



# GLOBAL FUND NIGERIA MALARIA GRANT

**Report of LMIS-HMIS Data Triangulation Exercise**

March 2020

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### iii. Abbreviations and Acronyms

ACT	Artemisinin Combination Therapy
BFSR	Bi-monthly Facility Stock Report
DHPRS	Department of Health Planning, Research and Statistics
FMOH	Federal Ministry of Health
GFATM	The Global Fund for AIDS, Tuberculosis and Malaria
HF	Health Facility
HMIS	Health Management Information System
IPD	In-patient Department
ISS	Integrated Supportive Supervision
LGA	Local Government Area
LHD	Long Haul Distribution
LMCU	Logistic Management Coordination Unit

LMD	Last Mile Distribution
LMIS	Logistics Management Information System
MEAL	Monitoring, Evaluation, Accountability, and Learning
MIS	Malaria Indicator Survey
NHMIS	National Health Management Information System
NSCIP	Nigeria Supply Chain Integration Project
OPD	Outpatient Department
PHC	Primary Health Care
PoD	Proof of Delivery
PR	Principal Recipient
PHF	Primary Health Facilities
RDT	Rapid Diagnostic Test
SHF	Secondary Health Facility
SR	Sub Recipient
TOT	Training of Trainers

## 0 Executive Summary

**Background:** In 2018, the Global Fund malaria grant procured approximately 20 million doses of Artemisinin Combination Therapy (ACTs), of which about 623,000 doses were quarantined leaving 19.6 million doses available for use. In 2018, the Nigerian health information system, DHIS2, recorded 7.9 million cases of malaria (both presumed and confirmed) as treated. In May 2019, following discussions between PRs, CCM and the Global Fund, the PRs carried out an analysis to identify the root causes of the misalignment between the LMIS and HMIS data.

Following the analysis/assessment in May 2019 (see *HMIS-LMIS Triangulation Report\_15th July\_FINAL.docx*), a number of gaps were identified, and the PRs and SRs subsequently developed and implemented several mitigation measures to address these gaps. In January 2020, the PRs and SRs carried out a similar assessment, to re-analyse the situation, and make new recommendations where necessary.

**Information systems:** Both LMIS and HMIS data are primarily recorded at health facilities, but through different processes: LMIS starts with Inventory Control Cards which record products received at the health facility and issued out of the facility's stores. This data is compiled on a bi-monthly basis into the Bi-monthly Facility Stock Report and entered into Navision. HMIS data starts with the record of a patient's attendance, diagnosis, and drug prescription at the Outpatient or In-patient Department (OPD/IPD reports). The health service data is aggregated into the Monthly Summary Form (MSF) and entered into DHIS2.

**Methods:** The team repeated the two-pronged study used in 2019.

- a) The first part comprised a desk review focused on reconciling the in-country receipts of ACTs for 2019, against quantities of ACTs distributed to health facilities as well as the stock balance.
- b) The second part was a field study at 234 health facilities to collect and triangulate HMIS and LMIS data at the facility level.

### Findings:

Key findings include the following:

#### A. Desk review

S/N	Description	ACT Quantity
A	Quantity of ACTs in HFs at the end of 2018	3,139,808
B	Quantity of ACTs on approved LMD plans	11,685,721
C	Quantity of ACTs delivered to IDPs, iCCM	1,140,505
D	Total Expected ACTs (A+B-C)	<b>13,685,024</b>
E	Quantity of ACTs in HFs at the end of 2019 from BFSR	2,063,905
F	Quantity dispensed to patients (D-E)	<b>11,621,119</b>

At the end of December 2018, the Global Fund Nigeria Malaria Grant had a balance of approximately 3.1 million doses of ACTs available at the Central and Axial warehouses. During 2019, the GF malaria grant procured approximately 16 million doses of ACTs, of

which approximately 11.6 million doses were allocated for distribution from the Central and Axial warehouses. Using national LMIS data, there were approximately 2.0 million doses remaining in the warehouses at the close of 2019. Thus, approximately 11.6 million doses of ACTs were dispensed to patients in 2019.

During 2019, approximately 9.9 million malaria cases (presumed and confirmed) were reported to have received first line antimalarial treatment (ACTs) at public sector health facilities.

	2018	2019
Revised ACT consumption in HFs (Navision)	13,179,184	12,761,624
Number patients reported treated (DHIS2)	7,974,104	9,992,285
Discrepancy (Navision – DHIS2)	5,205,080	2,769,339
	40%	21.7%

ACT consumption (LMIS data) was compared to the number of patients reported as treated in the HMIS system. In 2019, there was a 21.7% discrepancy between LMIS (Navision) and HMIS (DHIS2) data while in 2018, there was a 40% discrepancy.

B. Field data collection and analysis identified the following during the second semester of 2019 (July – Dec 2019):

- There was no variance between Chemonics’ Delivery Note (National Proof of Delivery (PoD)) and HF PoDs, which implies that all the ACTs were delivered to HFs in the 13 GF supported States.
  - The number of proxy deliveries has decreased since 2018. Over half of the reported proxy deliveries occurred in four states. These are Delta, Katsina, Ogun and Osun states
  - Use and completion of ICCs has increased between 2018 and 2019.
  - The number of ACTs recorded on ICCs is 18% higher than reported on the BFSRs.
  - The number of malaria patients reported on the OPD+ registers was 27% lower than on the MSFs which might be a data quality issue.
  - Analyzing ICC/BFSR, OPD+/MSF, and BFSR/MSF data by primary, secondary, and tertiary health facilities revealed different issues at different levels of the health care system.

#### **Gaps and Other findings from the field triangulation exercise**

- Data issues: These include missing source documents, incomplete documentation, under-reporting, ICCs not up to date, transcription errors. These are similar to the gaps noted in the July 2019 report.
- OPD/DHIS2 discrepancies are larger at secondary facilities

- Poor logistics communication: weak feedback from State LMCUs to HFs on commodity requests (through LGA LMCUs)

However, several issues identified in the 2019 assessment have been addressed. For instance;

- The rate of proxy deliveries has dropped to 7%, and almost half of these are clustered in four states.
- There is no variance between the National PoDs and the health facility PODs
- State LMCUs are now informed of commencement of delivery of commodities (by Chemonics)
- PoDs are now shared with PRs and State LMCUs following LMDs

### **Recommendations**

The following key recommendations are proposed, as further detailed in this report:

1. The PRs and SRs to collaborate to create forms and training on HF-level data triangulation, and to mentor to HF staff.
2. Analyze OPD/MSF discrepancies and systems at primary, secondary, and tertiary facilities. Identify targeted solutions for each level of health facility. Continue Hospital reporting of health service data on tablets.
3. Monitor performance of State LMCU Coordinators
4. Analyze ICC/BFSR discrepancies and systems at primary, secondary, and tertiary facilities. Identify targeted solutions for each level of health facility.
5. Investigate feedback mechanisms from LMIS data entry clerk to health facilities to inform HF of resupply quantities.
6. Develop feedback forms to report data check errors to HFs.
7. Motivate HF staff via a bi-monthly recognition system for HF and LGA health and logistics staff. Award certificates at bi-monthly meetings. Announce winners on local radio. Explore HF to HF knowledge sharing/exchanges by high performing staff.
8. Review DQA, IMSV, DVM reports regularly.
9. Develop one-page dashboard summarizing findings of field reports
10. Institute continuous in-service staff training. Train HF staff on stock management tools. Support LGA staff to provide HF oversight. Create database of trained staff.

## 1 Introduction

The Global Fund Nigeria Malaria Grant (2018-202) is being implemented in 13 States: Adamawa, Delta, Gombe, Jigawa, Kaduna, Kano, Katsina, Kwara, Niger, Ogun, Osun, Taraba, and Yobe. The National Malaria Elimination Program (NMEP) is the Principal Recipient (PR) responsible for grant coordination while Catholic Relief Services (CRS) is the PR responsible for grant implementation and oversight. There are three sub-recipients in this grant: Management Sciences for Health (MSH), responsible for supply chain management activities in the 13 States as well as Case Management and Monitoring and Evaluation (M&E) in seven States. Malaria Consortium is responsible for Case Management and M&E in six States. Society for Family Health (SFH) is responsible for Advocacy, Communication and Social Mobilization in all thirteen States as well as implementation of LLIN Mass Campaign in some selected States. One of the key mandates of the grant is to improve malaria commodity utilization and data reporting from the 13 GF-supported States.

In July 2019, following discussions with the Global Fund, the Principal Recipients (PRs) conducted a detailed assessment to analyze the misalignment between ACTs consumption (LMIS) and service data (HMIS) during 2018. As part of the detailed assessment, a desk review revealed that while 20,192,369 doses of ACTs were procured, a total of 16,068,614 doses were distributed to HFs, leaving a balance of 4,123,755 doses of ACT which the team accounted for (quantities quarantined, quantities distributed to IDPs, quantities distributed for iCCM, and stock balances at central/zonal warehouses). Of the 16,068,614 doses that were distributed to the HFs, the available LMIS data indicated that 13,179,184 doses were issued from health facility stores with the balance accounted for by the end of year stock on hand at the health facilities. The gap between the logistics consumption data (13,179,184 doses of ACTs) and the number of prescribed doses data (7,974,104 malaria cases) is 5,205,080 doses of ACTs.

To understand the reasons for the observed disparity, mixed teams comprising NMEP, CRS, MSH and MC staff carried out field visits to the 13 GF states, to identify the root causes. The teams carried out a comparative analysis of primary data sources for HMIS and LMIS data, as referenced above, for the second semester of 2018, using a stratified sample of 233 health facilities.

From the assessment (*see HMIS-LMIS Triangulation Report\_15<sup>th</sup> July 2019\_FINAL.docx*), several important gaps were identified, and the PRs and SRs subsequently developed and implemented several mitigation measures. In January of 2020, the PRs and SRs carried out another assessment, to re-analyse the situation, identify persisting gaps and new gaps, and make new recommendations where necessary.

This report presents the approaches, findings and recommendations from the second data triangulation assessment of a cohort of 234 facilities across the 13 target states of the Global Fund Nigeria Malaria Grant.



## 1.1 Background

The goal of the National Malaria Elimination Programme (NMEP) logistics system is to ensure a secure and dependable supply of malaria health products for the prevention, diagnosis and treatment of people with malaria. NMEP's target is to reach 80% of the population. Malaria commodity deliveries are tracked using Proof of Delivery documents between Axial warehouses and health facilities. Receipts and issues of each health product are recorded on Inventory Control Cards (ICC). Each health facility completes a bi-monthly report on stock usage (receipts, issues, expiries, damaged items) on the Bi-Monthly Facility Stock Report (BFSR). BFSR data is entered into the Navision computer system at the LGA/State LMCU.

