

**USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM**  
PROCUREMENT AND SUPPLY MANAGEMENT

**SEMIANNUAL REPORT**

April 1 to September 30, 2017

**QUARTER 4 REPORT**

July 1 to September 30, 2017





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# ACRONYMS

3PL	third-party logistics
ACT	artemisinin-based combination therapy
ALu	artemether-lumefantrine
API	active pharmaceutical ingredient
ART	antiretroviral therapy
ARTMIS	Automated Requisition Tracking Management Information System
ARV	antiretroviral
ASAQ	artesunate + amodiaquine
BI&A	Business Intelligence and Analytics
CARhs	Coordinated Assistance for Reproductive Health Supplies
CDC	U.S. Centers for Disease Control and Prevention
CHAI	Clinton Health Access Initiative
COTS	commercial off-the-shelf
CYP	couple years of protection
DCP	decentralized commodity procurement
DFID	Department for International Development
DMPA IM	depot medroxyprogesterone acetate intramuscular
DRC	Democratic Republic of the Congo
DTG	dolutegravir
eLMIS	electronic logistics management information system
EUV	end-use verification
FASP	forecasting and supply planning
FP/RH	family planning/reproductive health
FY	fiscal year
GDSN	Global Data Synchronization Network™
GHSC-PSM	Global Health Supply Chain Program-Procurement and Supply Management
GSI	Global Standards I
IDIQ	indefinite delivery, indefinite quantity
IPTp	intermittent preventive treatment of malaria in pregnancy
KMC	knowledge management and communication
KP	Khyber Pakhtunkhwa, Pakistan
KSCSS	Kenya Supply Chain System Strengthening activity
LabEQIP	Laboratory Efficiency and Quality Improvement Planning
LLIN	long-lasting insecticidal net
M&E	monitoring and evaluation
MIS	management information system
MMS	multi-month scripting
MNCH	maternal, newborn, and child health
NFO	non-field office
NMCP	National Malaria Control Program
OC	oral contraceptive

OTD	on-time delivery
OTIF	on time, in full
PEPFAR	U.S. President’s Emergency Plan for AIDS Relief
PMI	U.S. President’s Malaria Initiative
POC	point of care
PPMR	Procurement Planning and Monitoring Report
PPMR-HIV	Procurement Planning and Monitoring Report – HIV/AIDS
PPMRm	Procurement Planning and Monitoring Report - malaria
Q	quarter
QA	quality assurance
RDT	rapid diagnostic test
RHSC	Reproductive Health Supplies Coalition
RTK	rapid test kit
S/GAC	Department of State Office of the Global AIDS Coordinator
SOP	standard operating procedure
SP	sulphadoxine-pyrimethamine
SSA	semi-synthetic artemisinin
TB	tuberculosis
TLD	tenofovir, lamivudine, dolutegravir
TLE	tenofovir, lamivudine, efavirenz
TO	task order
UAV	unmanned aerial vehicle
UNAIDS	Joint United Nations Programme on HIV/AIDS
UNFPA	United Nations Population Fund
UNICEF	United Nations Children’s Fund
UNOPS	United Nations Office for Project Services
URC	University Research Co., LLC
USFDA	U.S. Food and Drug Administration
VAN	Visibility Analytics Network
VMMC	voluntary medical male circumcision
WHO	World Health Organization

# EXECUTIVE SUMMARY

The USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project is pleased to present this report summarizing our work and performance for the second half of Fiscal Year 2017 (FY17) and Quarter 4 (Q4). In this reporting period (April to September), we:

- Supported 59 countries with commodity procurement and/or supply chain systems strengthening
- Developed and used strategies and tools to strengthen countries' supply chain systems
- Conducted a number of foundational market analyses and negotiated long-term agreements with suppliers and service vendors
- Expanded our country presence, now totaling 30 field offices with 1,064 staff
- Procured \$374 million and delivered \$316 million in health commodities

The scale of just a subset of our commodity deliveries is summarized in the box at right.

