daily registers and MSFs were lower than those reported in DHIS2 (Appendix 4).

Table 10. Measures of data quality by state

	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
	Mean (%)	Mean (%)	Mean (%)	Mean (%)	Mean (%)	Mean (%)	Mean (%)
Availability of FP tools	2.0 (50)	2.5 (62)	2.2 (54)	2.6 (65)	2.2 (55)	2.5 (63)	2.3 (58)
Data availability/ completeness	8.1 (37)	11.5 (52)	11.1 (50)	14.5 (66)	16.4 (75)	8.6 (39)	11.7 (53)
Data consistency	11.9 (66)	13.8 (77)	12.9 (71)	13.3 (74)	13.9 (77)	10.7 (59)	12.7 (71)
Data validity	17.8 (36)	17.3 (35)	20.0 (40)	17.8 (36)	25.3 (51)	14.5 (29)	18.9 (38)
Training	2.4 (80)	1.7 (56)	0.1 (2)	2.8 (92)	2.0 (65)	1.7 (58)	1.8 (59)
Overall data quality score	44.1 (44)	49.0 (49)	48.3 (48)	53.1 (53)	62.0 (62)	39.8 (42)	49.5 (49)

The mean is the percentage of the total obtainable indicator for each variable.

The data quality indicators with the lowest scores and the states affected were availability of FP tools in Bauchi, data availability/completeness in Bauchi, data consistency in Osun, data validity in Osun, and training in Enugu. We set a target of ≥80 percent for the data quality scores, but only seven (6%) of the facilities scored above 80 percent, all located in Nasarawa.

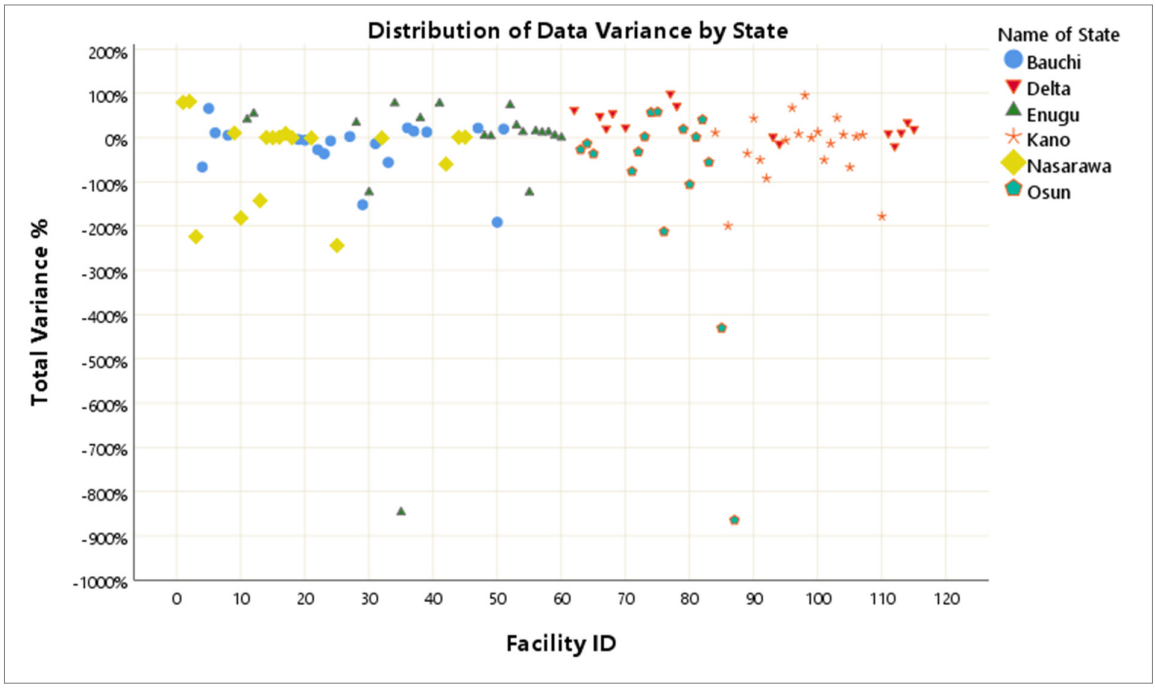
Table 11. Data quality score categories, by state

	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)	n (%)
< 80%	20 (100)	15 (100)	20 (100)	20 (100)	13 (65)	19 (100)	107 (94)
80% +	0 (0)	0 (0)	0 (0)	0 (0)	7 (35)	0 (0)	7 (6)
Total	20 (100)	15 (100)	20 (100)	20 (100)	20 (100)	19 (100)	114 (100)

Data Verification Factor

We used the data verification factor to consider the mean of the verification ratios and assess the variance between DHIS2 and the FP daily register across all service areas in 2018. Most of the variances cluster between 100 percent (underreporting) and -100 percent (overreporting) with Enugu and Osun states showing significant outliers as high as -800 percent to -900 percent overreporting.

Figure 2. Variance between data on FP daily register and DHIS2, by state



In Table 12, the average variance percentage between data in the FP daily register and data in DHIS2 across the study states shows positive values in yellow, indicating data underreported, and negative values in red, indicating data overreported. States generally overreport service numbers with FP counselling data as high as -559% overreported. Data uploaded for implants and sterilization were underreported across the states. Facilities in Bauchi state overreported in all their service areas. Delta underreported data in all their service areas except data for IUCD and pills, which were overreported.

Table 12. Average percentage variance between FP registers and DHIS2, by state

Indicators	Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
FP clients counselled	-31%	40%	-173%	-2771%	4%	-35%	-559%
FP clients (new acceptors)	-29%	10%	-7%	-59%	6%	-3%	-16%
Implants	-18%	40%	13%	-9%	4%	23%	5%
IUCDs	-122%	-47%	34%	1%	-96%	-57%	-50%
Injectables	-17%	24%	-66%	-4%	0%	-11%	-14%
Pills	-39%	-3%	24%	7%	-109%	-49%	-25%
Condoms	-57%	27%	18%	43%	-85%	-555%	-79%
Sterilization (male & female)		88%		100%		100%	98%
Overall (%)	**-39%**	**22%**	**-20%**	**-336%**	**-34%**	**-73%**	**-80%**

Overall, the states with facilities overreporting data from FP registers compared with DHIS2 are Kano (-336%), Osun (-73%), Nasarawa (-34%), Enugu (-20%), and Bauchi (-39%). Conversely, Delta generally underreported its data across all FP service areas.