The National Health Management Information System (NHMIS) was updated in 2018/2019 to incorporate new data elements and to include additional programme-specific indicators. Health facilities record health service data for each patient in Out-patient and In-patient Registers. Service data is summarized monthly on Monthly Summary Forms (MSF). MSF data is entered into the digital DHIS2 system at the LGA.

## 1.2 Problem Description

During the 2019 reporting period, from the Navision data, ACTs consumption was approximately 12.7 million doses. From the DHIS2 data, approximately 9.9 million malaria cases (presumed and confirmed) were reported to have received first line antimalarial treatment (ACTs) at public sector health facilities.

	<b>2019</b>
Revised ACT consumption in HFs (Navision)	12,761,624
Number patients reported treated (DHIS2)	9,992,285
Discrepancy (Navision – DHIS2)	2,769,339
	<b>21.7%</b>

In January 2020, NMEP, CRS, MSH and MC conducted a second assessment to investigate this 21.7% discrepancy between ACTs consumption (LMIS data) and the number of malaria patients reported to have received ACTs (HMIS data). The 2-pronged methodology used in the July 2019 report was also used in this assessment, viz;

- A desk review focused on the reconciliation of ACTs received in-country for 2019, against quantities of ACTs distributed to health facilities and stock balance.
- A field study at 234 health facilities to collect and triangulate HMIS and LMIS data at the facility level.

## 1.3 Objectives

The objectives of the HMIS-LMIS include:

- Determine, through a desk review, any differences between ACTs procured by the Global Fund and available for use (procurement orders, PoDs) against those reported as prescribed to patients (DHIS2) in 2019 as well as stock balance
- Compare HMIS and LMIS data from the target health facilities' source documents between July-December 2019 and identify any disparities.
- Identify the root causes of any observed disparities and make recommendations to address them.
- Monitor impact of previously defined interventions and recommend adjustments as needed.

## 2 Methodology and Limitations

The exercise reviewed the ACT commodity supply pipeline for the Global Fund Grant in Nigeria, adopting a two-pronged approach: an initial desk review, followed by field visits to 234 health facilities in all 13 GF-supported states.

The desk review included an analysis of all ACTs in the distribution pipeline from January to December 2019. The field visits aimed to verify the quantity of ACTs delivered to the last mile (i.e. health facilities) and the quantity of ACTs reported issued from HF storage (LMIS), reconciling the latter with the reported service data on number of malaria cases (presumed and confirmed) (HMIS). The field visit study covered just the last six months of 2019 (July – December).

### 2.1 Desk Review

The desk review was done in two parts: an analysis of the ACTs in the Central and Axial warehouses and then an analysis of the ACTs in the health facilities. All ACT numbers are reported in doses, not tablets. Reference documents included confirmed procurement orders from the Global Fund's PPM system, inventory reports from Chemonics for Central and Axial warehouses, approved distribution lists for all health facilities supported by the Global Fund grant, signed Proof of Delivery documents, and stock balance reports for the end of 2018 and 2019 from Navision.

### 2.2 Field Visits

Field visits were carried out to 234 health facilities in all 13 GF supported states. Field data were collected for the second semester of 2019 (July – December 2019). Data collection teams were made up of participants staff in supply chain management, M&E, and Program and Audit, were drawn from NMEP, CRS, MSH, MC, SMEP, State LMCU and LGA key personnel (M&E Officers, Malaria Focal Persons, and Logisticians).

#### 2.2.1 Site selection

A total of 234 health facilities were selected for inclusion in the study (the same survey size as 2019). In each state, two LGAs were selected in each of the State's Senatorial zones (i.e six LGAs per state, or 78 LGAs), and three HFs were selected per LGA - one secondary or tertiary

facility and two primary health facilities in each LGA. Thus 78 secondary or tertiary HFs and 156 primary HFs were included in the survey. LGAs with heavy security challenges were excluded from the pool of selected LGAs.

The PRs discussed three HF selection strategies for this study: 1) use the same 234 sites, 2) select new sites, or 3) a combination. Ultimately, the PRs decided to randomly select new primary HFs and where possible to select new secondary HFs. Due to the structure of the health system, there are a small number of tertiary and secondary facilities per State. Of the 78 secondary and tertiary facilities in the study, 22 were also in the 2019 study. The primary health facilities were randomly selected, with safety and security considerations as well as facilities with high case load. The facilities were randomly selected from the three senatorial zones in each state. Figure 1 below shows the distribution of survey sites.

### 2.2.2 Survey tool

The PRs revised the data collection tool to clarify the language. An additional section was added to collect logistics and health service data on RDTs. The survey team reviewed and adopted these minor changes to the data collection tool. The training for data collectors was revised to reflect these changes.

The major thrust of the exercise was to review HMIS and LMIS source documents in the health facilities and to compare source document data with BFSR and MSF reports, in order to identify any variances. Team members were provided copies of National Proof of Delivery (PoD) documents (signed Delivery Notes provided by Chemonics in Abuja) for each of the three deliveries made during the review period to each of the 234 health facilities. In each HF the teams:

- Compared the National PoDs with the copy of the PoD kept at the health facility.
- Checked the presence and completeness of Inventory Control Cards for each of the eight ACTs and RDTs
- Recorded the total ACT doses on the BFSR records for each reporting period
- Reviewed the OPD, IPD and outreach registers for completeness, and recorded the number of patients diagnosed with malaria (both confirmed and presumptive)
- Recorded the number of malaria patients and number of malaria tests reported on the MSF.

The tools reviewed were:

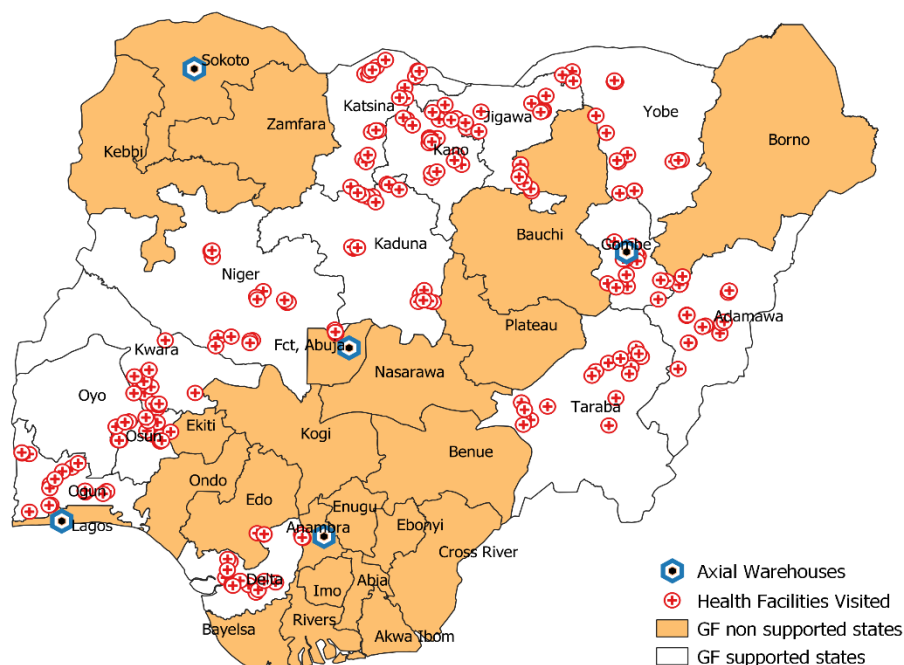
- LMIS Tools: PoDs (National, health facilities) ICC, Bin Cards; BFSR
- HMIS Tools: OPD register, IPC register and other service data document (if any); MSF

### 2.2.3 Data collectors

Data collectors were engaged for this exercise and they participated in a one-day training in each state. Data collection teams comprised 6 individuals per state (1 data collector per LGA for 6

LGAs). There were also 4 supervisors per state (2 national-level and 2 state-level supervisors). Each data collection team visited one health facility per day for three days. In other words, a total of 18 facilities were visited per state. The data collector was introduced by the state & LGA team members to the health facility staff to ensure easy access to the relevant health facility records.

Figure 1: Map showing the locations of the 234 health facilities visited across the 13 States



#### 2.2.4 The Activity Implementation process

The Activity Implementation Process remained the same between May 2019 and February 2020.

1. Data collection tool revised, finalized, and mobile platform updated by a team of NMEP, CRS, MSH and MC staff. The PRs revised the 2019 structured questionnaire used in 2019. The questionnaire was reloaded into a mobile data collection platform (a hand-held device) was used to administer the checklist/questionnaire. Data was transmitted electronically to a central server which enabled real-time monitoring of the data collection process and eliminated the need for hard-copy questionnaires or data entry thereafter.
2. National-level pre-planning meeting and TOT: National officers drawn from NMEP, CRS, MSH and MC were trained on the use of the data collection tool.

3. *State Level Activity*: The national officers were deployed to the States to conduct State level training for the data collectors. A daily work plan was developed at the end of the 1-day training. Each data collector was assigned to 3 health facilities to visit (one health facility per day). Each LGA team was comprised of Data Collectors, State Supervisors, LGA Personnel & National Supervisors. A total of 156 team members including staff of NMEP, CRS, MSH, MC, State LMCU, LGA LMCU participated in the exercise, with visits to a total of 234 health facilities where Android devices were used to capture responses to the checklist.
4. *Field monitoring*: During the activity, national officers supervised the data collectors as they collected the data in the health facilities. Overall, the strategy ensured that during field visits/data collections, national and state teams supervised the data collectors and data collection processes across all the states. A data monitoring system via a central server was setup to ensure completeness of the data submission and to ascertain that the data collectors were present in the allocated health facilities through a spatial analysis of the GPS coordinates of the visited facilities.
  1. *Data submission and feedback*: Data submission was real-time. These data were reviewed daily by the national team and feedback was provided to the LGA team on a daily basis (feedback included assessment of daily submission and coverage analysis). Data was submitted for 233 health facilities (one android device was lost).
  2. *Interview of Health Facility Staff*: Health Facility staff were interviewed as necessary to provide better understanding of some of the findings from the preliminary analysis of the source data collected. This was with the aim to identify gaps and weaknesses in the supply chain and commodity management systems.
  3. *Debriefing with State Stakeholders*: At the end of the field visits, a debriefing session was held in all the states to communicate the key observations to government representatives. The meetings noted that the data triangulation exercise is key, and any observed gaps/weaknesses need to be addressed collaboratively

### 2.3 Data Analyses

Quantitative and qualitative data was collected from the field. STATA was used for quantitative data analysis: The source documents and monthly/bi-monthly summary forms that were compared include:

- Inventory Control Cards (ICC) versus Bi-monthly Facility Stock Report (BFSR) for each ACT
- National Proof of Delivery (Nat POD) versus Health Facility POD (HF POD) data for each distribution for ACTs and RDTs
- Total ICC versus Total BFSR (ACT data, RDT data)
- Total Out-patient department (OPD) plus In-patient department (IPD) versus Total Monthly Summary Form (MSF)
- Total OPD+ (RDT) versus Total MSF (RDT)
- Total RDTs conducted versus Total RDT positive tests
- Total Microscopy conducted versus Total Microscopy positive tests

- Aggregated LMIS data (BFSR) were compared to aggregated HMIS data (MSF) for the 13 States.