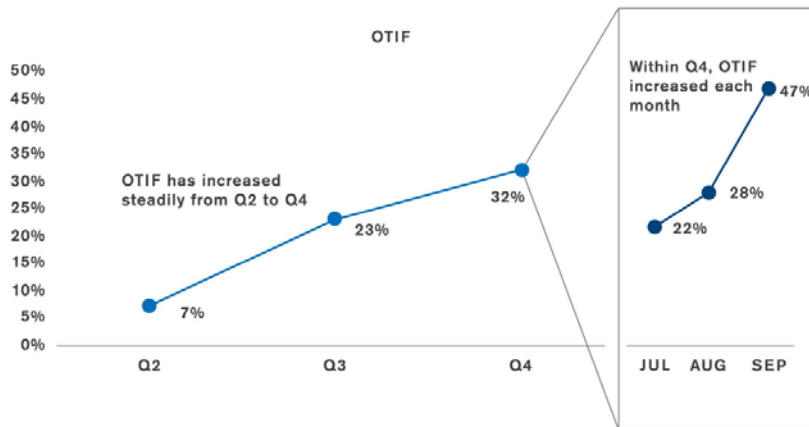
**GHSC-PSM Scale\***

To date, GHSC-PSM has delivered enough:

- Antiretroviral therapy (ART) to provide more than **1.5 million years of HIV treatment**
- Antimalarials to treat **42.5 million infections**
- Contraceptives to provide **9.4 million couple years of protection (CYP)**

\* See Annex A for data calculation methodology

Exhibit I. Increase in On Time in Full (OTIF) Rate



We concentrated on improving the timeliness of our deliveries. Working closely with USAID to establish priorities for addressing performance issues, we **significantly improved our on time in full (OTIF) rate in Q4 to 32 percent**. Over the year, our quarterly OTIF rate

improved from 7 percent in Q2 to 32 percent in Q4, and reached 47 percent for September. As shown in Exhibit I, we have delivered quarterly and month-to-month improvement. To achieve this progress, we implemented a number of steps detailed in an action plan with USAID. These changes will continue to improve our OTIF performance going forward.

Our efforts to increase the timeliness of our deliveries are described in Section C1a (pages 30 to 35). To summarize, we:

- Replaced key leadership and added surge staff to expedite orders
- Reorganized our supply chain team to source and process orders faster, and integrated country-based information into our supply chain planning more effectively

- Integrated more data into our information system and created a visual management system of our progress that we use every day to hone in on individual orders and troubleshoot them
- More aggressively managed supplier delays in providing goods and import documentation
- Expanded use of our order promise tool to provide realistic date commitments and effectively alert the team to orders that are in danger of missing those commitments
- Improved our processes for issue identification, escalation, and prioritization

Many factors influence whether patients can get the medicines they need at the point of care. A late delivery at the central level is a risk, but does not mean a patient goes without medicine. We do everything we can to prevent, diagnose, and mitigate late orders, and to avoid stockouts, due to any cause, to help ensure medicines are available at whatever level of the supply chain we support in a given country. Our work to avoid central stockouts and to help the global donor community ensure adequate stocks at all levels is summarized on pages 45 to 46. Our varied work to help countries manage stocks throughout their supply chains is detailed in Section C2a.

Importantly, GHSC-PSM conducts extensive and frequent analysis on late orders of lifesaving medicines to assess their effect on stock levels, and, ultimately, on patients. Targeted analysis of our late HIV/AIDS orders shows that most reported stockouts were limited to the central warehouse, and in all cases of late deliveries, commodities have been available in other levels of the health system.

In addition to improving the timeliness of our deliveries, we worked hard to:

- **Achieve greater health impact for less.** We reduced costs by negotiating contracts that lower prices while maintaining supplier interest in the market, optimized warehousing to shorten shipping routes, adopted an efficient and agile approach to shipping commodities, purchased more commodities from in-country suppliers, and helped national supply chains introduce efficiencies. These cost efficiencies help countries and the global community buy more health commodities with the funding available. (See box at right.)
- **Enhance commodity security.** We used market forces to attract long-term engagement of the commercial sector globally and in country, and engaged new suppliers to promote competitive pricing and reduce dependence on one supplier.
- **Build sustainable supply chains.** We helped the public sector improve systems and procedures in assisted countries and, where possible, attracted self-sustaining commercial involvement in the supply chain.