Reporting Rate

The reporting rate highlights the number of times each facility reported to DHIS2 in the 12-month period under review. Low reporting rates significantly affect data quality. Most of the facilities reported at least 10 out of 12 months to DHIS2 within the period under review, with an overall average reporting rate of 80 percent. Kano had the highest average (89%), and Osun had the lowest reporting rate (72%). The facilities in Bauchi reported more than one-half of the time (65%) to DHIS2, whereas facilities in Kano and Nasarawa were clustered around 83-percent reporting rates. Facilities in the southern region of the country (Osun, Delta, and Enugu) had low reporting rates. Osun and Nasarawa have facilities that did not report to DHIS2 throughout 2018.

Table 13. Average reporting rates, by state

		Bauchi	Delta	Enugu	Kano	Nasarawa	Osun	Total
Mean		88.3%	74.4%	75.0%	89.2%	80.4%	72.4%	80.3%
<80%	n (%)	5 (25)	7 (47)	8 (40)	3 (15)	4 (20)	9 (47)	36 (32)
>=80%	n (%)	15 (75)	8 (53)	12 (60)	17 (85)	16 (80)	10 (53)	78 (68)
Total	N (%)	20 (100)	15 (100)	20 (100)	20 (100)	20 (100)	19 (100)	114 (100)

Facilities with reporting rates above 80 percent, had data quality scores 14 times higher in value compared to facilities in states with reporting rates of less than 80 percent (B=14.1, p<0.001). Also, facilities with an SP trained in PPFP had data quality scores that were 11 times higher than those for facilities with no SP trained in PPFP (B=10.9, p<0.01). Other factors in the model did not significantly contribute to data quality (Table 14).

Table 14. Predictors of data quality

	Unstandardized coefficients				95.0% confidence interval for B		
	B	Standard error	t	Sig.	Lower bound	Upper bound	Remark
(Constant)	37.108	9.407	3.945	<0.001	18.456	55.76	**
Reporting rate category	**14.13**	**3.803**	**3.715**	**<0.001**	**6.589**	**21.671**	****
Has trained PPFP provider	**10.859**	**4.044**	**2.685**	**0.008**	**2.84**	**18.877**	****
Has trained LARC provider	-0.108	4.864	-0.022	0.982	-9.752	9.535	ns
Has trained CLMS provider	0.808	4.271	0.189	0.85	-7.66	9.276	ns
Is supported by FP partner	-5.074	3.835	-1.323	0.189	-12.679	2.531	ns
Type of facility ownership	4.388	5.931	0.74	0.461	-7.372	16.149	ns
Type of facility level	-4.54	7.336	-0.619	0.537	-19.087	10.006	ns
Cadre of FP provider	-0.044	3.403	-0.013	0.99	-6.792	6.704	ns

Dependent Variable = Data Quality Score; F = 4.19, p<0.01; R^2 = 0.24.

**Significant at 0.01 level; *Significant at 0.05 level; ns = not significant at 0.05 level.

Qualitative Findings

KIIs with Public Servants

Knowledge of Stakeholders and Offices Involved in Data Collection

Almost all respondents except one were aware of which partners were involved in FP data collection and were able to identify some of them. In Osun, four of six respondents—and all the respondents in Bauchi, Nasarawa, Delta, and Kano—were aware of which FP partners work in the state. Only three partner-supported facilities offer FP services in the LGAs assessed. In Delta, two implementing partners, TCI and Marie Stopes International, are involved in collecting FP data. The state DPRS office has always collected FP data from other programs across the state. The State Primary Healthcare Development Agency and the Delta SMOH use the NHMIS register and MSF to collect FP data. Information from these registers is uploaded to DHIS2.

Knowledge of FP Data Collection Tools and Information Collected

In Enugu, Delta, Nasarawa, and Osun, the states' FP coordinators, HMIS officers, and other respondents were aware of and familiar with the data collection registers used nationally. Only two state FP coordinators were aware of other registers (MSFs) or expanded data collection tools used by partners, aside from the national tools and registers. It is commonly acknowledged in Delta that partners use a tool that is more robust than the standard national tool to capture FP data; however, the respondents lacked information on the exact details of the tool and what information is collected. The following key information is captured by the state data collection tools: number of clients for different FP methods, commodities received and dispensed, and the consumption rate.

Seven of the 10 key informants interviewed in Nasarawa mentioned percentage of new acceptors as the most important indicator for key stakeholders (government) and supporting partners. Others mentioned number of IUCDs and number of implants used, FP services with highest uptake, and commodities consumption as information of interest. Indicators of interest mentioned in Kano and Osun included number of female condoms distributed and LARC uptake. All the indicators are of interest to the DPRS in Delta and Enugu.

All the respondents knew which data collection tools are used by the government, and four out of 10 knew the national tools used by partners. The LGA FP/RH focal persons responded that the tools used for FP commodities are the bin/storage cards, DCR, and requisition inventory request vouchers.

With regard to funding for FP data collection and reporting, the key informants reported that there is no incentive or financial support for FP specifically. All public health programs are funded as a whole. In all states, except Enugu, Marie Stopes International and Jhpiego were the main implementing partners providing extra FP support in the form of training and technical assistance.

Knowledge of FP Dataflow

From our KII findings, there is a general understanding of how data flow from the service delivery point to the national level, according to the respondents: SP → facility M&E officer/officer in charge → LGA M&E officer → DHIS2→ state DPRS office → NHMIS.

Respondents gave information about FP/RH commodities flows in this sequence: SP → RH focal person→ state stores/ logistics management information systems officer (bimonthly) → national logistics management information system (LMIS).

In all states, respondents said that data flows from the facilities to the LGA M&E officer. The aggregated and validated data are uploaded to DHIS2 where each state's HMIS officer validates the data again by comparing it to the facilities' aggregated data. However, there is no avenue through which feedback is given to the facilities that generated the data or other stakeholders involved in data collection.

At the facility level, data are collated in the NHMIS MSF, but at the LGA and state levels, the data are collated using DHIS2. Ultimately, all data are uploaded to DHIS2. Although the data are routinely collated, they are only validated at the state level after the LGA M&E officers have uploaded the data to DHIS2. The data are typically not uploaded in a timely manner; the timeliness rate is normally between 60 to 65 percent.

Data Analysis, Interpretation, and Communication

Data are used for forecasting commodity supplies and consumption at the facility level and for planning and distributing commodities at the state and LGA levels. A key informant in Nasarawa said data allow the stakeholders to determine if there are adequate human resource for FP activities and gives them the opportunity to identify the facilities that are not doing well and whose SPs may need additional support. In Kano, Nasarawa, and Osun, key informants affirmed that data are analysed at the state level and at the facility level in some LGAs. The data are used to determine which commodities are required, to plan community FP outreaches, and to see if the trend of new acceptors is low. M&E officers mentioned that their capacity has not been built to display data electronically.