The LMIS and HMIS data were analyzed for the 234 facilities in the study by State and by level of care (primary, secondary and tertiary).

The responses to the qualitative questions were grouped by theme and analyzed by frequency of response.

## 2.4 Limitations

Health facilities receive malaria commodities through multiple channels: the government, the Global Fund grant, other donors, or direct purchase. We expect to see the number of dispensed doses of ACT procured by the Global Fund grant to be less than the number of patients presumed treated for malaria with ACTs because there are other sources of ACTs in the health supply chain. It was not within the scope of this activity to track the GF ACTs exclusively, nor to identify other sources and quantities of ACTs at each health facility visited.

The PRs discussed various sampling methods for the second survey and decided to continue to select sites based on those facilities with a high fever case load and by geographical distribution. There was no overlap between primary health facilities between the first and second surveys. There is overlap of secondary and tertiary health facilities due to the relatively small number of these facilities. Of the 4 tertiary and 57 secondary facilities included in this study, 2 tertiary and 20 secondary facilities were visited during the 2019 assessment. .

When this report discusses findings by State, those findings refer only to the data collected at the 18 health facilities in that State. The data does not generalize for all health facilities in a State; no generalization is implied by reporting the findings at State or country levels. However, the findings do illustrate existing data management and analysis gaps.

## 3 Key Findings

### 3.1 Overview of findings

The results of the study fall into three categories:

1. Desk review 2019, ACT discrepancy. The desk study showed a strong correlation between the 15,980,778 doses of ACTs procured in 2019, the 17,860,319 of ACTs distributed to health facilities, the remaining stock on hand in the Central and Axial warehouses, and the quantity reported issued from the storerooms in the health facilities. See 3.2 below.
2. Field data collection and analysis, second semester of 2019 (July – Dec 2019)
  - Data issues: there are still missing and incomplete source documents, but data collectors reported fewer issues.
  - Delivery issues: the number of proxy deliveries averaged 7%.

- Logistics communication interventions have shown positive results. PODs match, and copies of signed PoDs are shared with State LMCUs and SRs. HFs still need more reliable information about resupply quantities.
3. The qualitative data analysis of the replies to the question “Root causes of any observed discrepancies.” Respondents were offered nine causes and could specify others. Six causes made up 75% of the responses. The top six responses related to tool use and staffing.

### 3.2 Desk review of 2019 LMIS and HMIS data

The findings from the desk review are presented in

Table 1 and

Table 2 below:

Table 1 summarizes the movement of ACTs through the Central and Axial warehouses managed by Chemonics under the Global Fund grant. Of note is that:

- 17,860,319 doses ACT were available for distribution from Central and Axial warehouses
- Of which 11,685,721 doses were allocated for distribution to HFs

**Table 1: Federal / Central-level analysis of Stock of ACT doses**

S/N	Description	Quantity ACTs
A	ACT stock on hand at Central and Zonal Stores, end of Dec 2018	3,392,457
B	Quantity ACTs procured for 2019	15,980,778
C	Quantity of ACTs rejected due to QA issues from manufacturers	1,079,941
D	Quarantined ACTs as of Dec 2019	432,975
E	Quantity available for Distribution from Central Stores (= A+B-C-D)	17,860,319
F	Quantity ACTs distributed for IDP and iCCM programs	1,140,505
G	Quantity ACTs on approved LMD plans for routine distribution to HF	11,685,721
H	Expected stock on hand, Central & Zonal Stores end 2019 (= E-F-G)	5,034,093
I	Actual stock on hand at Central & Zonal Stores end of 2019	4,838,057
J	Variance (I-H)	(196,036)

In summary, there were 17,860,319 doses of ACTs available for distribution in 2019, of which 11,685,721 were allocated on distribution lists. The physical inventory count conducted at the end of 2019 reported 4,838,057 doses of ACTs in Central and Zonal stores, which was 196,000 doses less than expected. The PRs will follow up with Chemonics on this variance, including quantities of ACTs distributed in non-GF supported states in a bid to mitigate expiration variance.

Table 2 summarizes 2019 data on ACT doses at the health facilities.



**Table 2: Facility-level Analysis of stock of ACT doses**

S/N	Description	Quantity ACTs
K	Reported Stock on hand at HF, end of 2018, from BFSR reports	3,139,808
L	Quantity of ACTs on approved LMD plans for routine distribution to HF	11,685,721
M	ACTs available at the health facility through 2019 (= K+L)	14,825,529
N	Reported quantity issued (BFSR) (Jan - Dec 2019)	13,666,509
O	Expected quantity (balance) at HFs end of 2019 (= M – N)	1,159,020
P	Reported balance at the HF end of 2019 (from BFSR)	2,063,905
Q	Variance, stock balance at HF (= P–O)	904,885
R	Revised base ACT consumption at HFs (= M-P)	12,761,624

In summary, there were 14,825,529 doses of ACTs available in the GF-supported health facilities in 2019. Data from the Navision database (LMIS) reported that 13,666,509 doses were reported dispensed from the health facility stores in 2019. This suggests that we would expect to find 1,159,020 doses of ACT remaining in the HFs at the end of 2019, but according to Navision, there were 2,063,905 doses in stock at the GF health facilities at the close of 2019.

The higher than expected quantity of ACT could be explained by the fact that health facilities receive ACTs from sources other than the Global Fund. The government procures and distributes ACTs to HFs, other donors and NGOs could supply some treatments, and some facilities procure directly. Additional analysis of all ACTs arriving at the HFs is required to understand this discrepancy.

At the close of 2019, there were 12,761,624 doses of ACTs recorded as used during 2019 in the Navision system (LMIS). There were 9,992,285 patients recorded in the DHIS2 (HMIS) system. This is a discrepancy of 2,769,339 doses of ACTs, or 21.7% of the 12.7 million. The 2019 study found a 40% discrepancy.

	2018	2019
Revised ACT consumption in HFs (Navision)	13,179,184	12,761,624
Number patients treated (DHIS2)	7,974,104	9,992,285
Discrepancy (Navision – DHIS2)	5,205,080	2,769,339
	<b>40%</b>	<b>21.7%</b>

### 3.3 Field data

The desk review in 3.2 above included all Global Fund malaria data for 2019, the Field data analysis is limited to the 234 health facilities in the field study out of the 10,000+ included in the grant. These included: 4 Tertiary facilities, 57 Secondary facilities, and 173 primary care facilities.

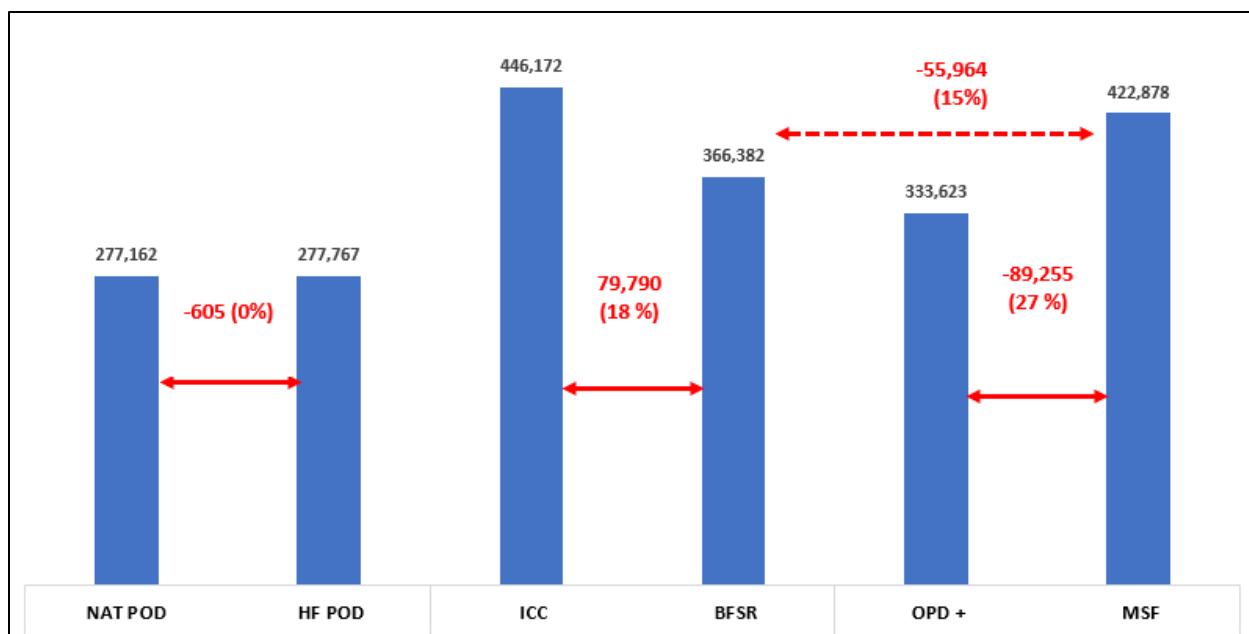


Figure 2: Comparison of LMIS and HMIS aggregated data for 234 sampled health facilities

### 3.3.1 In-country ACT distributions

Team members compared the National Proof of Delivery (PoD) documents (signed Delivery Notes provided by Chemonics in Abuja) to the signed copies of the PODs kept at the health facilities for each of the three deliveries made during the review period. There was a difference of 605 doses of ACTs out of 277,162, or 0%. The previous study found a 5.75% difference.

The qualitative section of the survey asked about proxy deliveries. These questions were clarified since the first study. Staff were asked a sequence of questions.

“Are ACTs delivered directly to your health facility by 3PLs during LMDs? (Y/N)”

If No: “Did the commodity ever arrive? (Y/N)”

If Yes: “How did the commodity arrive?”

