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EVALUATION

Strategic Program for Analyzing Complexity and Evaluating Systems (SPACES) Retrospective Evaluation of SCMS and DELIVER in Nigeria

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This publication was produced at the request of the United States Agency for International Development. It was prepared independently by ResilientAfrica Network (RAN) on behalf of the SPACES Consortium.

ACRONYMS

3TC	Lamivudine
AA	Artesunate + Amodiaquine
ABC	Abacavir
ABC/3TC	Abacavir /Lamivudine
ACT	artemisinin-based combination therapy
AL	Artemeter + Lumefantrine
ARV	Antiretroviral
ATV	Atazanavir
ATV/r	Atazanavir/ritonavir
d4T	Stavudine
AZT	Zidovudine
AZT/3TC	Zidovudine/Lamivudine
AZT/3TC/EFV	Zidovudine/Lamivudine/Efavirenz
AZT/3TC/NVP	Zidovudine/Lamivudine/Nevirapine
CD3	Cluster of differentiation 3
CD4	Cluster of differentiation 4
d4T/3TC	Stavudine/Lamivudine
d4T/3TC/NVP	Stavudine/Lamivudine/Nevirapine
ddI	Didanosine
DPTT	Dynamic Project Trajectory Tracking
DRV	Darunavir
EFV	Efavirenz
ETR	Etravirine
FP	Family Planning
FTC	Emtricitabine
GHSC	Global Health Supply Chain
GKI	Global Knowledge Initiative
GOPC	Global Obesity Prevention Center
HCT	HIV Counselling and Testing
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IUCD	Intra-Uterine Contraceptive Devices
LGA	Local Government Area
LLIN	Long-Lasting Insecticide Treated Net
LMIS	Logistics Management Information System
LPV/r	Lopinavir/Ritonavir
M&E	Monitoring and Evaluation
NVP	Nevirapine
OI	Opportunistic Infection
PMTCT	Prevention of Mother-to-Child Transmission
PPL	Policy, Planning and Learning
PSM	Procurement and Supply Management
RAL	Raltegravir
RAN	ResilientAfrica Network
RDT	Rapid Diagnostic Test
RH	Reproductive Health
RTK	HIV Rapid Test Kits
RTV	Ritonavir
SCMS	Supply Chain Management System

SPACES	Strategic Program for Analyzing Complexity and Evaluating Systems
MERL	Monitoring, Evaluation Research and Learning
SDP	Service Delivery Point
SP	Sulphadoxine + Pyrimethamine
SQV	Saquinavir
TDF	Tenofovir
TDF/3TC	Tenofovir/ Lamivudine
TDF/3TC/EFV	Tenofovir/ Lamivudine/ Efavirenz
TDF/FTC	Tenofovir/Emtricitabine
TDF/FTC/EFV	Tenofovir/Emtricitabine/ Efavirenz
USAID	United States Agency for International Development

EXECUTIVE SUMMARY

Introduction and Evaluation Focus

This report presents evaluation findings from the USAID DELIVER and SCMS project implementation at the country level in Nigeria. The goal of the DELIVER and SCMS programs is to ensure availability of commodities under the three in-country program elements (HIV/AIDS, Malaria, and Population and Reproductive Health) to end users in Nigeria at a range of service delivery points served by the program. The report highlights findings from investigating the performance of the service delivery points in managing stock levels of health commodities and reporting in Nigeria. The findings are derived from data captured in the Logistics Management Information System (LMIS) at country level.

The purpose of this evaluation was to conduct a systems based retrospective analysis of USAID's DELIVER and SCMS programs for health commodity supply in Nigeria over three fiscal years 2013 to 2015. This evaluation is designed to gauge performance in reporting and stock management of health commodities under the SCMS (HIV/AIDS supply chain) program and the DELIVER (Malaria and Family Planning supply chains) program while simultaneously linking the performance to system level drivers. The evaluation was centered on three evaluation questions: (1) Document progress over the three year review period for the SCMS and DELIVER projects using a defined list of performance metrics and any other pertinent metrics; (2) Based on currently available data, what were the most likely driving forces for program indicators that have improved over time or for those that have stagnated or declined? And (3) what are the lessons learned and recommendations from both SCMS and DELIVER programs?

The evaluation questions were assessed using three performance indicators for regular monitoring of country-level systems strengthening programs following consultation with USAID. The indicators were extracted from the in-country indicator set of performance indicators as presented in the GHSC-PSM monitoring and evaluation plan. The in-country performance indicators of focus were:

A. Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in the supply system
B. Stock out rate at SDPs
C. SDP reporting rate to the Logistics Management Information System (LMIS)

Project Background
The ResilientAfrica Network (RAN) that is one of the four partners in the Strategic Program for Analyzing Complexity and Evaluating Systems (SPACES) Monitoring, Evaluation, Research, and Learning (MERL) consortium conducted this analysis. USAID's Global Development Lab and the Bureau for Policy, Planning and Learning (PPL) supports the SPACES MERL project, which aims to bring systems methods and tools to help decision-making. The SPACES MERL Consortium includes the GOPC at Johns Hopkins University (Prime), Global Knowledge Initiative (GKI), LINC, and ResilientAfrica Network (RAN).

From February 2017 – July 2017, the RAN implemented its Dynamic Project Trajectory Tracking (DPTT) Tool to evaluate the SCMS and DELIVER programs in Nigeria. The USAID Global Health Supply Chains consist of three separate supply chains. The USAID Supply Chain Management Systems (SCMS) project manages a supply chain to deliver HIV/AIDS commodities to countries. The USAID DELIVER project manages two supply chains to countries, one for malaria commodities and another for family planning commodities. systems. The scope of these in-country supply chain systems managed health commodities delivered to the service delivery points (SDPs).

Methodology
The evaluation utilized data reported in the LMIS for the period of October 2012 to September 2015 as was available for the different health commodities that were distributed in the various service delivery points through the SCMS and DELIVER programs in Nigeria. For the SCMS program, data on ARVs, RTK and CD4 commodities was considered. For DELIVER, health commodities for Malaria and Reproductive Health were considered.

SCMS and DELIVER projects data were analyzed separately using RAN's dynamic project trajectory tracking (DPTT) tool based on the health commodities' stock status as derived from the three key variables

- Stock on hand obtained from opening balance, received quantity, positive adjustments, negative adjustments and quantity consumed
- Minimum stock for the cycle was equivalent to the quantity consumed in the two months or twice the average monthly consumption
- Maximum stock computed as twice the quantity consumed in the two months cycle or four times the average monthly consumption

Each of these analyses led to the construction of performance trajectories.

Key Findings and Recommendations
The following are the main findings from this evaluation according to each performance indicator and the corresponding recommendations:

Performance Indicator 1: Percentage of stock status observations in storage sites, where commodities are stocked according to plan

Findings: Stocking according to plan was low-to-moderate for most commodities and was better for higher demand commodities compared to lower demand commodities. Secondary hospitals performed better than other facility types in stocking practices for ARVs while primary care facilities performed very well in stocking of malaria commodities. Some States performed better than others in stocking of Cotrimoxazole and Malaria commodities

Recommendations: For most commodities that were not stocked according to plan, over-stocking was the main contributing factor compared to under-stocking. There is need for ongoing programs to prioritize capacity enhancement for commodity forecasting and inventory management at the health

facilities, especially at the primary care facilities where the bulk of the supplies go. Procurements of the newly recommended drugs should be implemented in a phased way to reduce over-stocking and expiry of drugs that are facing withdrawal from the system. There is need to improve supportive supervision so that all program health care facilities receive at least one supervisory visit focusing on stock management every financial year. Closer monitoring of stock flows for selected commodities at risk of expiry is necessary to be done so as to rump up their utilization or optimize their orders.

Performance Indicator 2: Stock out rate at SDPs

Findings: The frequency of stock outs was low for both 1st line and 2nd line ARVs but high for rapid diagnostic tests and short term family planning methods. The higher the facility level the lower the stock out rates for most commodities.There were some differences in stock out rates between States, some states showing marked reductions while others showed high stock out rates for certain commodities

Recommendations: The stocking levels of HIV RTKs fluctuated a lot in periods where HIV testing campaigns were conducted and this resulted into stock outs, especially for Determine, which were also exacerbated by procurement disagreements at the national level. There is need for national level health program planners to coordinate with the procurement teams at the national level to improve forecasting for HIV RTKs when HCT campaigns are planned. The consumption of 1st line RTKs was higher at the primary care centers compared to Secondary Hospitals, leading to more frequent stock outs at the former. There is need to reset the prevalence rates used for fore-casting needs for RTKs relative to their demand at primary care facilities vs. Secondary Hospitals. Factors that drove the reductions in stock outs rates for AA in Kogi State and reductions in Malaria RDT stock outs in Kebbi State would need to be explored to draw cross-lessons on measures that could be applied in other States.

Performance Indicator 3: SDP reporting rate to the logistics management information system (LMIS)

Findings: Starting from low levels, reporting rates for commodities increased steadily over the review period for HIV and Malaria commodities but remained low for RH commodities. Reporting rates for primary care centres and secondary Hospitals were low at the beginning but improved steadily while reporting rates for tertiary hospitals were very low.

Recommendations: To improve reporting, there will be need to re-inforce health worker skills and support supervision. These efforts need to be targeted to primary care facilities where more challenges with stock management were observed. However, tertiary hospitals need to be engaged to improve their responsiveness to reporting.

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1.0 INTRODUCTION

This report presents evaluation findings from the USAID DELIVER and SCMS project implementation at the country level in Nigeria. The goal of the DELIVER and SCMS programs is to ensure availability of commodities under the three in-country program elements (HIV/AIDS, Malaria, and Population and Reproductive Health) to end users in Nigeria at a range of service delivery points served by the program. The report highlights findings from investigating the performance of the service delivery points in managing stock levels of health commodities and reporting in Nigeria. The findings are derived from data captured in the Logistics Management Information System (LMIS) at country level. The report is presented in six sections: Section 1 contains an introduction to the evaluation program, including the purpose of the evaluation and the evaluation questions. Section 2 gives a background to the program at the country level, the SPACES consortium and its approach to systems level M&E, as well as one of the MERL-SPACES tools, the Dynamic Project Trajectory Tracking Tool that was adapted and used for this analysis. Section 3 describes the methodology and the data used for the evaluation as obtained from the LMIS system, together with the definitions of the key variables included in the analysis. Section 4 presents the findings from the evaluation by the performance metrics of interest. Section 5 presents the recommendations and concluding remarks. Section 6 gives the Annexes to the findings. The annexes contain detailed tables and graphics from which the key findings summarized in the results section were derived.

1.1 Focus of the evaluation

1.1.1 Evaluation purpose and evaluation questions

The purpose of this evaluation was to conduct a systems based retrospective analysis of USAID's DELIVER and SCMS programs for health commodity supply in Nigeria over three fiscal years 2013 to 2015. This evaluation is designed to gauge performance in reporting and stock management of health commodities under the SCMS (HIV/AIDS supply chain) program and the DELIVER (Malaria and Family Planning supply chains) program while simultaneously linking the performance to system level drivers. The evaluation was centered on three evaluation questions: (1) Document progress over the three year review period for the SCMS and DELIVER projects using a defined list of performance metrics and any other pertinent metrics; (2) Based on currently available data, what were the most likely driving forces for program indicators that have improved over time or for those that have stagnated or declined? And (3) what are the lessons learned and recommendations from both SCMS and DELIVER programs?

1.1.2 Performance metrics

To assess performance of both programs, the evaluation focused on three performance indicators for regular monitoring of country-level systems strengthening programs following consultation with USAID. The indicators were extracted from the in-country indicator set of performance indicators as presented in the GHSC-PSM monitoring and evaluation plan. The in-country performance indicators of focus were:

D. Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in the supply system
E. Stock out rate at SDPs
F. SDP reporting rate to the Logistics Management Information System (LMIS)

These indicators are defined in Table I below as follows:

Table 1: Performance indicator definitions

Performance Indicator	Definition	Comments
Percentage of stock status observations in storage sites, where commodities are stocked according to plan, by level in supply system.	**Numerator:** Number of stock status observations for a tracer commodity that are within the designated minimum and maximum quantities at storage sites **Denominator:** Total number of stock status observations for a tracer commodity at storage sites	Each product has an estimate for the minimum stock level that is based on the average monthly consumption or 2-monthly consumption. Since the supply cycles are 2-monthly, the minimum stock level is the quantity that should last 2 months while the maximum stock is the quantity that should last 4 months. Stocked according to plan is when stock on hand is between the minimum and maximum stock levels.
Stock out rate at SDPs	**Numerator:** Number of SDPs that were stocked out of a specific tracer product according to the ending balance of the most recent logistics report (or on the day of site visit) **Denominator**: Total number of SDPs that reported/were visited in GHSC-PSM supported countries which offer the tracer product.	An SDP had stock out on a product when stock on hand was zero
Service Delivery Point (SDP) reporting rate to the Logistics Management Information System (LMIS).	**Numerator:** Number of SDPs that submitted the required LMIS report(s) or order form(s) during the previous reporting period. **Denominator:** The total number of SDPs in country which should be reporting.	-Percentages of unique SDPs that reported for each 2-monthly cycle out of the total unique SDPs for each product were computed -For each product, the consistency in reporting into LMIS for unique SDPs over the 3-year period were analyzed.

2.0 PROJECT BACKGROUND

2.1 The Nigeria program of the Global Health Supply Chain

The Nigeria program consists of two projects: The SCMS project supplied HIV commodities including adult ARV drugs, Pediatric ARV drugs, RTKs, OI drugs and CD4 commodities to facilities providing HIV/AIDS services in various states of Nigeria. The DELIVER project supplied malaria and reproductive health commodities. Deliveries targeted approximately 6,000 facilities at different levels in Nigeria. There are three main facility types: Primary health centers, secondary hospitals and tertiary hospitals. The supplies targeted several States in Nigeria. The projects collected data on the utility of the commodities in health facilities using LMIS at periodic intervals of two months. The overall objective of the program was increased availability of essential health supplies in public and private services by strengthening health commodity supply chains, strengthen environment for commodity security, and increasing knowledge management and dissemination. Supported facilities are expected to report on a regular basis through Logistics Management Information System (LMIS).

2.2 The SPACES Consortium

The ResilientAfrica Network (RAN) that is one of the four partners in the Strategic Program for Analyzing Complexity and Evaluating Systems (SPACES) Monitoring, Evaluation, Research, and Learning (MERL) consortium conducted this analysis. USAID's Global Development Lab and the Bureau for Policy, Planning and Learning (PPL) supports the SPACES MERL project, which aims to bring systems methods and tools to help decision-making. The SPACES MERL Consortium includes the GOPC at Johns Hopkins University (Prime), Global Knowledge Initiative (GKI), LINC, and ResilientAfrica Network (RAN).

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2.3 Dynamic Project Trajectory Tracking (DPTT) tool

Developed by RAN the dynamic project trajectory tracking (DPTT) is an innovative web-based project tracking & evaluation tool for single/multiple projects. It links shared static milestones with other emergent indicators; Milestone commitments and their actual dates of attainment (time to events), emergent explanatory signals for tardiness or rapid success and dynamic indicators and events. The platform can construct trajectories, signal stall, and better understand delay or other system behaviours. It uses a mix of shared process indicators (pipeline milestones) and stated early impact indicators (project-specific outcomes). DPTT is very innovatory because it tracks all individual or multiple orders/projects on the pipeline and presents their progress in real-time as individual orders and as a cohort.

3.0 METHODOLOGY

3.1 Description of the Data

The evaluation utilized data reported in the LMIS for the period of October 2012 to September 2015 as was available for the different health commodities that were distributed in the various service delivery points through the SCMS and DELIVER programs in Nigeria. For the SCMS program, data on ARVs, RTK and CD4 commodities was considered. For DELIVER, health commodities for Malaria and Reproductive Health were considered.

The data were reported in cycles of two months with information on states, service delivery points, and their facility codes. The service delivery points were classified into primary health centres, secondary hospitals and Tertiary hospitals. Primary health centres included service delivery points recorded as dispensaries, clinics, primary health centres, maternal and child health centres, domiciliaries, health centres, and health posts. Tertiary hospitals included teaching hospitals and federal medical centres. Secondary hospitals comprised of general hospitals, medical centres, rehabilitation centres, trauma and orthopedic centres and all service delivery points recorded as hospitals with the exception of teaching hospitals. The service delivery points that were not obvious to classify were assigned to be primary health centres on assumption that they would provide basic health services. In addition, data on quantities of the health commodities were recorded on the following key variables

- Stock on hand obtained from opening balance, received quantity, positive adjustments, negative adjustments and quantity consumed
- Minimum stock for the cycle was equivalent to the quantity consumed in the two months or twice the average monthly consumption
- Maximum stock computed as twice the quantity consumed in the two months cycle or four times the average monthly consumption

To address the performance metrics the SDPs were considered to have been

i. Stocked according to plan if stock on hand was between the minimum and maximum stock (i.e. Min stock < Stock on Hand < Max stock)
ii. Understocked if stock on hand was less or equal to minimum stock (i.e. 0 < Stock on Hand <= Min stock)
iii. Overstocked if stock on hand was greater or equal to maximum stock (i.e. Stock on Hand >= Max stock)
iv. Stocked out if stock on hand was zero (i. e. Stock on Hand = 0)

The health commodity categories considered for both SCMS and DELIVER are the following:

(a) SCMS – HIV/AIDS ARV drugs

The Antiretroviral drugs evaluated include: Adult first line, adult second line, pediatric first line, and pediatric second line drugs. They also included commodities for treatment of opportunistic infection as indicated in the Table 2.

Table 2: HIV/AIDS drugs

HIV drugs	categories
Adult first line ARV drugs	3TC, AZT, EFV, NVP, TDF/3TC/EFV, ABC/3TC AZT/3TC, AZT/3TC/NVP, TDF/3TC, TDF/FTC, TDF/FTC/EFV, AZT/3TC/EFV, d4T/3TC/NVP, d4T/3TC
Adult second line ARV drugs	ATV, ATV/r, LPV/r, ABC, ABC/3TC, RTV, ddI, SQV, DRV, ETR, RAL
Pediatric first line ARV drugs	ABC/3TC, AZT/3TC, AZT/3TC/NVP, d4T/3TC, d4T/3TC/NVP, NVP, EFV, AZT, 3TC, d4T
Pediatric second line ARV drugs	ABC, LPV/r, ddI
Drugs for Opportunistic Infections	Cotrimoxazole, Fluconazole, Ciprofloxacin

(b) SCMS – HIV Rapid Diagnostic Test Kits (RTK)

The evaluation considered three HIV Rapid Test Kits: Determine (the first-line RTK) and Stat-Pak and Uni-Gold (which are used as second-line tests.

(c) SCMS - CD4 commodities

These included commodities needed to conduct the CD4 count testing. The main items are summarized in the table below:

Table 3: CD4 analysis commodities

Category	Category Description
BD FACSCOUNT REAGENTS	Absolute and Percentage Count; CD4/CD3 Reagent Kit; Clean Solution, 5L; Control Kit, 25 Tests; Rinse Solution, 5L; Sheath Fluid, 20L; Thermal Paper 5 Rolls
PARTEC CYFLOW REAGENTS	CD4 Easy Count Buffer; CD4 Easy Count Kit, Absolute; CD4% Easy Count Kit; Cleaning Solution, 250mL; CountCheck Beads, Green; Decontamination Solution; Sample Syringes sample tubes; Sample Tubes, 3.5mL, 500 Pcs Sheath Fluid, 5L; Thermal Printer Paper, 5 Rolls
PIMA	Analyzer Thermal Printing Paper; CD4 Cartridge Kit,100 Tests; Pima Sample Collection Kit, 100 Units

(d) DELIVER - Malaria

Malaria commodities considered included drugs, bed nets and rapid diagnostic tests. These are presented in Table 4;

Table 4: Malaria commodities considered

Categories	Category elements
AL	Artemeter 20 mg + Lumefantrine 120 mg (1 X 6 tabs; 1 X 12 tabs; 1 X 18 tabs; 1 X 24 tabs)
AA	(a) Artesunate 100 mg + Amodiaquine 270 mg (1 X 6 tabs) (b) Artesunate 50 mg + Amodiaquine 153.1 mg (1 X 6 tabs; 1 X 12 tabs; 1 X 24 tabs)
LLIN	Long Lasting Insecticide Treated Nets (LLIN)
RDT	Rapid Diagnostic Test (RDT)
SP	SP (Sulphadoxine 500 mg + Pyrimethamine 25 mg) 1 X 3 tabs

(e) DELIVER – Reproductive Health

Unlike other health commodities, the data for reproductive health commodities was available from October 2012 to December 2013 and it included no information on states. The service delivery points were reported by facility codes hence no classifications into primary, secondary and tertiary facilities could be made. The birth control methods examined included: Exluton, Jadelle implant, Condom female, Implanon implant, Microgynon, Noristerat 200mg, Depo-Provera 150mg, Condom male, IUCD and Lo-femenal.

4.0 KEY FINDINGS

This section presents the findings from the analyses conducted on the SCMS and DELIVER supply chain in Nigeria programs using the DPTT tool. The findings are presented under the three main evaluation questions for the Global Health Supply Chain assessment, namely: (1) Progress over the three years of review, (2) driving forces for the indicators and (3) lessons learned and recommendations for the country level program. Within each evaluation question, we present and discuss highlights of the key findings and key drivers of performance.

4.1 Evaluation Question 1 and 2: Progress over the three year review period for the SCMS and DELIVER projects and driving forces for the indicators

Within the core evaluation questions (progress over the review period and driving forces for the indicators, results are presented under the three main performance indicators specified in the scope of work, and focusing on aspects of the data that could be adapted to the DPTT tool: (1) Performance Indicator 1: Percentage of stock status observations in storage sites, where commodities are stocked according to plan, (2) Performance Indicator 2: Stock out rate at SDPs and (3) Performance Indicator 3: SDP reporting rate to the logistics management information system (LMIS).

4.1.1 Performance Indicator 1: Percentage of stock status observations in storage sites, where commodities are stocked according to plan

Key Finding 1.1 Stocking according to plan was low-to-moderate for most commodities and was better for higher demand commodities compared to lower demand commodities

Tracking of performance trajectories for the indicator 'percentage of stock-status that was according to plan' shows that performance on the indicator was low to moderate for most commodities on both programs over the review period. In general, first line medications tended to be better stocked according to plan compared to second line commodities. Commodities that were on higher demand (e.g. the ARV TDF/3TC/EFV and Cotrimoxazole) also performed generally better than the less demanded second-line commodities. It was important to disaggregate performance on this indicator to understand whether for commodities that were reported not to be stocked according to plan, the deviance was majorly from understocking or over-stocking. Disaggregation of the indicator shows that for most commodities, not stocking according to plan was mainly driven by over-stocking rather than under-stocking. Trends show that for most commodities, the proportion of facilities that were overstocked significantly exceeded the proportion that were understocked or stocked according to plan. However, for RH commodities, understocking was comparatively as high as overstocking.

HIV Drugs: The figure below shows trajectories for stocking according to plan for various 1st line ARV drugs. 1st line ARVs were generally better stocked according to plan compared to other HIV drugs. An average of one fifth of facilities stocked 1st line ARV drugs according to plan. TDF/3TC/EFV, which we explored as an indicator drug, showed steady improvement in this indicator over the review period (See figure below). On the other hand, 2nd line ARVs showed low levels of stocking according to plan throughout the review period. Among the pediatric 1st line ARV drugs, NVP and AZT/3TC/NVP showed better levels of stocking according to plan compared to other first line pediatric HIV

commodities. The percentage of facilities that stocked 2nd line pediatric ARVs according to plan was very low throughout the review period, majority of them showing overstocking. There was a slow but steady increase in percentage of facilities stocking drugs for Opportunistic Infections (OIs) according to plan over the review period especially Cotrimoxazole, a high throughput commodity.

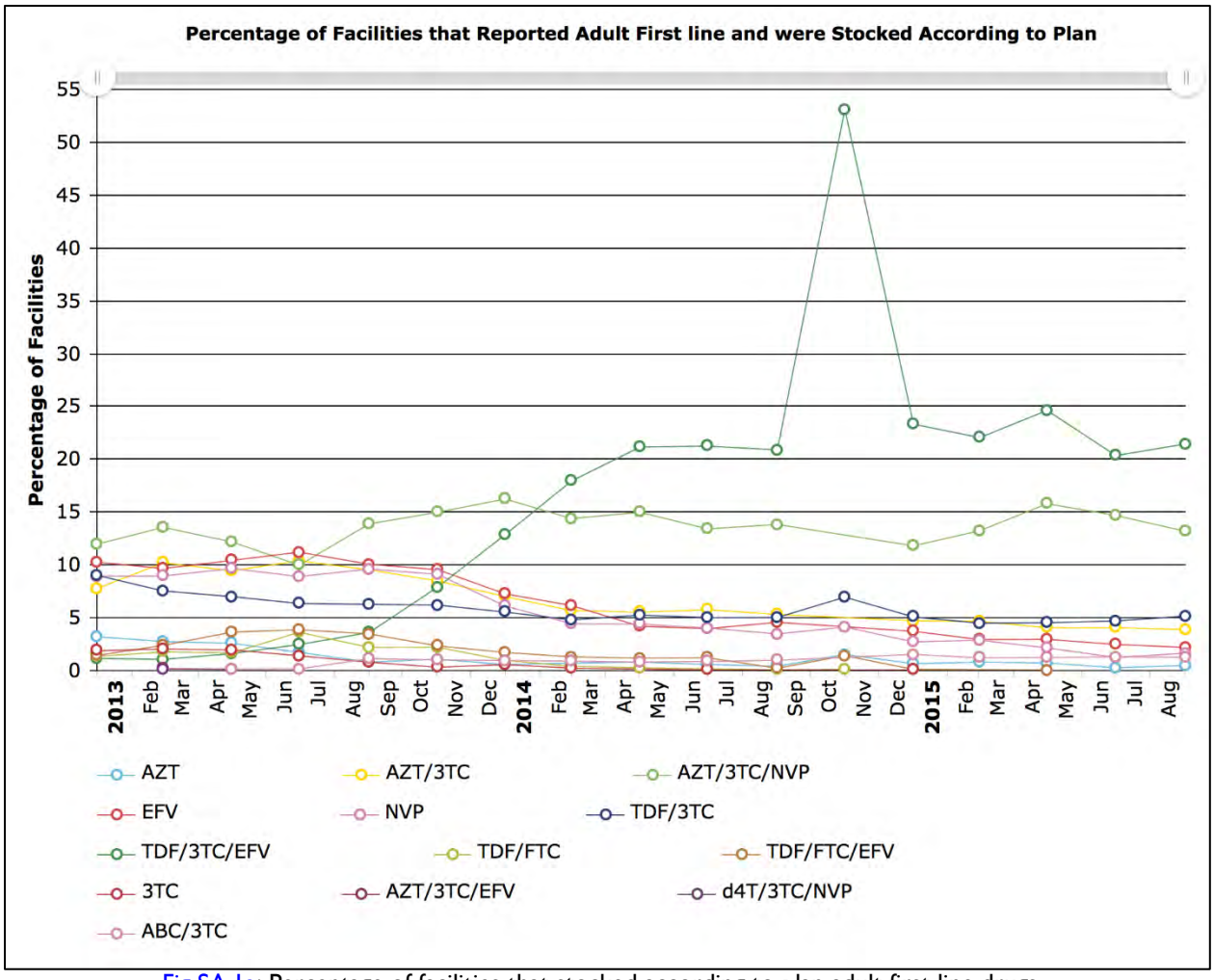

Fig SA.1a: Percentage of facilities that stocked according to plan adult first line drugs.