Data Quality Gaps

Key informants attested that there are measures in place to ensure data quality; however, these measures are only functional at the facility and LGA levels owing to lack of funds to support state-level officers' attendance at review meetings. To improve data quality, Management Sciences for Health provides financial and technical support for data review at the LGA level in Bauchi. The key informants rated the status of quality of FP data as generally "improving." This was attributed to the presence of implementing partners in the six study states. The existing data gaps are attributed to the lack of data validation and data review exercises, especially at the state level, because of a lack of funds allocated for these processes. Key informants identified a major data quality gap associated with the ambiguity of the indicator "number of clients offered sterilization." Some SPs do not understand it.

In Nasarawa, a key informant suggested that because the SMOH's Clinical Services Unit is responsible for the monitoring and license renewal of private facilities, the State Primary Healthcare Development

Agency should work in partnership with this unit to verify timely and accurate data submission to the LGAs, prior to hospital licensing and renewals, to ensure compliance and cooperation.

The key informants responded that inadequate health resources for health data management and knowledge gaps among SPs, especially in the private sector, as problematic for data quality. Most of the key informants complained that the private sector SPs do not submit complete or timely data, which affects the overall FP service delivery picture in DHIS2.

Case Study: KIIs with a State FP Coordinator, LGA M&E Officer, and SMOH Gender/FP Desk Officer

The FP coordinator and LGA M&E officer were aware of stakeholders involved in FP data collection in the state, but only the FP coordinator was able to name a few and knew the HMIS and CLMS tools used in data collection. The coordinator and LGA officer explained the dataflow from the service delivery point to the national level. The coordinator could identify which stakeholders are involved in the dataflow as well as the data quality measures in place. The SMOH gender/FP desk officer didn't have much knowledge of the dataflow system because the SMOH acts in the capacity of policy enforcement, formulation, and advocacy; most data issues are addressed at the State Primary Healthcare Development Agency level.

Although the LGA officer explained that there is some form of data validation at the facility and LGA levels, the SMOH desk officer recommended monthly data validation meetings to address data gaps. The coordinator said that FP commodities consumption is the primary indicator of interest to the State Primary Healthcare Development Agency. The LGA officer shared problems with providers understanding the indicators (e.g., facilities report number of sterilizations as number of equipment sterilized) and the measure they have taken to address this gap. All three key informants recommended capacity building to understand the FP indicators and address data quality gaps. The coordinator said they "use the FP dashboard to check levels of FP commodity consumption." The LGA officer also stressed that they "give feedback on the data at various levels."

KIIs with Staff of Implementing Partners

KII with a PLAN International State Officer

The M&E officer mentioned the dataflow system and the stakeholders involved from the facility level to the national level. He stressed how PLAN International supported the FMOH to revise the current HMIS registers and community data capture tools. The key informant explained how community-based data are reported to the catchment facility and how it feeds into DHIS2. PLAN International does not have a separate reporting tool apart from the HMIS. New FP acceptors is PLAN International's key indicator, which is both a donor indicator as well as an indicator of national interest. The project supports the state to conduct integrated supportive supervision and DQAs. The respondent believes that state officials have the capacity to conduct integrated supportive supervision and DQAs, but lack commitment and need more capacity building.

KII with TCI Technical Officer

The key informant could explain the dataflow and various data quality checks from the service delivery point to the national level as well as which stakeholders are involved. His organization does not have a separate data reporting tool. TCI supports Bauchi to strengthen the HMIS. This key informant provided examples of data use for decision making. He thought the indicators in the HMIS were sufficient and believed the state had the technical capacity to carry out all data quality assurance if funds were made available. The key informant noted that most private facilities and some public facilities do not report their data to DHIS2. This has huge implications on the reporting rate. He encouraged the state to ensure

all services rendered are reported (i.e., increase the reporting rate) and recommended more data demand and use at the management level.

KII with BA Project/Bauchi

The respondent had knowledge of the stakeholders involved in FP data collection in Bauchi. BA actively participates in monthly data collection from partner facilities where FP referrals from BA are completed. Some partners, including BA, have an abridged version of the HMIS they use to capture information from partner-supported facilities and populate their organization's database. BA also uses a USAID data reporting system. Data flow from the SPs, who record client information daily, summarize the aggregated data monthly using the HMIS summary forms, and then send the data to the LGA M&E officers for validation and entry into DHIS2. BA submits the data to USAID quarterly.

Routine data quality checks are performed at the partners' level on a quarterly basis. The LGA stakeholders involved in data validation are SPs, maternal and child health coordinators, the PHC director, and LGA M&E officers. The state M&E officers at the SMOH and State Primary Healthcare Development Agency are responsible for routine checks at the state level. In Bauchi, data are validated at every level. The M&E Health Development Consultative Committee (a unit of the SMOH) looks at the data and generates a scorecard for the state that is transmitted to the Health Data Governing Council, which is the highest level of data reporting in Bauchi. BA does not incentivize activities related to FP data management .

Partners, including BA, conduct quarterly DQAs in their supported facilities. BA's M&E unit works closely with the state and LGA M&E officers to conduct DQAs. States require financial support (for logistical support, tool production, and manpower) to conduct routine DQAs. Consequently, states rarely conduct them because of funding constraints. UNICEF supported a state-level DQA in the past.

The most important indicator tracked by BA is mCPR. Because Bauchi's mCPR is low, and religious, social, and cultural norms contribute significantly to FP use, BA focuses their approaches on referrals and improving spousal communication. They evaluate outcomes biannually to calculate the percent of the population accessing FP services. Program-generated evidence is disseminated to key stakeholders, including those in the project-supported LGAs. BA uses different platforms to disseminate information around access to FP methods.

The BA respondent recommended improving the capacity of data entry personnel, adding an indicator on social norms, improving data collection methods, conducting periodic data dissemination, presenting data in simple ways to get financial commitments from stakeholders, and using data for decision making.

FGDs

Dataflow and Structure

All participants across the states were aware of the HMIS dataflow and reporting structure. They explained that data are collected daily and flow from the SPs (primarily in public facilities), who fill the daily attendance registers and send the data summaries to the record officers. The record officers complete the HMIS summary forms and send them to the LGA M&E officers on or before day five of the new month. By the fifteenth of the new month, the LGA M&E officers input the data in DHIS2. In Enugu, an FGD participant said, "Sometimes late submission of data from different facilities affects the collation for the LGA." Some participants who are SPs double as record officers in their facilities. In Nasarawa, a participant said, "We were given phones from an FP partner. This is what we use to collect summary data from our registers." A private SP said, "I operate a private facility, and I get technical and commodities support from an FP partner. They gave me a reporting template, which I use to collect data, which I send via email."