Health facility staff were provided four options to the last question (see Figure 5 in the Annex).

An average of 7% of health facilities in the study answered that commodities had not arrived and that they reported the non-delivery. Half of these reports (26 of 55) come from four states: Delta, Katsina, Ogun, and Osun.

Focus areas to address regarding these issues of proxy deliveries include working with Chemonics and the 3PLs in Delta, Katsina, Ogun, and Osun; and continuing to improve information sharing from the State LMCUs to the health facilities about planned deliveries.

### 3.3.2 Logistics and Health Information Data Management

The teams checked for the presence and completeness of Inventory Control Cards for each of the eight ACTs and the RDTs in the health facility store; the BFSRs for each reporting period; the

out-patient department register, In-patient care and outreach health registers (OPD+); and the MSFs.

The teams reported that a greater number of ICCs were updated than in the first study in the health facilities visited. For the ICCs that were not complete, health staff attributed this to lack of time, lack of training, and lack of tools among other explanations.

Focus areas moving forward to address these findings include: one-time data capture to reduce the need for data transcription between documents – for example, using digital data collection; continued training of staff in logistics and medical data tools; support to the LMCUs to monitor which facilities have received trainings; and monitoring of LGA and State LMCU performance as they support health facilities. Finally, the PRs will continue to explore reporting differences between primary, secondary and tertiary facilities.

### 3.3.3 Analysis of aggregated LMIS and HMIS data (Figure 2)

#### 1. Comparison of physical evidence of delivery of ACTs at Health Facilities (first two bars).

Data collectors compared quantities of ACTs recorded on National PoD with the signed PoDs held at the health facility. The aggregated quantity of ACTs on the National Proof of Delivery documents for the 234 HFs is 277,162; the quantity listed of ACTs on the 234 HF PODs is 277,767. This is a difference of 605 doses across 702 deliveries or 0%.

#### 2. Comparison of total quantity of ACTs distributed in the HFs as recorded on the ICCs and reported in the BSFR (third and fourth bars). The ICCs recorded 446,172 ACTs issued from the HF storeroom; the BSFRs recorded 366,382 doses. The BSFR total was 79,790 doses or 18% lower than the ICC total. Both the ICC and the BSFR total are larger than the 277,767 doses recorded as delivered on the GF PoDs.

The ICC and BSFR totals exceeding the PoD totals could be the result of other sources of ACTs supplying ACTs to health facilities, including Drug Revolving Fund Schemes in the secondary, tertiary, and some Primary HFs. Additional research is required into this discrepancy.

#### 3. Comparison of records of patient care and source information for HMIS (last two bars). The data collectors reported 333,623 doses of ACTs prescribed to patients recorded in the 234 OPD, IPC and Outreach Registers (“OPD+”). A total of 422,878 patients diagnosed with malaria were reported on the MSFs in the 6-month study period. Both the OPD+ and MSF totals are greater than the number of ACTs recorded on the PoDs; again, this could be due to additional sources of ACTs.

The MSF total was 27% higher than the OPD+ total. This is discussed below.

#### 4. Comparison between LMIS (BSFR) and HMIS (MSF) (fourth and sixth bars). There is a difference of 112,549 doses of ACTs between the ICC doses (446,172) to number of patients reported in OPD registers (333,623), a difference of 25%. Comparing the BSFRs (366,382 doses) to the MSFs (422,878 patients diagnosed) revealed a difference of -55,964 doses or

15%. Note that when comparing the ICC and OPD registers, the ICCs have the higher reported doses, but when comparing the BFSR to the MSF, the MSF has the higher value.

These two figures are inconsistent. There is not enough information to explain why the total number of doses listed on ICCs is 25% greater than the number of patients identified in the OPD registers; this requires continued investigation.

The four analyses above were repeated using data aggregated by state. Those graphs are presented in Annex 1.2. Annex 1.3 includes the above analyses repeated for two health facilities.

### 3.3.4 Analysis by level of health facility

After the 2019 survey, the PRs and SRs analyzed the LMIS and HMIS data for each of the ~10,000 health facilities operating under the GF grant (see Interventions Section). One finding from this study was a low reporting rate from secondary and tertiary health facilities. This motivated an analysis of LMIS and HMIS data by primary, secondary, and tertiary health facilities. Figure 3 below contains this data.

There were 4 Tertiary facilities, 57 Secondary facilities, and 173 primary care facilities included in the survey.

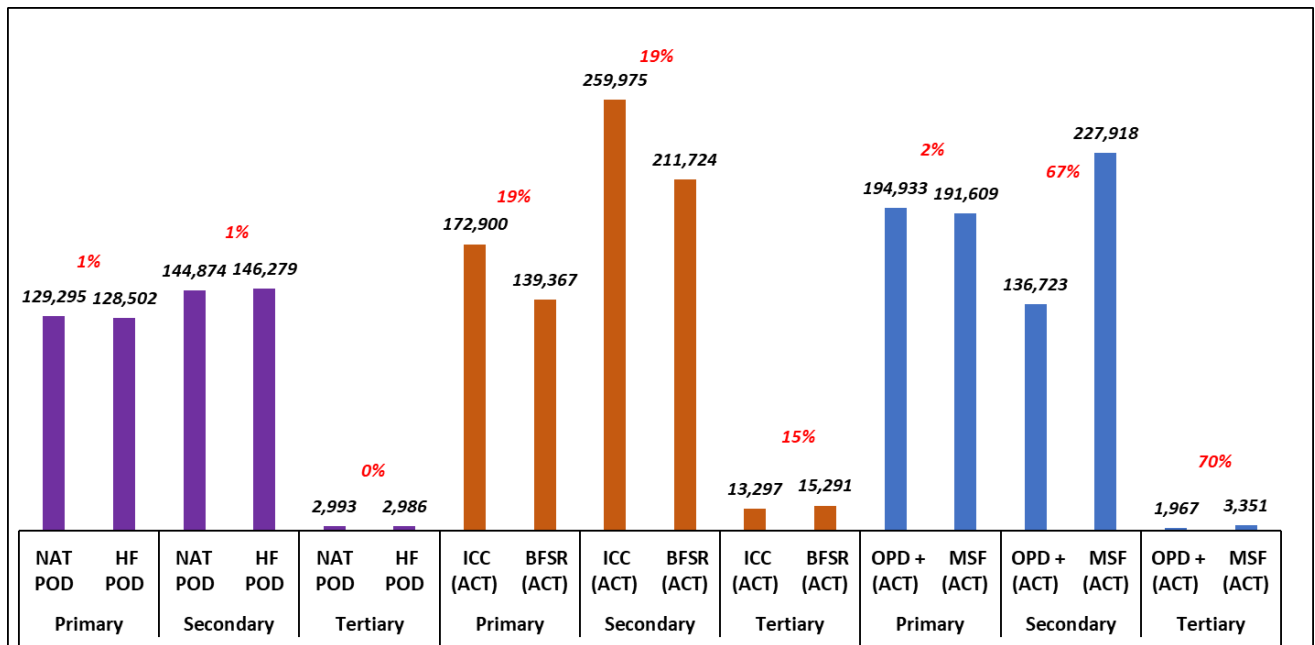


Figure 3: Comparison of LMIS and HMIS data by level of care

1. Comparison of physical evidence of delivery of ACTs at Health Facilities (purple bars). There was no distinction between health facilities by level of care.

2. Comparison of total quantity of ACTs distributed in the HFs as recorded on the ICCs and reported in the BSFR (brown bars).
  - In primary and secondary HFs, there were 19% more ACTs recorded issued from the storeroom on the ICCs than were reported on the BSFR (primary: 172,900/139,367; secondary: 259,975/211,724).
  - In tertiary facilities there were 15% fewer ACTs recorded issued from the storeroom on the ICCs (13,297) than were reported on the BSFR (15,291).
  
3. Comparison of records of patient care and source information for HMIS (blue bars)
  - In primary HFs, the number of cases recorded in the OPD registers (194,933) was nearly identical to those in the MSF (191,609; 2%).
  - In secondary HFs, the number of cases recorded in the OPD registers (136,723) was 2/3<sup>rd</sup> of those in the MSF (227,918). This requires further investigation into alternative health registers and record keeping systems.
  - In tertiary HFs, the number of cases recorded in the OPD registers (1,967) was 1/3<sup>rd</sup> of those in the MSF (3,351). This requires further investigation into alternative health registers and record keeping systems.
  
4. Comparison between LMIS (BSFR) and HMIS (MSF) (brown and blue bars).
  - Primary HF source documents show fewer ACTs issued from the storeroom (ICC: 172,900) than the quantity of ACTs prescribed to patients (OPD: 194,933). There were fewer ACTs reported on the BSFR (139,367) than on the MSF (191,609).
  - Secondary HF source documents show a greater quantity of ACTs issued from the storeroom (ICC: 259,975) than the quantity of ACTs prescribed (OPD: 136,723). In contrast, there were fewer ACTs reported on the BSFR (211,724) than on the MSF (227,918). The number of ACTs recorded in the OPD registers was approximately half of the ACTs presumed issued to patients (136,723/259,975).
  - Tertiary HF source documents show a greater quantity of ACTs issued from the storeroom (ICC: 13,297) than the quantity of ACTs prescribed (OPD:1,967). there were fewer ACTs reported on the BSFR (15,291) than on the MSF (3,351). The MSF report – the data that is entered into DHIS2 – is approximately 1/6<sup>th</sup> of the ACTs issued to patients (1,967/13,297).

Note that the survey only checked PODs of GF deliveries. Because health facilities receive ACTs from multiple sources, differences between quantity of ACTs on PODs and ICCs is to be expected, with the quantity of ACTs on the ICCs being greater than on the PODs.

### 3.3.5 Cross-cutting observations

The data collectors reported that:

1. Data issues continue (missing source documents, primary source documents not up-to-date, incompletely filled source documents, under-reporting, transcription errors etc.) As discussed above, submitted BSFR and MSF reports do not always match the source documents (ICC and OPD registers).

2. The completion rate of Inventory Control Cards has jumped since the 2019 survey. This might be due to the LMIS training rolled out in September 2019.
3. Reports of delivery issues, such as proxy delivery, averaged 7%. New proxy protocols were implemented in 2019; in addition, the question about proxy deliveries was reworded before the February 2020 survey.

### 3.4 Root Cause Analysis

Data collectors asked health facility staff what they thought were the reasons for discrepancies in reporting of ACTs in between ICC and OPD and OPD and MSF. During the discussion which followed, data collectors checked off any of the staffs’ statements which matched ten previously identified causes and recorded additional responses under “other”. Each staff member could offer multiple reasons; a total of 520 reasons were collected. The responses are graphed in Figure 4 below.