SCMS - HIV Rapid Diagnostic Test Kits (RTK): Determine, the most frequently used RTK, showed improving trends in stocking according to plan over the review period, a pattern that was not seen for the 2nd line RTKs. Second-line RTKs tended to be over-stocked.

SCMS - CD4 Reagents: CD4 reagents showed generally good stocking according to plan for the majority of reporting facilities. However, qualitative reports indicate that because of the low reporting levels, these trends should be interpreted with caution.

DELIVER – Malaria: Stocking of malaria commodities compared to planned stocking levels fluctuated over the review period. LLINs showed a generally low level of stocking according to plan throughout the period reviewed. Malaria RDTs, AL and AA showed low to moderate levels of stocking according to plan.

DELIVER – Reproductive Health: In general, stocking levels for RH commodities relative to planned levels was low. Less than 2.2% of facilities stocked RH commodities according to plan. Shorter acting contraceptives showed slightly better stocking practices than longer acting ones.

Drivers of performance of stocking of commodities according to plan

For most commodities that were not stocked according to plan, overstocking was the predominant contributing component other than understocking or stockouts. This is illustrated in the trajectories in the figure below for the indicator commodities TDF/3TC/EFV (an ARV) and Determine (a RTK):

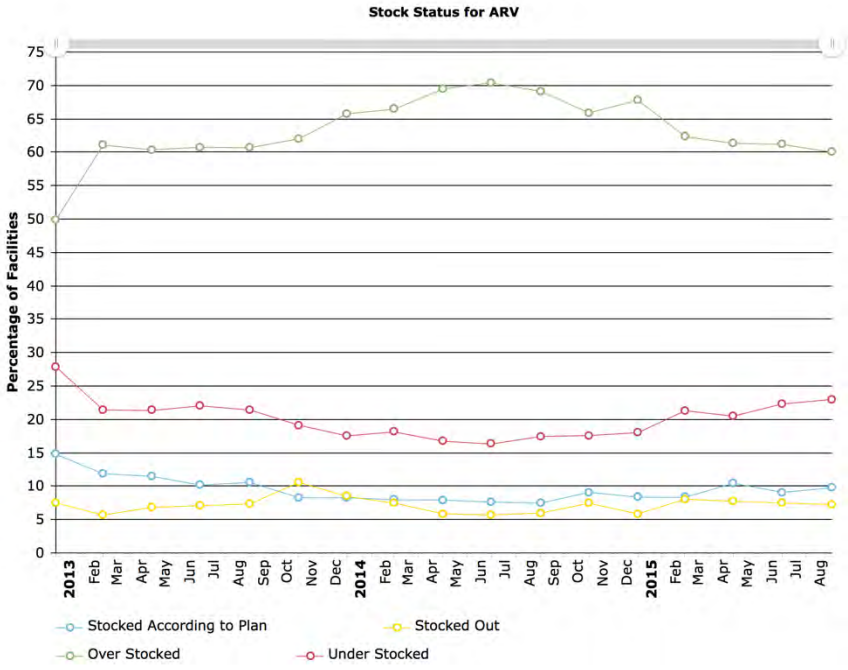

Fig SS.1: Components of stock status for the ARV drug.

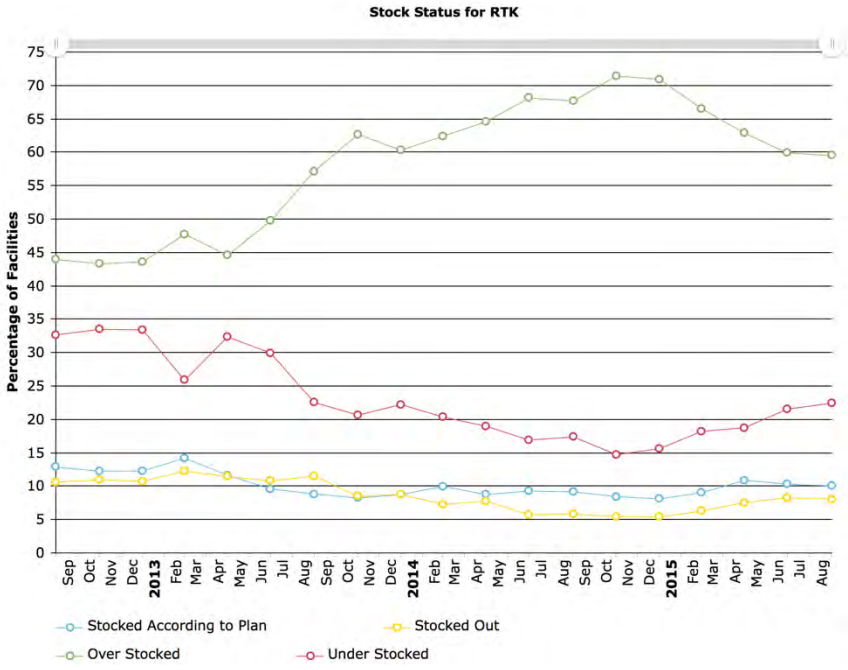

Fig SS.2: Components of stock status for RTK Determine.

The reports [1] and [2] outlined some possible explanatory factors that affected stocking practices. One of the key factors was disruptions in consumption levels as a result of switching of regimens and priority drugs. Over the implementation period, policies on regimens or preferred drugs kept changing including the switch from PMTCT Option A to Option B, the phasing out of some ARV drugs in preference for others, and the switch from liquid formulations to dispersible drug formulations for some commodities. Such abrupt changes led to accumulation of existing stock due to reducing demand. However, regimen changes were insufficient to explain why many commodities tended to be overstocked in the reporting health facilities. Other possible explanatory factors cited included the level of training of health workers, the capacity of the service delivery managers at State level to effectively supervise over 6,000 program health facilities and the effect of HCT campaigns on sudden increase in demand for RDKs. Capacity for fore-casting and tracking of inventory levels ought to be one of the key challenges at operational level.

Adult first line ARVs: The slow improvement in stocking trends for TDF/3TC/EFV over the review period is attributed to the switch to TDF-based combinations as the preferred first line drug both for treatment and Option B PMTCT, hence increase in its demand. The increase in its consumption resulting from its prioritization contributed to improvements in its stocking levels as it tended to reduce overstocking. In one review period, the consumption of TDF/3TC/EFV increased by 66%. There were also multiple drugs that were withdrawn over the intervention period (e.g. AZT and FTC based medication) being substituted with other drugs (e.g. ABC/3TC and TDF based medications).

First line pediatric ARVs vs second-line: The better stocking practices for first line pediatric formulations are also attributed to their higher consumption rates compared to the second line drugs. However, the qualitative report [2] indicated on several occasions, some products in this category were at high risk of expiry and indeed in the subsequent reporting period, 11,292 bottles of NVP (50mg/5mL) expired despite efforts in doubling the consumption rate. Expiry of these drugs was attributed to the switch from PMTCT Option A to Option B that emphasizes AZT-based medications and tablets to replace liquid-based medications. Product substitution was therefore a key determinant of consumption rate which affected planned stock. It appears that the substitutions occurred abruptly without sufficient planning on how to deal with the redundancies from old regimen drugs that were already in abundant stock.

Second Line ARVs: Stocking levels of second line ARVs were also affected by the switching of regimens or formulations that greatly slowed the consumption rates of several commodities replaced in the switching. Report [3] indicated that while one commodity (LPV/r) was well above the maximum stock level, a new shipment for the same drug was expected. This further supports the suggestion that forecasting efficiency and sudden changes in regimens contributed to over-stocking of some commodities. ATV was another drug whose consumption fell by the introduction of a new preferred formulation[2]. Report [1] highlights: *"The consumption of the 100/25mg strength (of LPV/r) should be monitored closely with the view to suspend the July 2013 order if there is no significant increase in consumption"*. Subsequent reports do not however show how this 'close monitoring' was effected at operational levels and whether it mitigated the problem. In fact, several periodic reports indicated situations in which it was certain that some drugs would expire and indeed in subsequent reports some drugs became overstocked and expired, LPV/r being an example.

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[1] *4th Nigeria: National antiretroviral drugs and Co-trimoxazole Bi-monthly Stock Status Report: February 2013*
[2] 5th *Nigeria: National Bi-monthly Stock Status Report for Antiretroviral drugs, Co-trimoxazole and Rapid Test Kits: June 2013*
[3] 10th edition *Nigeria: National Stock Status Report for Antiretroviral Drugs, Co-trimoxazole, HIV Rapid Test Kits and CD4 Analysis Reagents: May, 2014*

Cotrimoxazole: The improving trends in stocking of tablet Cotrimoxazole according to plan are attributed to a gradual increase in its demand due to the phasing out of liquid formulations of the drug. The liquid form of the drug was also threatened by potential expiry.

RTKs: The qualitative reports [2] and [4] affirmed highly fluctuant demand levels for RTKs especially Determine that made it difficult to make accurate forecasts. They mentioned increased anticipatory demand when HCT campaigns are implemented, especially for the 1st line Determine RTKs. Report [4] mentions that 'only 25% of HCT campaign requirements would be met by available stock' and that 'the campaign would result into stockouts, especially for Determine'. The same report mentioned difficulty in procurement of Determine due to disagreements between the manufacturer and the local distributor. On the other hand, overstocking of second line tests is attributed to low HIV positivity and discordance rates observed in contrast to the projections for use of these products in the outreach HIV testing strategy.

Malaria commodities: Overstocking of malaria RDTs was partly attributed to low utilization of the tests by health workers who initiated treatments based on clinical symptoms.

Key Finding 1.2: Secondary hospitals performed better than other facility types in stocking practices for ARVs while primary care facilities performed very well in stocking of malaria commodities

Regarding SCMS commodities, Secondary Hospitals performed better than other health facility types in stocking the indicator 1st line ARVs according to plan. They also performed better than other facility types in stocking of the indicator OI drug according to plan (Cotrimoxazole was used as the indicator drug) (See figure below for an example of the trajectories). On the other hand, secondary hospitals did not perform as well for Rapid Diagnostic tests. The improving trends in stocking according to plan for Determine the first line RTK were mainly observed in the primary health centers, with a 3-times increase from the situation at baseline. Secondary hospitals on the other hand showed a decline in stock performance for Determine while tertiary hospitals had consistently low performance in stocking HIV RTKs according to plan. Conversely, secondary hospitals showed better performance than primary care facilities in stocking of second and third line HIV testing kits (StatPak and Unigold).

[4] 6th *Nigeria: National Stock Status Report for Antiretroviral Drugs, Co-trimoxazole, HIV Rapid Test Kits and CD4 Analysis Reagents: August 2013*

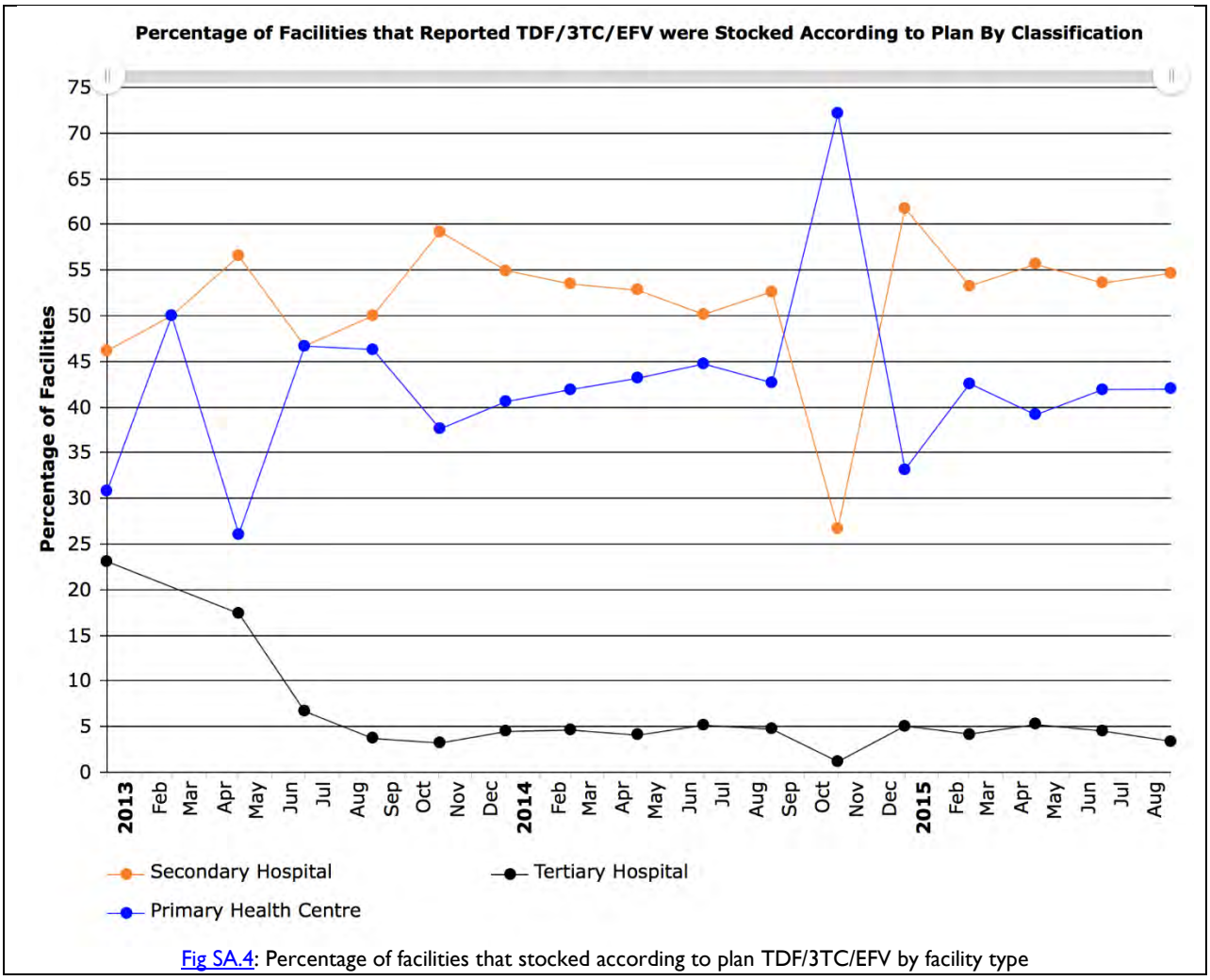

Fig SA.4: Percentage of facilities that stocked according to plan TDF/3TC/EFV by facility type

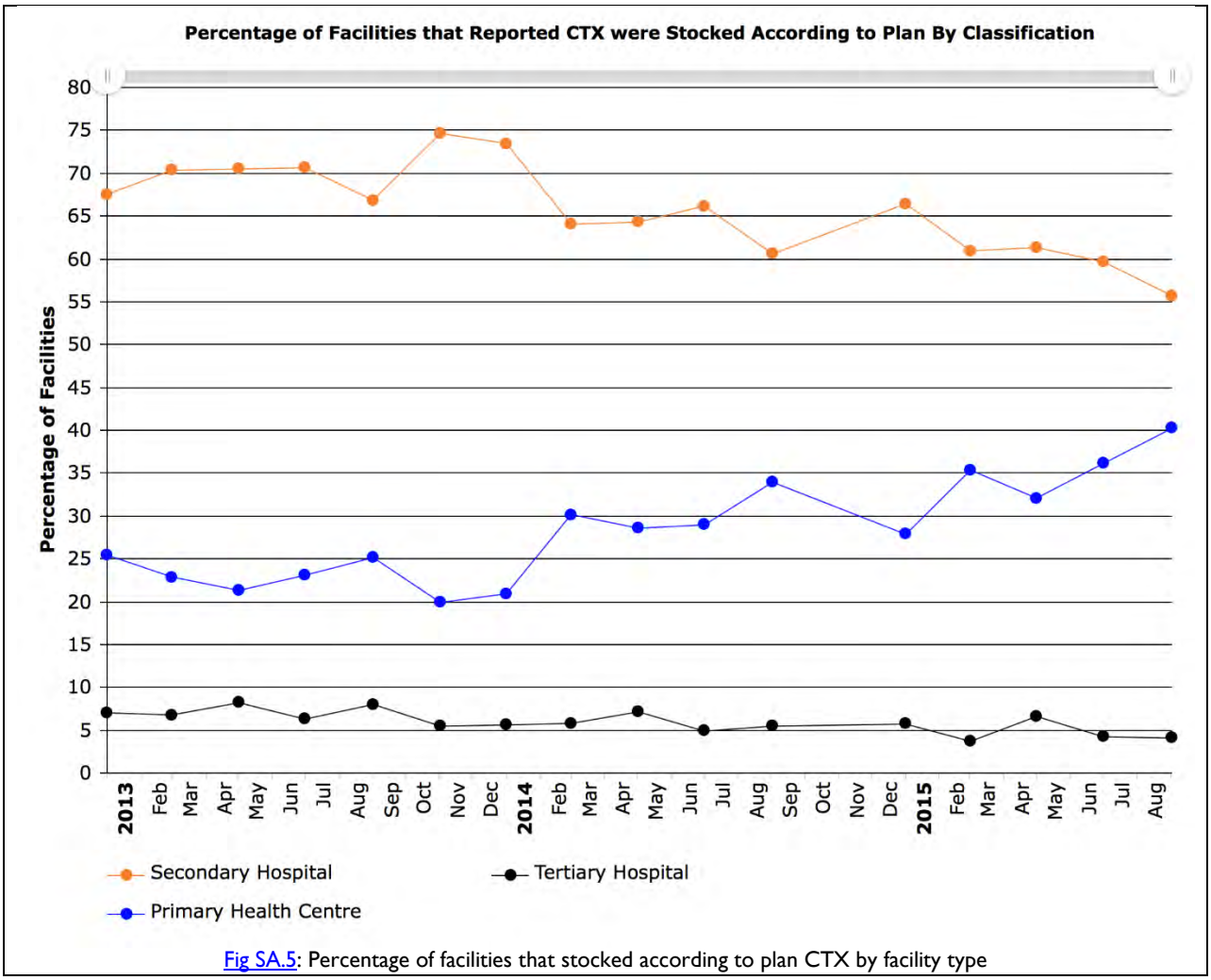

Fig SA.5: Percentage of facilities that stocked according to plan CTX by facility type

Regarding DELIVER commodities, Primary care facilities showed excellent stocking according to plan for Artemether-Lumefantrine (AL) for the entire review period, peaking at 97% in one report. Similar to AL, primary care centres had excellent stocking according to plan for Artesunate-Amodiaquine (AA) for the entire reporting period, peaking at 96% in one report. For both of these commodities, Hospitals (both Secondary and tertiary) were much less efficient. The period around November 2014 was characterized by the highest compliance with planned stock levels. Primary care centres had excellent stocking according to plan for Malaria RDTs. There were some fluctuations till November 2013 but PHC facilities performed generally better than higher levels. Stocking of SP according to plan was excellent, reaching 100% between October '12 and May '13, and stabilizing at about 80% for the remaining period but once again, hospitals were much less efficient.

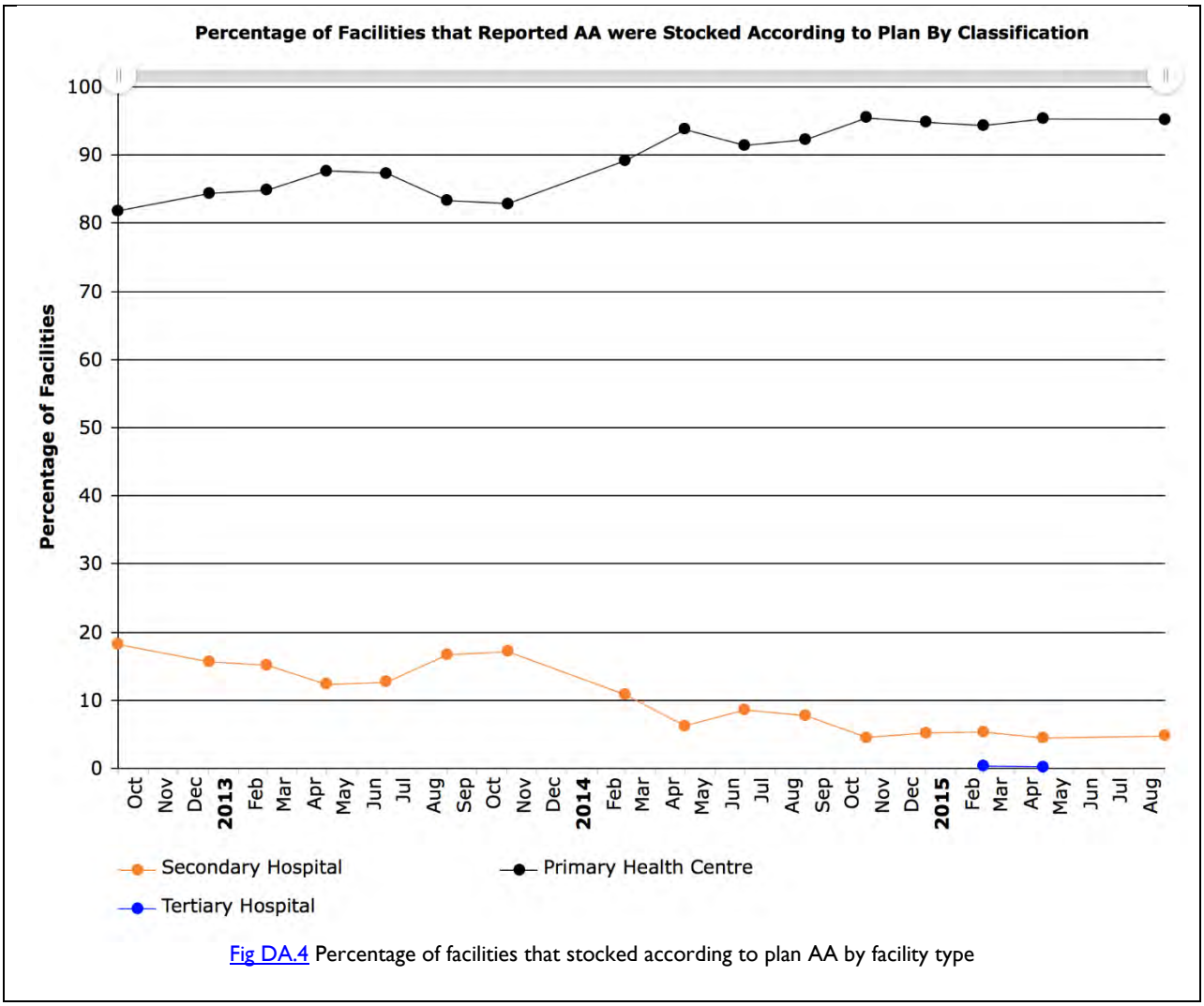

Fig DA.4 Percentage of facilities that stocked according to plan AA by facility type

Drivers of differences in stocking according to plan for different facility types

The reasons for the better performance of secondary hospitals in handling of ARV commodities could not be directly identified from the qualitative reports. However, they could be attributed to better staffing, better skills among health workers and better systems for logistics management at the hospital level compared to primary care centres. Reasons for primary care facilities performing better in stocking of Determine were also not indicated in the qualitative reports but could be attributed to higher demand for HIV testing at the peripheral levels that are reducing the incidents of over-stocking compared to the referral levels. It was also not clear why Secondary Hospitals had better stocking practices for the Second Line RTKs but this could be attributed to secondary hospitals being more likely to receive clients who test positive at initial screening and clients with indeterminate results hence requiring second line tests.

Key Finding 1.3: Some States performed better than others in stocking of Cotrimoxazole and Malaria commodities

Regarding the SCMS commodities, there were no clear differences between States in stocking of ARVs and other HIV drugs according to plan. However, compared to other states Benue state stood out in

stocking of OI drugs (especially Cotrimoxazole) according to plan. Akwa Ibom and Cross River states had a better performance than other States in stocking practices for Determine RTK. On the other hand. Akwa Ibom and Benin states had a better performance than other states in stocking of the second and third line RTKs (StatPak and Unigold) according to plan.

Regarding Malaria commodities, Oyo State reported the best performance for stocking of AL according to plan but momentum was lost around September 2015. It also recorded the best stocking trends for RDTs. Nasarawa and Sokoto had the lowest percentage of facilities stocking AL according to plan. Oyo, Nasarawa and Benue states reached 100% of their facilities stocking SP at the start of the review period.