Data Capturing, Entry, and Validation

Some participants affirmed that data validation happens monthly at their facilities with the SPs and facility record officers. An SP in Enugu said, "Yes, we make sure that what we collate is correct and we check for errors before sending the data." There is, however, a validation gap between the record officers and LGA M&E officers. Some record officers and SPs are not able to validate the data because of the large number of clients and not having additional manpower to help, which leads to poor data quality. One record officer said, "We conduct weekly validation because of huge client flow and other tools that have to be filled at the end of the month." In Nasarawa, a participant said, "Validation should be conducted daily, since the service is provided daily, to ensure tracking and accuracy."

Trainings and Capacity Building on Data Management

In Bauchi, three out of 12 participants (25%) had been trained on data management. Out of the four record officers present in the discussion, only one had any form of data management training, which was sponsored by the National Action Agency for the Control of AIDS years ago. The other participants that had been trained also said it was years ago and partner-sponsored with support from the FMOH. In Kano, all 10 participants had been trained on FP data management, PPFP, and LARC. In Enugu, one-half of the eight participants had been trained. The last training on FP data management in Enugu was held in 2017. In Osun state, an SP said, "Training had only been held for FP providers and no other cadre of FP providers. The last training was held in 2004—no update since then." For Osun and Nasarawa, FP providers in the private sector were trained by the USAID-funded Sustaining Health Outcomes in the Private Sector (SHOPS) project and the Family Friendly Initiative. Four of the 12 FP (33%) providers in public facilities were trained on LARC by Marie Stopes and Jhpiego in 2018.

Challenges with Data Collection and Reporting

In Osun, an SP said "Due to personnel shortage, I have a lot of multiple roles. I will work in the antenatal clinic, labour ward, and I still have to provide FP service and record the data, many times. I'm overwhelmed." Another SP said, "Due to shortage of staff, there's no room for delegation of duties. I will do what I can do for one day and leave filling the register till the next day." The records officer and an SP in Enugu and Osun states affirmed that the current version of HMIS (version 2016) has gaps in terms of data completeness and capturing. They mentioned that the 2013 version of HMIS was very comprehensive (had all the essential data elements for each of the methods for easy summation) and user-friendly. Even though the rows were tiny, they found the newer version to be cumbersome, difficult to use, and with incomplete information, which leads to data entry and summation errors, especially at the end of the month when they have to fill out the HMIS summary form. A records officer in Bauchi mentioned, "The paper quality and alignment of the HMIS summary forms (which comes in triplicates) makes it difficult to accurately report as duplicates tends to shift and data meant for a particular columns and rows shifting to next." All participants recommended that the DPRS should revert to the 2013 version of the HMIS with minor adjustments (such as expanding the columns to avoid data entry errors).

Data Use for Decision Making

Participants mentioned that they use data to inform decisions around commodities, such as forecasting FP client volume to manage supplies and avoid stock outs. An SP who is also the head of a facility said, "Yes, we use the data to know the number of people that came for FP services in the month, and also we use the data to plan. We also use it request for supply of our consumables in the facility." Another SP added, "Stock-out has really affected the numbers of clients coming to visit the facilities." Two out of four record officers said they conducted some analysis to see how facilities are faring in terms of client volume. For data visualization, four out of 12 (33%) SPs display FP data in their facilities.

Feedback Mechanism

Most participants said that they don't receive any feedback on the data submitted to the LGA M&E officers. Most SPs and record officers are also not aware of any feedback mechanism for their facility data that is entered in DHIS2. A participant in Enugu said "Like we said, if your data are not okay, they send for you to come and correct it. So, if nobody sends for you, you know that your data are okay." The officers in charge in the discussion mentioned that there are monthly coordination meetings where all discuss the performance of facilities using a scorecard developed from the data entered in DHIS2. There is a feedback gap between the officers-in-charge and the SPs and record officers, who are primarily responsible for generating the data, because the majority of them were not aware of the monthly scorecard. A participant in Osun said, "There is an obvious communication gap between FP providers and record officers. The record officer has never asked me to provide information on number of clients counselled. I don't even have access to the NHMIS register; it is usually with the records officer."

Facilities in the northern part of the country enrolled in the National States Health Implementation Project receive feedback on their data entered into DHIS2, but facilities not under the program do not.

Commodity Availability and Reporting

Stock-outs have affected the number of clients receiving facility-based FP services. Some states have not provided consumables in years except for facilities that have a partners' presence. In some states SPs buy commodities and consumables and charge clients for FP services, which are supposed to be free in public facilities according to the national health policy. An SP in Osun said, "Usually I have to travel to the state capital to collect commodities, and on the day of collection, I may be the one on duty in the facility. It will be better if the commodities are supplied directly to the health facilities." Another SP commented, "Yes, if there is no commodity there won't be anything to report. There was also a time there were no registers. It affected the reporting."

DISCUSSION

In the 114 health facilities surveyed, the most available tool was the FP daily attendance register, and the least available tools were the bin/storage cards and HMIS referral forms. Inadequacy and unavailability of referral forms poses a challenge with linkage to services. This shows the low priority placed on data capturing and reflects poor data accountability. Consumption records were poorly kept, and inconsistencies were noted in commodity records tracking related to the bins/storage cards (in secondary facilities, where they are used), daily consumption records, and FP register in certain facilities, especially in Bauchi and Enugu states.

Though client cards and FP health facility registers are widely available , there are challenges with data completeness, accuracy, and consistency in the use of these tools. Across all tools assessed, availability of tools was highest in Kano and Nasarawa. Assessing data consistency using client cards as the proxy tool revealed inconsistencies in the ways important client information was collected. This can be problematic for tracing, tracking, and/or following up with clients. Furthermore, this gap shows that a lack of documentation of client records, client data, or services rendered negatively affects the overall quality of service provision nationally.

Using the information collected with the HMIS data tools on data availability and completeness entailed verifying that all fields and data entries in the tools were completely filled, signed, and up-to-date. When we analysed the 22 domains of questions for assessing this attribute of data quality, we found that none of the data quality indicator scores across the six states reached the set target, indicating poor data quality. Based on the individual scoring for each facility across the zones, Nasarawa had the highest scores for data completeness, availability, validity, and overall quality. The use of the DCR was not optimized in most facilities, because just a little more than one-third had it, and most did not use it appropriately with the daily register.

The FP indicator assessment revealed inconsistencies in data transmission from the FP register to the MSFs to DHIS2, demonstrating that internal validations are necessary to correct errors at the facility level before data are aggregated at the LGA level and uploaded to DHIS2. However, it appears that the data validation conducted by SPs alone is not enough to ensure data are error free.