Six causes made up 75% of the responses. All of the top six responses related to tool use and staffing.

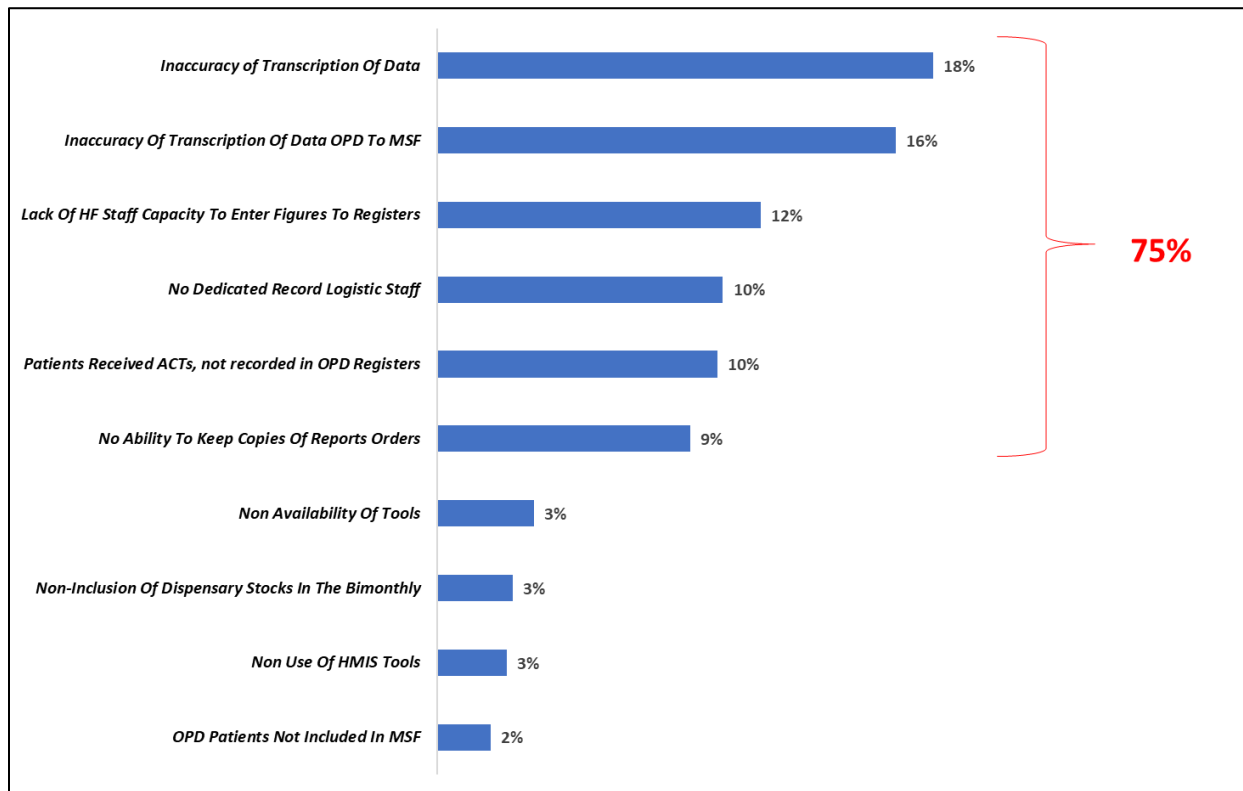


Figure 4: Bar chart showing “Root causes of any observed [ACT] discrepancies”. Graph shows 444 of 520 responses.

## 4 Summary of Key Gaps

The key gaps observed in the study of the 2019 supply chain were:

- Data issues persist: missing source documents, incomplete documentation, under-reporting, ICCs not up to date, transcription errors.
- Inconsistencies between ICC and BFSR, between OPD+ and MSF, and between BFSR and MSF.
- OPD/DHIS2 discrepancies (specifically at secondary facilities)
- Poor logistics communication: weak feedback from State LMCUs to HFs on commodity requests (through LGA LMCUs).

There were an average of 7% proxy deliveries over the three distribution cycles. Almost half of the reported proxy deliveries between July and December of 2019 (26 of 55) came from four states: Delta, Katsina, Ogun and Osun.

Some of the gaps identified in the previous study have been addressed and are no longer priority action items:

- National and health facility PODs now match
- State LMCUs are now informed of commencement of delivery of commodities (by Chemonics)
- PoDs are now shared with PRs and State LMCUs following LMDs

## 5 Interventions since July 2019

Following the June 2019 HMIS-LMIS survey and the subsequent report, the PRs and SRs have implemented numerous interventions to address system weaknesses. They are described below.

### 1. LMIS data issues

The June 2019 study revealed that none of the 233 HFs in this study could show data collectors a complete set of Inventory Control Cards (ICCs) for the eight ACTs. Some HFs could not locate the ICCs from the July-December 2018 survey period; for those that could share the ICCs, data collectors reported the cards as incomplete.

**Intervention:** NPSCMP, NMEP, CRS, Chemonics, GHSC-PSM, Malaria Consortium and MSH collaborated from March – May 2019 to review the Malaria Health Product Logistics Management System (MHPLMS) SOPs and the existing tool (ICCs and BFSR) as well as introduced new tools like the daily consumption registers for better triangulation with service data and improved accountability. The review of the MHPLMS was then followed by a Training of Trainers training which was conducted by MSH with support from NMEP and CRS in May 2019. This was subsequently followed by rolling out trainings to HFs supported under the GF grant. Trainers for roll out training to HFs were selected from State LMCUs and LGA SCM specialists. The roll out trainings were conducted from July - September 2019.

Between September – October 2019, MHPLMS tools were printed and distributed to HFs in November 2019 by leveraging on the LGA structure in each of the 13 GF State.

Data collectors from the February 2020 study reported that ICCs were found in all HFs and the majority of those were complete. This, however, can be attributed to the MHPLMS training in 2019 as well as the distribution of tools.

### 2. Proxy deliveries

In the qualitative section of the June 2019 study analysis facility staff were asked: “Did your health facility receive last mile delivery from 3PL?”. This question required a Yes/No response for each of the three delivery cycles. Approximately 15% of respondents replied “No”.<sup>1</sup>

Based on the responses, one could attribute the “No” response to any of the following:

1. Proxy Delivery (delivery to facility different from the intended health facility)
2. Communications gaps between State/LGA LMCU and health facility; there is currently no system in place for the State LMCU to inform the health facility of the quantities of ACTs in their order, if there will be an order, and when to expect the order.
3. Commodities that were never delivered to the health facility.

### Interventions:

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<sup>1</sup> There were 3 deliveries during the study period, so each facility answered this question 3 times.



- The PRs recognize that there are times when a 3PL has advance knowledge that they cannot reach a HF (e.g. a flood or political unrest). In such instance, Chemonics inform the PR and modalities for deliveries to such HFs are jointly discussed between PR and Chemonics. In certain instances where commodities could not be delivered to HFs that have become dysfunctional, Chemonics escalate this to the PR. The PR subsequently inform the SR to notify the State LMCUs about these HFs.
- As part of the PR's effort to curtail the practice of Proxy deliveries, the new Service Level Agreement (SLA) between Chemonics and the PR, included a Key Performance Indicator (KPI) that will track the number of proxy deliveries made by 3PLs. Chemonics has a threshold of 0.25% proxy deliveries in the SLA. SR report any proxy deliveries every distribution cycle to the PR, who in turn escalate this to Chemonics for corrective action. In addition, the PR routinely update a PSM issue log with details of proxy deliveries and other issues encountered during distribution, which is shared with Chemonics, to ensure all issues are resolved. Also, the proxy delivery KPI in the SLA will be tracked by NPSCMP through the State LMCUs. The performance assessment report of this KPI is prepared on quarterly basis and shared with the PR, Chemonics and all stakeholders during the quarterly performance assessment meeting facilitated by the RSSH grant.

### **3. POD differences**

When a request from the HF is to be actioned, a delivery note is prepared which comes in quadruplicate, when the malaria health products requested from the HF leaves the central warehouse, a copy of the delivery note is left at the central warehouse which indicates transaction has not been completed. When the malaria health products arrive the health facilities through the assigned 3PL, the receiving officer at the HF confirms the products, quantities and signs the remaining copies of the delivery note thereby making the delivery note a Proof of delivery (POD) , once this is done, a copy of the signed POD stays at the HF, one copy goes back with the 3PL, and the third copy is returned to the Central warehouse. However, it was observed that it was difficult for the SRs and State LMCUs (the teams that help create the distribution lists) to validate the quantities of malaria health product delivered to each health facilities based on the generated LMD request by the State LMCUs. As the June 2019 field study showed that there were discrepancies between quantities delivered at the HF and quantities requested in the generated LMD from the State LMCUs.

#### **Interventions:**

- Chemonics now shares a copy of the signed PODs that is returned to the warehouse after LMD with the State LMCUs after 48 hours of LMD completion timeline (this timeline is in line with the new SLA between CRS and Chemonics in Q1, 2020). This intervention was put in place in September 2019.
- The SR and State LMCUs have defined a POD reconciliation process to be carried out at the State LMCU level. The SRs and LMCUs will check that any quantity differences are

corrected in their records and to ensure the correct quantity of stock is ordered in the next cycle. This new process is scheduled to begin from May 2020 LMD.

#### **4. Strengthening systems for reporting of quality data at state level**

The responsibility for data collection and reporting is shared across the different levels in the states including service delivery point at health facility, local government and the State Ministry of health. Overtime, these different levels have been particularly challenged by inadequate human resources, staff turnover and inadequate skills sets to sustain quality documentation and reporting. This is in addition to sub-optimal understanding of the documentation tools and indicators for reporting especially at service delivery points. These are some of the challenges identified from the HMIS-LIMIS onsite triangulation exercise.