#### Affording More Health Products Through Significant Cost Cutting

- An estimated \$38 million savings over six years from optimized distribution centers that reduce transportation and warehousing costs
- \$8 million in savings for first-line antiretroviral (ARV) combination tenofovir, lamivudine, efavirenz (TLE) on one round of contracts
- \$1.3 million in savings on an order for viral load tests for just two countries
- Annual projected savings of \$1 million for artemisinin-based combination therapy (ACT)

- **Use data to improve performance.** We provided donors and countries visibility into stock levels to help preclude overstocks and stockouts, and supported end-to-end supply chain visibility to further enable host governments to sustain and improve their own supply chains.
- **Contribute on a global scale.** We responded to new epidemics (e.g., Zika), scaled up new approaches (e.g., viral load testing), developed global guidance (e.g., on oxytocin), promoted use of global standards (e.g., Global Standards I – GSI), and helped shape markets.
- **Realize synergies from integration.** We gained economies of scale by stocking commodities for multiple health areas in the same central warehouses, diffused successful systems-strengthening approaches across health areas, and centralized all commodity ordering into one system.

Details on our activities, achievements, learning, and adaptation are provided throughout this report.

It has been a year of enormous challenges. With continued insightful guidance and prioritization from USAID and the dedication of our staff in Washington and around the world, we are confident that we have laid a solid foundation for even greater contributions to global health in the coming years.

# INTRODUCTION

## AI. BACKGROUND

The USAID GHSC-PSM project connects technical solutions, experts, and proven commercial processes to promote efficient and cost-effective health supply chains worldwide. Our goal is to ensure uninterrupted supplies of health commodities to save lives and to create a healthier future for all. The project directly supports five global health areas of importance to the U.S. government:

- The U.S. President’s Emergency Plan for AIDS Relief (PEPFAR) to help reach the Joint United Nations Programme on HIV/AIDS (UNAIDS) global 90-90-90 HIV/AIDS testing, treatment, and viral load suppression targets
- The U.S. President’s Malaria Initiative (PMI) to help reduce the burden of malaria
- USAID’s family planning and reproductive health (FP/RH) program to ensure that key reproductive health commodities are available for safe and reliable family planning
- USAID’s maternal, newborn, and child health (MNCH) program to help reduce preventable child and maternal deaths
- Other public health threats as they emerge, with support for Zika, Ebola, and pneumonic plague at this time

Working across Africa, Asia, Central America, and the Caribbean, we operate in some of the world’s most challenging environments, navigating complex issues such as poor infrastructure, inefficient bureaucracies, political and financial crises, and natural disasters to ensure that lifesaving health supplies reach those most in need.

The project purchases and delivers health commodities, offers comprehensive technical assistance to strengthen national supply chain systems, and provides global supply chain leadership. **Since our launch in January 2016, we have procured commodities for 59 countries, established 30 field offices, and provided technical assistance in supply chain functions in 38 countries.**



GHSC-PSM supports priority health programs in some of the most challenging environments in the world. *Photo credit: Lan Andrian*

GHSC-PSM is the largest project administered by USAID, integrating for the first time USAID’s multiple procurement and supply management activities across all health areas. It requires extensive communication and collaboration among hundreds of stakeholders; careful commodity

forecasting and planning in dozens of countries; and detailed tracking and follow-up of several thousand transactions at any given moment. It also requires significant flexibility to meet requirements in widely diverse countries and changing environments. Tackling these challenges with the necessary speed and scale has resulted in suboptimal performance in on-time delivery. In April, GHSC-PSM received a request from USAID for an action plan to overcome performance issues. Since then, we have been working closely with USAID to carefully monitor progress and further refine our approaches to continue to improve our performance.

## **A2. ABOUT THIS REPORT**

We are pleased to present our performance report for the second half of FY 17 (April 1 through September 30, 2017) and Q4 (July 1 through September 30, 2017), including calculations of all required quarterly, semiannual, and annual metrics. This report summarizes significant achievements, key challenges, performance, and adaptation in response to lessons learned in the reporting period.