Findings from the qualitative studies (KIIs and FGDs) showed that respondents have knowledge of the stakeholders involved in FP data collection in the states with parallel levels of data reporting. More of these were identified in the northern states (Bauchi, Kano, and Nasarawa) owing to the presence of multiple partners. The BA project tracks mCPR the most carefully, though most states closely track the number of new FP acceptors and commodities usage.

In Enugu, most of the FP providers had not been trained. Our multivariate analysis showed that facilities with trained providers and those with good data reporting rates were more likely to have good-quality data. Previous studies conducted in other settings where performance of DHIS2 was assessed have shown that untrained health workers contribute to poor data quality, and training healthcare providers improves data management and programmatic performance (Mitoko, et al., 2017) (Bujari, 2017).

All of the health facilities assessed revealed that they still have challenges with data management, with overreporting of FP data the most common data quality issue. Despite FP registers and HMIS tools being available in most facilities, the FP data recorded in the registers is often inconsistent and incomplete. This incompleteness can be seen in the fact that the FP method requested by clients was not indicated in the registers for more than one-third of the facilities audited. And although just a little more than one-third of facilities had checked the column for FP counselling, indicating the activity had been carried out, the indicator was overreported in DHIS2.

A major gap observed in both the quantitative and qualitative data collection was that DHIS2 only looks at FP service statistics and does not capture consumption data. It aggregates FP services offered without delineating them into specific categories, making it challenging to validate consumption data. This brings up issues with commodities accountability, FP services coverage, quality of services offered, and waste.

CONCLUSION

Several factors have constrained optimal FP service delivery and compromised data quality. These include unavailability of FP data and NHMIS reporting tools in some facilities, inadequate supervision and monitoring from the state and local government agencies, lack of funding for FP activities (e.g., training and service provision in modern contraception techniques) infrequent DQAs, lack of capacity building at the LGA and State Primary Healthcare Development Agency levels, and personnel shortages, which have overburdened the already fragile healthcare delivery system.

Inadequate resources for health data management, knowledge gaps among SPs, and facilities not submitting complete or timely data (especially in the private sector) affects the overall FP status in DHIS2.

This research shows that FP data quality depends on an interplay of factors that include human, financial, and organizational elements. A weak link in any of these factors compromises data quality. The study revealed several concerns vis-à-vis data quality, including poor capacity of SPs in the private sector; multiplicity of SPs' roles at the facility level; and shortages of well-trained SPs and data managers. These lead to FP data inconsistencies, inaccuracies, overreporting, and underreporting, which has a cascade effect on data quality at the LGA, state, and ultimately the national level. Furthermore, there is a need to expand HMIS tools and the DHIS2 platform to incorporate service and consumption data to improve availability of FP data for informed decision making.

RECOMMENDATIONS

The findings from this research revealed gaps in data quality across the study states, especially data validity, emphasizing the need for improved data management systems. The key informants and research team recommend the following:

1. Implement a comprehensive data capacity building program across the states for facility and LGA staff to include the following:
    - Periodic trainings on internal data quality checks for FP/RH focal persons as well as officers in charge and facility M&E officers/record officers at the LGA level; Provide support for them to attend dashboard meetings
    - Clear instruction for FP data managers on how to use standardized indicator reference sheets to ensure consistent indicator definitions, calculations, and disaggregation
    - Active monitoring and supportive supervision of FP focal persons on data capture and transcription
    - Supporting and training more SPs in the LGAs on how to analyse and use data
2. Involve a third-party logistics company to help with the last-mile distribution of commodities in states with personnel shortages.
3. Leverage existing platforms to create coordination forums for FP data.
4. Conduct routine supervision, internal data quality checks, and DQAs through the SMOHs to improve data validity, consistency, and completeness to enhance data quality for informed decision-making.
5. Provide organizational resources and support at the LGA and state levels through the SMOHs and establish standards and processes for conducting data validity exercises to help data managers determine whether DQAs and reporting guidelines and targets have been met.
6. Establish private sector collaboration and legislation that mandates private providers must submit their FP data. Engage professional groups such as the National Association of Nigerian Nurses, the Nigerian Medical Association, and health facility registration boards, to make data submission to DHIS2 a mandatory condition for private facilities for renewing registration. The State Primary Healthcare Development Agency, whose purview is FP, RH, and primary healthcare, should work in partnership with the Clinical/Hospital Services Units of the SMOHs to verify evidence of data submission to the respective LGAs prior to hospital licensing and renewals and to ensure compliance and cooperation. This will, over time, provide a better picture of FP service in the sector, improve service delivery, and subsequently improve data quality.
7. Conduct targeted advocacy to politicians and other stakeholders to promote the use of data for informed decision making and encourage prioritizing health and FP services in communities across the country.
8. Thorough review of FP data elements and indicators with accompanying indicator definition manual so it is clear exactly what information must be collected.
9. Address the lack of registers and other data capturing tools in private facilities by providing them with data capture tools.
10. Revise the registers and NHMIS tools currently being used to be more provider- and user-friendly. Upgrade the DHIS2 platform to focus not only on FP service data and service use, but also on consumption records and commodities use data. The NHMIS tools and DHIS2 should be expanded to include all aspects of FP data collection, collation, and aggregation, to improve data use for decision making.

DISSEMINATION

The National/Federal Level Dissemination took place following advocacy discussions with the director of the Reproductive Health Unit, director Planning, Research and Statistics, deputy director Family Planning, and assistant director Family Planning, who are key stakeholders in the Reproductive Health Unit of the Family Health Division, in the FMOH.

AFENET graciously hosted the dissemination meeting. In attendance were representatives from the FMOH and implementing partners, including the assistant director (family planning logistics), chief nursing officer (family planning services), and a population planning officer (research) from the DPRS. Other stakeholders present were the sexual and reproductive health specialist from the Clinton Health Access Initiative (CHAI), an independent researcher and a consultant with the Nigeria Urban and Reproductive Health Initiative (NURHI), the resident advisor for AFENET, and the research team members. Opening remarks were given by the principal investigator (PI), who welcomed all the participants to the meeting. The PI gave an overview of the whole study while introducing MEASURE Evaluation and AFENET, the call by MEASURE Evaluation for the FP small grants research, details of the study design and method, the purpose of the DQA, the key components of the DQA, and the framework for the DQA and indicators assessment. She further discussed the ethical considerations of the project with a proof of ethical approval obtained from the National Health Research Ethics Committee.