**Intervention:** The PRs and SRs analyzed the LMIS and HMIS data from January to December 2018 at the HF level, and compared the LMIS data to the HMIS data for each and noted discrepancies, possible reasons for the variances observed and recommendations. In responding to the recommendations from the outcome of the desk review and onsite health facility LMIS-HMIS triangulation the PRs, SRs, GF CT and CCM engaged all stakeholders at National, State and LGAs with a view to developing a clear road map to prevent and mitigate the outcome of the results of the exercise on the program especially service delivery to beneficiaries. A national and state-level stakeholders engagement was conducted:

**National stakeholder engagement:** Between the 7<sup>th</sup> and 8<sup>th</sup> of August 2019, stakeholders across the country including GF supported malaria implementing states converged in Abuja to deliberate on the finding of the assessment and review of the HMIS LIMIS variance observed. The 2-day meeting deliberated on the outcome of the triangulation exercise and reached a communique calling for greater country, state and local government level accountability and ownership of malaria commodities. A key recommendation of this meeting was the conduct of similar meeting and engagement with the respective 13 GF supported states to extract commitment and action for mitigating gaps and ensuring malaria commodity accountabilities in their respective states

**State level advocacy and stakeholder's engagement meetings:** Between the 16<sup>th</sup> of October and 2<sup>nd</sup> of November 2019, a two-part activity involving a one-day high level advocacy visit to the State governments and state level stakeholders meeting was held across the 13 GF supported states. Outcome of this activity has increased state commitment to accountability for GF malaria commodities, the development of an implementable and measurable state specific action plan to bridge the gap between consumption and service data and the signing of a state-specific communique. In addition, the meetings committed to addressing other systemic issues of inadequate staffing at health facility, staff turnover and the strengthening of monitoring and supervision at all levels of support in the respective states.

Some of the action points from the state level stakeholders meeting implemented to strengthen systems for improved data quality include strengthening the capacity of Officers-in-Charge (OIC) of health facility, health care workers and LGA officers on Commodity Logistics and

documentation, implementing reward and sanctions system for personnel of service Delivery Point for good or poor data quality. The various states supported the movement of tools from LGAs to the facilities to prevent stockout of tools at facilities thus ensuring continuous document and the enforcement of the use of all relevant NHMIS tools

## **5. RDT results not reliably recorded in HF**

Data collectors found during the May 2019 study that RDT test results were incomplete in several HFs. HF recorded the positive tests, but negative tests were not recorded consistently. Without a complete record of how many tests were conducted, it is not possible to accurately model RDT consumption.<sup>2</sup> In addition, accurate figures on the number of positive RDT tests could be used to cross check the number of doses of ACTs prescribed to patients and the number of patients reported diagnosed with malaria.

**Intervention:** To address this, the introduction of the triangulation form developed by the SRs and SMEP enable the crosschecking of laboratory reports against case note and the OPD register. Discrepancies are corrected before summation on the MSF is carried out. Additionally, during mentoring and supervisory visits by the states, health care workers are mentored to carry out this activity pre reporting every month.

## **6. Low HMIS reporting from secondary and tertiary HFs**

An additional finding of the HF-level study (point 4 above) was that not all of the 23 secondary and tertiary HFs visited in May 2019 report their health service data. LGA Supply Chain and M&E specialists support the primary HFs by entering MSF data into DHIS2, but do not always receive MSF from hospitals. These facilities have out-patient departments that both treat malaria and provide prophylactic interventions (especially to pregnant women).

**Intervention:** To improve data reporting, 400 Android devices were procured under the grant to support direct data reporting from secondary and tertiary institutions. The DHIS2 software was uploaded on the devices. In November 2019, staff from the ~400 secondary and tertiary facilities were trained on DHIS2, allowing these staff to report their HMIS data directly to DHIS2. Facilities began reporting on the devices in December 2019, with the first set of data were received in February 2020. Unfortunately, several of the health facilities are still facing challenges with system access and permission, and the team has continued to support in addressing these. In addition, as of March, due to the global coronavirus situation, the data has not yet been analyzed.

## **7. Gap between prescribed and dispensed ACTs**

When patients are diagnosed with malaria at a health facility, the diagnosis is recorded in the patient OPD Register. If ACTs are prescribed, the column “ACT? Y/N” is checked. In smaller facilities, the same clinician who diagnosed the patient dispenses the medicine while in larger facilities, the patient goes to the dispensary to collect the ACT. Data collectors reported that

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<sup>2</sup> Nigeria’s malaria Standard Treatment Guidelines require testing by RDT or microscopy before treatment. However, treatment should not be delayed if a test cannot be carried out promptly.

occasionally the patient arrives at the dispensary and is told there are no ACTs and to buy them from a pharmacy. In this situation, the number of doses recorded in the OPD Register might not be consistent with what was issued from the health facility.

**Intervention:** NMEP with support from CRS, MSH and other PSM stakeholders developed a Daily Consumption Register (DCR) that record the number of ACTs dispensed to HF patients each day. This tool is intended to close the information gap between what is prescribed and what is dispensed to patients. Trainings of trainers was held in July - September 2019, and the DCR was put into use in November 2019. There was an LFA finding on the complexity of the DCR in Dec. 2019. MSH is working on gathering feedback on the ease of use of the tool from facilities in the 13 States. This information will be used to support reviewing the register with all stakeholders going forward.

## **8. Some HFs and LGAs do not cross-check/compare LMIS & HMIS data**

Cross-checking LMIS and HMIS data is most effective when done using LMIS and HMIS records of individual health facilities. While this activity was not carried out at all at service delivery point, it was not routinely practice across board during LGA bi-monthly validations meetings. Additionally, there was no tool or guide to carry out this activity in a uniform manner and health facility staff noted the lack of time to carry out this labor-intensive activity, while others did not know how to go about it.

**Intervention:** The SRs collaborated with State malaria program staff developed a simple tool to guide the LMIS/HIMS data cross check and thereafter instituted the implementation at all supported health facilities as part of data quality improvement initiative. State LMCU and LGA malaria staff work with HF staff to check the LMIS and HMIS data at the bi-monthly review meetings and ensuring that evidence of facility is established with submission of the facility validation form. LGA staff also check that the total LMIS and HMIS data for the LGA match and resolve all discrepancies before entry into the DHIS platform. This intervention is running in all 13 states and began in November 2019.

## **9. States do not cross-check LMIS & HMIS data**

Once LMIS and HMIS data is cross checked at the HF and LGA level, the aggregate data should be cross checked at the state level before it is aggregated at the national level during the State quarterly review meeting.

**Intervention:** Pilot project in Yobe; State LMCU officers doing triangulation of state-level data Yobe state has established a data triangulation team made up of senior SMOH officials and directors from SMOH, HMB and SPHCDA. Yobe has instituted its own State-led quarterly data triangulation exercise. This activity is led by the Director of Public Health, the Director of Disease Control and the LMCU coordinator under the oversight of the Commissioner for Health. The first state-wide data check took place in January 2020.

The SRs conduct State level bimonthly HMIS-LMIS triangulation using a triangulation tool to analyse LMIS data from Navision and Service data from DHIS. The output of this analysis will inform visit to facilities with high variance between the 2 sets of data. There is a plan by MSH to engage ad-hoc personnel that would visit such identified facilities and provide on the job capacity building on identified gaps.

#### **10. Order fill rates not monitored**

Resupply quantities for health facilities are calculated in the Navision platform as the BFSR is entered into the system. The State LMCU staff and the SRs in each state use this information and together with data on available malaria commodities in regional warehouse as the basis of the distribution lists that are submitted to Chemonics bi-monthly. Chemonics fills orders against the distribution lists based on availability. Currently, no one is monitoring how closely the delivered orders match the distribution lists created by the SRs.

**Intervention:** As part of the new Service Level Agreement (SLA) between Chemonics and CRS signed in Q1, 2020. CRS will begin to monitor On-Time and In-Full (OTIF) Key Performance Indicators (KPI) on quarterly basis. CRS will share the KPI output with Chemonics, and PSM stakeholders during the quarterly performance review meeting facilitated by RSSH grant. The intervention will begin from May 2020. In the case of under delivery, this will allow supply chain staff at the State and LGA levels to monitor HF stock levels against any stock outs, arrange for an additional delivery if needed, and allow them to authorize higher than normal replenishment quantities in a subsequent supply cycle to restore a health facility's stock and buffer.

## 5 Recommendations

Reductions in the HMIS/LMIS discrepancies since the May 2019 study indicate that the first set of interventions are having a positive impact. The PRs and SRs plan to continue the current interventions. Additional opportunities to strengthen systems are itemized below.

### **Issue: Data triangulation not done at health facilities**

- 1) **Recommendation:** The PRs and SRs to collaborate to create forms and training on HF-level data triangulation, and to mentor to HF staff. In the future, this could include teaching HF staff how they can use the data in their work.

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Medium

### **Issue: OPD Register/MSF discrepancies**

- 2) **Recommendation:** Analyze discrepancies at primary, secondary, and tertiary facilities. Identify targeted solutions for each level of health facility. Continue Hospital reporting of health service data on tablets.

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Short

- 3) **Recommendation:** Monitor performance of State LMCU Coordinators.

Responsible Organizations: NPSCMP

Timeline: Medium, on-going

### **Issue: ICC Navision discrepancies**

- 4) **Recommendation:** Analyze ICC/BFSR discrepancies and systems at primary, secondary, and tertiary facilities. Identify targeted solutions for each level of health facility.

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Short

### **Issue: Health facilities not always informed of planned resupply quantities**

- 5) **Recommendation:** Investigate feedback mechanisms from LMIS data entry clerk to health facilities to inform HF of resupply quantities.

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Short

**Issue: No mechanism to verify if health facilities data records are updated/and corrected after bi-monthly review or after data entry**

6) **Recommendation:** Develop feedback forms to report data check errors to HFs.

Responsible Organizations: NMEP, CRS, State LMCUs, MSH, MC

Timeline: Medium

**Issue: Lack of staff motivation**

7) **Recommendation:** Develop bi-monthly recognition system for HF and LGA health and logistics staff. Award certificates at bi-monthly meetings. Announce winners on local radio. Explore HF to HF knowledge sharing/exchanges by high performing staff.

Responsible Organizations: State, MSH, MC

Timeline: Short

**Issue: Actionable information in DQA, IMSV, and DVM reports**

8) **Recommendation:** Review DQA, IMSV, DVM reports regularly.

9) **Recommendation:** Develop one-page dashboard summarizing findings of field reports

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Immediate

**Issue: Staff attrition and frequent staff transfers**

10) **Recommendation:** Institute continuous in-service staff training. Train HF staff on stock management tools. Support LGA staff to provide HF oversight. Create database of trained staff.

Responsible Organizations: NMEP, CRS, MSH, MC

Timeline: Short

## 6 Conclusions

The desk review and field study showed improvements since the 2019 study.