GHSC-PSM is a matrixed project that integrates work across two axes: health areas and technical objectives. To reflect our work in each of these, the report is organized as follows:

- Section B summarizes major activities in each of the **five health areas** (HIV/AIDS, malaria, FP/RH, MNCH, and other public health threats).
- Section C describes activities in each of the **three main technical objectives** (global commodity procurement and logistics, systems strengthening, and global collaboration). Because our monitoring and evaluation (M&E) indicators are structured around our objectives, in Section C we also discuss key indicator results and describe lessons learned and ongoing adaptation to improve performance.
- Section D summarizes **management and operations** progress in the last half year that underpins the work described in preceding sections.
- Annex A provides our quarterly, semiannual, and annual **performance and context indicators**.

Given the size and complexity of GHSC-PSM, this report reflects only a fraction of the effort the project makes each day to help people around the world live healthier lives.

## PROGRESS BY HEALTH AREA

In this section, we summarize GHSC-PSM's support for each of the five health areas (HIV/AIDS, malaria, FP/RH, MNCH, and other public health threats) over the last half year.

### BI. HIV/AIDS

#### In Brief

**41 countries procured HIV/AIDS commodities and 32 countries received systems strengthening support with HIV/AIDS funding under the contract.**

GHSC-PSM continued to **support transitions** critical to the success of the UNAIDS 90-90-90 framework, including transition to tenofovir, lamivudine, dolutegravir (TLD).

GHSC-PSM also provided extensive support to countries to prepare them to **scale up viral load monitoring**.

#### Procurement of HIV/AIDS Commodities

##### FY17 Q3 and Q4:

- \$292.5 million
- including \$177.5 million in ARVs

##### Life of Project:

- \$502.3 million
- including \$337 million in ARVs

**We have delivered enough ARVs to provide 1.5 million years of HIV treatment.**

In 2017, GHSC-PSM continued to support the PEPFAR goal of achieving an AIDS-free generation in the countries supported by the HIV/AIDS task order (TO). With PEPFAR funding, we worked to help countries achieve epidemic control under the UNAIDS 90-90-90 framework — 90 percent of people living with HIV know their status, 90 percent of people who know their status are on treatment, and 90 percent of people on treatment have suppressed viral loads. To help achieve epidemic control, in this reporting period we provided procurement support (any procurement activity from order entry to delivery) for 41 countries<sup>1</sup> (see Exhibit 2). We also provided technical assistance to 32 countries<sup>2</sup> to strengthen national supply chains and improve health commodity availability (indicated by an asterisk in the list below Exhibit 2).

*For the first time in modern history, we have the opportunity to change the very course of the HIV pandemic, by actually controlling it without a vaccine or a cure. For the first time, the end of the epidemic as a public health threat is in sight.*

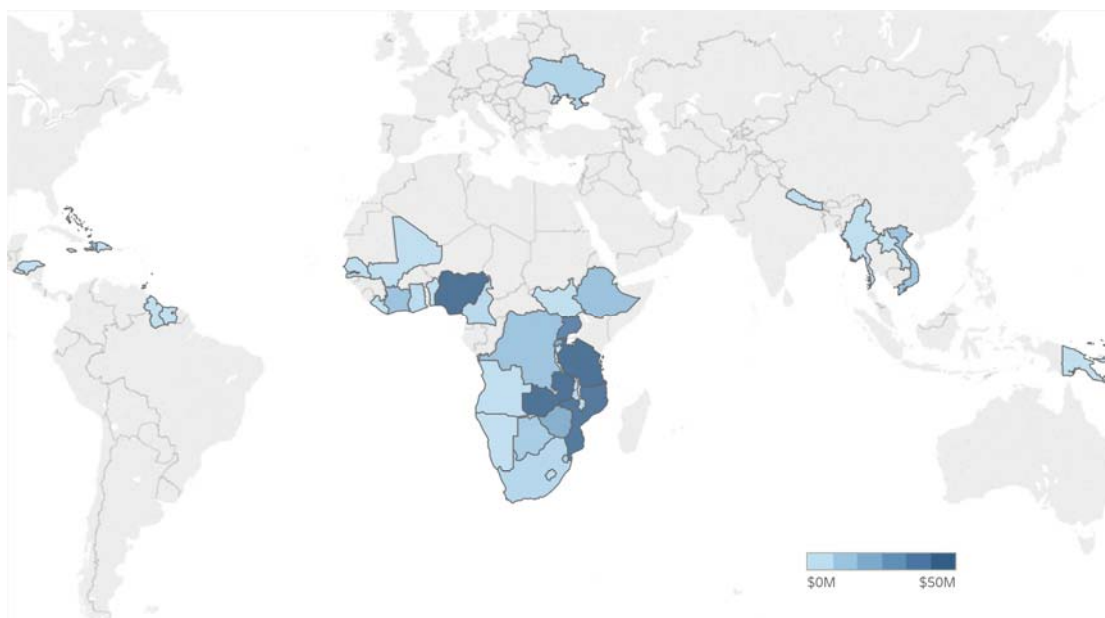
– PEPFAR Strategy for Accelerating HIV/AIDS Epidemic Control (2017–2020)