The PI discussed the findings of the study, which included the distribution of health facilities by state and rural/urban location, data quality scores, distribution of data quality indicator scores, average percentage variance between FP registers and DHIS2 by state, measures of data quality by state, and the findings from the qualitative component of the research from the FGD and DQA.

Officers from the FMOH expressed surprise at some of the findings of the DQA—especially the need for training of health workers to improve their capacity for data management. They pledged to consider this gap in their planning.

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APPENDIX 1. FP IMPLEMENTING PARTNERS ACROSS THE STUDY STATES

	Name of State													
	Bauchi		Delta		Enugu		Kano		Nasarawa		Osun		Total	
Implementing partner	n	%	n	%	n	%	n	%	n	%	n	%	n	%
MARIE STOPES	7	50.0	4	44.4	1	33.3	9	50.0	3	27.3	7	53.8	31	45.6
CHAI	0	0.0	0	0.0	0	0.0	10	55.6	0	0.0	0	0.0	10	14.7
TCI	2	14.3	6	66.7	0	0.0	0	0.0	0	0.0	0	0.0	8	11.8
NSHIP	1	7.1	0	0.0	0	0.0	0	0.0	7	63.6	0	0.0	8	11.8
UNICEF	4	28.6	0	0.0	0	0.0	1	5.6	0	0.0	0	0.0	5	7.4
HYGEIA FOUNDATION	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	30.8	4	5.9
PLAN INTERNATIONAL	4	28.6	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	4	5.9
MNCH2	0	0.0	0	0.0	0	0.0	3	16.7	0	0.0	0	0.0	3	4.4
BREAKTHROUGH ACTION NIGERIA	2	14.3	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	2	2.9
AMAZON	1	7.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
CDC	0	0.0	0	0.0	0	0.0	1	5.6	0	0.0	0	0.0	1	1.5
ENHANCE PROJECT	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	7.7	1	1.5
EUROPEAN UNION	1	7.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
JHPIEGO	0	0.0	0	0.0	0	0.0	0	0.0	1	9.1	0	0.0	1	1.5
LOTTERY CLUB	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0	1	1.5
PPFN	1	7.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
PPHF	0	0.0	0	0.0	1	33.3	0	0.0	0	0.0	0	0.0	1	1.5
PRIME HEALTH INITIATIVE RESPONSE	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	7.7	1	1.5
PSI	0	0.0	1	11.1	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
ROLL BACK MALARIA	0	0.0	0	0.0	0	0.0	0	0.0	1	9.1	0	0.0	1	1.5
SOCIETY FOR FAMILY HEALTH	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	7.7	1	1.5
SOLINA	0	0.0	0	0.0	0	0.0	0	0.0	1	9.1	0	0.0	1	1.5
TSHIP	1	7.1	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	1.5
WHO	0	0.0	0	0.0	0	0.0	1	5.6	0	0.0	0	0.0	1	1.5
WOMEN FRIENDLY INITIATIVE	0	0.0	0	0.0	0	0.0	0	0.0	1	9.1	0	0.0	1	1.5
TOTAL	14	100.0	9	100.0	3	100.0	18	100.0	11	100.0	13	100.0	68	100.0

APPENDIX 2. DATA AVAILABILITY AND COMPLETENESS SCORING IN HEALTH FACILITIES USING THE NHMIS TOOLS

	Name of State													
	Bauchi		Delta		Enugu		Kano		Nasarawa		Osun		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
a. Last month facility NHMIS Monthly Summary Form available	10	50	15	100	14	70	19	95	17	85	16	84	91	80
b. Last month facility NHMIS Monthly Summary Form duly signed	10	50	11	73	10	50	15	75	16	80	10	53	72	63
c. All the required and relevant data fields in the facility NHMIS completely filled out	9	45	11	73	14	70	15	75	16	80	14	74	79	69
d. Do data on NHMIS Monthly Summary Form correspond with data on DHIS2 (for new & revisits clients)	9	45	3	20	8	40	13	65	9	45	1	5	43	38
e. Entries on the stocks received completely filled out? (i.e., Balance Brought Forward, Received, On Hand)	6	30	13	87	16	80	17	85	17	85	7	37	76	67
f. Entries on stock consumed completely filled out? (i.e. Quantity Dispensed, Total Dispensed, Losses)	6	30	13	87	15	75	14	70	16	80	6	32	70	61
g. On last completely filled page, is the Balance Brought Forward for each contraceptive method equal to Balance on Hand from previous page	8	40	12	80	17	85	14	70	16	80	8	42	75	66
h. All the data fields on the BIN/Storage Card were completely filled out	3	15	1	7	1	5	10	50	16	80	10	53	41	36
i. Data on the bin/storage card is up-to-date	2	10	0	0	0	0	11	55	14	70	10	53	37	32
j. Is last month's facility CDRR monthly summary form available	8	40	6	40	8	40	13	65	14	70	8	42	57	50
k. Are all required and relevant fields on the CDRR completely filled out	5	25	5	33	8	40	11	55	14	70	7	37	50	44
l. Is last month facility (CDRR) Monthly Summary Form duly signed	8	40	5	33	7	35	12	60	13	65	2	11	47	41
m. Is the Daily Health Facility Family Planning Register available	19	95	15	100	19	95	20	100	18	90	16	84	107	94
n. Is the Daily Health Facility Family Planning Register duly signed	7	35	15	100	9	45	17	85	14	70	6	32	68	60
o. Were all date entries within the last month of reporting duly filled	16	80	14	93	17	85	13	65	15	75	7	37	82	72

	Name of State													
	Bauchi		Delta		Enugu		Kano		Nasarawa		Osun		Total	
	n	%	n	%	n	%	n	%	n	%	n	%	n	%
p. Does each month start on a fresh page in the cohort register	16	80	10	67	17	85	18	90	18	90	14	74	93	82
q. All the data fields within past month of reporting completely and correctly filled out	16	80	13	87	16	80	13	65	17	85	9	47	84	74
r. Are booklets of HMIS referral forms available? If yes, cite a copy	2	10	3	20	6	30	9	45	15	75	4	21	39	34
s. Are the entire data fields on the HMIS referral form correctly filled	1	5	2	13	5	25	9	45	13	65	3	16	33	29
t. Were the HMIS referral forms duly signed	1	5	1	7	3	15	8	40	13	65	1	5	27	24
u. Is there a single check for the column of FP counselling	0	0	2	13	6	30	9	45	13	65	3	16	33	29
v. All the data fields were completely filled out up to the FP counselling column	0	0	2	13	6	30	9	45	14	70	2	11	33	29
Total	20	100	15	100	20	100	20	100	20	100	19	100	114	100