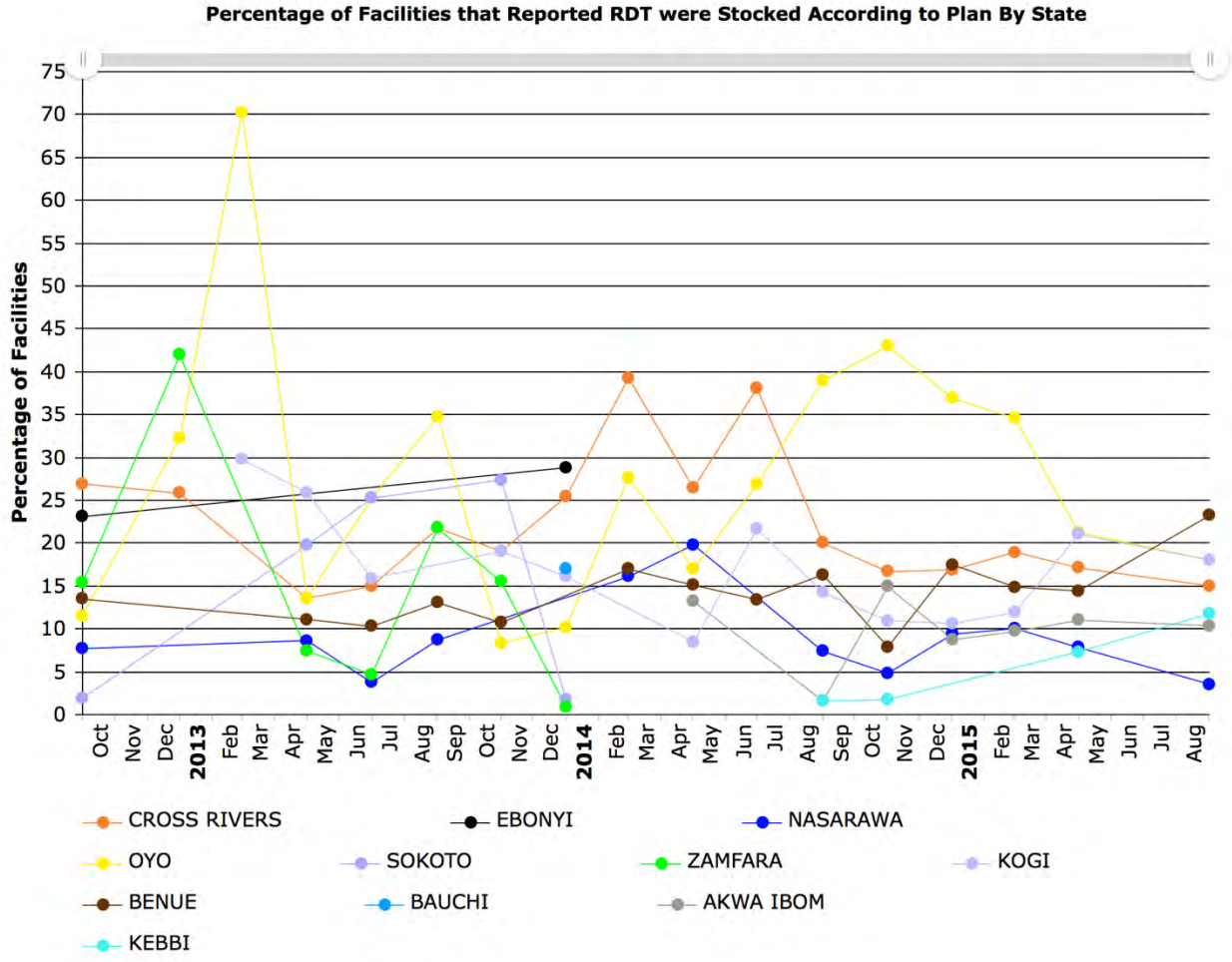

Fig DA.10 Percentage of facilities that stocked according to plan RDT by state

Drivers of differences in stocking according to plan across States

There is not sufficient information from the qualitative reports to show why some States performed better than others in stocking some commodities according to plan.

4.1.2 Performance Indicator 2: Stock out rate at SDPs

Key Finding 2.1: The frequency of stock outs was low for both 1st line and 2nd line ARVs but high for rapid diagnostic tests and short term family planning methods

Stockout rates were relatively low-moderate for most commodities. As observed earlier regarding the indicator on 'stocking according to plan' products that were not stocked according to plan were more likely to be overstocked than understocked or stocked-out. Stockout rates were very low for 1st line ARV drugs and low-to-moderate for OI drugs like Cotrimoxazole. However stockouts occurred frequently for 1st line RDKs (Determine). Stock out rates were relatively more frequent for Malaria commodities, especially the Malaria RDTs. Stockouts for short term methods of Family Planning were relatively frequent while those for long term methods were infrequent.

SCMS – HIV drugs: Overall, stock out rates for first line ARV drugs were relatively low and reduced slowly over time. The percentage facilities that had stockouts of Adult second line drugs were lower than 4.5% for most of the review period. Among the 1st line pediatric ARV formulations, there were significant stockouts for NVP followed by the combination drug AZT/3TC/NVP. Pediatric second line drugs had very low stock out rates over the review period. Most adult 2nd line drugs also showed a slow reducing trend as demonstrated in the figure below:

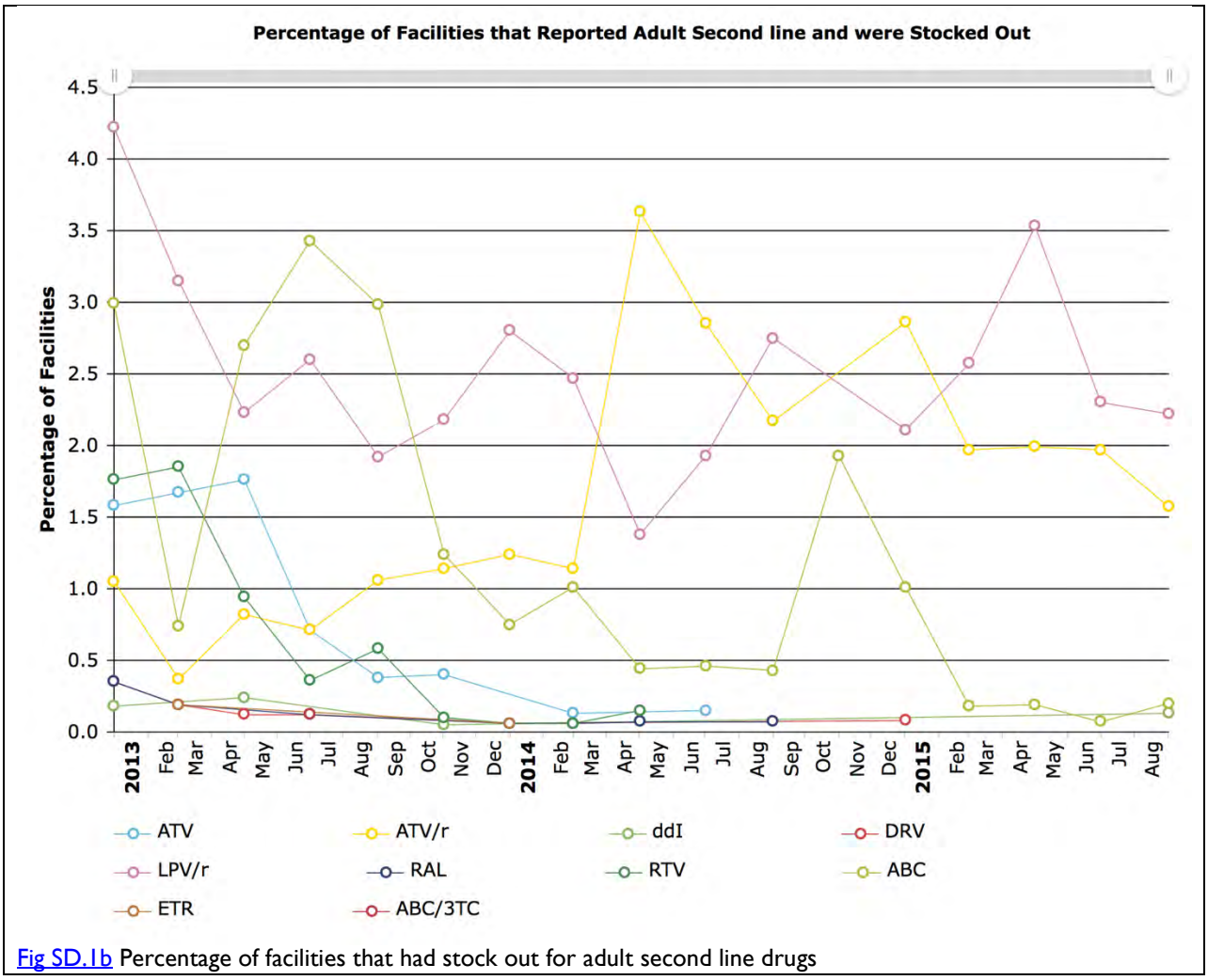

Fig SD.1b Percentage of facilities that had stock out for adult second line drugs

Cotrimoxazole showed moderate and fluctuating stock out rates, peaking at 15%, with a spurious rate of 92% observed at one occasion. It should be noted that this is one of the HIV drugs with the highest demand and throughput in the system.

SCMS – HIV Rapid Diagnostic Test Kits (RTK): Determine had higher stock out rates than other kits, at one time reaching a 60% stockout rate.

DELIVER – Malaria: Stockouts rates were moderate to high for the high demand malaria commodities. RDTs had higher stockout rates compared to other malaria commodities. Stockouts for RDTs peaked in March 2013

DELIVER – Reproductive Health: Stockouts for LGA commodities declined over the review period for all commodities. Among SDP commodities, stockout rates for male condoms were consistently high while long-term FP methods had low stockout rates.

Drivers of performance for stockout rates

According to the qualitative reports [5], [6] and [7] stockouts of first line ARVs were relatively low compared to commodities supplied through other programs. Explanatory factors for the stockouts included several factors, some of which were out of control for the program including:

- Inadequate capacity for inventory management for staff at health facilities although qualitative reports show that that capacity was improving. Inadequate capacity affected not only the skills for health workers to fore-cast accurately their needs but also accurate reporting and reporting rates. Staff attrition and transfers also affected fore-casting capacity in that skilled staff sometimes left the program facilities, leaving a gap.
- There was a national health workers strike in which health facilities on strike did not receive commodities for some time, resulting in later stockouts
- The qualitative reports note that although the status was improving, streamlining of the new regimens was still not fully functional in some facilities, affecting ordering and stocking practices for newly recommended preferred regimens or formulations.
- Stockouts for AL and AA were attributed to the international manufacturers who occasionally failed to provide the authentication codes which affected importation.
- Stockouts of RDTs were attributed to rapid utilization of kits during mass HIV testing campaigns while those for Malaria RDTs were attributed to inaccurate forecasting of demand especially at the peripheral facilities.

Key Finding 2.2: The higher the facility level the lower the stockout rates for most commodities

Stocking trends for most commodities show that the higher the facility level, the lower the stockout rates. This was observed for 1st line HIV commodities as well as Malaria commodities. However,

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[5] Ajulo, Vincent, Fatiya Askerin, Kolawole Falayajo, Elizabeth Kelly, Melissa Levenger, and Imelda Moise, **2015.** Nigeria National Supply Chain Assessment Results: A Review of the Public Health Supply Chain for Nigeria. Arlington, Va.: Supply Chain Management System and the USAID | DELIVER PROJECT, Task Orders 4 and 7.

[6] 3rd Nigeria HIV/AIDS Supply Chain Unification Semi-Annual Report: July 2014

[7] Quantification report on FY 12 PMI-Funded Anti-Malaria medicines & commodities in PMI-supported states. This publication was produced for review by the U.S. Agency for International Development. It was prepared by the USAID | DELIVER PROJECT, Task Order 7.

second-line commodities were more likely to be stocked out in the higher facilities (Secondary Hospitals) compared to the primary care centres.

SCMS – HIV drugs: Stockouts for the adult 1st line indicator ARV drug TDF/3TC/EFV were higher in the primary health centers. While stockouts for Cotrimoxazole showed a decreasing trend in the secondary hospitals over the period of review, they increased in the primary care facilities.

SCMS – HIV Rapid Diagnostic Test Kits (RTK): Primary health centers had more frequent stockouts of Determine, the first line RTK. On the other hand, stockout rates for StatPak were high in secondary hospitals and primary health centers but reduced from 60% in 2013 towards 35% by July 2014. Similar to StatPak, stockout rates for Unigold also started high but reduced towards 30% in both secondary hospitals and primary facilities

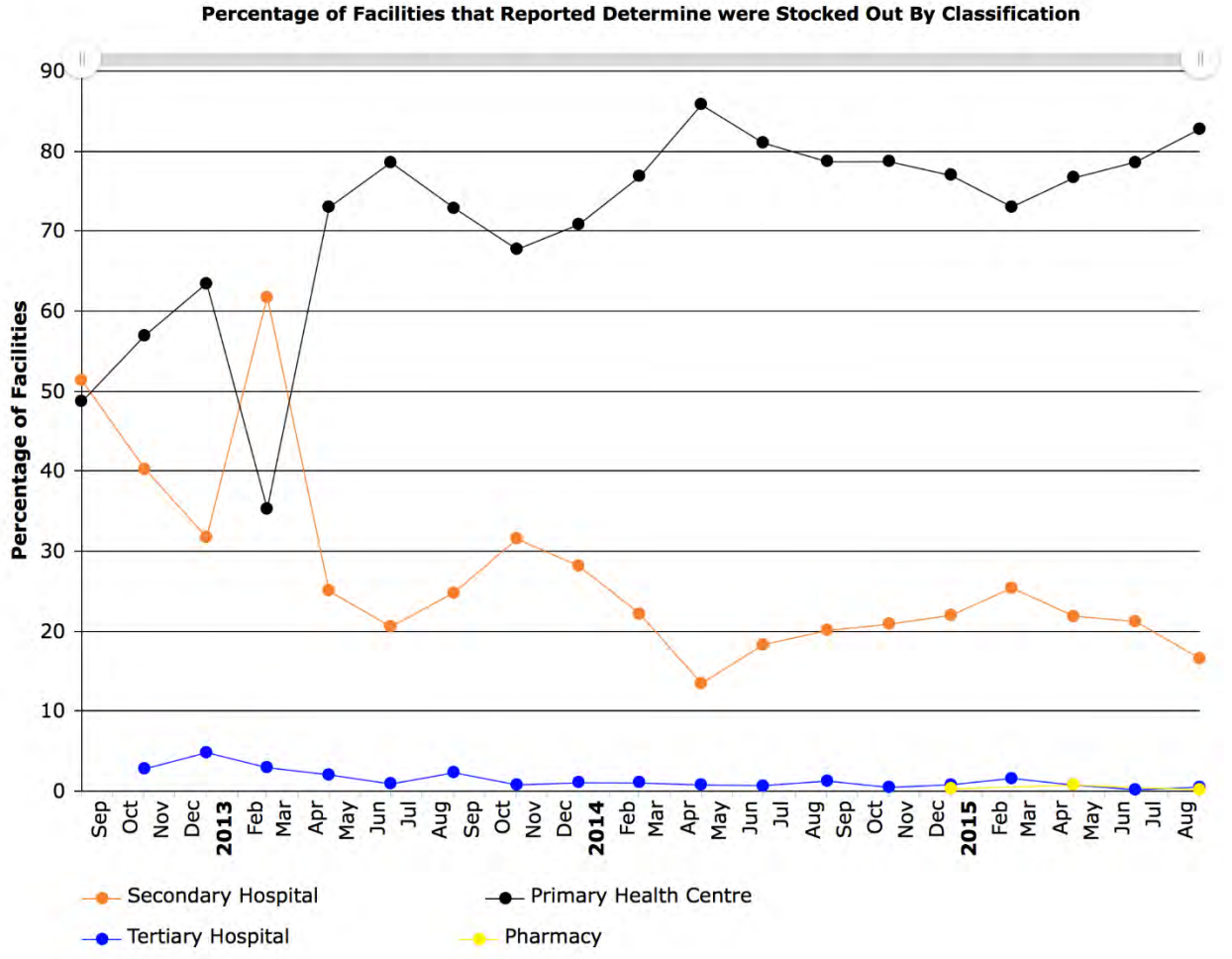


Fig SE.2 Percentage of facilities that had stock out for determine RTK category by facility type

DELIVER – Malaria: Generally, for malaria commodities, the higher the facility level, the lower the stock out rates. Primary care facilities reported stockout rates for AL and AA consistently above 70% of facilities throughout the review period. Stockouts for LLINs and RDTs were higher in primary health centers compared to secondary hospitals. Stockouts for SP were high in primary care facilities yet secondary facilities saw a decline in stockout rates.

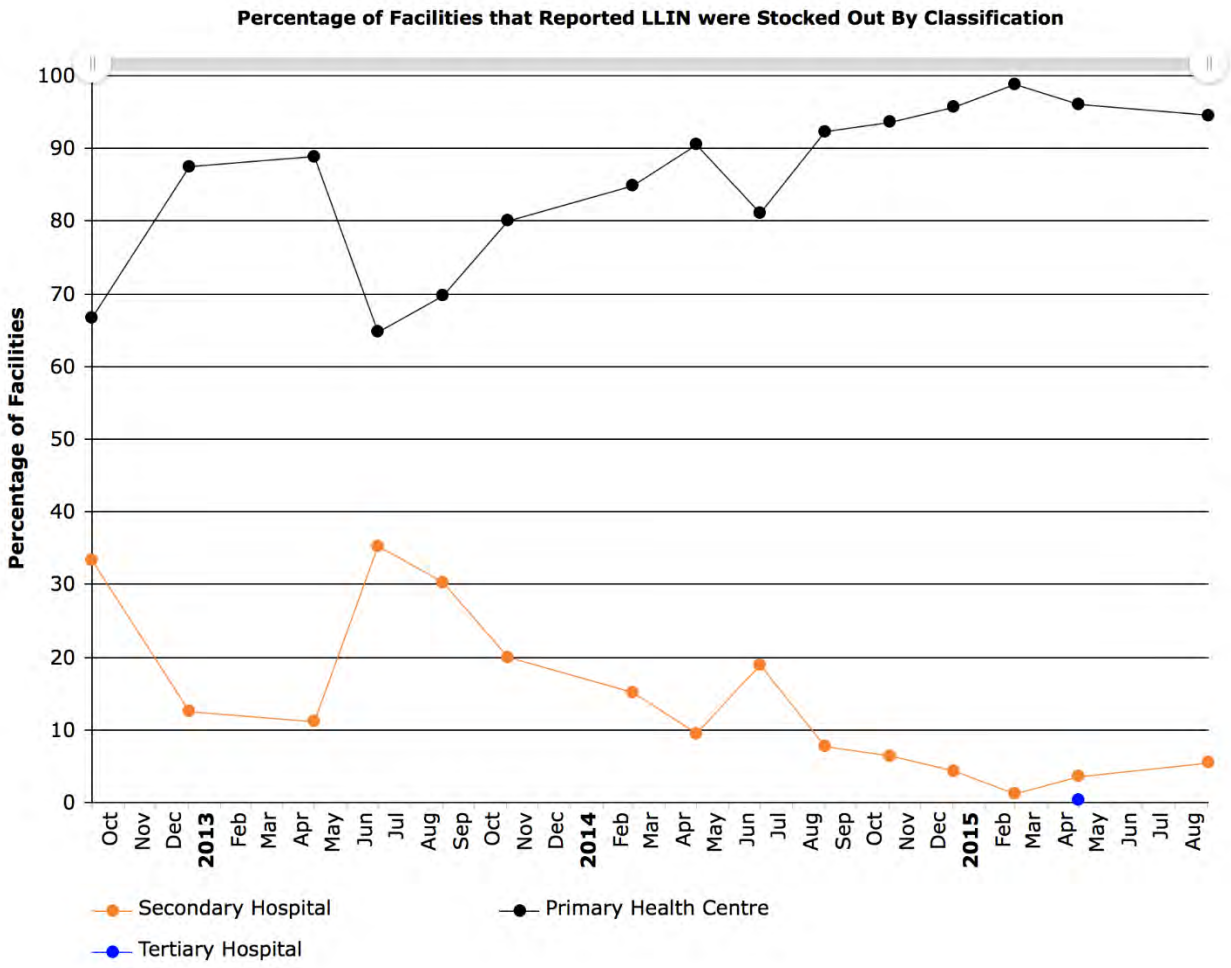


Figure DC.2 Percentage of facilities that stocked according to plan LLINs by facility type

Drivers for differences in stockout rates at different levels of care

In general, the qualitative reports did not directly provide specific explanatory information for the differences in stockout rates between facility levels. However, the higher stockout rates for higher demand 1st line commodities at lower facilities could be attributed to the higher patient load at these facilities since they are the first line of care. The challenges of availability of skilled staff trained in inventory management might also be more prevalent at the primary care facilities compared to the higher level facilities. The higher stock out rates for second-line commodities like HIV testing kits seen in Secondary care facilities could be attributed to the fact that these are the levels more likely to handle re-testing for indeterminate HIV results.

Key Finding 2.3: There were some differences in stockout rates between States, some states showing marked reductions while others showed high stock out rates for certain commodities

A few differences between States were observed in stockout rates for some commodities. Regarding 1st line HIV commodities for example, we see that stock outs for TDF/FTC/EFV an indicator drug were highest in River State. Regarding the HIV Rapid Diagnostic Test Kits, Anambra, Ebonyi and Gombe States had the highest stockout rates for Determine RTK. Bono State had a spike in StatPak stockout

rates between October 2013 and February 2014 while Abia State had a spike in Unigold stockout rates between April and December 2013. Regarding malaria products, Zamfara and Benue states, a highest proportion of facilities with LLIN stockouts Kogi state started with high stockout rates for Artesunate-Amodiaquine (100% in 2013) but they reduced markedly to 31% in mid-2014 and eventually to 3.6% by September 2015. Kebbi State managed to reduce its high RDT stockouts from 48% to 13% over the last one year of review. Kogi State maintained RDT stockouts at the lowest rates compared to the other States. Sokoto State has the highest proportion of facilities with SP stockouts for the period for which data was available

Drivers of differences in stockout rates between States

From the qualitative report [8] the higher stockouts for TDF/FT/EFV in River State were spurious, attributed to errors in recording of commodities. It was noted that there was wrongful reporting of TDF/FTC/EFV, an indicator drug as TDF/3TC/EFV. There was also incomplete entry into the LMIS in which for some products' expiry dates were not entered, resulting in accumulation of stock and expiry of the drug. Apart from this explanation however, other factors that drove some States to perform lower in stockout rates for HIV and Malaria commodities were not clear and would need to be further elucidated to facilitate cross-learning. In addition, factors that drove the reductions in stockout rates for AA in Kogi State and Malaria RDTs in Kogi State need to be explored so that other States can learn from them.

4.1.3 Performance Indicator 3: SDP reporting rate to the logistics management information system (LMIS)

Key Finding 3.1 Starting from low levels, reporting rates for commodities increased steadily over the review period for HIV and Malaria commodities but remained low for RH commodities

From a slow start, the percentage of facilities reporting on ARV commodities increased steadily from 9% at the beginning to over 60% in 2015. Facility reporting rates stated picking up in FY 2014. Reporting rates for HIV RTKs also increased consistently from 3% to 70%. Reporting rates on CD4 reagents increased steadily from 18% to 64%. Similar trends of increase in reporting rates were observed for malaria products. On the other hand, reporting rates for RH commodities remained relatively low over the review period. An example of increasing reporting rated for malaria commodities is given in the figure below:

[8] Nigeria: Semi-Annual HIV/AIDS Supply Chain Unification Report. 4th edition. December, 2014

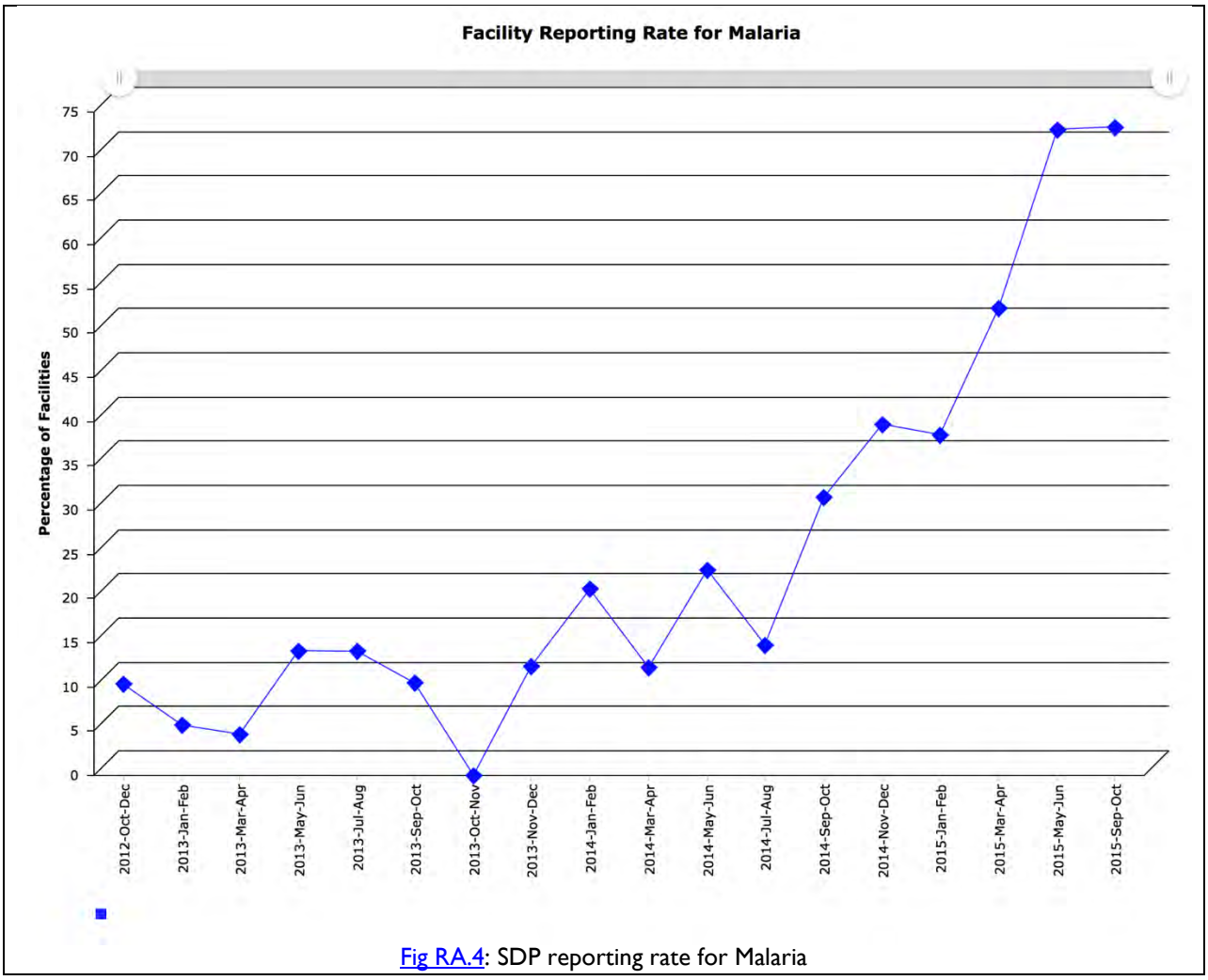


Fig RA.4: SDP reporting rate for Malaria

Drivers of reporting rates

The shortfall in facilities submitting timely and complete LMIS reports especially at the start of the review period was attributed to an increase in number of sites on-boarded. The qualitative report [9] also mentions that few states were the main sources of this problem (Kaduna, Benue and Delta State) Because of these shortfalls, the quality of forecasting and supply chain planning data was questioned The large number of reporting facilities also affected supervision. Report [5] also cited lack of skills to fill the LMIS forms among some of the staff.

Other challenges to reporting included; Limited human resources, limited infrastructure to support reporting, lack for reporting forms and other tools (e.g. Inventory control card, Daily Consumption Records, CRRIRFs, etc.), insufficient commitment to good inventory practices by some health workers (reports often being viewed as an additional task that is not in their mainstream work), outright refusal of some facilities to report, poor quality data, including instances of missing data elements or difficulties

[9] 2nd Edition Nigeria HIV/AIDS Supply Chain Unification Semi-Annual Report: December 2013

to make sense of some numbers [10]. There is need to repeatedly share the list of facilities that have not reported with the implementing partners, so that their follow up is made easier. Staff from these facilities will need training on the reporting. Among actions that improved reporting rates, support visits to health facilities and reminders were reported to have worked. However, because there are 6000 facilities, coverage with effective support supervision was a challenge.