<sup>1</sup> Per USAID guidance, all condom procurements are counted under the HIV/AIDS task order.

<sup>2</sup> The number of countries receiving systems strengthening support includes Kenya, which is funded via its own task order, and Papua New Guinea, which had USAID funding in support of the Global Fund.



## Exhibit 2. HIV-Related Procurement Activity in the Second Half of FY17



**AMERICAS:** Bahamas, Barbados\*, Dominican Republic, El Salvador\*, Guatemala\*\*, Guyana\*, Haiti\*, Honduras\*, Jamaica\*, Panama^, Suriname\*, Trinidad and Tobago ■ **ASIA:** Burma\*, Cambodia^, Indonesia^, Laos#, Nepal#, Papua New Guinea\*, Vietnam\* ■ **E. EUROPE:** Ukraine ■ **AFRICA:** Angola\*, Benin#, Botswana\*, Burundi\*, Cameroon\*, Côte d'Ivoire, Democratic Republic of the Congo, Ethiopia\*, Ghana\*, Kenya^, Lesotho\*, Liberia#, Malawi\*, Mali\*, Mozambique\*, Namibia\*, Nigeria\*, Rwanda\*, Senegal, South Africa, South Sudan\*, Swaziland, Tanzania, Uganda\*, Zambia\*, Zimbabwe\*

\* Also received technical assistance.

^ Only received technical assistance with no procurement activity this reporting period. Not shown on map.

# Had condom procurement activity funded by FPIRH TO (which, per USAID guidance, is counted under HIV/AIDS TO).

GHSC-PSM is poised to support PEPFAR's new strategy for 2017 to 2020, which has an intensified focus on 13 priority high-burden countries.<sup>3</sup> We currently provide some level of support in all 13 countries, including technical assistance to 10 countries through field offices and commodity procurement for the remaining three (Côte d'Ivoire, Swaziland, and Tanzania).

### Commodity Procurement

The commodities procured by GHSC-PSM for HIV/AIDS programs include ARVs; essential medicines, primarily consisting of medications to treat opportunistic infections; laboratory reagents for general laboratory testing (chemistry hematology); diagnostics for opportunistic infections; and reagents for viral load and CD4 testing, including the consumables required to perform these tests. Other HIV-related commodities that we procure include male and female condoms and personal lubricants, voluntary medical male circumcision (VMMC) kits, and the injectable anesthetics used during procedures. In the second half of FY17, GHSC-PSM procured HIV/AIDS commodities valued at \$292.5 million for 41 countries and our regional distribution

<sup>3</sup> The 13 priority high-burden countries are: Botswana, Côte d'Ivoire, Haiti, Kenya, Lesotho, Malawi, Namibia, Rwanda, Swaziland, Tanzania, Uganda, Zambia, and Zimbabwe.

centers, including \$177.5 million in ARVs. In Q4 alone, we procured HIV/AIDS commodities totaling \$134.3 million, including \$63.2 million in ARVs.