1. In 2019, health facilities reported consumption of 12.7 million doses of ACTs (LMIS) and 9.9 million cases of malaria were reported (HMIS). The discrepancy of 2.7 million is 21% of the ACTs that were on the approved Last Mile Distribution lists. This is a decrease from the 40% LMIS/HMIS discrepancy reported for 2018. This reduction in the HMIS/LMIS disparity suggests the ongoing interventions are yielding positive results. We recommend continuing efforts to build staff reporting capacity, improve reporting tools, and continuing information sharing between all partners.
2. The review of National POD and HF PODs showed that nearly all the ACTs on the National PODs were delivered to and signed for by the health facilities.
3. Disaggregating LMIS and HMIS data into primary, secondary, and tertiary health facilities showed different gaps at different levels of the health system. The analysis showed greater discrepancies between LMIS and HMIS source documents (ICC and OPD registers) and the reports (BFSR and MSF) at secondary and tertiary health facilities than at primary health facilities. We recommend continuing to build staff capacity, expanding the use of digital tools at secondary and tertiary facilities, and continuing to look for different, targeted solutions for each level of the health care system.
4. Interventions taken since July 2019 appear to be having a positive impact. We recommend continuing these interventions, including supervision and monitoring and DQA activities. LMIS/HMIS assessment to continue for the 2020 implementation.



# Annex 1 Annexes

## 1.1 Proxy delivery survey questions

**\*37a. Are ACTs delivered directly to your health facility by 3PLs during LMDs?**  
*Supply period is JULY-AUGUST 2019*

Yes  
 No

**\*37ai. Did the commodity ever arrived?**  
*Supply period is JULY-AUGUST 2019*

Yes  
 No

**\*37aii. How did the commodity arrived?**  
*Supply period is JULY-AUGUST 2019*

Health facility collected at LGA  
 LGA delivered to health facility  
 Health facility paid for private transport  
 Other

Figure 5: Questions around delivery or proxy delivery

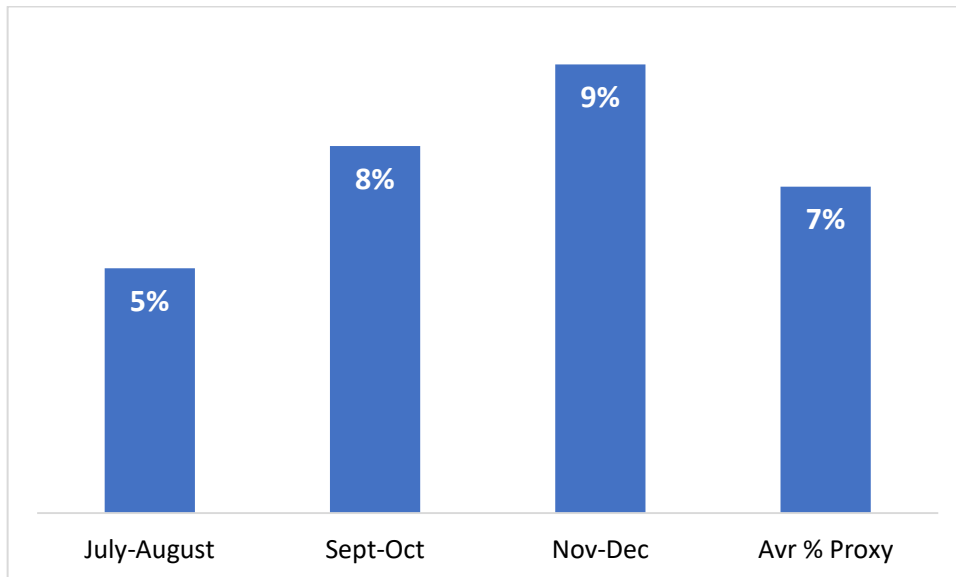


Figure 6: Reported proxy deliveries

## 1.2 LMIS and HMIS data aggregated by State

Aggregating data show general trends but can lose information if data cancel other data out. Because the GF malaria grant is implemented by different partners in different States, we analyzed the LMIS/HMIS data for each at State.

### 1. Comparison of physical evidence of delivery of ACTs at Health Facilities

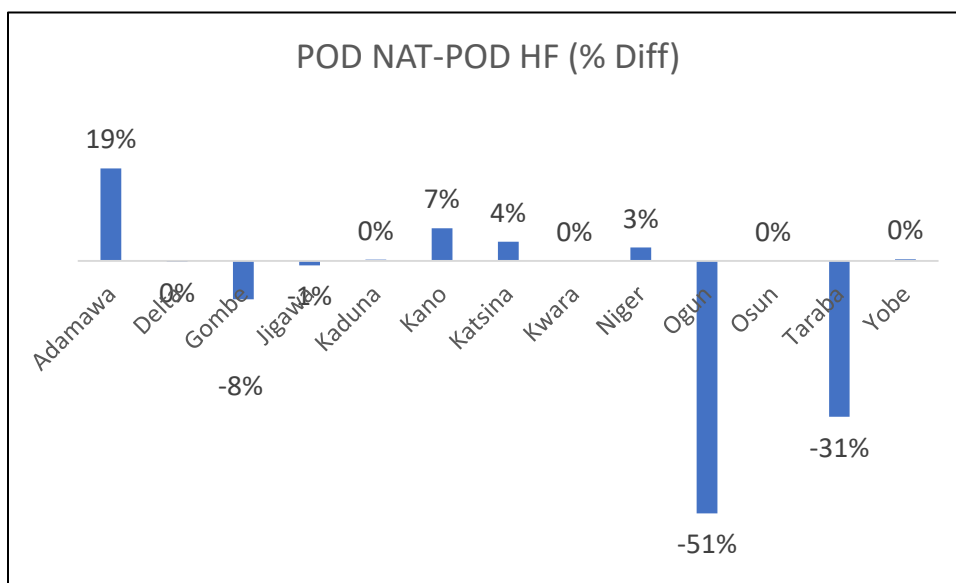


Figure 7: Comparison between National POD and HF POD, by State

This analysis shows that 10 States have less than 8% discrepancy between National POD and the HF POD. However three States seem to be contributing significantly to the discrepancy. The data suggest the need for a targeted intervention in Ogun and Taraba, and possibly in Adamawa.

### 2. Comparison of total quantity of ACTs distributed in the HFs as recorded on the ICCs and reported in the BSFR

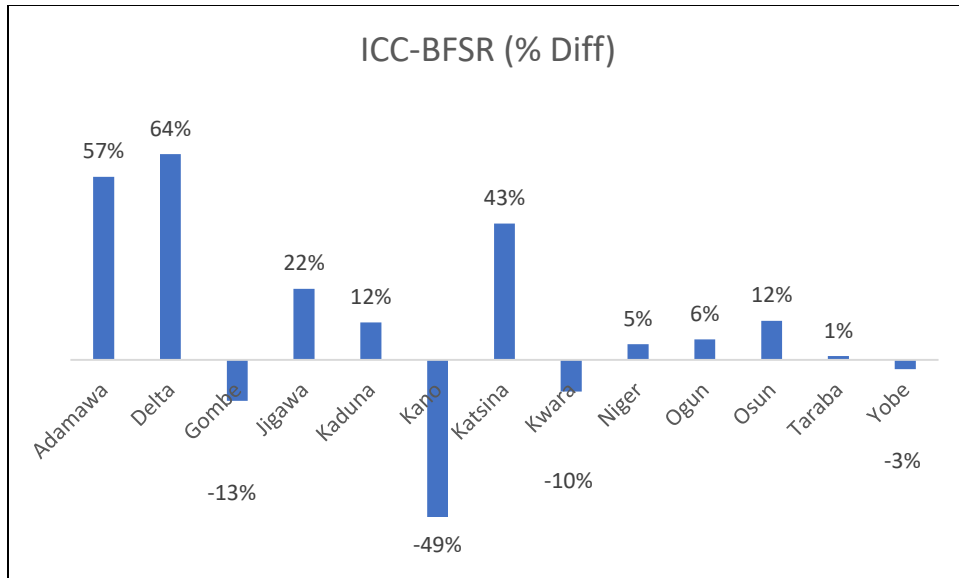


Figure 8: Comparison between ICC & BFSR records, by State

This state-level analysis shows that in eight States the discrepancy between ICC and BFSR is less than 13%. The discrepancy in Jigawa is 22%. The difference in ACT doses recorded on ICC in Katsina, Adamawa and Delta is greater than the quantity reported on the BFSR (ranging from 43%-64% respectively). The ICC/BFSR discrepancy in Kano is -49% which means that more doses of ACT were reported on the BFSR than were recorded on the ICCs. All of these differences suggest the need for additional study. Refresher training for HF and LGA staff on LMIS tools could start by focusing on these four States.

### 3. Comparison of records of patient care and source information for HMIS

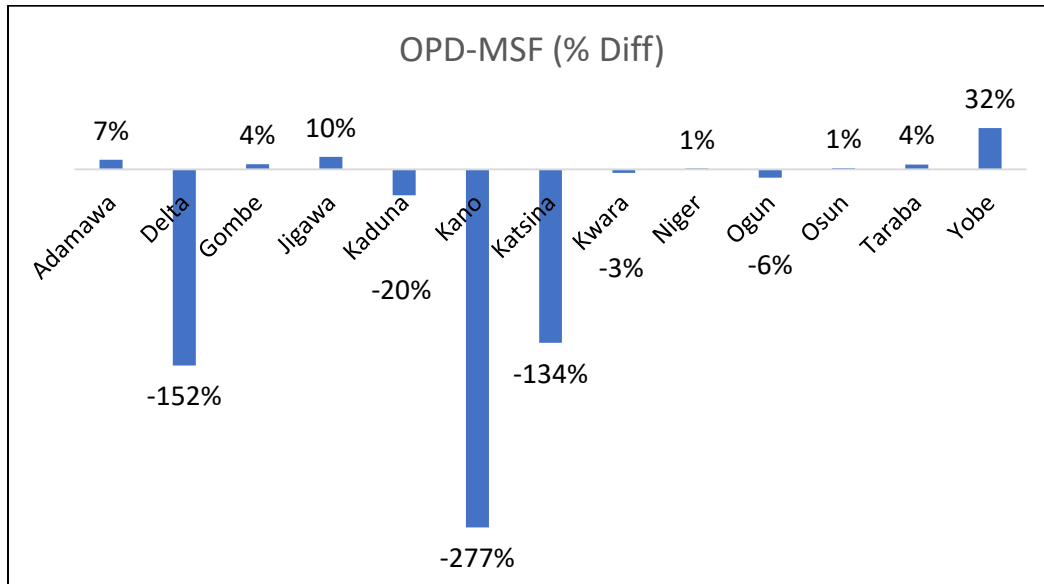


Figure 9: Comparison between OPD & MSF records, by State

The health facilities visited for this survey in Delta, Kano, and Katsina recorded discrepancies between the number of malaria cases recorded in the OPD and IPD registers and the MSF of -134%, -152%, and -277% respectively. This means that the number recorded on the MSF was greater than the number in the registers. (Ex: in the HF's visited in Delta, the registers recorded 7607 cases of malaria and the MSF recorded 19142.) These differences suggest the need for additional study.