Key Finding 3.2: Reporting rates for primary care centres and secondary Hospitals were low at the beginning but improved steadily while reporting rates for tertiary hospitals were very low

Primary centers' and secondary hospitals' reporting rates on ARVs were low at the beginning but increased steadily, especially from FY 2014. On the other hand, tertiary hospitals had generally lower reporting rates for ARV compared to other levels. Tertiary facilities' reporting on RTKs was also intermittent throughout the review period. Both Primary centres and Secondary Hospitals started off with intermittent reporting for RTKs but improved and became consistent later in the review period. Primary care centers more inconsistent in reporting on CD4 reagents compared to other levels. They also had higher reporting rates for malaria products than secondary hospitals except for a large number that did not report in 2013. Tertiary hospitals hardly reported on malaria commodities. With regard to RH commodities, Facilities from SDP were more consistent than facilities from LGA

Regarding States, 7 states had at least 50% of their facilities reporting: Akwa Ibom, Anambra, Benue, Ekiti, Lagos, Oyo and Kebbi. Akwa Ibom State's artemisinin combination therapies (ACT) consumption across all weight bands and type was 14% higher than the 2015 forecast while Sulphadoxine Pyrimethamine (SP) and malaria rapid diagnostic tests' consumption were 79% and 77% lower respectively than the forecast. Lower rapid diagnostic test usage may suggest that malaria treatments are still significantly being initiated based on clinical symptoms unless otherwise ascertained that most public health facilities have the technical proficiency, medical equipment and constant power availability to conduct malaria microscopy. Artesunate injection was not reported to be used in the period under review.

[10] 1st Edition Nigeria HIV/AIDS Supply Chain Unification Semi-Annual Report: June 2013

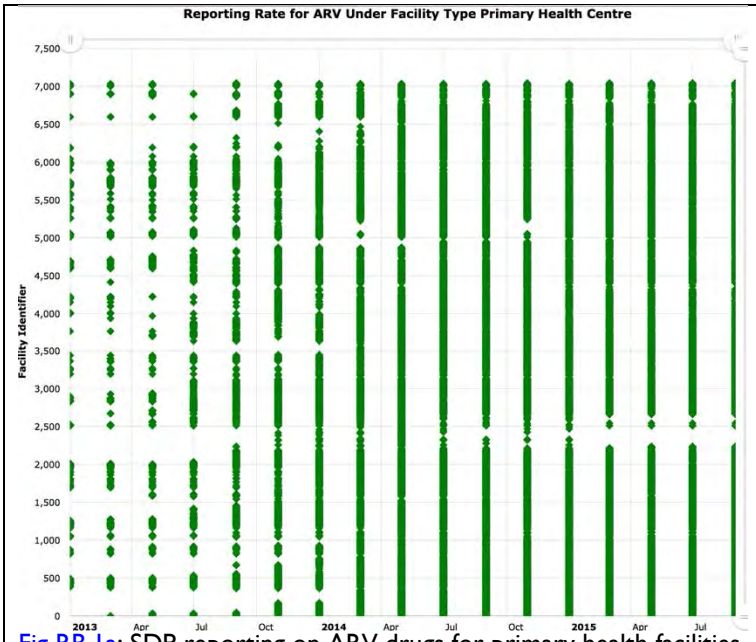


Fig RB.1a: SDP reporting on ARV drugs for primary health facilities

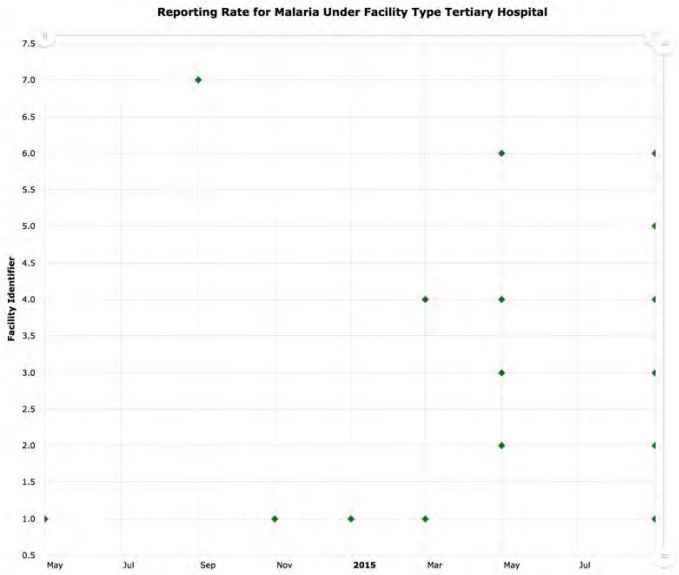


Fig RB.4c: SDP reporting on Malaria commodities for tertiary hospitals

Drivers of differences in reporting rates across facility levels and States

Inventory management practices were reported to be weaker at lower facilities, hence lower stocking according to plan and higher stockout rates, as were challenges arising from shortage of skilled staff. Lower level facilities also comprise the bulk of the program facilities, and were probably more affected by the inadequate capacity for supportive supervision to enhance skills of health workers. Explanatory factors for low reporting among tertiary facilities and for 7 states having better reporting rates were not clearly discernible. There is need to explore these to facilitate cross learning between facility levels and States.

4.2 Evaluation Question 3: Lessons Learned and recommendations for the SCMS and DELIVER projects

The following recommendations for improvement of Nigeria's national level supply-chain performance arise from the key findings of the evaluation:

- For most commodities that were not stocked according to plan, over-stocking was the main contributing factor compared to under-stocking. This mainly points to inadequate fore-casting and inventory management practices at health facilities. There was evidence of inadequate capacity for inventory management for staff at health facilities although qualitative reports show that capacity was improving. The new phase of the program should prioritize capacity enhancement for commodity forecasting and inventory management at the health facilities, especially at the primary care facilities where the bulk of the supplies go. Country level programs will need to re-enforce skills in fore-casting and stock management through training and support supervision to optimize the quantities that are ordered to suit the average monthly consumption and the supply cycles of the products.

- Over-stocking of some commodities resulted from sudden changes in treatment regimens without adequate plans to phase out existing stock for commodities that were replaced in the regimens. It appears from the qualitative reports that over the period of review, various policy changes occurred affecting entire regimens, selected drugs within regimens or changes in formulations. While the basis for these changes was justified as increasing efficiency, it led to sharp reductions in the consumption rates of already stocked commodities leading some commodities to expire. In one case involving LPV/r, a sharp reduction in consumption rate following a regimen switch led to accumulation of stock above the maximum stock level yet a sizeable new shipment of the same commodity was expected. Countries has no clear mechanisms to reverse such shipments in time to prevent overstocking, the only solutions being to try and rump up consumption or donate the drug to other countries with a supply gap. In some cases, it was very clear that some commodities were bound to expire. It was also noted in the qualitative reports that there were irregularities in roll out and uptake of new regimens, some facilities adopting them while others delayed to adopt them. There is need to improve the process rolling out new regimens when such changes are made. This includes improvements in the handling of existing stock for commodities that are removed from revised treatment regimens. Procurements of the newly recommended drugs should be implemented in a phased way to reduce over-stocking and expiry of drugs that are facing withdrawal from the system. Implementation of regimen changes should also be flexible to allow gradual substitution of the old commodities rather than switching suddenly to the new formulations. Mechanisms for donation of over stocked drugs/commodities should also be mainstreamed into the basic procedures of health facilities so that health facilities know what do when they forecast that a commodity is likely to expire. There is need to streamline the roll out of new regimens so that adoption is uniform across implementing sites.

- There is need to improve supportive supervision so that all 6,000 program health care facilities receive at least one supervisory visit focusing on stock management every financial year. Mechanisms for local supervision at State level should be strengthened as the more feasible approach. Facilities should also be supported to smoothly manage the transition from older commodities to new ones when there is a regimen change. Supportive supervision should focus on enhancing health worker skills in forecasting and inventory management

- The reports [4] and [3] recommend closer monitoring of stock flows for selected commodities at risk of expiry so as to rump up their utilization or optimize their orders. In order to do this, the program will need to develop a mechanism to facilitate such close monitoring. Such a mechanism

should allow warning information about impending expiry to be relayed from peripheral health facilities to the State government and the center, so that the facilities can be supported in re-distributing some of their stock to other facilities were the commodity may be running out.

- The stocking levels of HIV RTKs were reported to fluctuate a lot in periods where HIV testing campaigns were conducted. This resulted into stockouts, especially for Determine, which were also exacerbated by procurement disagreements at the national level. There is need for national level health program planners to coordinate with the procurement teams at the national level to improve forecasting for HIV RTKs when HCT campaigns are planned. This planning should allow sufficient time for procurement to make the necessary adjustments to accommodate the potential increase in demand for RTKs during HCT campaigns.

- It was noted that consumption of 1st line RTKs was higher at the primary care centers compared to Secondary Hospitals, leading to more frequent stockouts at the former. Conversely, consumption of second-line RTKs was lower in the primary care facilities compared to Secondary facilities, leading to over-stocking of these commodities at the primary health centers. This was attributed to low positivity rates compared to forecasts. There is need to reset the prevalence rates used for fore-casting needs for 1st and 2nd line RTKs relative to their demand at primary care facilities vs. Secondary Hospitals.

- Overstocking of malaria commodities was partly attributed to health workers who made prescriptions for malaria without malaria testing. This practice, which is common especially in the primary care centres should be addressed through support supervision and re-enforcement of health workers' clinical skills, especially on the justification for malaria testing for all patients suspected to have malaria.

- Reasons for some States performing better than others in stocking of HIV and malaria drugs need to be explored further to facilitate cross-learning on best practices. For example, factors that drove the reductions in stockouts rates for AA in Kogi State and reductions in Malaria RDT stockouts in Kebbi State would need to be explored to draw cross-lessons on measures that could be applied in other States.

- Stockouts for AL and AA were attributed to the international manufacturers who occasionally failed to provide the authentication codes which affected importation while stockouts of Determine were attributed to contractual conflicts between local suppliers and international manufacturers. Measures to mitigate such shocks to the supply chain need strengthening.

- To improve reporting, there will be need to re-inforce health worker skills and support supervision. These efforts need to be targeted to primary care facilities where more challenges with stock management were observed. However, tertiary hospitals need to be engaged to improve their responsiveness to reporting.

5.0 ANNEXES

5.1 Detailed description of findings from the trajectory analyses

5.1.1 Indicator 1: Percentage of stock status observations in storage sites, where commodities are stocked according to plan

SCMS – HIV drugs

Table 5: Description of SCMS trajectories for HIV drugs over the review period (Refer to Annex SA for the trajectories)

Figure	Description	Observations
	SCMS-HIV	
	General	
Fig SA.1a	Shows trajectories for the facilities that stocked according to plan the Adult First line ARV drugs	Facilities that stocked TDF/3TC/EFV according to plan increased steadily (1.16% to 20.9%) from the start of the review period until September-October 2015 from where they rose significantly to 53.1% in November-December 2015. They declined and stabilized within 20-30% for the rest of the review period. The percentage of facilities that stocked the other drugs according to plan showed less variations in trends with AZT/3TC/NVP percentages higher than for the rest of the drugs.
Fig SA.1b	Shows trajectories for the facilities that stocked according to plan the Adult second line ARV drugs	Although the percentage of facilities that stocked Adult second line drugs according to plan were lower than 7% they were consistently higher for LPV/r compared to other drugs followed by ATV/r. Trends of stocking according to plan consistently declined for ATV, ABC, and RTV.
Fig SA.2a	Shows trajectories for the facilities that stocked according to plan the Pediatric First line ARV drugs	NVP and AZT/3TC/NVP were stocked according to plan in similar trends in 5% to 10.3% facilities with AZT/3TC/NVP having a sharp rise to 32% in November-December 2015. The percentage of facilities that stocked the other drugs were lower than 4% with AZT/3TC stocked according to plan in 1.18% to 3.2% of the facilities
Fig SA.2b	Shows trajectories for the facilities that stocked according to plan the Pediatric second line drugs	The percentage of facilities that stocked LPV/r according to plan ranged from 0.36% to 0.99% across the review period in a uniform pattern.
Fig SA.3	Shows trajectories for the facilities that stocked according to plan OI drugs	Cotrimoxazole was the commonly reported opportunistic infection drug across the review period compared to Fluconazole and Ciprofloxacin. The percentages of facilities stocking these drugs according to plan increased steadily with a range of 10.2% to 17.9% for Cotrimoxazole.
	By facility type	
Fig SA.4	Shows trajectories for the facilities that stocked the indicator 1st line ARV drug TDF/3TC/EFV according to plan by facility type	Stocking of the indicator drug TDF/3TC/EFV according to plan was highest for secondary hospitals followed by primary health centers and lowest for tertiary hospitals. Where trends showed an increase for secondary hospitals there was a decrease for primary health centres.
Fig SA.5	Shows trajectories for the facilities that stocked	Stocking of the indicator OI drug Cotrimoxazole was highest for secondary hospitals followed by primary health centres and lowest for tertiary hospitals

Figure	Description	Observations
	Cotrimoxazole according to plan by facility type	although primary health centers showed a general decrease over the review period.
	By state	
Fig SA.6	Shows trajectories for the facilities that stocked according to plan TDF/3TC/EFV by state	The percentage of facilities that stocked according to plan TDF/3TC/EFV tended to decline over the review period regardless of state.
Fig SA.7	Shows trajectories for the facilities that stocked according to plan CTX by state	Although Benue state had high percentages of facilities that stocked Cotrimoxazole, there was no particular pattern in fluctuations for the different states.

SCMS - HIV Rapid Diagnostic Test Kits (RTK)

Table 6: Description of SCMS trajectories for Rapid Test Kits over the review period (Refer to Annex SB for the trajectories)

Figure	Description	Observations
	General	
Fig SB.1	Shows trajectories for the facilities that stocked RTKs according to plan	There was an upward trend in stocking according to plan for RTKs from 2013-2015 for Determine. The other two RTK commodities (Unigold and stat Pak) showed down ward trends.
	By facility type	
Fig SB.2	Shows trajectories for the facilities that stocked Determine RTK according to plan by facility type	There was an upward trend from 25% to 70% of facilities that reported stock according to plan for the Primary Health centres. The secondary hospitals had a downward trend for the facilities that reported stock according to plan from 67% - 30%. Tertiary hospitals remained constant between 3-7% of the facilities that reported stock according to plan.
Fig SB.3	Shows trajectories for the facilities that stocked Stat-Pak RTK according to plan category by facility type	The percentage of secondary hospitals that reported StatPak stocked according to plan was higher at 70% however the trend went down to 45% in Nov 2014, another small rise to 60% at the end of the review period. Primary Health Centers that reported stat Pak had a relatively stable trend that ranged between 40-45% throughout the review period.
Fig SB.4	Shows trajectories for the facilities that stocked Unigold RTK according to plan category by facility type	The percentage secondary hospitals and primary health centers that reported Unigold stocked according to plan fluctuated between 30-60%. Between April 2013 and end of review period, there was slightly stable trend. Tertiary Hospitals were continuously reported as not stocked according to plan.
	By State	
Fig SB.5	Shows trajectories for the facilities that stocked Determine RTK according to plan category by State	The percentage of facilities that reported determine as stocked according to plan was generally low for all the states. Akwa Ibom and Cross River states had relatively higher rates that ranged between 10-20% between September 2012 and March 2013. This later continued to diminish up to 10% The remaining Months and for other states, the trend was relatively constant between 2 and 8%.
Fig SB.6	Shows trajectories for the facilities that stocked StatPak	The percentage of facilities that reported Stat-Pak as stocked according to plan were slightly higher for Akwa Ibom and Benin states than other states between 17-18 %. The rest of the states reported the percentage of Stat Pak not stocked

Figure	Description	Observations
	RTK according to plan category by State	according to plan and this was constant between 2-12%.
Fig SB.7	Shows trajectories for the facilities that stocked Unigold RTK according to plan category by state	The percentage of facilities that reported Unigold as stocked according to plan were higher for Akwa Ibom and Benin states than other states at 18 %. However, the stocking trends for all the states kept going down from 18-2%, with the highest performance being between September '12 and August '13, at the beginning of the review period.

SCMS - CD4 Reagents

Table 7: Description of SCMS trajectories for CD4 over the review period (Refer to Annex SC for the trajectories)

Figure	Description	Observation
Fig SC.4	Shows trajectories for the facilities that stocked BD FACSCOUNT reagents according to plan the	Majority of facilities stocked CD4/CD3 Reagent Kits according to plan throughout the review period
Fig SC.4	Shows trajectories for the facilities that stocked PARTEC CYFLOW reagents according to plan the	Decontamination Solution were stocked according to plan for most facilities throughout the review period

DELIVER - Malaria

Table 8: Description of DELIVER trajectories for Malaria over the review period (Refer to Annex DA for the trajectories)

Figure	Description	Observations
	General	
Fig DA.1	Shows trajectories for the facilities that stocked Malaria commodities according to plan	January 2014 had the highest proportion of facilities (62.8%) that reported and stocked RDT according to plan with the lowest RDT stock (17.6%) reported in May 2014. Generally, LLITNs registered a relatively low percentage of facilities that stocked according to plan with the highest and lowest percentages at 12.5% and 3.5% respectively. There were few facilities that stocked Sulphadoxine according to plan in the period between October 2012 and May 2013 with some facilities reporting as low as 0.4%. However, improvements in stocking started picking up in June until January 2014. Stocking for AL according to plan ranging between 27.1% and 44%
	By Facility type	
Fig DA.2	Shows trajectories for the facilities that stocked LLINs according to plan by facility type	Over 60% of the primary health facilities reported to have stocked LLIN according to plan with the highest percentage (97.4%) reported in November 2014. However, less than 40% of secondary hospitals reported to have stocked LLIN according to plan with a drastic decrease in the period after January 2014
Fig DA.3	Shows trajectories for the facilities that stocked AL according to plan by facility type	Over 80% of the primary health care centers stocked AL according to plan across the entire reporting period (2013-2015) with 96.8% of the facilities stocking it according to plan in September 2015. However, secondary hospitals did not stock AL according to plan, reporting less than 20% in 2013 to 2015.
Fig DA.4	Shows trajectories for the facilities that	Similar to AL, over 80% of the primary health care centres stocked AA according to plan in the entire reporting period with 95.5% of them achieving

Figure	Description	Observations
	stocked AA according to plan by facility type	this indicator in November 2014. Less than 20% of the Secondary hospitals stocked Artesunate according to plan in the entire reporting period. Reporting under tertiary Hospital was done for only March and May 2015
Fig DA.5	Shows trajectories for the facilities that stocked according to plan RDT facility types	Despite the high percentage of the facilities stocking RDTs according to plan in the primary health centres, the percentages fluctuated for a period up to November 2013 they stabilized and consistently rose from 81% to 97% in by September 2015. A similar trend of intermittent stocking of RDT according to plan was observed for the secondary hospitals up to November 2013 with the proportion of facilities that stocked according to plan quite low (majorly below 20%) over the reporting period after November thought August 2015
Fig DA.6	Shows trajectories for the facilities that stocked SP according to plan by facility type	The percentage of primary health center facilities that reported SP stock according to the plan was higher with all facilities reporting 100% in the period between October 2012 and May 2013. Over the reporting period between July 2013 and August 2015, over 80% of the primary health center facilities reported having stocked SP according to plan. However, over the entire reporting period, less than 20% of the secondary hospitals were stocking SP according to the plan.
	By State	
Fig DA.7	Shows trajectories for the facilities that stocked LLIN according to plan for by state	Only two states (Cross Rivers and Nasarawa) reported on the stocking according to plan for the entire review period between October 2012 and August 2015. Zamfara state only reported up to November 2013 as Oyo state started reporting in January 2014. Majority of the states reported less than 40% stock levels for LLIN in the entire reporting period. Only Zamfara and Kogi states hit above 60% stock levels as planned but only May 2013 (70%) and January 2014 (63.4%) for Zamfara and Kogi respectively
Fig DA.8	Shows trajectories for the facilities that stocked AL according to plan by state	On average, all states reported that below 20% of the facilities had stocked AL according to plan. Despite Oyo state reporting the highest percentage (68%) of facilities stocking according to plan, its momentum went down to 17.9% September 2015. Nasarawa and Sokoto states had the lowest percentage of the facilities stocking according to plan thought the review period with only 1.7% (September 2015) and 0.8% (September 2013) of the facilities stocking according to plan in Nasarawa and Sokoto states respectively
Fig DA.9	Shows trajectories for the facilities that stocked according to plan AA by state	With exception of Oyo state that had about 60% of the facilities reporting AA stock according to plan for only January and March 2013, all other states had less than 40% of their facilities reporting to have stocked according to plan throughout the review period. Kebbi state only reported AA for only one year (September 2014-September 2015)
Fig DA.10	Shows trajectories for the facilities that stocked according to plan RDT by state	Oyo state reported the highest proportion of facilities that stocked RDT according to plan compared to other states with the highest percentage (70.3%) reported in March 2013. All other states reported less than 40% of their facilities stocking RDT according to plan. Similar to AA, Kebbi state was reviewed for only one year.
Fig DA.11	Shows trajectories for the facilities that stocked according to plan SP by state	Oyo, Nasarawa and Benue states had 100% of their facilities stocking SP according to plan in October 2012, January 2013 and May 2013 respectively. However, the reporting drastically dropped in the period around September 2013 to some states like Nasarawa reporting 3.8% in September 2013.

DELIVER – Reproductive Health

Table 9: Description of DELIVER trajectories for Reproductive Health over the review period (Refer to Annex DB for the trajectories)

Figure	Description	Observations
Fig	Shows trajectories for	Overall, very few facilities stocked RH commodities according to plan

Figure	Description	Observations
DB.1	the facilities that stocked RH commodities from LGA according to plan	(percentages less than 2.2%). Nevertheless, stocking according to plan was higher for the shorter term contraceptives compared to the longer term methods and female condoms.
Fig DB.2	Shows trajectories for the facilities that stocked RH commodities from SDP according to plan	For the facilities reported from SDP, the percentage of facilities that stocked RH commodities according to plan were higher compared to LGA and showing similar trends for the two sets of birth control methods. Still, stocking practices were more efficient for the shorter acting contraceptives.

Exploring the explanatory components of commodities not being stocked according to plan

Table 10: Comparing overstocking and understocking as explanatory components of not stocking according to plan

Figure	Description	Observations
Fig SS.1	Shows trajectories for stock status for ARV commodities	Over the whole review period, majority of the facilities overstocked ARV drugs (from 50% in January 2013 peaking to 70% in July 2014 and declining to 60% in September 2015). The trends declined over time for understocking (27.8% in January 2013 to 23% in September 2015), stocked according to plan (14.8% in January 2013 to 9.8% in September 2015), and had stock outs (7.5% in January 2013 to 7.3% in September 2015)
Fig SS.2	Shows trajectories for stock status for RTK commodities	Percentage of facilities that overstocked RTK increased over the review period until 71% in November 2014 and then declined to 59% in September 2015. The percentage of facilities that understocked RTK decreased over time (33% in January 2013 to 22% in September 2015). Trends for stocked according to plan and stock outs were similar over the review period (both lower than 15%).
Fig SS.3	Shows trajectories for stock status for CD4 commodities	Similar to other commodities, overstocking of CD4 reagents occurred in majority of the facilities (54% in January 2013 to 52% in September 2015).
Fig SS.4	Shows trajectories for stock status for Malaria commodities	On average, 50% of the facilities reported overstocking of malaria drugs across the entire reporting period with the exception of October 2013 where 100% of the facilities were overstocked. Stocking levels according to plan were generally low with the highest as 20% of the facilities in March 2013. On average, 20% of the facilities reporting understocking across the entire reporting period with the highest understocking reported in 29.4% of the facilities in May 2014 and lowest understocking reported in 16.8% of the facilities in October 2012. Generally, 10% of the facilities reported malaria drug stock out
Fig SS.5	Shows trajectories for stock status for reproductive health commodities	The percentage of facilities that supplied reproductive health commodities fluctuated proportionately in opposite directions for overstocking (from 39.8% in September 2012 dropping to 38% in January 2013 and rising to 42% in November 2013) and understocking (from 35% in September 2012 peaking at 38% in January 2013 and declining to 34% in November 2013). The percentage of facilities that stocked according to plan ranged from 15% to 19% while occurrences for stock outs were less than 9% over the review period.

5.1.2 Indicator 2: Stock out rate at SDPs

SCMS – HIV drugs

Table 11: Description of SCMS trajectories for Anti-retroviral drugs over the review period (Refer to Annex SD for the trajectories)

Figure	Description	Observations
Fig SD.1a	Shows trajectories for stockout rates for of Adult First line drugs	The percentage of facilities that had stockout for most ARV drugs declined over time in similar patterns (From a high of 9.6% to as low as 2%. However, stockouts for one drug (TDF/3TC/EFV) increased from 2.8% in January 2015 to 26% in September 2015)
Fig SD.1b	Shows trajectories for the facilities that had stockout of Adult Second line drugs	The percentage facilities that had stock out for Adult second line drugs were lower than 4.5% for most of the review period. However, sporadic stockouts occurred for LPV/r, ABC and ATV/r compared to the other drugs.
Fig SD.2a	Shows trajectories for the facilities that had stockout of Pediatric First line drugs	The percentage of facilities that had stockouts for pediatric first line were highest for NVP (10.9% in January 2013 to 20.6% in September 2015) followed by AZT/3TC/NVP (4.8% in January 2013 to 4.7% in September 2015) and AZT/3TC (6.3% in January 2013 to 3% in September 2015) with sporadic fluctuations between the start and end of the review period.
Fig SD.2b	Shows trajectories for the facilities that had stockout of Pediatric Second line drugs	Pediatric second line drugs had very low stock out rates over the review period. For LPV/r the percentage of facilities with stock out ranged from 1.2% in Jan 2013 to 1.4% in Sep 2015 with a peak of 1.97% in July 2015 while for ABC they ranged from 0.88% in Jan 2013 to 0.46% in Sep 2015 with a peak of 1.65% in Nov 2014.
Fig SD.3	Shows trajectories for the facilities had stockout of OI drugs	Cotrimoxazole had fairly significant stock out rates ranging from 4% of the facilities in January 2013 to 8.4% in September 2015 with peaks of 15.9% in May 2013 and 92% in November 2014
Fig SD.4	Shows trajectories for the facilities that had stockout of TDF/3TC/EFV	Percentage of facilities that had stock out for TDF/3TC/EFV increased from 25% in January 2013 to 83% in September 2015 for primary health centres. For secondary facilities the percentages decreased from 50% in January 2013 to 17% in September 2015
Fig SD.5	Shows trajectories for the facilities that stock out for Cotrimoxazole	The percentages decreased for secondary facilities from 61% in January 2013 to 36% September, 2015. The percentages of stockout increased for primary centres from 35% in January 2013 to 63% in September 2015.