### **Working to Achieve the First 90: Diagnosis**

A common problem faced by many HIV/AIDS programs is site- and campaign-level shortages of HIV rapid test kits (RTKs). Although procurement and delivery of RTKs are handled by another GHSC contract,<sup>4</sup> GHSC-PSM helped countries develop strategies to ensure RTKs are available to diagnose HIV infection, the first 90, which is key to reaching the second 90, ensuring that people with HIV receive treatment. Late in Q4, we completed the design of a 21-country survey to learn how best to strengthen the supply chain for HIV RTKs. Based on the findings, which will be available in December, we plan to launch an RTK supply chain strengthening effort in a subset of countries and to extract lessons that will be rolled out to all GHSC-PSM countries. The goals will be to ensure that countries' supply plans include RTKs, that countries place and follow up on orders with GHSC-RTK, and that countries are prepared to support the receipt and distribution of RTKs, as needed.



In Ethiopia, availability of first-line tests has increased from 83 to 94 percent at testing sites in hotspots. *Photo credit: GHSC-PSM*

### **Working to Achieve the Second 90: Treatment**

To help countries reach the second 90, GHSC-PSM provides forecasting and supply planning (FASP), sourcing, and distribution of ARVs. Our solid relationship with all major ARV suppliers is essential to ensuring a reliable supply of these lifesaving drugs at the best possible price. In Q4, we met with all of the major generic ARV manufacturers to discuss our supply needs and learned about their production plans. We focused on approved manufacturers' plans to scale up production of the newest preferred first-line ARV, TLD, while encouraging other

#### **GHSC-PSM Supports Country Transitions to TLD**

PEPFAR encourages countries to adopt TLD soon. HIV/AIDS programs can place orders for TLD now. Orders delivered after April 1, 2018, will benefit from the global price agreement. GHSC-PSM is providing comprehensive support to help countries transition to TLD.

<sup>4</sup> Procurement and delivery of RTKs are handled by the GHSC-RTK project, implemented by Remote Medical International.

manufacturers to file for U.S. Food and Drug Administration (USFDA) approval to produce TLD.

We assisted countries in forecasting during national quantification exercises and in updating quarterly supply plans for ARVs. We reviewed country supply plans to determine needs for ARV stocks in our regional distribution centers. In the last half year, we provided FASP support for ARVs to Angola, Burundi, Cameroon, Côte d'Ivoire, the Democratic Republic of the Congo (DRC), Ghana, Haiti, Jamaica, Mozambique, Nigeria, Rwanda, Suriname, Tanzania, Uganda, Vietnam, Zambia, and Zimbabwe. We also provided input to USAID forecasts of ARV needs to the global community at the annual World Health Organization (WHO) forecast meeting. This helped suppliers plan their production and ensure a reliable supply of product.

GHSC-PSM also is working to support rollout of multi-month scripting (MMS). For example, in Haiti, GHSC-PSM worked to ensure that 22 health facilities — including many remote facilities — were well equipped and ready to accommodate the additional stock required for MMS.

**Preparing Countries to Transition to TLD.** ART drug optimization aims to ensure that people living with HIV receive the best ART available in the most efficient and cost-effective way. The newest preferred first-line ART regimen involves dolutegravir (DTG). As a single dose, to be used in conjunction with other drugs to form a regimen, a 50mg DTG single tablet has been on the market in developed countries for several years. However, its relatively high price and unavailability in a triple fixed-dose form limited significant uptake in PEPFAR countries. In August 2017, the USFDA provided tentative approval for two Indian generic ARV suppliers — Aurobindo Pharma and Mylan Laboratories Limited — for the fixed-dose combination of tenofovir 300mg/lamivudine 300mg/dolutegravir 50mg (TLD). Several other suppliers are expected to file for USFDA approval by early 2018. Many clinicians are excited about the introduction of TLD because the drug combination provides clinical benefits, including, according to WHO, improved tolerability, higher antiretroviral efficacy, lower rates of treatment discontinuation, a higher genetic barrier to resistance, and fewer drug interactions than other ARVs. In a cable dated August 29, PEPFAR encouraged its country teams to review their ARV procurement plans for calendar year 2018 to identify how to transition expeditiously to the use of TLD as their first-line ARV regimen and to adjust future ARV procurements accordingly.