APPENDIX 3. DEFINITIONS AND SCORING FOR DATA VALIDITY INDICATORS

Data validity (comparing the RH/FP MSF [MOH 711] data with the Daily Activity Register)	Yes	No
Indicator 1: Total # FP visits (Verify two methods, preferably implants & DMPA) Did the total # of new FP clients (new acceptors) on the Daily Family Planning Register equal the total # of new clients on the RH/FP , MSF, as reported in DHIS2?	5	0
Indicator 2: Number of contraceptives dispensed Did the ending balance from last month's DCR equal the beginning balance for contraceptives reported?	5	0
Indicator 3: Number of revisits Does the total number of revisits for FP methods on the state copy or DHIS2 of FP equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0
Indicator 4: Patients counselled Does the total number of clients counselled for FP methods on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during last reporting year?	5	0
Indicator 5: Patients given implants Does the total number of clients (both old and new) given implants in the last 12 months on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year? .	5	0
Indicator 6: Patient given IUCDs Does the total number of clients (both old and new) given an IUCD in the last 12 months on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0
Indicator 7: Patients given injectables Does the total number of clients (both old and new) given injectables in the last 12 months on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0
Indicator 8: Patients given pills Does the total number of clients (both old and new) given pills in the last 12 months on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0
Indicator 9: Patients given condoms Does the total number of clients (both old and new) given male and female condoms in the last 12 months on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0
Indicator 10: Patients offered sterilization Does the total number of sterilizations done on the state copy or DHIS2 equal the total reported on the Health Facility Family Planning Register during the last reporting year?	5	0

APPENDIX 4. VARIANCE IN DATA FROM FP DAILY REGISTERS, MSF, AND DHIS2

State	LGA	Facility Name	Service Numbers on Daily Register	Service Numbers Reported to DHIS2	MSF	Sum of Variance (Register vs DHIS2)	Mean of % Var
Bauchi	Ganjuwa	Kariya Health Clinic	3,065	1,048	1,151	2,017	66%
		Bunga Primary Health Centre	1,033	923	986	110	11%
		Firo Maternal/CH Clinic	326	309	0	17	5%
		Gabi Primary Health Centre	626	653	729	-27	-4%
		Ganjuwa Primary Health Centre	1,058	1,121	728	-63	-6%
		Dabe Primary Health Centre	1,472	1,585	1,666	-113	-8%
		Kafin Liman PHC	497	633	233	-136	-27%
		Nassarawa PHC	1,201	1,640	339	-439	-37%
		Kafin Madaki PHC	1,246	2,076	1,032	-830	-67%
		Digawa Primary Health Centre	0	643	454	-643	-100%
		Ganjuwa LGA Total	**10,524**	**10,631**	**7,318**	**-107**	**-17%**
	Bauchi	Doya Primary Health Centre	2,179	1,703	2,208	476	22%
		Dumi Primary Health Centre	1,336	1,051	776	285	21%
		Bauchi Specialist Hospital	6,118	4,936	0	1,182	19%
		Dawaki Primary Health Centre	2,810	2,409	0	401	14%
		Ibrahim Bako Health Centre	7,651	6,702	0	949	12%
		Yelwa Domiciliary Clinic	16,111	15,749	15,998	362	2%
		BayanFada PH Centre	14,033	15,974	17,000	-1,941	-14%
		Family Planning Clinic	3,019	4,713	0	-1,694	-56%
		Federal Low Cost PH Centre	547	1,378	548	-831	-152%
		Bauchi Urban Maternity	7,192	20,955	19,195	-13,763	-191%
		Bauchi LGA Total	**60,996**	**75,570**	**55,725**	**-14,574**	**-32%**
		TOTAL FOR BAUCHI STATE	**71,520**	**86,201**	**63,043**	**-14,681**	**-24%**
Delta	Oshimili South	Police Clinic	1,196	7	272	1,189	99%
		Mother and Child maternity	2,264	638	1,501	1,626	72%
		Okwe Primary Health Centre	1,797	675	12,811	1,122	62%
		Oko Anala PHC	996	449	1,070	547	55%
		Model PHC	1,507	778	1,499	729	48%
		Anwai Primary Health Centre	537	414	275	123	23%
		Umuagu Asaba PHC	2,854	2,267	2,853	587	21%
		Cable point PHC	0	1,446	0	-1,446	-100%
		Oshimili South LGA Total	**11,151**	**6,674**	**20,281**	**4,477**	**35%**
	Oshimili North	Ogboli CHC	353	231	141	122	35%
		Ibusa PHC	1,265	1,019	1,020	246	19%
		Ugbolu PHC	750	668	653	82	11%
		Illah PHC	1,571	1,419	978	152	10%
		Okpanam PHC	1,196	1,171	1,265	25	2%

State	LGA	Facility Name	Service Numbers on Daily Register	Service Numbers Reported to DHIS2	MSF	Sum of Variance (Register vs DHIS2)	Mean of % Var
		Okpanam CHC	645	737	733	-92	-14%
		Ebu PHC	491	587	378	-96	-20%
		Oshimili_North Total	**6,271**	**5,832**	**5,168**	**439**	**6%**
		TOTAL FOR DELTA STATE	**17,422**	**12,506**	**25,449**	**4,916**	**22%**
		Obin/storageagu Uwani Health Centre	750	171	1,820	579	77%
		Ozalla Health Centre	1,040	754	977	286	28%
		O'ejiNdiunoClinic (AkpugoHealth Centre	856	732	858	124	14%
		Amangwu Health Centre	770	673	773	97	13%
		Ojiagu Health Centre	1,653	1,450	1,678	203	12%
		Amodu Model PHC	159	140	163	19	12%
		Obe Health Centre	1,009	962	1,002	47	5%
		Agbani Health Centre	5,670	5,433	5,973	237	4%
		Akegbe Ugwu Health Centre	546	529	553	17	3%
		Amigbo Health Centre	315	315	144	0	0%
Enugu	**Nkanu West**	Amurri 1 Health Centre	424	948	881	-524	-124%
		Nkanu_West Total	**13,192**	**12,107**	**14,822**	**1,085**	**4%**
		Ndiagu Amechi Health Centre	777	174	233	603	78%
		Amaegbu Health Post	247	66	117	181	73%
		Ugwuaji Health Centre	2,269	1,035	1,615	1,234	54%
		Obeagu Health Centre	626	350	0	276	44%
	Enugu South	Uwani Cottage Hospital	2,229	1,311	2,229	918	41%
		Amechi Cottage Hospital	355	235	0	120	34%
		St Gertrude Maternity Home	273	611	609	-338	-124%
		Obeagu Amechi Health Centre	49	464	0	-415	-847%
		Light Of God Hospital/Maternity	8	806	0	-798	-9975%
		Enugu South LGA Total	**6,833**	**5,052**	**4,803**	**1,781**	**-1180%**
		TOTAL FOR ENUGU STATE	**20,025**	**17,159**	**19,625**	**2,866**	**-529%**
		Alfindiki Health Clinic	8,497	2,791	6,040	5,706	67%
		Sharada Industrial Clinic	11,635	9,917	10,240	1,718	53%
		Yakasai Zumunta Health Clinic	3,072	1,739	1,541	1,333	43%
		Unguwar Gini PHC	4,507	4,135	4,548	372	8%
	Kano Municipal	Dan Agundi Health Post	291	309	237	-18	-6%
Kano		MurtalaMohammed Specialist Hospital	31,158	42,351	79,825	-11,193	-36%
		Marmara Maternal Child Health	7,290	10,964	3,285	-3,674	-50%
		Gandu Model PHC	2,101	4,039	3,886	-1,938	-92%
		Tukuntawa Health Clinic	1,589	4,761	571	-3,172	-200%
		Kano_Municipal LGA Total	**70,140**	**81,006**	**110,173**	**-10,866**	**-16%**
	Gezawa	Gezawa Health Clinic	1,218	676	660	542	44%