SCMS – HIV Rapid Diagnostic Test Kits (RTK)

Table 12: Description of SCMS trajectories for Rapid Test Kits over the review period (Refer to Annex SE for the trajectories)

Figure	Description	Observations
	General	
Fig SE.1	Shows trajectories for stockout rates for Determine RTK	Determine had the highest stock out rates compared to other kits. The peak rate was in October to November, 2014 at 60%.
	By Facility Type	
Fig SE.2	Shows trajectories for stockout rates for Determine RTK by facility type	Percentage of facilities that reported Determine stockouts was higher in the primary health centres which also had an upward trend. Secondary hospitals had a downward trend for stockout rates
Fig SE.3	Shows trajectories for stockout rates for StatPak RTK by facility type	Secondary hospitals had the highest rates of StatPak stock out rate at 60%. This however had a downward trend from 60% to 35% in July 2014. There was later a spike from 27% to 55% rate in Dec 2013. The Primary health

Figure	Description	Observations
		centers had a relatively similar trend. The percentage of Primary health centers which reported StatPak stockout increased to 66% but later fluctuated downwards.
Fig SE.4	Shows trajectories for stockout rates for Unigold RTK by facility type	The percentage of secondary hospitals that reported Unigold stocked out was higher at the start of the review period and later took a downward trend to 30%. Primary health facilities had an upward trend showing an increase in the percentage of facilities that reported Unigold stocked out.
	By State	
Fig SE.5	Shows trajectories for the facilities that had stock out for determine RTK category by State	Anambra, Ebonyi and Gombe states had the highest percentage of facilities that reported stockout of Determine RTK compared to other states. There a consistent trend that ranged between 3-20% of stock out.
Fig SE.6	Shows trajectories for stockout rates for StatPak RTK by State	Borno State had a spike in StatPak stockout rates between October 2013 and February 2014, following which the rates went down.
Fig SE.7	Shows trajectories for stockout rates for Unigold RTK by state	Enugu State had a spike in Unigold stockout rates for Unigold to 23%. Between April and December 2013 there was also spike in Unigold stockout rates for Abia state.

SCMS - CD4

Table 13: Description of SCMS trajectories for CD4 over the review period (Refer to Annex SF for the trajectories)

Figure	Description	Observation
Figure SF.1	Shows trajectories for the facilities that had stock out for BD FACSCOUNT reagents	Percentage of facilities that had stockout of CD4 reagents were higher for the reagents rinse solution 5L, Clean solution 5L and Control Kit 25 tests at the beginning of the review period compared to the other reagents. However, from May 2013 onwards there was no difference in stockout patterns between the different reagents.
Figure SF.2	Shows trajectories for the facilities that had stock out for Partec Cyflow reagents	The percentage of facilities with stockouts for Sheath Fluid 5L reagents increased over time until July 2014 with 19% and declined to 11% in September 2015. The rest of the reagents showed similar fluctuations with no particular pattern over the review period

DELIVER - Malaria

Table 11: Description of DELIVER trajectories for Malaria over the review period (Refer to Annex DC for the trajectories)

Figure	Description	Observations
	General	
Fig DC.1	Shows trajectories for stockout rates for Malaria commodities	With exception of October 2012 and November 2013, RDT had higher stockout rates compared to other malaria products throughout the entire review period. Stockout rates for malaria commodities were highest in March 2013 at 73.9% of facilities. The percentage of the facilities that reported SP stock out were below 15% with exception of January 2014 where 50% of the facilities had SP stock out. On average, stock out for LLIN, SP, AL and AA was below 20% throughout the entire review period.
	By facility type	
Fig	Shows	Stockouts for LLIN were reported in over 60% of the primary health facilities

Figure	Description	Observations
DC.2	trajectories stockouts of LLIN by facility type	compared to the average of 20% of the secondary hospitals that reported LLIN stock outs. The highest proportion of facilities (35.3%) that reported LLIN stock out was in July 2013 with the lowest proportion at 1.2% in March 2015
Fig DC.3	Shows trajectories for the facilities that had stock out for AL by facility type	Generally, the higher the level, the lower the stockouts rates. Primary health centres experienced higher rates of AL stockouts compared to Secondary and Tertiary with the highest stock outs (96.2%) reported in January 2015. AL Stock outs in the primary health facilities were maintained at more than 70% of the facilities throughout the entire review period while for the secondary hospitals, below 25% of the facilities reported AL stockouts except in January 2013 (55.6%) and May 2013 (25.9%). Tertiary hospitals were only reviewed for September 2014 (0.8%) and May 2015 (0.6%)
Fig DC.4	Shows trajectories or stockout for AA by facility type	Similar to AL, over 70% of the primary health facilities reported AA stockout. In March 2013, November 2014 and March 2015, 100% of primary health facilities had AA stock out. For a period of one year (September 2014-September 2015), over 95% of the primary health facilities had AA stock out. For secondary hospitals, AA stocking improved over time with the highest stock out experienced in 25% of the secondary hospitals in January 2013 which reduced to 3% in September 2015.
Fig DC.5	Shows trajectories of stockout for RDTs facility type	Like other malaria products, more RDT stockouts were reported in over 70% of the primary health centres compared to less than 25% of the secondary hospitals. Review for Tertiary hospitals was done for only September 2014 and March 2015.
Fig DC.6	Shows trajectories for stockouts of SP by facility type	In October 2012, all primary health centre facilities had SP stock out and the stock out was persistently reported in over 65% of the primary health facilities. There was some improvement over time among secondary hospitals with the proportion of facilities experiencing SP stock outs ranging from 25% in May 2013 to 4.8% in March 2015
	By State	
Fig DC.7	Shows trajectories for the facilities that had stock out for LLIN by State	In Zamfara and Benue states, a highest proportion of facilities (75% in Jan 2013 and 81% in July 2013) reported LLIN stock outs. For most of the facilities in the states, LLIN stock out was quite intermittent over the review period
Fig DC.8	Shows trajectories for the facilities that had stock out for AL by state	Generally, Kogi state had the lowest proportion of facilities that reported AL stock out. Despite Sokoto maintaining a higher percentage of facilities reporting AL stock out (76% in October 2012 and 82.4% in July 2013, reviews was only done up to November 2013. In Benue state, 90.5% of the facilities reported AL stock out in July 2014
Fig DC.9	Shows trajectories for the facilities that had stock out for AA by state	Kogi state that had 100% of its facilities reporting AA stock out in March 2013 significantly reduced to 30.8% in July 2014 and 3.6% in September 2015. Sokoto state only reported up to November 2013 with over 40% of its facilities reporting AA stock out. Cross Rivers and Kebbi reported a high proportion of AA stock out in Sept 2013 (80%) and Sept 2014 (79%) respectively
Fig DC.10	Shows trajectories for the facilities that had stock out for RDT by state	Kebbi state reduced the percentage of the facilities reporting RDT stock out from 47.7% in September 2014 to 13% in September 2015. Benue had intermittent reports of facilities experiencing RDT stock out over the review time ranging from 6.2% to 78%. The highest (78%) proportion of facilities reporting RDT stock out was reported in July 2014. Kogi state had the lowest proportion of facilities of facilities reporting RDT stock out maintaining it to less than 10% of the facilities
Fig DC.11	Shows trajectories for the facilities that had stock out for	Only Nasarawa state reported on SP stockouts throughout the entire review period with the highest percentage (50%) of facilities reporting SP stock out reported in October 2012 and reduced to 13.1% in September 2015. Sokoto had the highest proportion of facilities that reported SP stock to over 50% of

Figure	Description	Observations
	SP by state	the facilities. However, review only considered the period between October 2012 to January 2014

DELIVER – Reproductive Health

Table 15: Description of DELIVER trajectories for Reproductive Health over the review period (Refer to Annex DD for the trajectories)

Figure	Description	Observations
Fig DD.1	Shows trajectories for stock out of RH commodities from LGA	The trends of facilities were RH commodities were stocked out declined over the review period for all the RH commodities with Implanon implant having more facilities compared to the others (from 3.5% in October 2012 to 1% in November 2013)
Fig DD.2	Shows trajectories for stockout for RH commodities from SDP	Male condoms were consistently highly stocked out in most facilities (24% in September 2012 to 21% in November 2013) followed by Microgynon, Noristerat, Exluton and Depo-provers. The long-term family planning methods (implants-Implanon and Jadelle; and IUCD) and female condoms had percentage of facilities less than 8%.

5.1.3 Indicator 3: SDP reporting rate to the logistics management information system (LMIS)

Overall SDP Reporting rate of the commodities

Table 12: Description of trajectories for SCMS and DELIVER health commodities over the review period (Refer to Annex RA for the trajectories)

Figure	Description	Observations
Fig RA.1	Shows trajectories for the facilities that reported into LMIS for ARV commodities	A total of 9,009 facilities reported into the LMIS on ARV commodities. The percentage of facilities that reported on ARV commodities increased steadily from 9.3% in January 2013 to 69.3% in May 2014 then it declined slightly to 62.6% in September 2015.
Fig RA.2	Shows trajectories for the facilities that reported into LMIS for RTK commodities	The facility reporting rate for RTK had an upward trend from 3 to 70% throughout the review period.
Fig RA.3	Shows trajectories for the facilities that reported into LMIS for CD4	A total of 902 facilities reported into LMIS on CD4 commodities. The percentage of facilities reporting on CD4 increased over time ranging from 18% in January 2013 to 64% in September 2015.
Fig RA.4	Shows trajectories for the facilities that reported into LMIS for Malaria	Facility reporting rate for malaria products improved over time with 73.3% of the facilities reporting in March-April 2015. However, reporting was worse in October-November 2013 where one out of 4376 (0.02%) reported on malaria products. The situation improved after November 2013
Fig RA.5	Shows trajectories for the facilities that reported into LMIS for Reproductive Health commodities	There was little increments in the reporting rate of the facilities for RH commodities until September 2013 (ranging between 10% to 11.5%) from which the rate sharply increased to about 17%

Consistency of SDP Reporting on commodities

Table 13: Description of trajectories for SCMS and DELIVER health commodities over the review period (Refer to Annex RB for the trajectories)

Figure	Description	Observations
Fig RB.1a	Shows trajectories for the primary health facilities that reported into LMIS for ARV commodities	The reporting rate for primary health centres was low at the beginning of the review period but increased immensely from January 2014 onwards.
Fig RB.1b	Shows trajectories for secondary hospitals that reported into LMIS for ARV commodities	Secondary hospitals reported more consistently from 2013 although the numbers increased from Jan 2014 onwards.
Fig RB.1c	Shows trajectories for tertiary hospitals that reported into LMIS for ARV commodities	The rate of reporting for tertiary hospitals was lower compared to the primary and secondary health facilities.
Fig RB.2a	Shows trajectories for the primary health facilities that reported into LMIS for RTK commodities	Reporting rates for RTK under tertiary facilities were intermittent thought out the review period.
Fig RB.2b	Shows trajectories for primary facilities that reported into LMIS for RTK commodities	The reporting rate for RTK under primary health centre was intermittent between September 2012 and January 2014 after which facilities started reporting consistently to the end of the review period
Fig RB.2c	Shows trajectories for tertiary hospitals that reported into LMIS for RTK commodities	The reporting rate for RTK under secondary hospital was intermittent between September 2012 and August 2013 after which facilities started reporting consistently to the end of the review period
Fig RB.3a	Shows trajectories for the primary health facilities that reported into LMIS for CD4 commodities	Though the facilities that reported on CD4 were much lower compared for the other commodities, the primary health centres showed a lot of inconsistency in reporting the CD4 results
Fig RB.3b	Shows trajectories for secondary hospitals that reported into LMIS for CD4 commodities	Although secondary hospitals reported more consistently over the review period compared to primary centres and tertiary hospitals, there were some case of intermittent reporting.
Fig RB.3c	Shows trajectories for tertiary hospitals that reported into LMIS for CD4 commodities	The reporting rate for tertiary hospitals was more consistent over the review period compared to primary facilities.
Fig RB.4a	Shows trajectories for the primary health facilities that reported into LMIS for Malaria commodities	With exception of the primary health facilities with identifiers up to 500 that did not report for 2013, the reporting rate of malaria products in primary health centres was high compared to secondary hospitals. Facilities ranging between 2000-2500 hardly reported in 2013 and 2014 and consistency reporting was observed in facilities ranging between 500-2000.
Fig RB.4b	Shows trajectories for secondary hospitals that reported into LMIS for Malaria commodities	Secondary Hospitals with unique identifiers up to 50 did not report on malaria in 2013 while some secondary hospitals reported only once in November, 2014 or March, 2015. Generally, more secondary hospitals with identifiers ranging between 100 to 250 reported on malaria products over review period than the facilities below 100 and above 250 with exception of 150 which only

Figure	Description	Observations
		reported in 2015
Fig RB.4c	Shows trajectories for tertiary hospitals that reported into LMIS for Malaria commodities	Generally, Tertiary reports did not report on malaria products for 2013 and 2014 with some few hospitals reporting in 2015. Only hospital 1 was consistent in reporting over the review period
Fig RB.5a	Shows trajectories for facilities that reported into LMIS for Reproductive health commodities from LGA	Very few facilities from LGA reported consistently over the one year 2012-2013. In March and September 2013 there was no reporting done.
Fig RB.5b	Shows trajectories for facilities that reported into LMIS for Reproductive health commodities from SDP	Majority of the facilities from SDP reported consistently over the year as compared to the facilities from LGA

5.2 List of Trajectories

5.2.1 Annex SA: ARV drugs stocked according to plan

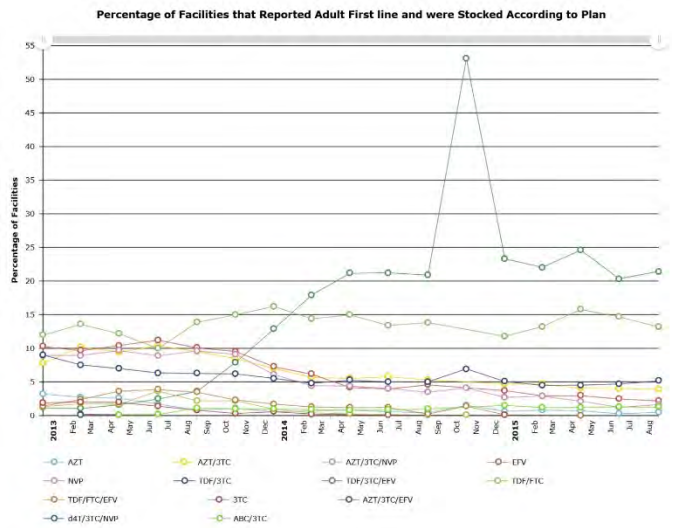


Fig SA.1a: Percentage of facilities that stocked according to plan adult first line drugs

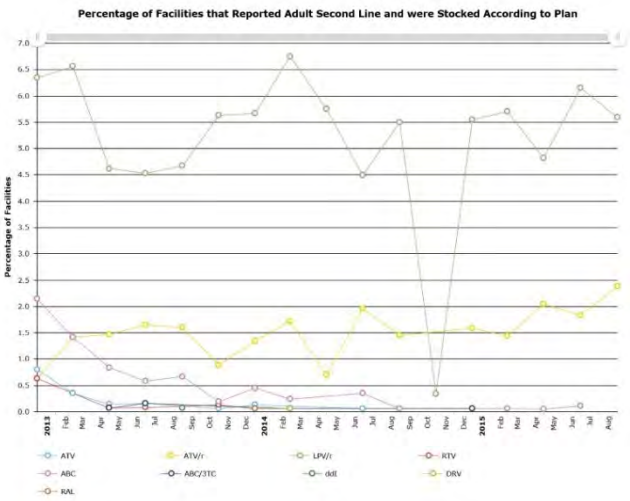


Fig SA.1b: Percentage of facilities that stocked according to plan adult second line drugs

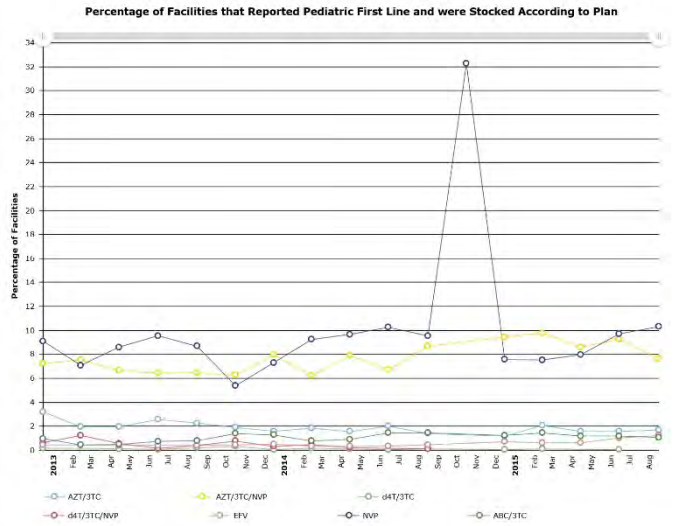


Fig SA.2a: Percentage of facilities that stocked according to plan pediatric first line drugs

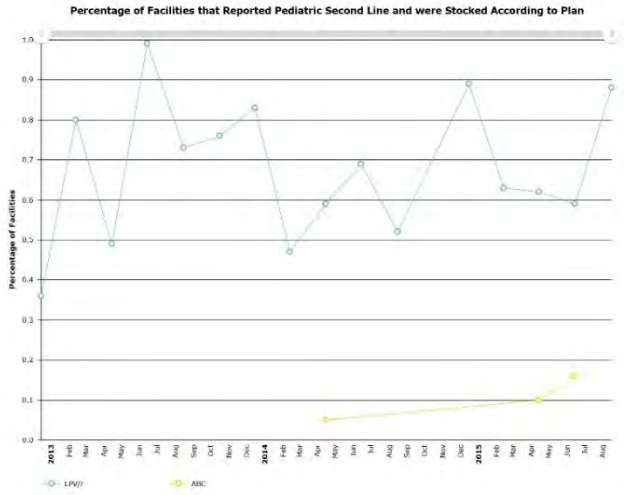


Fig SA.2b: Percentage of facilities that stocked according to plan pediatric second line drugs

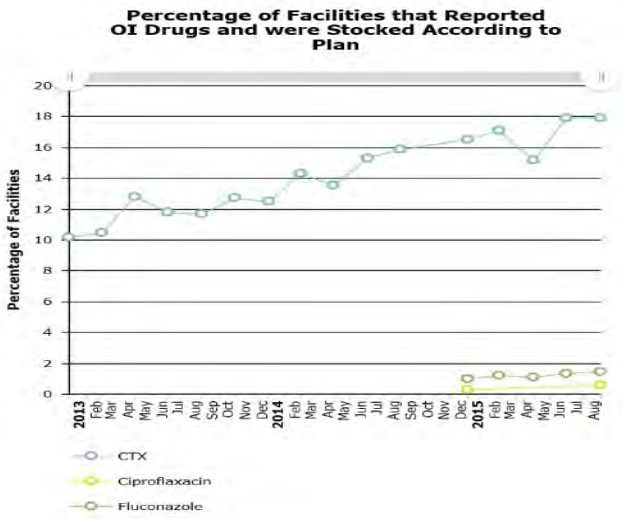


Fig SA.3: Percentage of facilities that stocked according to plan OI drugs

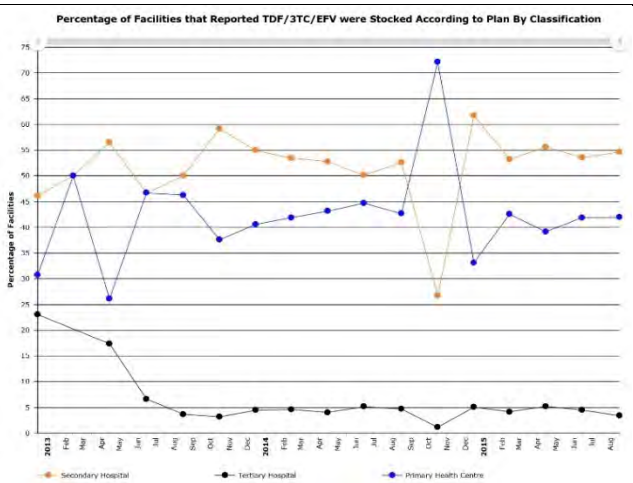


Fig SA.4: Percentage of facilities that stocked according to plan TDF/3TC/EFV by facility type

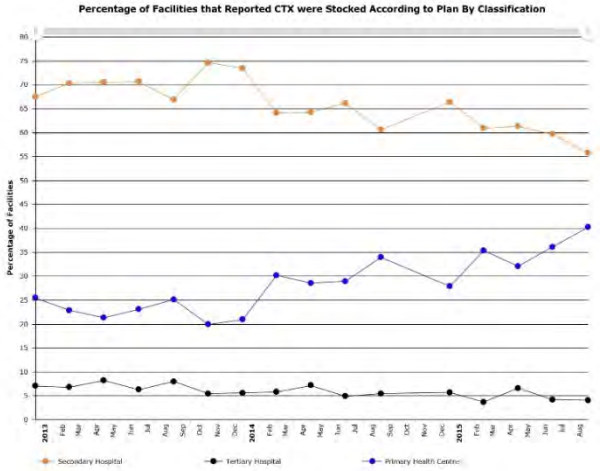


Fig SA.5: Percentage of facilities that stocked according to plan CTX by facility type

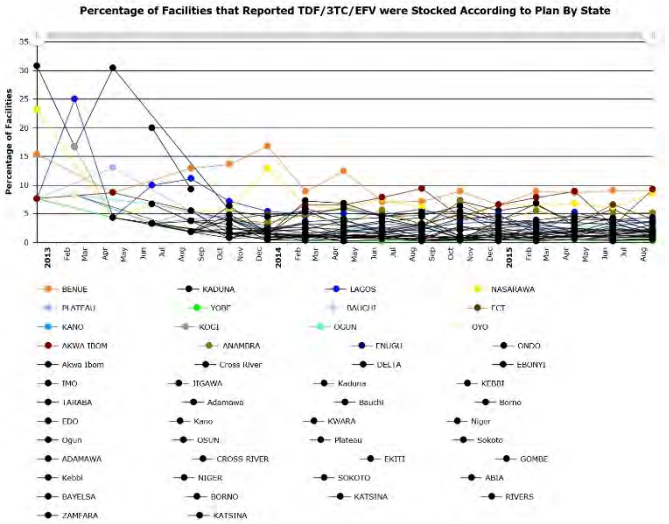


Fig SA.6: Percentage of facilities that stocked according to plan TDF/3TC/EFV by state

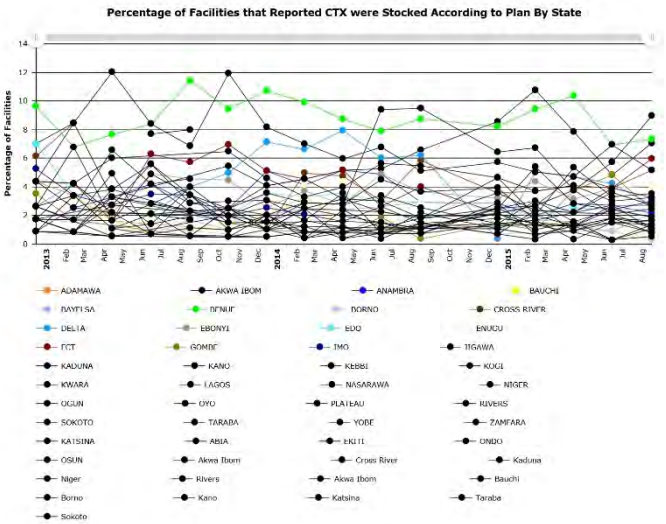


Fig SA.7: Percentage of facilities that stocked according to plan CTX by state

5.2.2 Annex SB: RTKs stocked according to plan

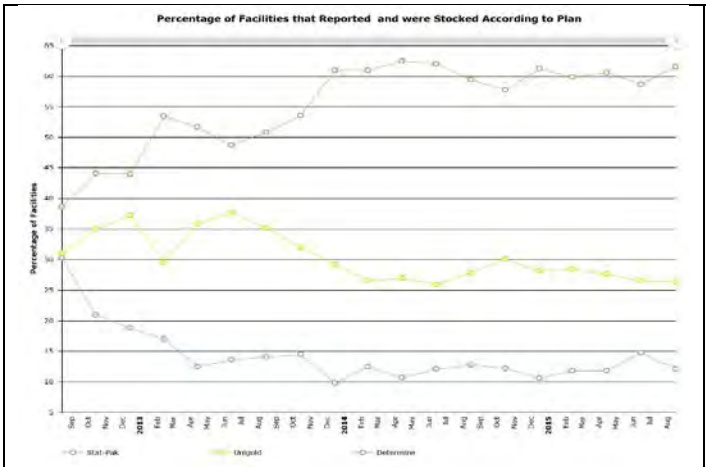


Fig SB.1: Percentage of facilities that stocked according to plan RTK

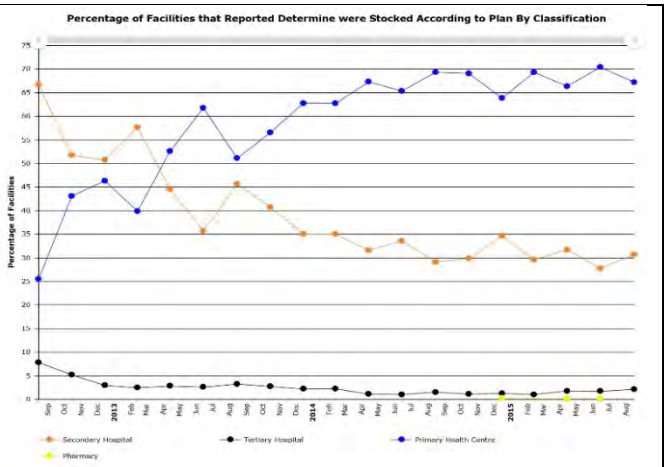


Fig SB.2: Percentage of facilities that stocked according to plan determine RTK category by facility type

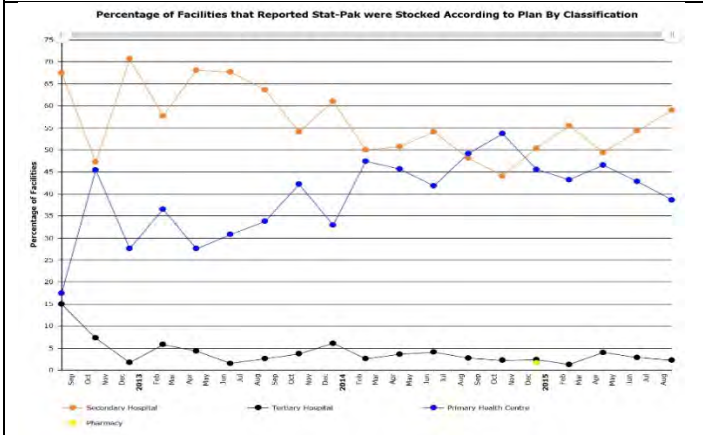


Fig SB.3: Percentage of facilities that stocked according to plan Stat-Pak RTK category by facility type