In September, UNAIDS and other donors announced a breakthrough pricing agreement with Aurobindo and Mylan. Under the agreement, in which PEPFAR and USAID participated, the price of DTG-containing regimens will be a weighted average of \$75 per person/per year, considerably lower than the price of \$80 to \$90 per person/per year for other first-line regimens, in exchange for a commitment to a minimum annual volume of orders. Having DTG available in a fixed-dose combination at a lower cost reduces two barriers to adoption in developing countries. Cost savings from TLD can then be used to put even more patients on treatment.

Based on experience with introducing other new ARV medicines, transition to TLD brings potential

### Supporting the TLD Transition

GHSC-PSM launched a TLD Transition team in August to prepare our supply chain, country programs, and systems strengthening teams at headquarters and our field office teams to support the launch of TLD. The Transition team continues to work very closely with key USAID colleagues and is communicating regularly with suppliers and our field offices to balance capacity and demand while supporting countries to move forward given the many advantages of TLD.

risks, such as global demand outpacing manufacturing capacity or poorly implemented transition leading to stockout or overstock of various ART regimens at different levels of the supply chain. GHSC-PSM formed a team to support this important transition (see box at right). We conducted a detailed market analysis and are supporting quantification and forecasting exercises, using a TLD transition forecasting tool, that engage all partners and donors to ensure the new regimen is incorporated into supply plans and is adequately funded. In addition, we have surveyed countries about their supply plans and transition timelines. By the end of Q4, four countries — Malawi, Nigeria, Tanzania, and Uganda — had firm plans to transition first-line patients to TLD in 2018. Many other countries are reviewing their standard treatment guidelines and considering the inclusion of TLD. The recent guidance from PEPFAR and release of the pricing agreement might very well accelerate transition plans in some countries.

Initial orders for TLD have been received for Nigeria and for stocking at the regional distribution centers. As additional orders are received, Aurobindo and Mylan are prepared to scale up production, having either acquired or built facilities to augment their manufacturing capacities to prepare for TLD production while maintaining their production capabilities for another first-line medicine, TLE. Based on information received to date, supply is anticipated to meet demand in 2018.

### **Working to Achieve the Third 90: Viral Load Suppression**

Reaching the third 90 presents the complex challenge of scaling up viral load monitoring of patients on ART. Viral load monitoring measures viral load suppression, which indicates whether a patient's treatment is effective. A suppressed viral load also decreases the likelihood of transmitting HIV to a partner, which is critical to stemming the epidemic. To support the third 90, GHSC-PSM worked to:

- **Support procurement.** We obtained the best possible value for viral load reagents; ensured consistency between commodities requested and the viral load instrument capacity of the destination country; ensured the accuracy, specificity, and timeliness of all orders for viral load reagents and consumables; and ensured ongoing functionality of diagnostic instruments by contracting suppliers to provide service and maintenance.
- **Support countries.** We provided technical assistance in quantification, supply planning, and network optimization (through use of the Laboratory Efficiency and Quality Improvement Planning [LabEQIP] software); and strengthened lab supply chains and stock management in Burundi, Cameroon, Ghana, and Nigeria.
- **Engage globally.** We supported USAID in lab strategy development and global collaboration; and used market dynamics findings to inform procurement and network strategies.

**Better Prices Enable More Viral Load Testing**

GHSC-PSM's negotiations with one of the major suppliers of viral load commodities has resulted in a savings of \$1.3 million, which would allow us to procure an additional 75,000 tests.

We supported the work of Unitaid through the Diagnostics Consortium.<sup>5</sup> Our network approach to viral load scale-up dovetails with the consortium's aims, ultimately enabling all consortium members to benefit from a coordinated viral load procurement and placement strategy. We hosted consortium discussions on behalf of USAID and contributed supply plan and other data on GHSC-PSM-supported programs' progress in scaling up viral load.