State	LGA	Facility Name	Service Numbers on Daily Register	Service Numbers Reported to DHIS2	MSF	Sum of Variance (Register vs DHIS2)	Mean of % Var
		Jogana Dispensary	710	618	692	92	13%
		Imam Wali Private Hospital	296	276	344	20	7%
		Tsamiya Babba Dispensary	614	576	635	38	6%
		Danzaki Health Post	395	387	380	8	2%
		Babawa Primary Health Centre	899	902	918	-3	0%
		Larabar Abasawa Health Post	2,802	3,179	2,595	-377	-13%
		Gofara Model PHC	284	428	273	-144	-51%
		Ketawa Health Post	146	244	151	-98	-67%
		Gezawa General Hospital	3,178	8,833	10,252	-5,655	-178%
		Gezawa LGA Total	**10,542**	**16,119**	**16,900**	**-5,577**	**-24%**
		TOTAL FOR KANO STATE	**80,682**	**97,125**	**127,073**	**-16,443**	**-20%**
Nasarawawa	Lafia	Agu Hospital	1	0	0	1	100%
		Bukan Sidi Health Clinic	1,402	1,274	1,373	128	9%
		Primary Health Centre Kwandere	921	911	908	10	1%
		BAD Comprehensive HC	3,154	3,128	3,128	26	1%
		Lafia East PHC	10,050	9,978	9,843	72	1%
		Awuma Health Clinic	2,308	2,301	2,305	7	0%
		M and D Hospital	0	0	0	0	
		Primary Health Centre Doma Rd	1,164	1,169	1,165	-5	0%
		Primary Health Centre Akurba	908	912	925	-4	0%
		Dhabi CHC	1,709	1,726	1,716	-17	-1%
		Lafia LGA Total	**21,617**	**21,399**	**21,363**	**218**	**12%**
	Doma	Alarama PHC	1,068	197	1,068	871	82%
		Alagye Health Centre	1,443	296	1,443	1,147	79%
		Doma General Hospital	357	320	552	37	10%
		Arumagye Health Centre	3,083	3,117	3,133	-34	-1%
		Pakasa Primary Health Centre	30	48	41	-18	-60%
		Shalom Clinic Doma	0	15	0	-15	-100%
		Ungwa Nupawa PHC	1,119	2,714	1,743	-1,595	-143%
		Andoma Palace PHC	858	2,418	2,911	-1,560	-182%
		New Market Health Centre	275	891	1,364	-616	-224%
		New Era Clinic	638	2,194	1,964	-1,556	-244%
		Doma LGA Total	**8,871**	**12,210**	**14,219**	**-3,339**	**-78%**
		TOTAL FOR NASARAWA STATE	**30,488**	**33,609**	**35,582**	**-3,121**	**-35%**
Osun	Ife North	Ipetumodu General_Hospital	1,747	734	1,052	1,013	58%
		Baakun Primary Health Centre	4,802	2,071	2,973	2,731	57%
		Okooko Primary Health Centre	2,270	1,838	1,064	432	19%
		Moro Primary Health Centre	3,070	3,015	3,070	55	2%
		Jim Steve Private Hospital	0	0	0	0	
		Triumph Private Hospital	0	0	0	0	

State	LGA	Facility Name	Service Numbers on Daily Register	Service Numbers Reported to DHIS2	MSF	Sum of Variance (Register vs DHIS2)	Mean of % Var
		Edunabon CHC	1,070	1,462	1,223	-392	-37%
		Ife_North LGA Total	**12,959**	**9,120**	**9,382**	**3,839**	**20%**
		Oba Ile CHC	192	114	0	78	41%
		Kelebe Primary Health Centre	1,623	1,605	1,614	18	1%
		Atelewo Primary Health Centre	10,652	12,091	10,722	-1,439	-14%
		Sabo Primary Health Centre	977	1,242	1,648	-265	-27%
		Ota Efun PHC	3,825	5,056	3,128	-1,231	-32%
		Ayekaale Primary PHC	181	282	270	-101	-56%
		Enikan Oyun PHC	600	1,059	612	-459	-77%
	Olorunda	Olude Primary Health Centre	1,273	2,621	2,384	-1,348	-106%
		Gbonjubola Hospital	16	50	64	-34	-213%
		Oba-Oke Primary Health Centre	43	565	24	-522	-265%
		Dagbolu Primary Health Centre	45	434	491	-389	-864%
		Olorunda LGA Total	**19,427**	**25,119**	**20,957**	**-5,692**	**-156%**
		TOTAL FOR OSUN STATE	**32,386**	**34,239**	**30,339**	**-1,853**	**-105%**
Grand Total			**252,523**	**280,839**	**301,111**	**-28,316**	**-122%**

APPENDIX 5. MEASURE EVALUATION-AFENET FP INDICATORS ASSESSMENT AND DQA RESEARCH TEAM

Name	Designation	Location
Dr. Olukemi Olugbade	Principal Investigator	Osun and Nassarawa
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WORKING PAPER

This publication was produced with the support of the United States Agency for International Development (USAID) under the terms of MEASURE Evaluation cooperative agreement AID-OAA-L-14-00004. MEASURE Evaluation is implemented by the Carolina Population Center, University of North Carolina at Chapel Hill in partnership with ICF International; John Snow, Inc.; Management Sciences for Health; Palladium; and Tulane University. Views expressed are not necessarily those of USAID or the United States government. WP-19-237