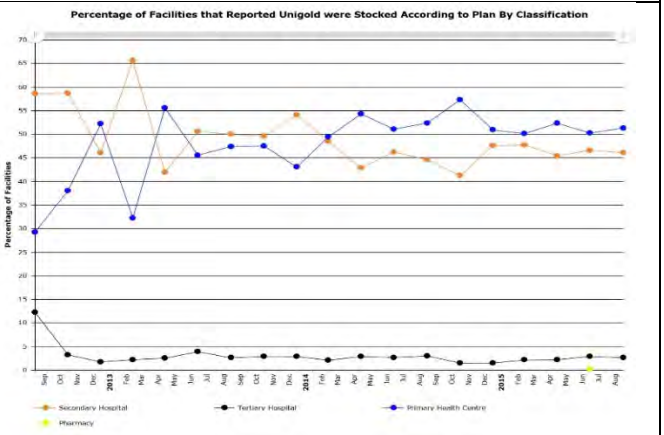


Fig SB.4: Percentage of facilities that stocked according to plan Unigold RTK category by facility type

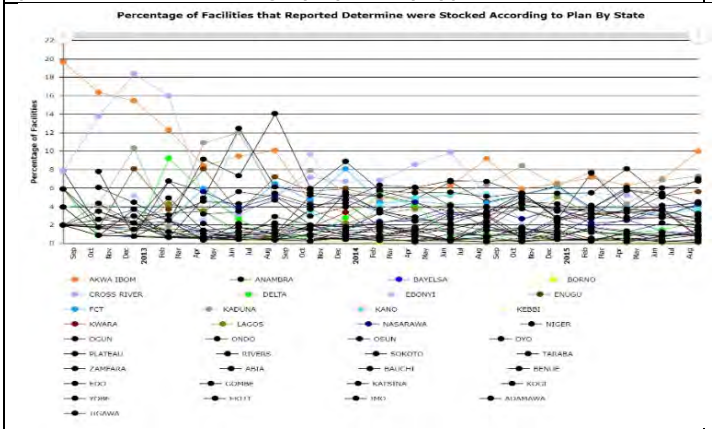


Fig SB.5: Percentage of facilities that stocked according to plan determine RTK category by state

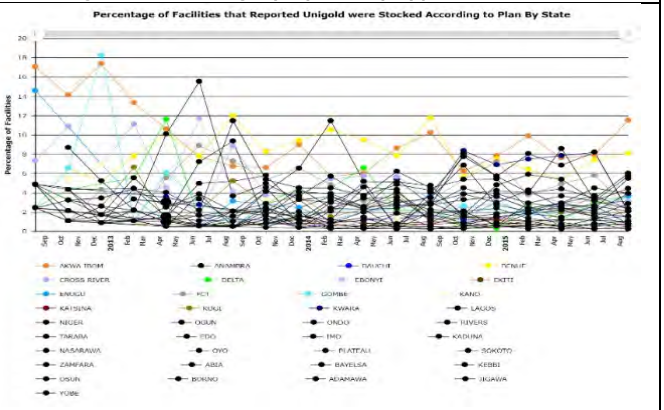


Fig SB.7: Percentage of facilities that stocked according to plan Unigold RTK category by state

5.2.3 Annex SC: CD4 reagents stocked according to plan

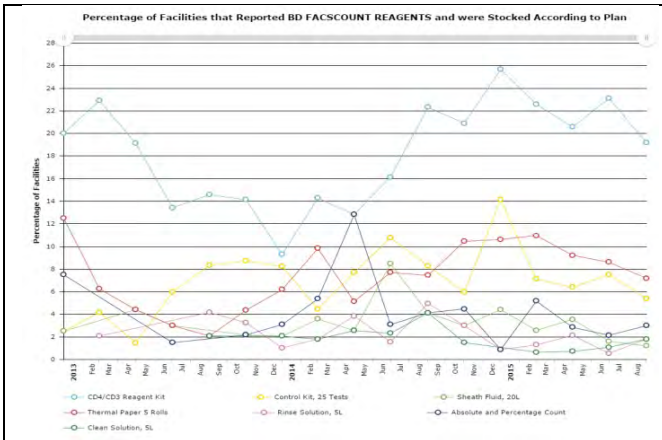


Fig SC.1: Percentage of facilities that stocked according to plan BD FACSCOUNT reagents

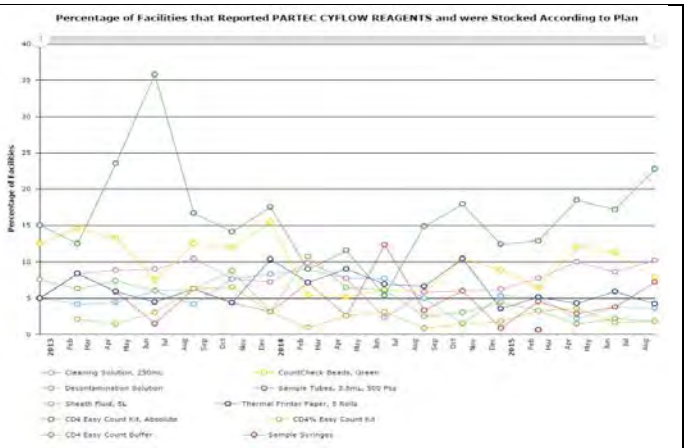


Fig SC.2: Percentage of facilities that stocked according to plan Partec Cyflow reagents

5.2.4 Annex DA: Malaria commodities stocked according to plan

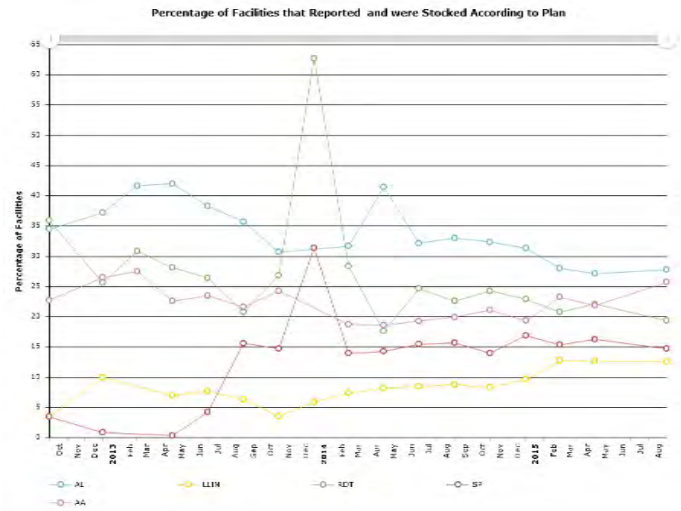


Figure DA.1 Percentage of facilities that stocked according to plan Malaria commodities

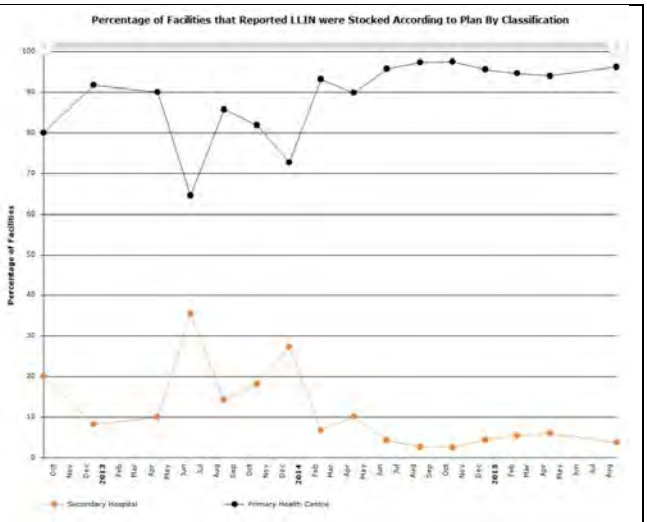


Figure DA.2 Percentage of facilities that stocked according to plan LLINs by facility type

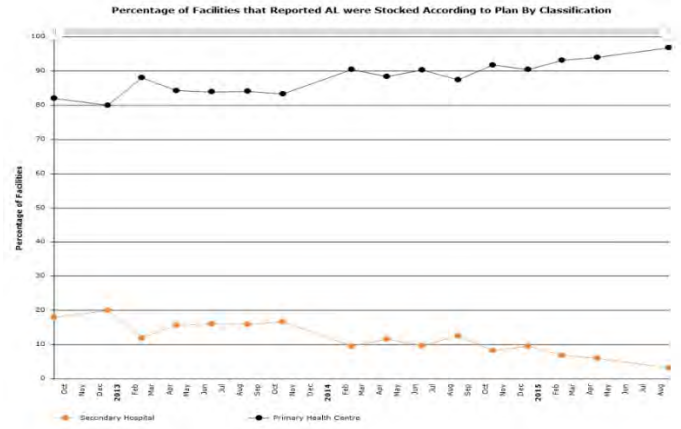


Fig DA.3 Percentage of facilities that stocked according to plan AL by facility type

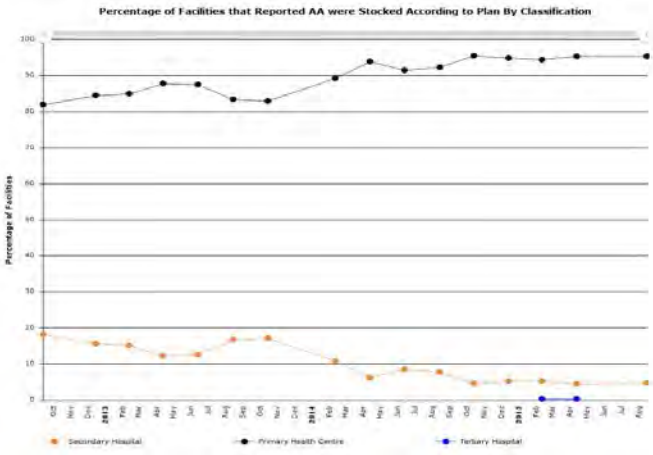
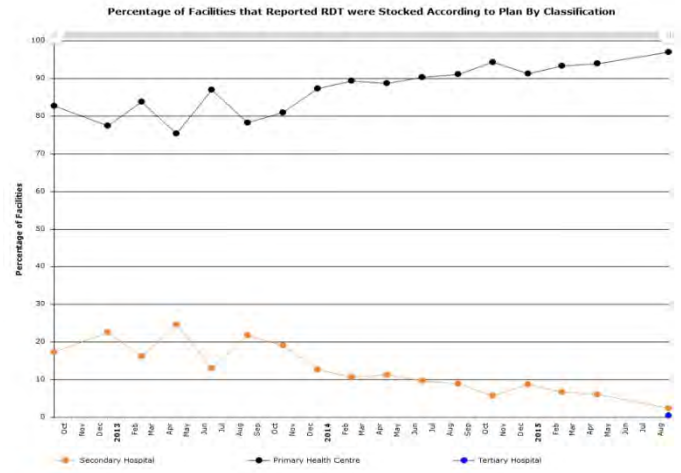


Fig DA.4 Percentage of facilities that stocked according to plan AA by facility type



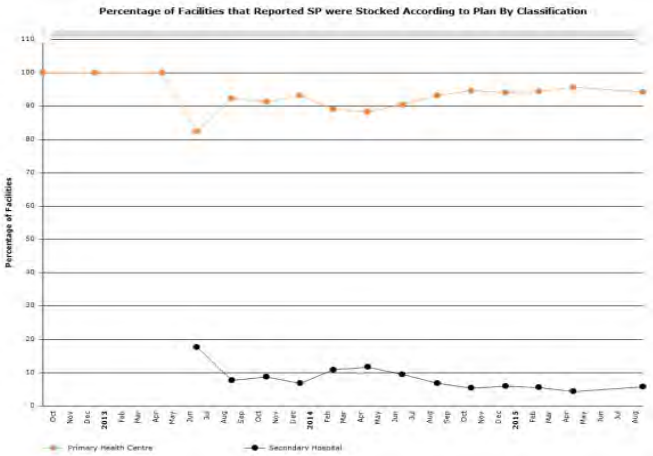


Fig DA.6 Percentage of facilities that stocked according to

Fig DA.5 Percentage of facilities that stocked according to plan RDT by facility type

plan SP by facility type

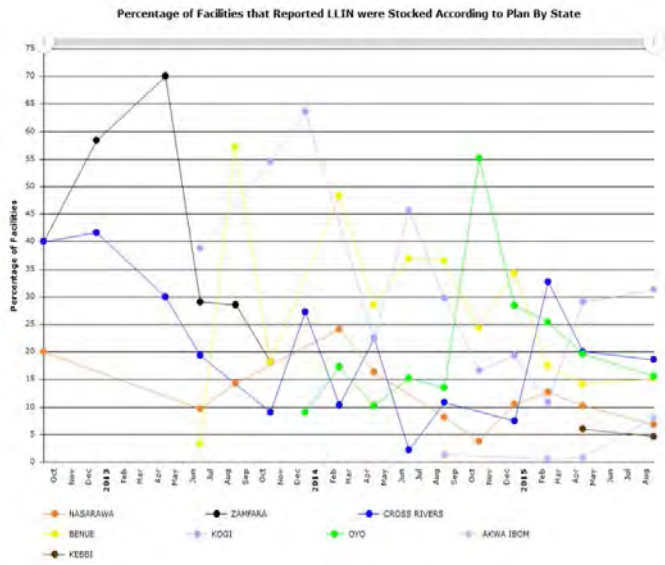


Fig DA.7 Percentage of facilities that stocked according to plan LLIN by state

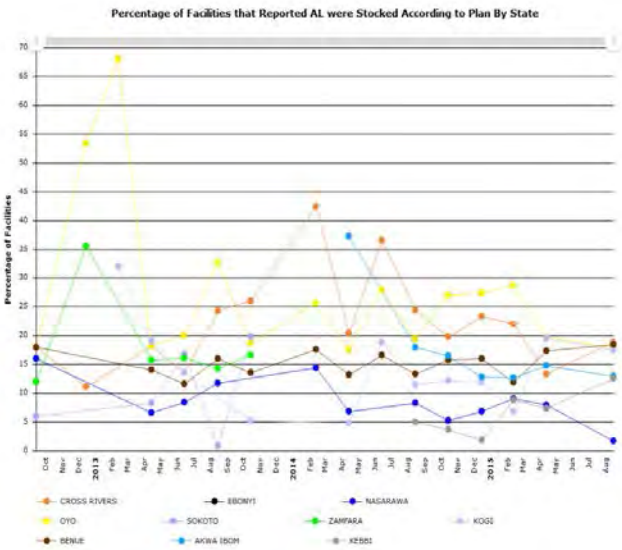


Fig DA.8 Percentage of facilities that stocked according to plan AL by state

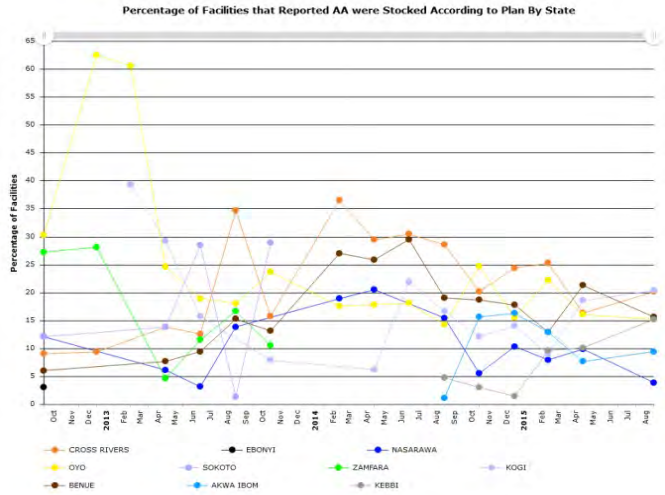


Fig DA.9 Percentage of facilities that stocked according to plan AA by state

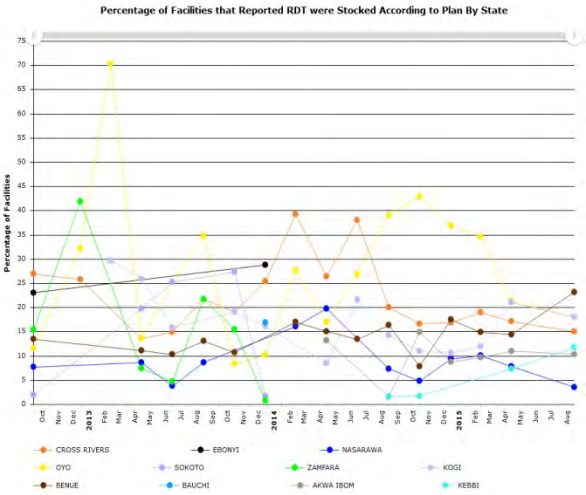


Fig DA.10 Percentage of facilities that stocked according to plan RDT by state

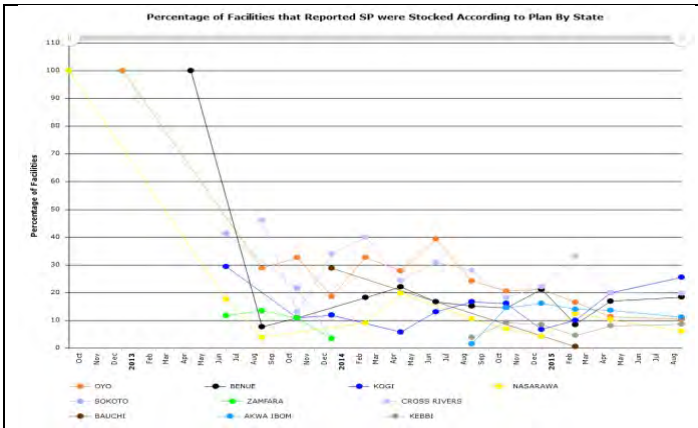


Fig DA.11 Percentage of facilities that stocked according to plan SP by state

5.2.5 Annex DB: Reproductive Health commodities stocked according to plan

Fig DB.1 Percentage of facilities that reported LGA and were stocked according to plan

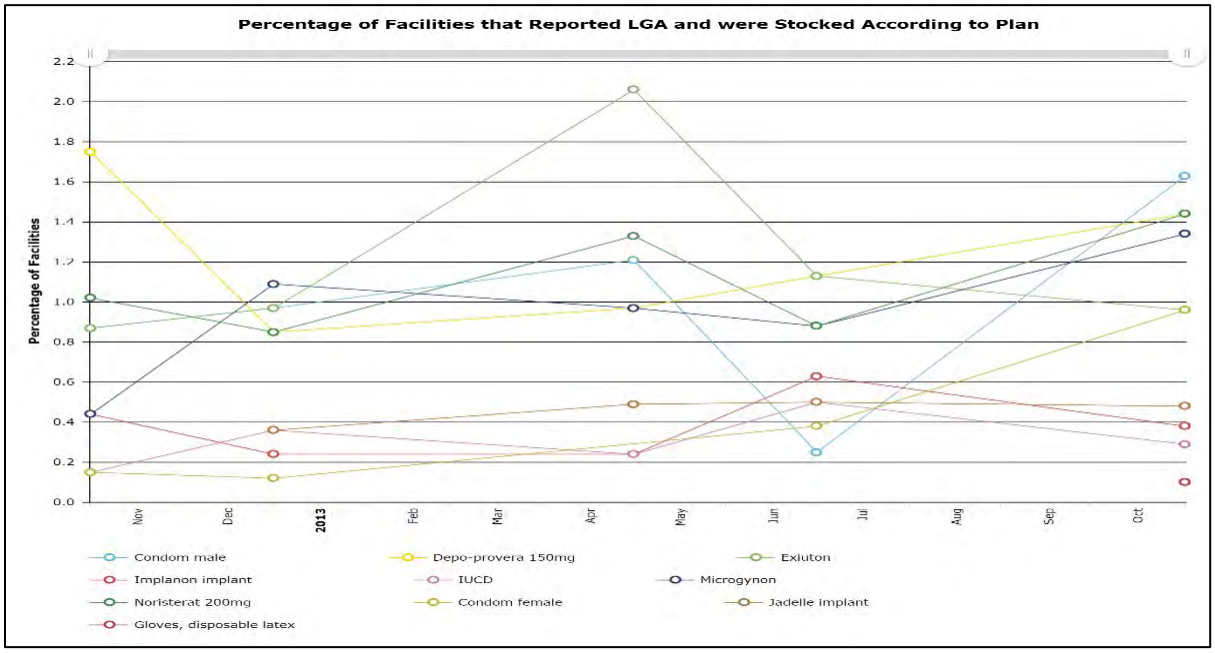
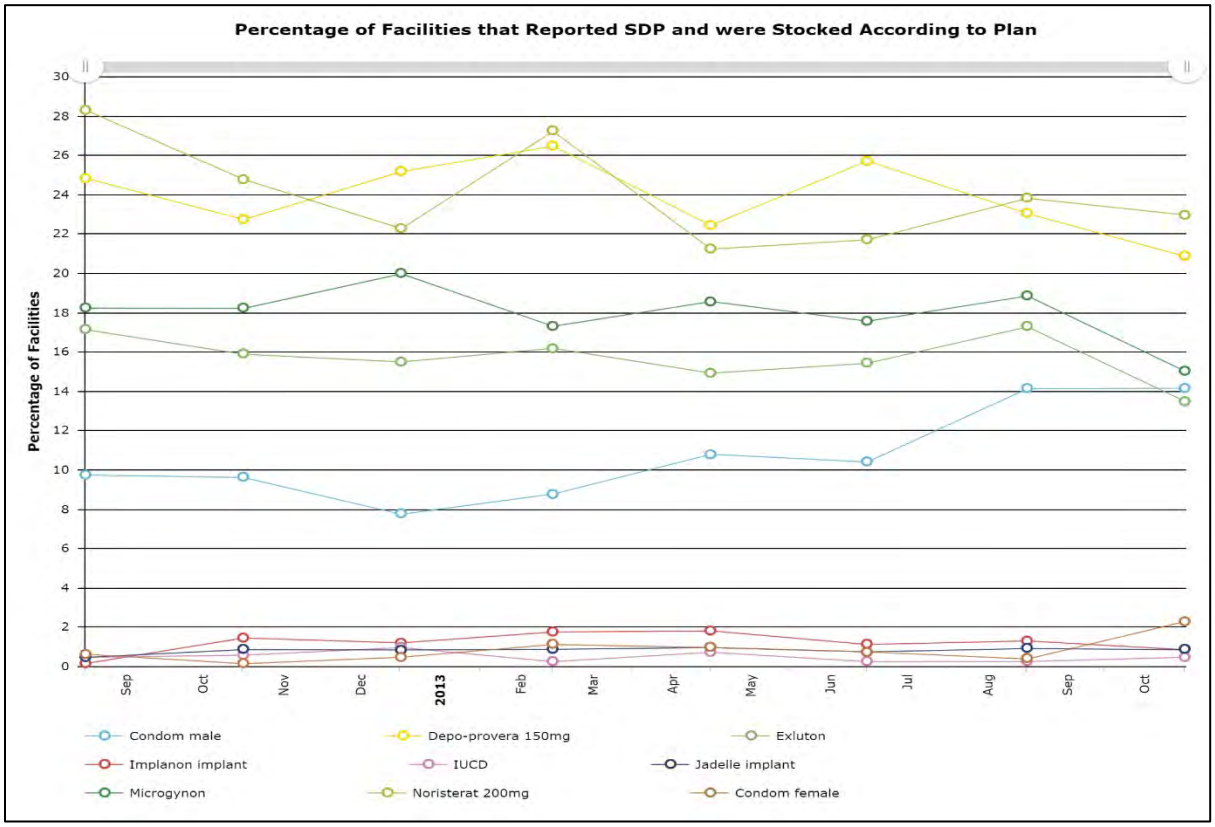


Fig DB.2 Percentage of facilities that reported SDP and were stocked according to plan



5.2.6 Annex SD: Stock out for ARV drugs

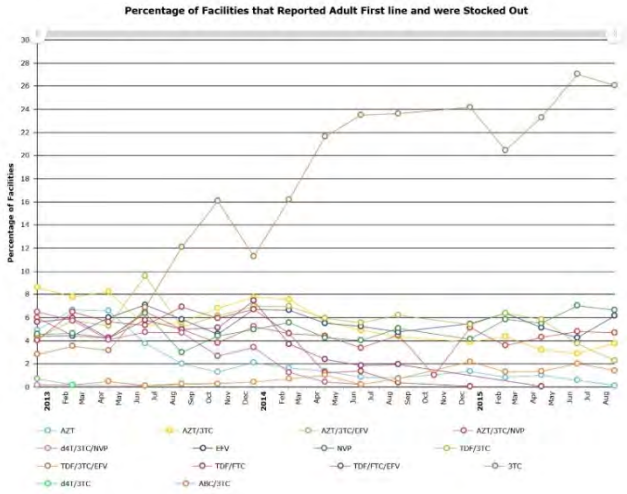


Fig SD.1a Percentage of facilities that had stock out for adult first line drugs

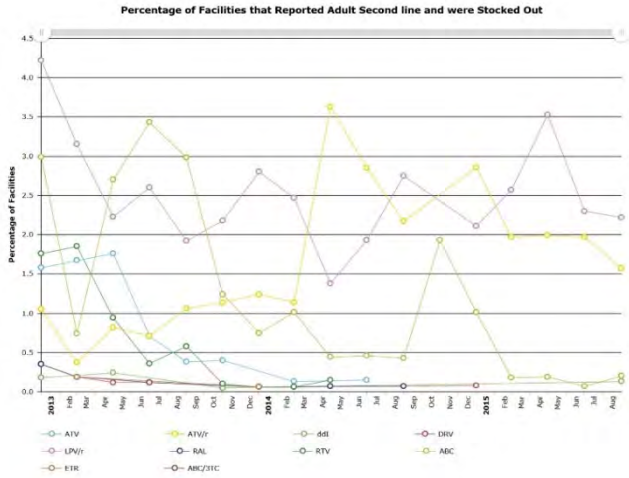


Fig SD.1b Percentage of facilities that had stock out for adult second line drugs

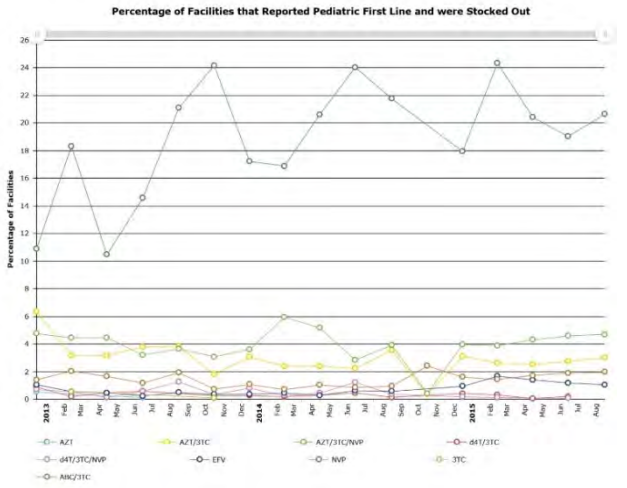


Fig SD.2a Percentage of facilities that had stock out for pediatric first line drugs