#### 4. Comparison between LMIS (BFSR) and HMIS (MSF)

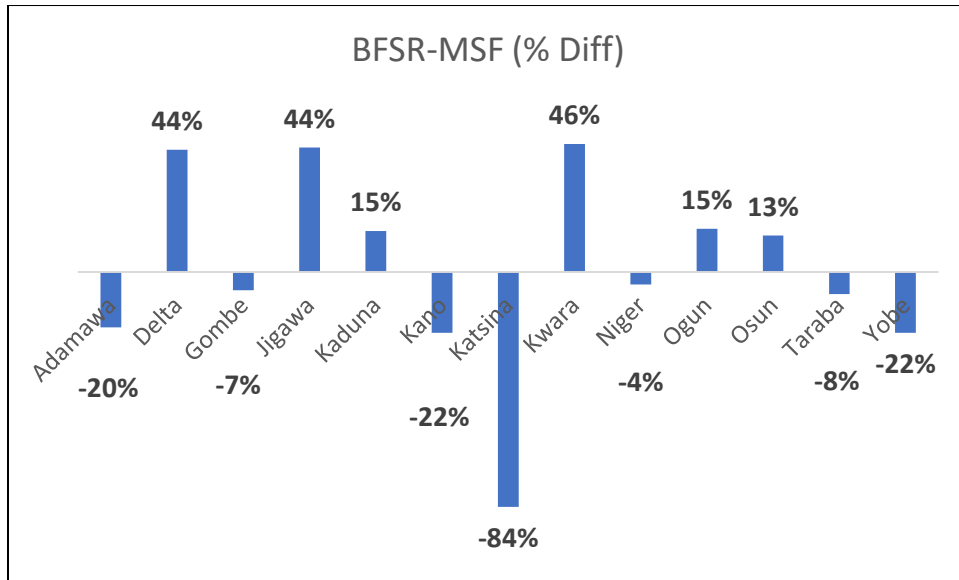


Figure 10: Comparison between LMIS & HMIS, by State

This chart is more difficult to analyze. BFSR (LMIS) data was taken as the base. A positive difference (Delta, Jigama, Kwara) indicates a greater number of doses of ACT were reported as Issued from Dispensary than were reported as Prescribed to Patients (i.e., reported number of malaria cases). Without checking the stock levels at each health facility it is not possible to know if there is stock remaining at these locations or if the reported data are incorrect. For Adamawa, Kano, Katsina, and Yobe, the chart shows that the number of cases of malaria at the health facilities in the survey was greater than the quantity of ACT doses issued from the Dispensary. Again, further study is required to see whether patients were diagnosed but not dispensed ACTs (perhaps due to a stock out), if the data on the BFSR are incorrect, or there is another reason.

These four state-level analyses suggest possible future detailed studies.

#### 1.3 LMIS and HMIS data for two individual health facilities

Just as grant-wide aggregated data lose State-level details, State-level aggregated data lose details on what is happening at individual health facilities. To illustrate this point, the LMIS/HMIS data for two primary health facilities in Kano State are shown below.

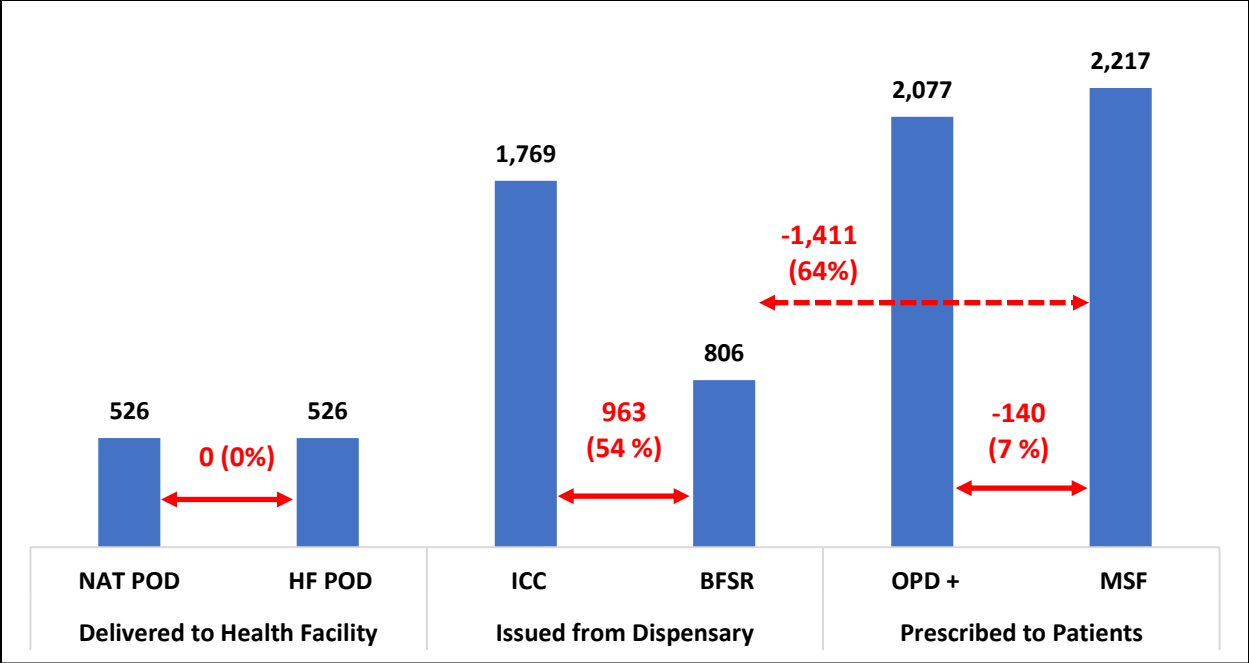


Figure 11: Chiromawa health facility, Kano State

The data from Chiromawa Health Facility show a perfect match between the National PODs and the health facilities PODs. In addition, the number of malaria cases recorded in the registers and the number reported on the MSF differ by only 7%. Where the data diverge is in the logistics data. With 1,769 doses of ACTs recorded on the ICCs, but only 806 reported in the BFSRs, there is a difference of 54%. Whether the HF failed to submit one BFSR or staff require additional training, cannot be determined without further discussions.

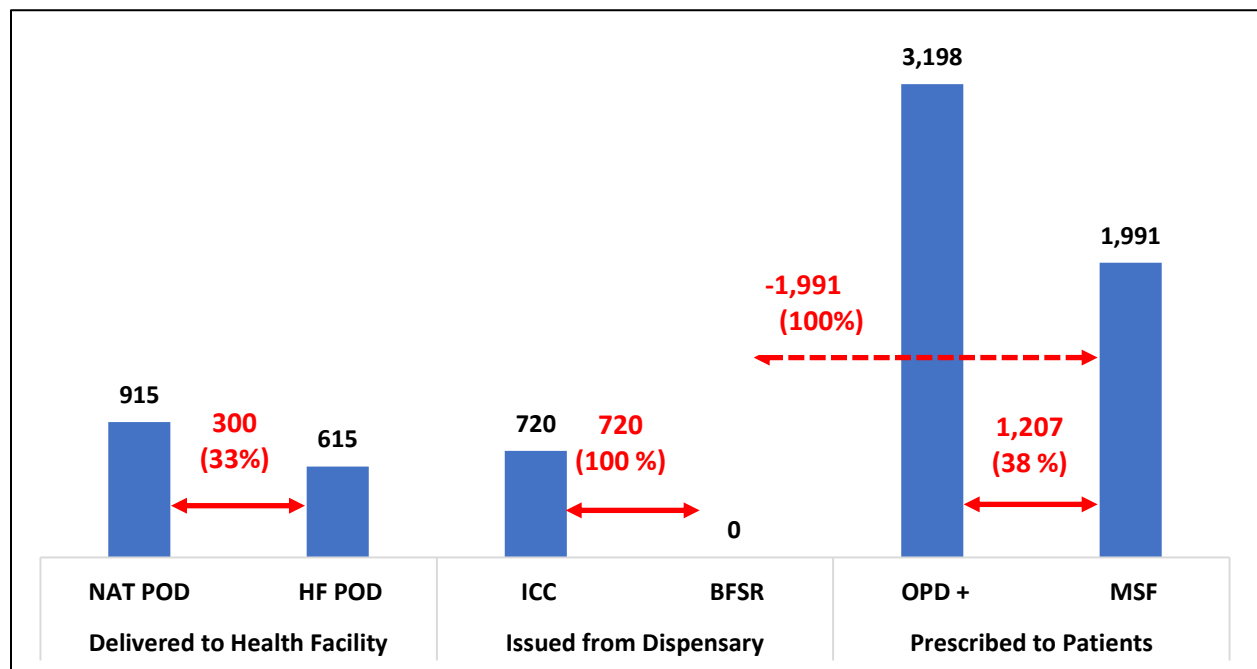


Figure 12: Dantamashe health facility, Kano State

The most striking thing in this graph is that Dantamashe Health Facility did not submit any of the three required BFSR reports between July and December 2019. Second, while Kano averaged 7% difference between National POD and the HF POD, at Dantamashe HF the discrepancy was 33%. Last of all, this HF reported fewer cases of malaria on their MSF than were recorded in their OPD register.

These two examples illustrate that some interventions will apply to all health facilities, while other interventions will be targeted to specific facilities. With approximately 10,000 health facilities operating under the GF Malaria grant, developing analyses to identify which health facilities and regions require which interventions will be important.

#### 1.4 Root causes of ACT discrepancies

Data collectors asked HF staff their thoughts on causes of ACT discrepancies. Data collectors marked off as many of the responses below that matched.

**\*31. Root cause(s) of any observed discrepancies**

- Inaccuracy of transcription of data from ICC to BFSR reports
- Staff have inadequate time to enter data in registers
- Health record tool not available
- Logistics record tool not available
- Inaccuracy of transcription of data from OPD to MSF
- Patients received ACTs were not registered in the OPD registers
- Dispensary stocks not included in the bimonthly stock (BFSR) reports
- OPD patients not included in MSF
- No ability to keep copies of reports, orders
- No dedicated health/logistic record staff
- Other

Figure 13: Root causes of LMIS and HMIS report discrepancy question.

For the root cause analysis, data collectors discussed why there were discrepancies with health facility staff and checked off all responses on the list above. Additional responses were noted under “Other”.