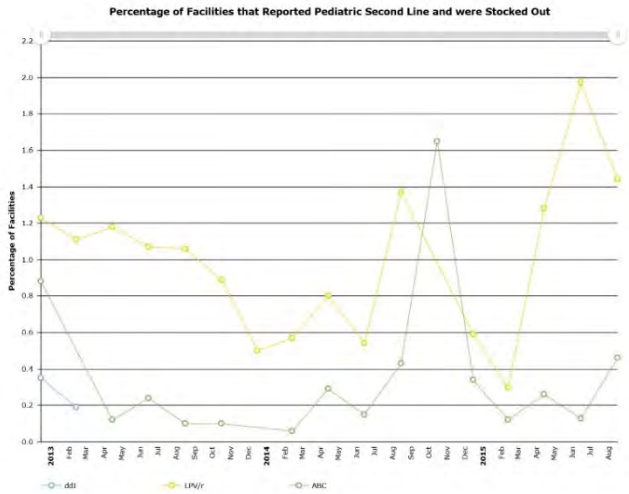


Fig SD.2b Percentage of facilities that had stock out for pediatric second line drugs

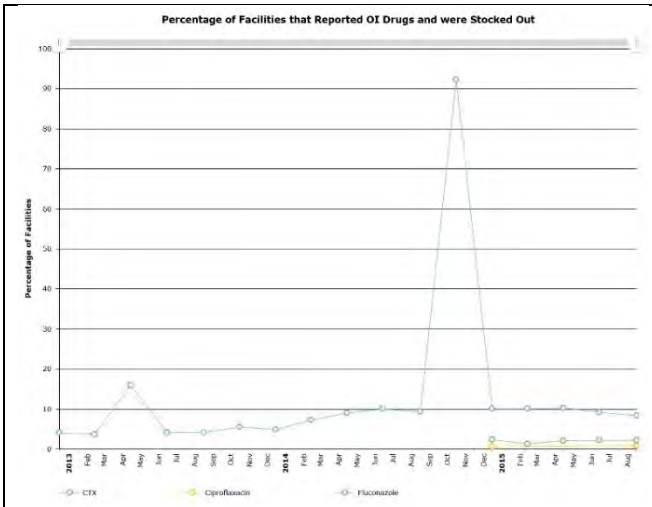


Fig SD.3 Percentage of facilities that had stock out for OI drugs

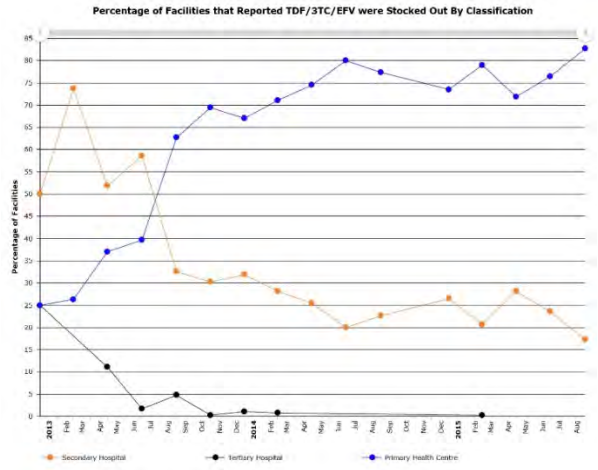


Fig SD.4 Percentage of facilities that had stock out for TDF/3TC/EFV by facility type

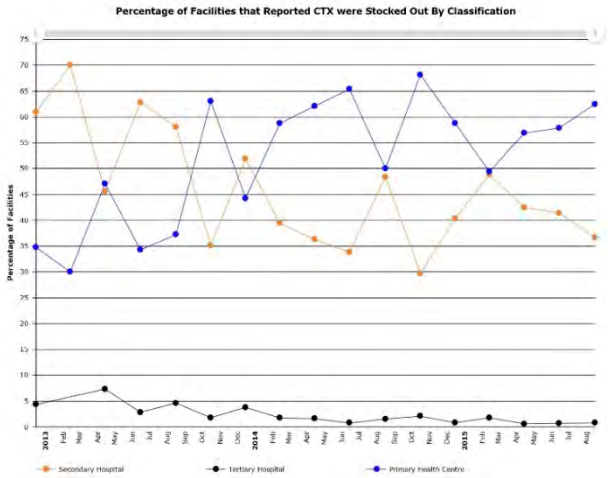


Fig SD.5 Percentage of facilities that had stock out for CTX by facility type

5.2.7 Annex SE: Stock out for RTK

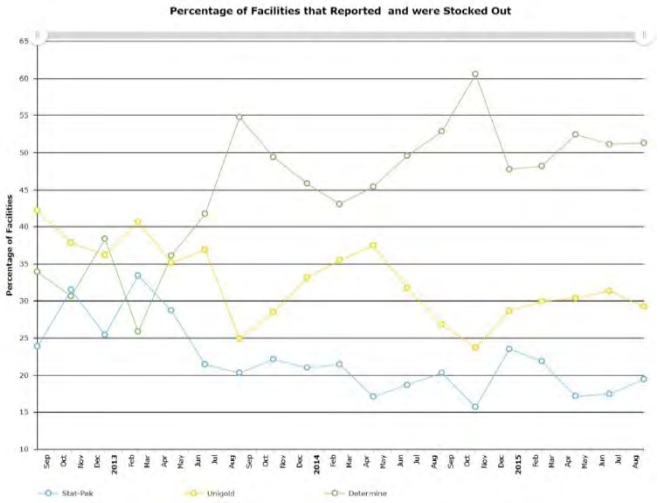


Fig SE.1 Percentage of facilities that had stock out for RTK

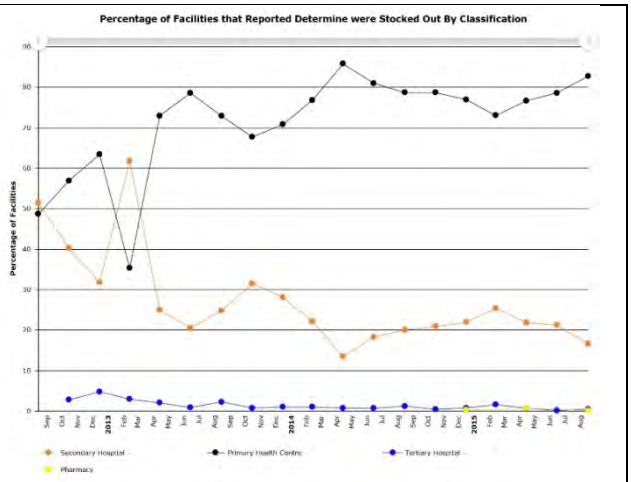


Fig SE.2 Percentage of facilities that had stock out for determine RTK category by facility type

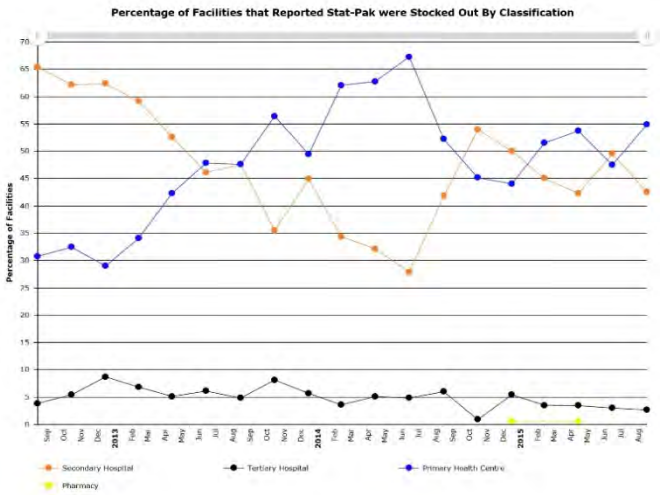


Fig SE.3 Percentage of facilities that had stock out for Stat-Pak RTK category by facility type

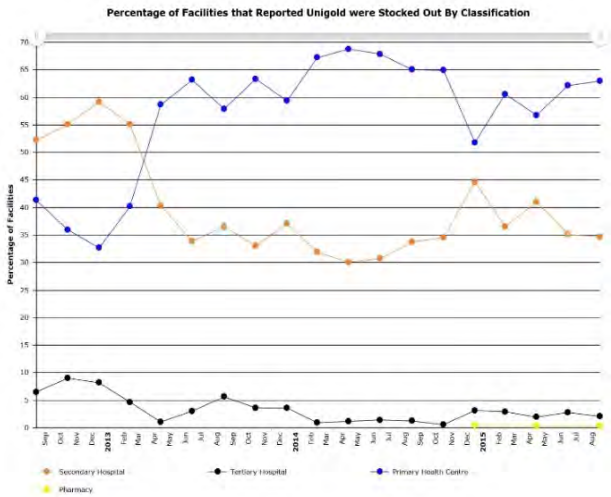


Fig SE.4 Percentage of facilities that had stock out for Unigold RTK category by facility type

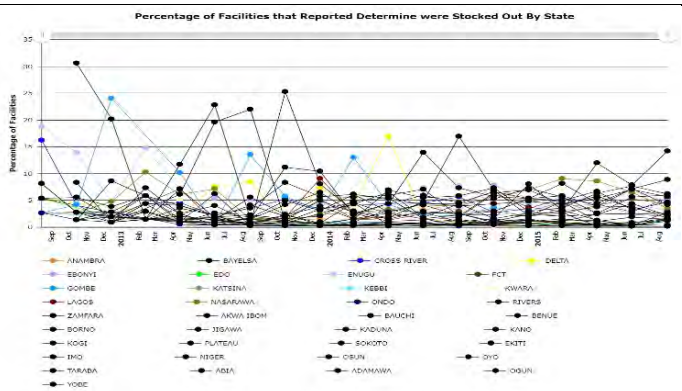


Fig SE.5 Percentage of facilities that had stock out for Determine RTK category by state

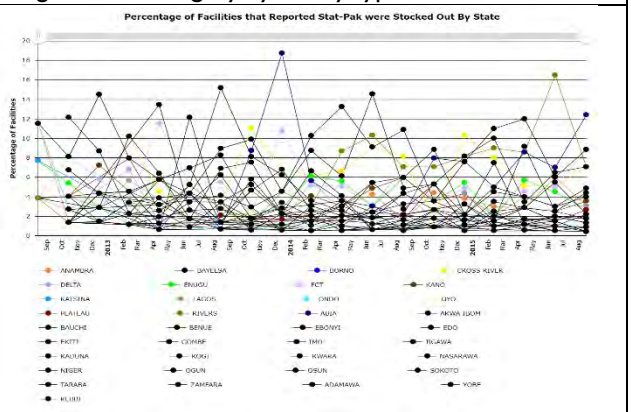


Fig SE.6 Percentage of facilities that had stock out for Stat-Pak RTK category by state

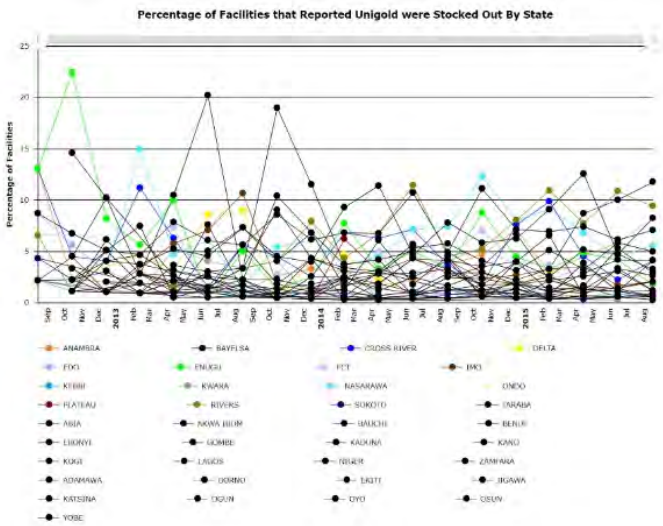


Fig SE.5 Percentage of facilities that had stock out for Unigold RTK category by state

5.2.8 Annex SF: Stock out for CD4 commodities

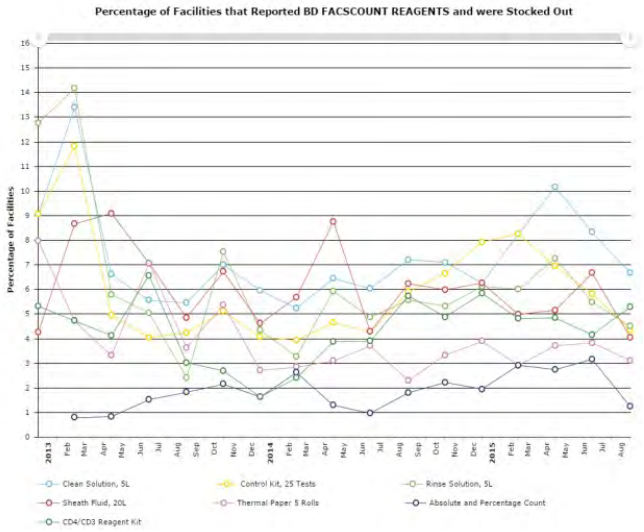


Fig SF.1 Percentage of facilities that had stock out for BD FACSCOUNT reagents

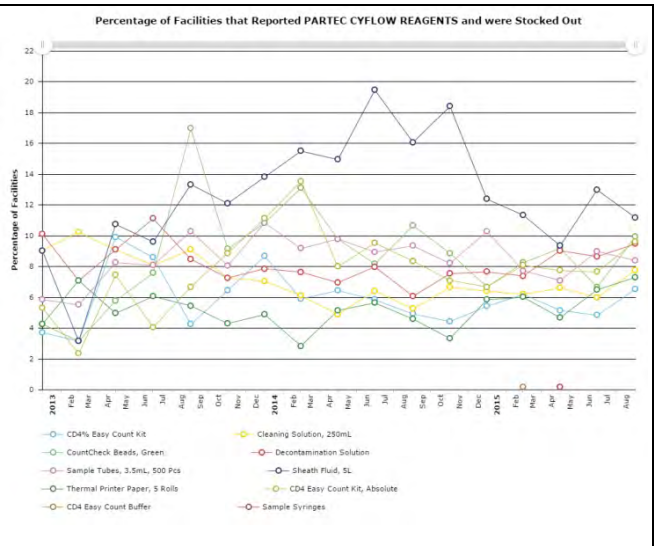


Fig SF.2 Percentage of facilities that had stock out for Partec Cyflow reagents

5.2.9 Annex DC: Stock out for Malaria commodities

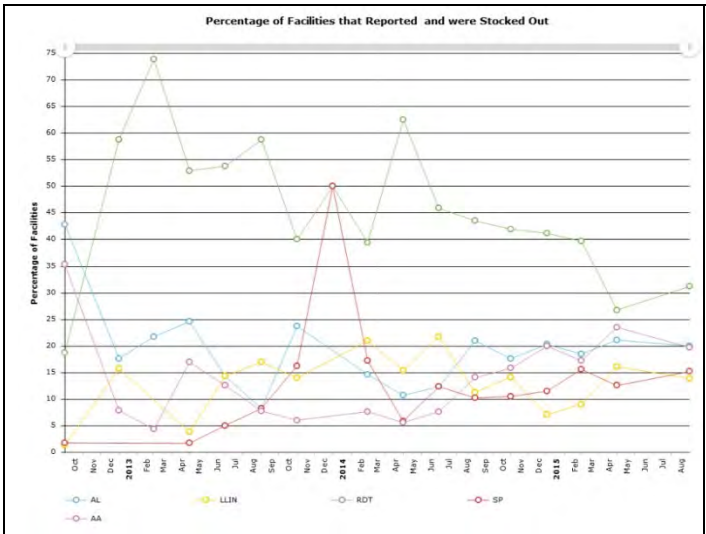


Figure DC.1 Percentage of facilities that stocked according to plan Malaria commodities

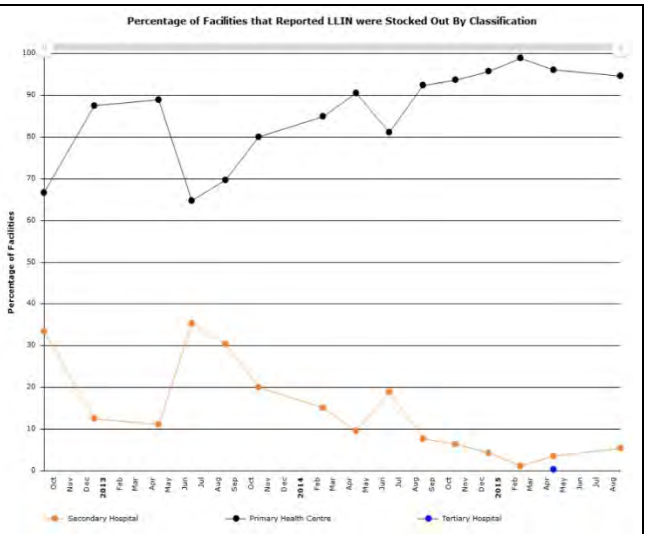


Figure DC.2 Percentage of facilities that stocked according to plan LLINs by facility type

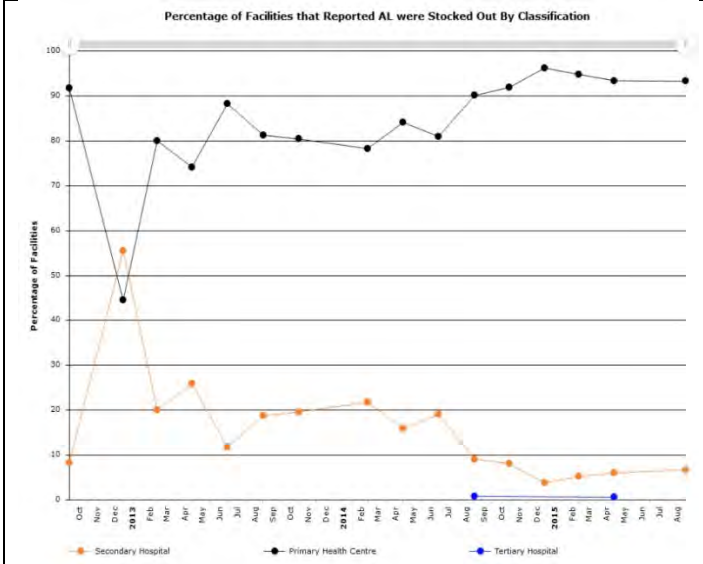


Fig DC.3 Percentage of facilities that had stock out for AL by facility type

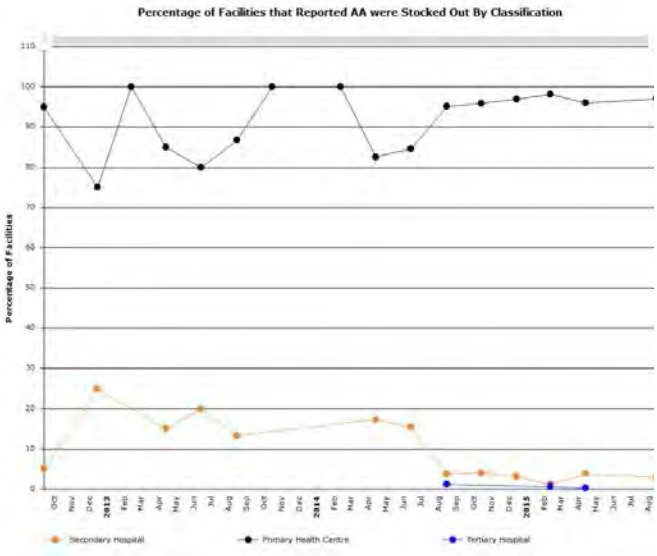


Fig DC.4 Percentage of that had stock out for AA by facility type

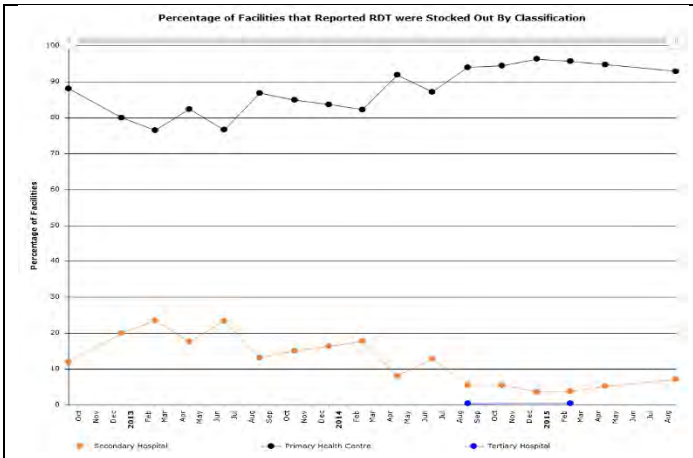


Fig DC.5 Percentage of facilities that had stock out for RDT by facility type

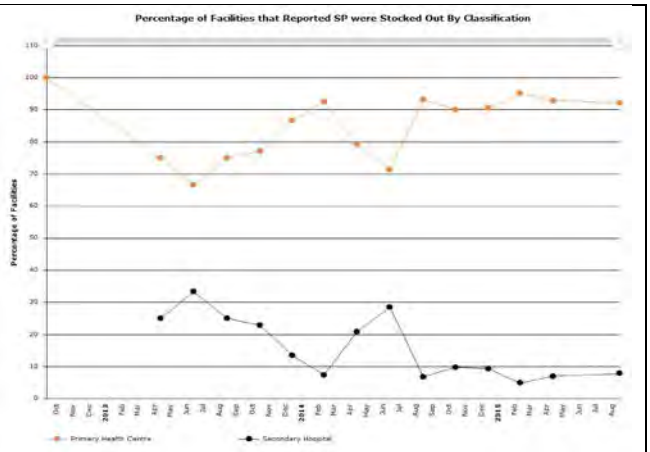


Fig DC.6 Percentage of facilities that had stock out for SP by facility type

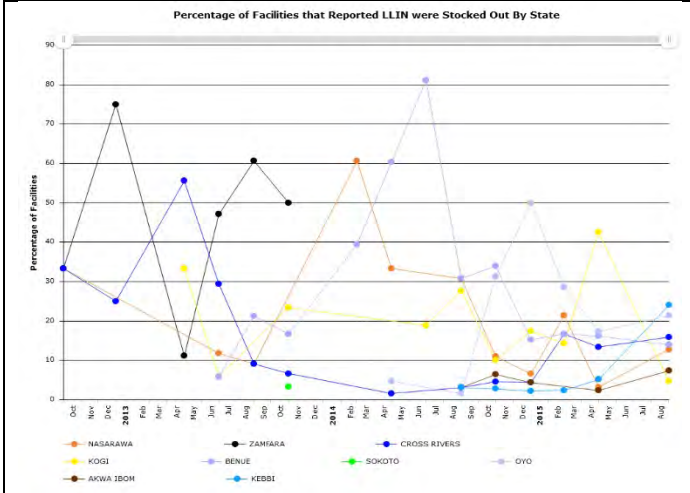


Fig DC.7 Percentage of facilities that had stock out for LLIN by state

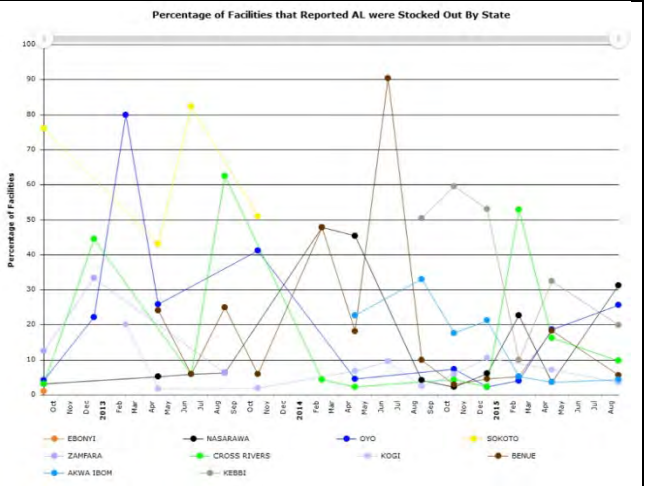


Fig DC.8 Percentage of facilities that had stock out for AL by state

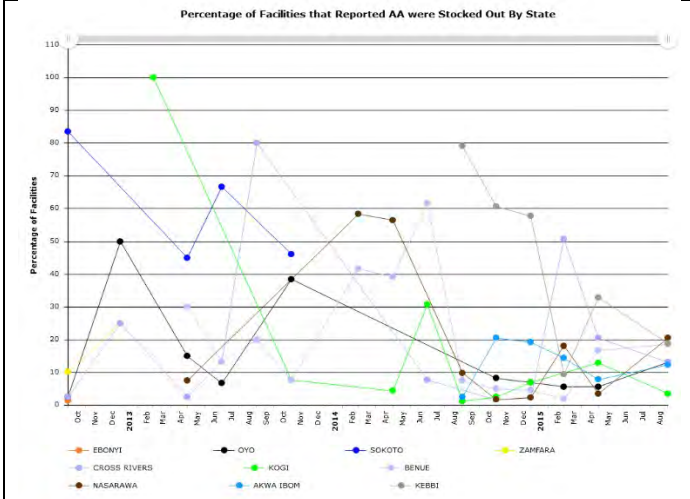


Fig DC.9 Percentage of facilities that had stock out for AA by state

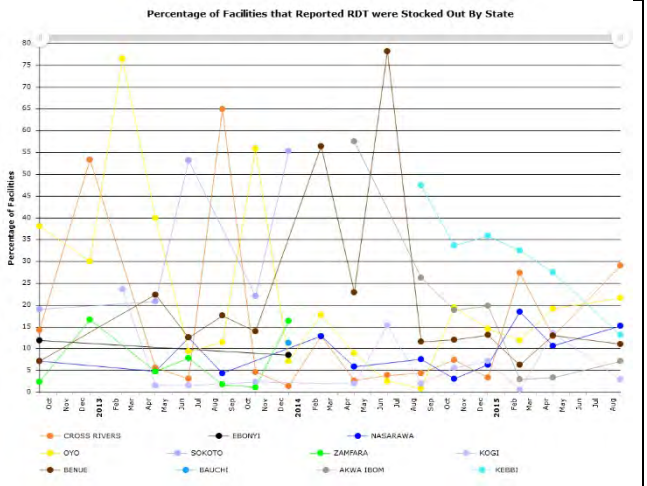


Fig DA.10 Percentage of facilities that had stock out for RDT by state

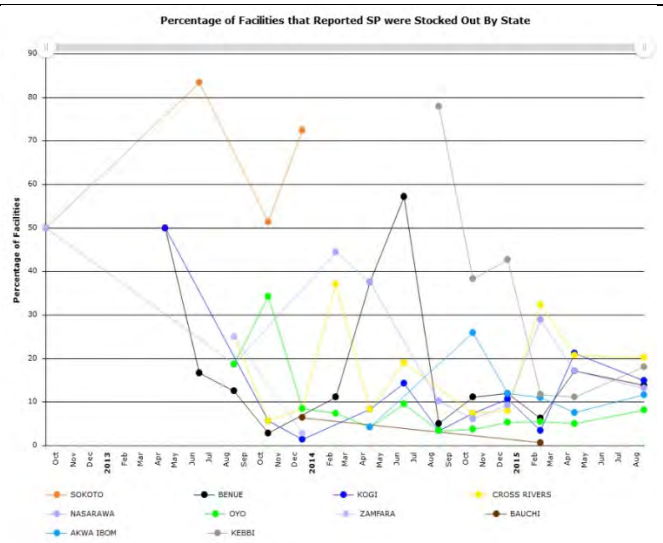


Fig DC.11 Percentage of facilities that had stock out for SP by state

5.2.10 Annex DD: Stock out for Reproductive Health commodities

Fig DD.1 Percentage of facilities that had stock out for Reproductive Health commodities (LGA)

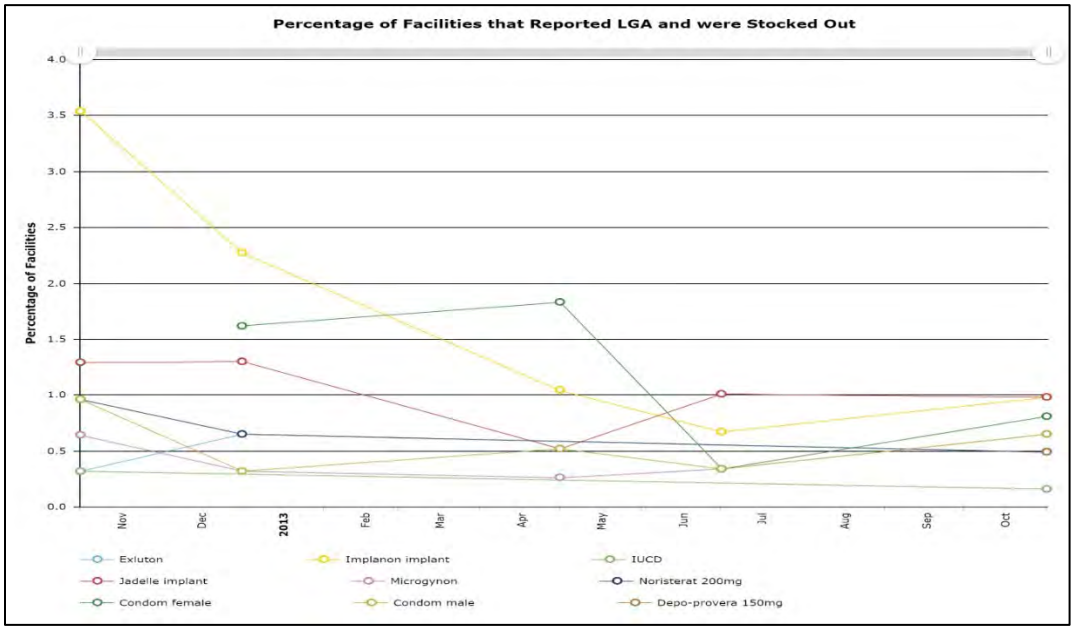
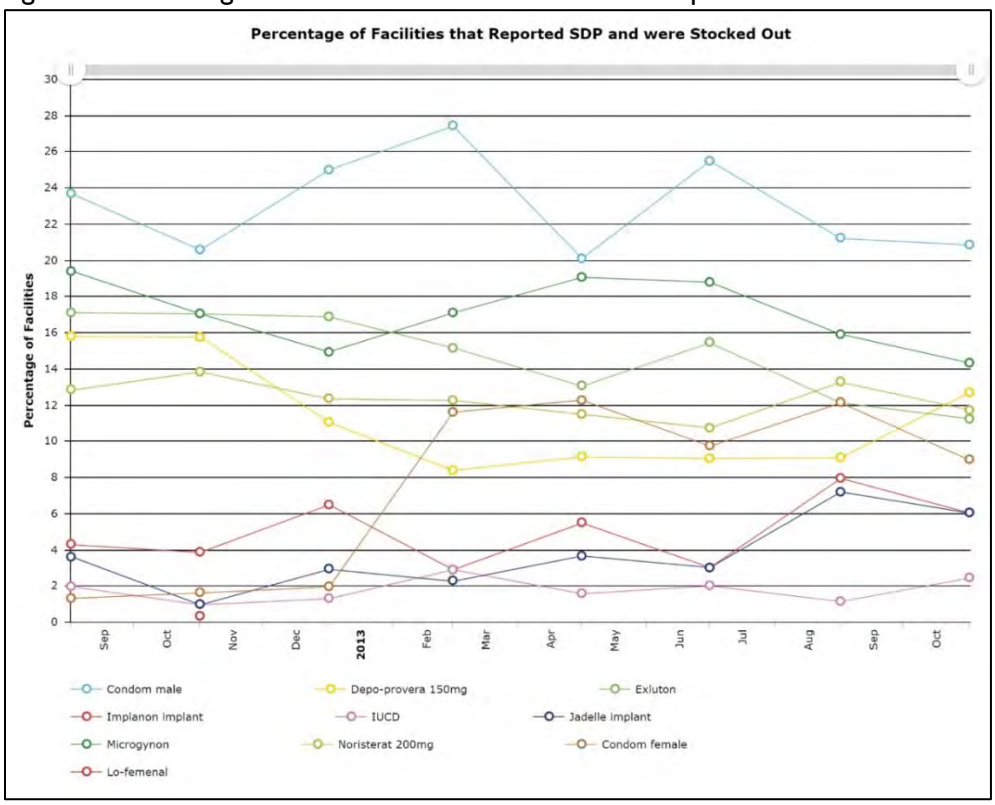


Fig DD.2 Percentage of facilities that had stock out for Reproductive Health commodities (SDP)



5.2.11 Annex RA: SDP reporting rate for SCMS and DELIVER health commodities

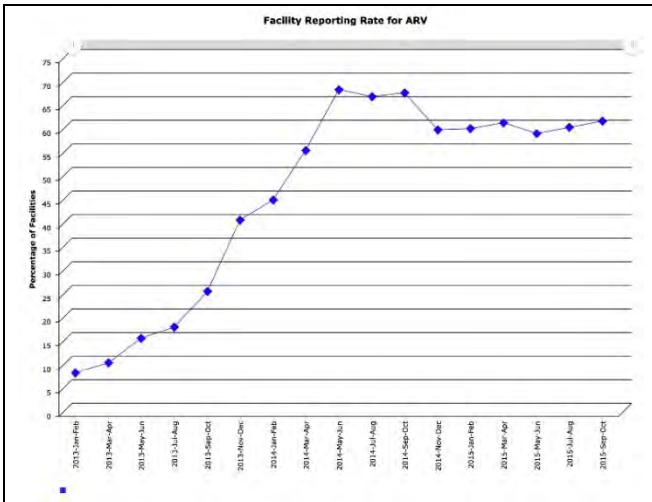


Fig RA.1: SDP reporting rate for ARV drugs

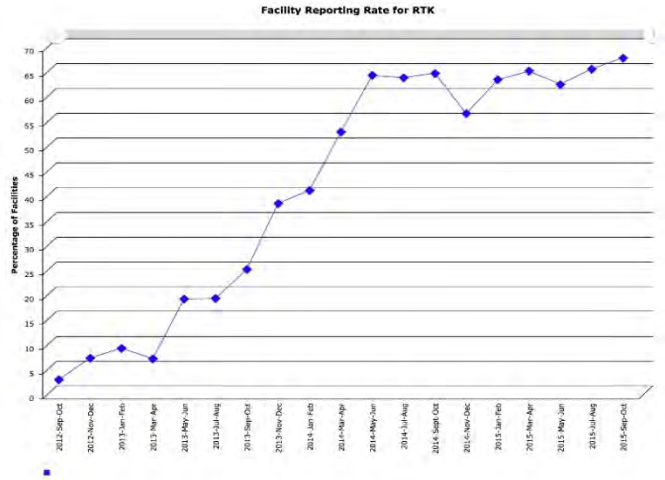


Fig RA.2: SDP reporting rate for RTK

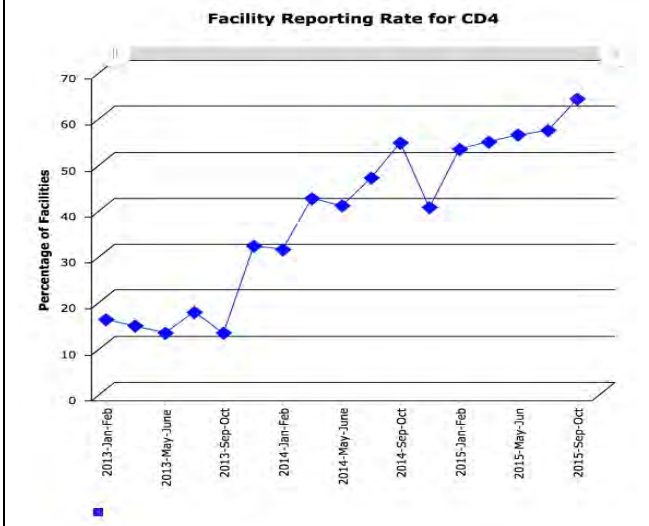


Fig RA.3: SDP reporting rate for CD4

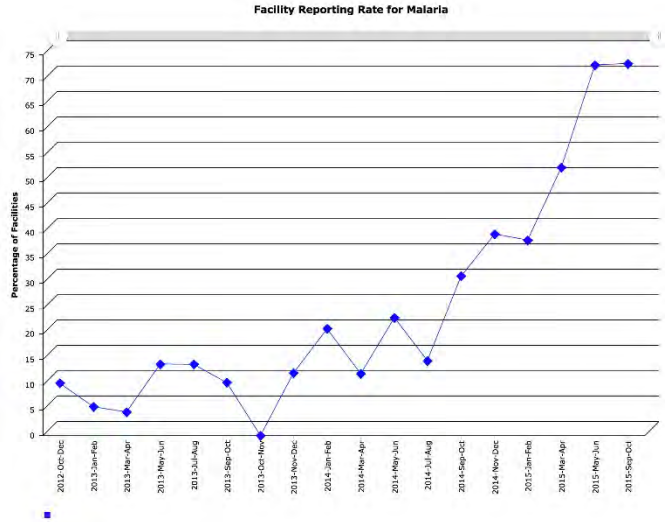


Fig RA.4: SDP reporting rate for Malaria

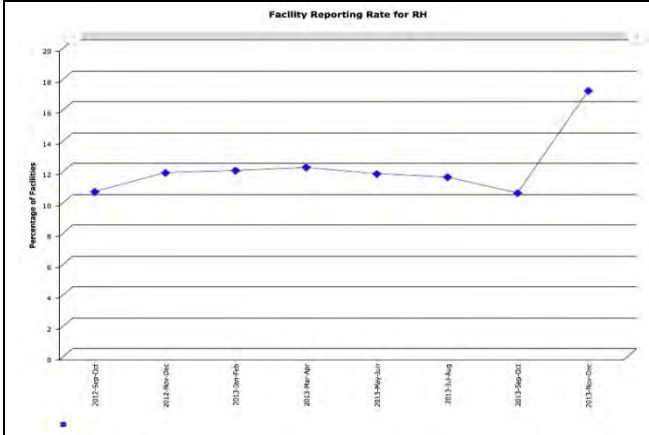


Fig RA.5: Reporting rate for reproductive health commodities

5.2.12 Annex RB: Consistency of SDP reporting by Facility type

Fig RB.1a: SDP reporting on ARV drugs for primary health facilities

Fig RB.1b: SDP reporting on ARV drugs for secondary hospitals

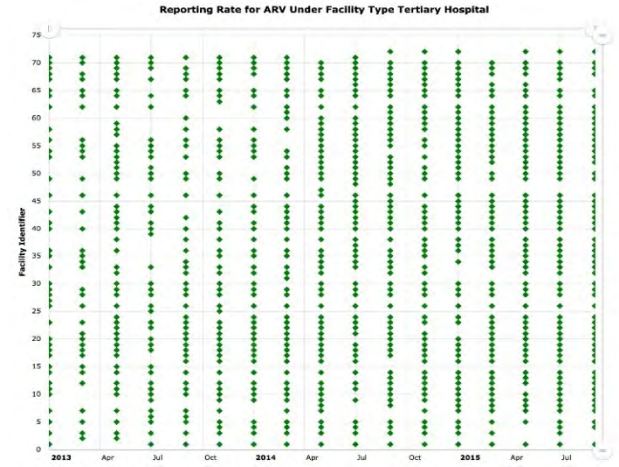


Fig RB.1c: SDP reporting on ARV drugs for tertiary hospitals

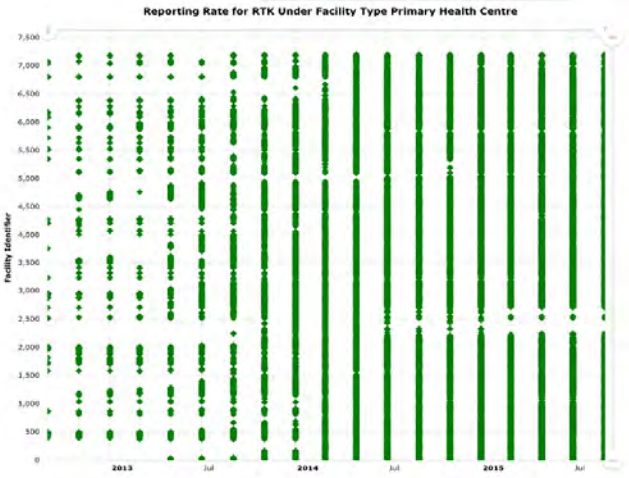


Fig RB.2a: SDP reporting on RTK for primary health Centers

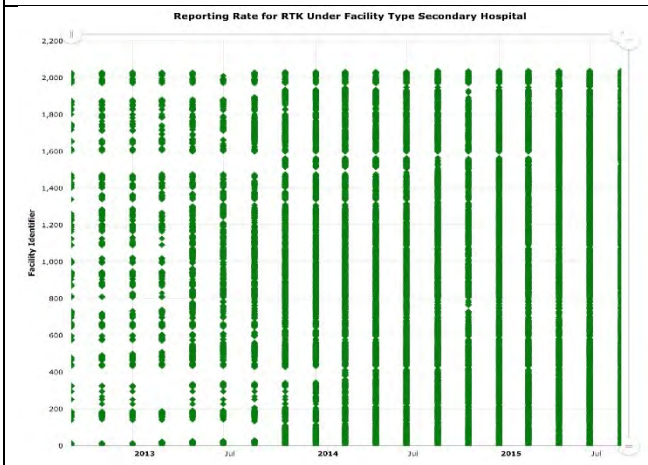


Fig RB.2b: SDP reporting on RTK for secondary hospitals

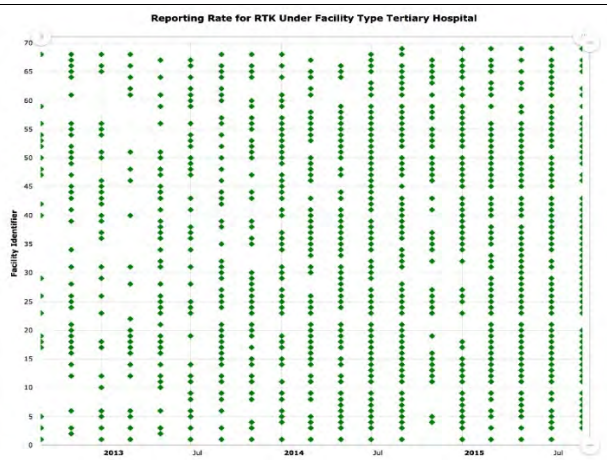


Fig RB.2c: SDP reporting on RTK for tertiary hospitals

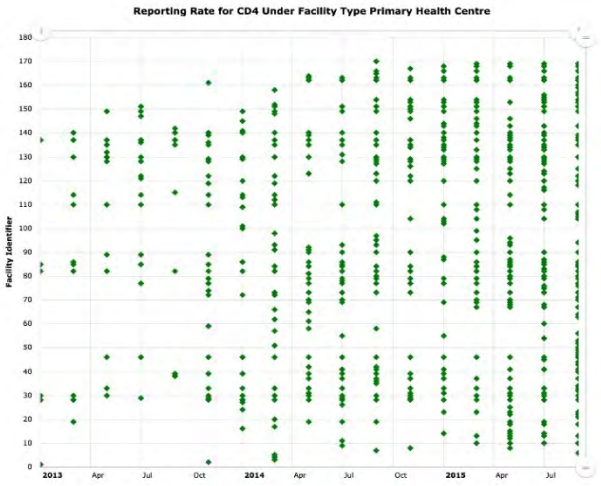


Fig RB.3a: SDP reporting on CD4 for primary health centres

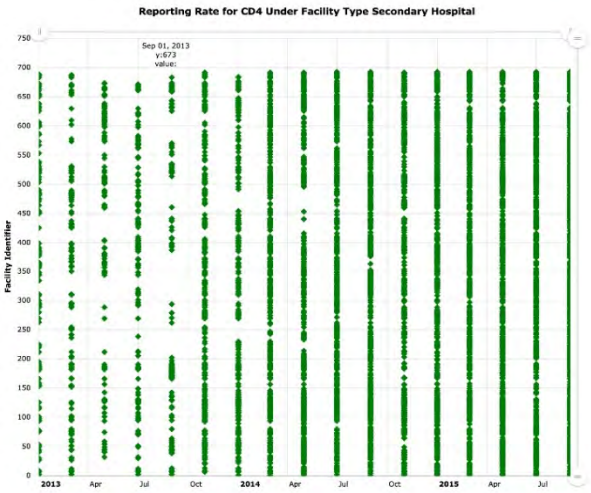


Fig RB.3b: SDP reporting on CD4 for secondary hospitals

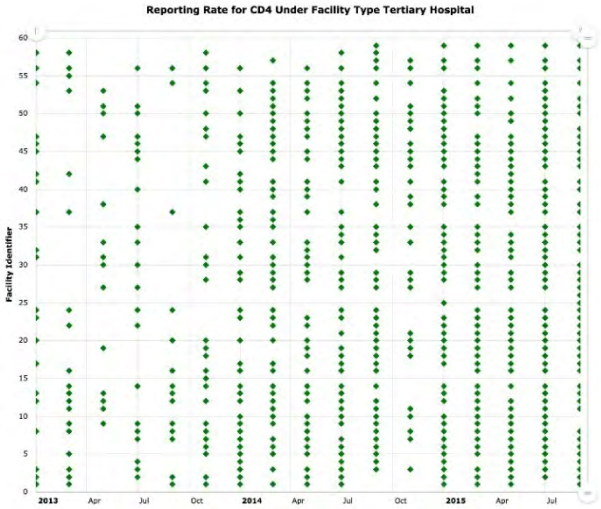


Fig RB.3c: SDP reporting on CD4 for tertiary hospitals

Fig RB.4a: SDP reporting on Malaria commodities for primary health centres

Fig RB.4b: SDP reporting on Malaria for secondary hospitals

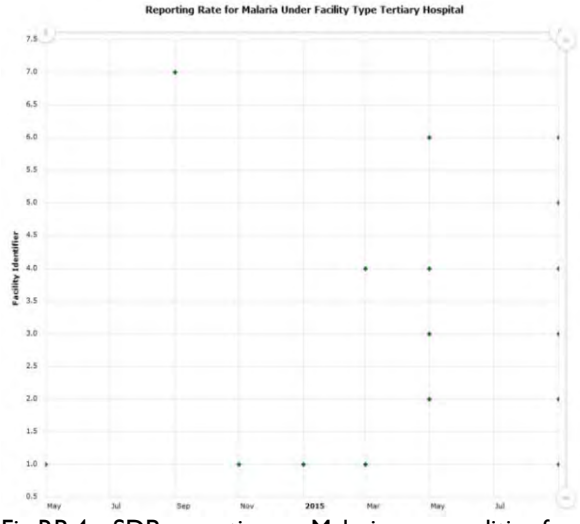


Fig RB.4c: SDP reporting on Malaria commodities for tertiary hospitals

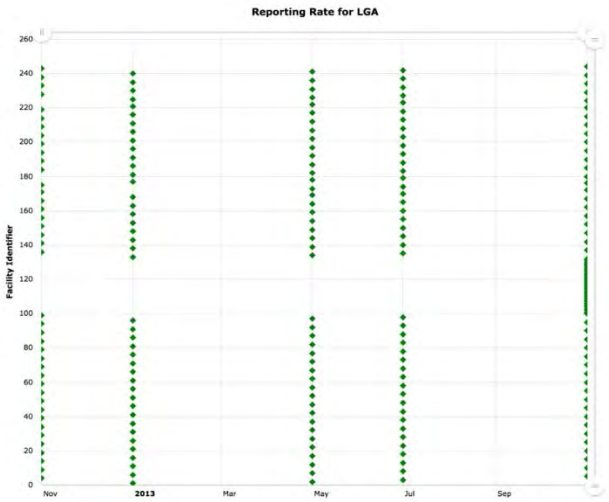


Fig RB.5a: Facility Reporting on reproductive health commodities from LGA

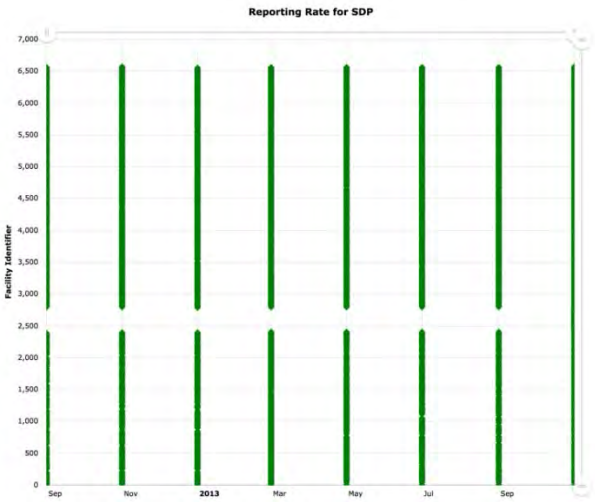


Fig RB.5b: Facility Reporting on reproductive health commodities from SDP

5.2.13 Annex SS: Overall stock status for health commodities

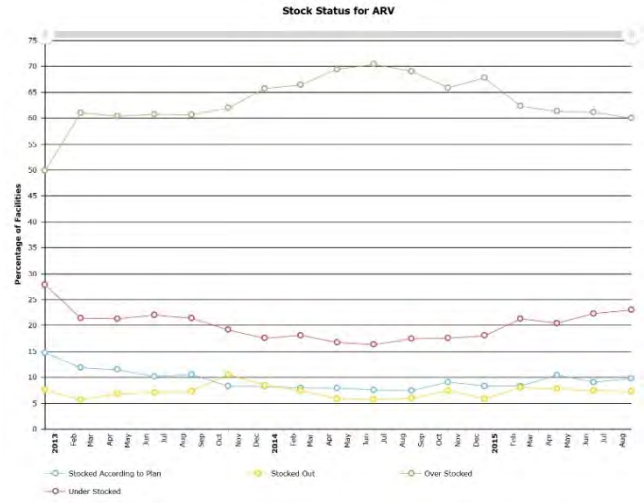


Fig SS.1: Overall stock status for ARV drugs

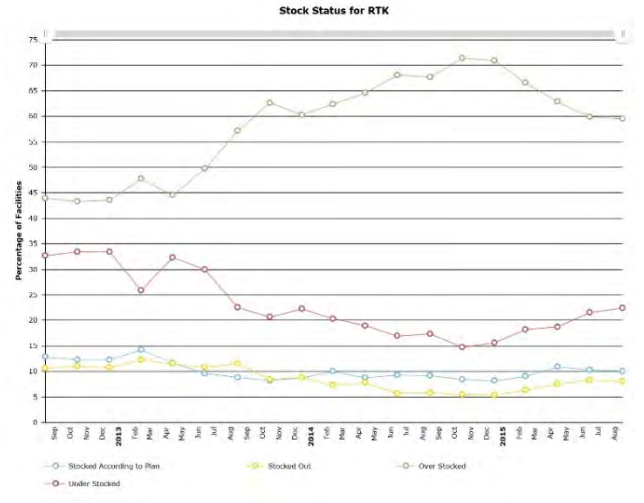


Fig SS.2: Overall stock status for RTK

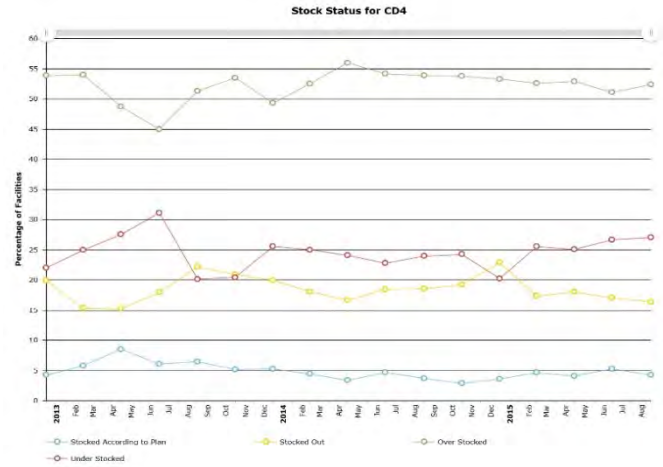


Fig SS.3: Overall stock status for CD4 reagents

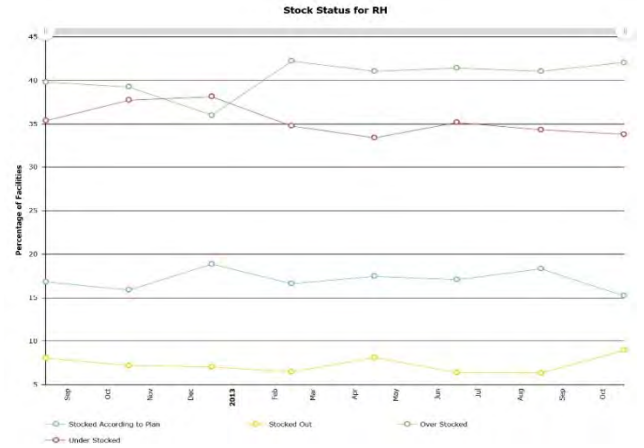


Fig SS.5: Overall stock status for Reproductive health commodities