The GHSC-PSM FASP and Plan teams provided global diagnostic demand forecasts to manufacturers so they can increase production capacity to meet demand for viral load targets. Further, we helped strengthen laboratory systems in Burundi, Cameroon, Ghana, Haiti, Nigeria, and other countries to scale up access to diagnostics.

As part of our information sharing and planning function, GHSC-PSM held lab retreats in April and June with USAID and the CDC. The retreats shared data on the project's and countries' progress in reaching viral load and early infant diagnosis targets as well as work on building field office and country capacity for procuring viral load testing reagents, specimen collection consumables, and testing equipment. Staff developed key performance indicators to track performance and rental agreements to enable the business agreements to scale up sites that can offer viral load testing. Data gathered through instrument surveys showed the number and placement of instruments in countries; procurement expenditures; incoterms; anticipated volumes for 2017–2018; and price paid per test for 11 African countries.<sup>6</sup> We will use these data to inform future procurement decisions of viral load instruments and determine if additional capacity is needed in country before additional funds are spent. We also will use the data to optimize laboratory network efficiency, which should lead to cost savings through consolidation or reallocation of laboratory equipment. The lab retreats identified next steps for technical assistance and strategic direction for countries. Our lab experts consult at least quarterly with the lab advisor in each of our field offices to discuss procurement issues, trends, and data needs and to respond to queries and capacity-building needs.

### **Preparations for Better Global Management of Stocks**

Building off the successes of well-established reports used by global partners to help monitor and manage stocks of contraceptives and malaria commodities, the Procurement Planning Monitoring Report (PPMR) and Procurement Planning and Monitoring Report for Malaria (PPMR<sub>m</sub>), respectively, GHSC-PSM started a six-month pilot in July of a new PPMR focused on HIV/AIDS, the PPMR-HIV. In September, we started collecting and monitoring data on first- and second-line ART and RTKs in the first pilot countries — Ghana, Tanzania, and Zambia —with plans to add additional countries to the pilot. The PPMR-HIV will represent the next generation of country-by-country stock information consolidation, separately reporting stocks at multiple levels, pulling stock data from national electronic logistics management information systems (eLMIS) where available, and pulling shipment data from GHSC-PSM's Automated Requisition Tracking Management Information System (ARTMIS) and, ultimately, the procurement information systems of other donors.

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<sup>5</sup> The Diagnostics Consortium includes the U.S. Centers for Disease Control and Prevention (CDC), the Clinton Health Access Initiative (CHAI), the Elizabeth Glaser Pediatric AIDS Foundation, Médecins Sans Frontières, United Nations Children's Fund (UNICEF), USAID, WHO, and others.

<sup>6</sup> The first meeting covered Cameroon, Mozambique, Nigeria, Zambia, and Zimbabwe and the second covered Burundi, DRC, Ethiopia, Malawi, Tanzania, and Uganda.

## **Support for Voluntary Medical Male Circumcision**

GHSC-PSM also supports PEPFAR's VMMC program, a biomedical intervention campaign proven to reduce the risk of transmission of HIV. We support the supply chain for PEPFAR's VMMC program, primarily through procurement of VMMC kits and consumables. We have advised key implementing partners, including Jhpiego, John Snow International, and University Research Co., LLC (URC), on our supply chain and developed reference documents to help country programs better forecast demand and plan their supply of VMMC commodities.

## Rapid Response to Emergencies

In this reporting period, GHSC-PSM had to work proactively to address several urgent situations. Examples are provided below.

***GHSC-PSM response to field safety notices.*** On August 8, 2017, GHSC-PSM was notified that Abbott Molecular, Inc. issued field safety notices for selected lots of viral load and all lots of early infant diagnosis reagents. We immediately formed a crisis response team that met daily until early October, acting as a liaison between GHSC-PSM-supported countries and the supplier to minimize stockout risk. The crisis team worked closely with Abbott and the USAID lab team to expedite replacement shipments and to find alternative sources of viral load and early infant diagnosis tests where necessary. We managed to expedite shipments of replacement reagents to Cameroon, DRC, and Uganda to avoid stockouts of these critical commodities. We maintained a country tracker that allowed the USAID team to share regular updates on shipments and dates for delivery of affected products with the Department of State Office of the Global AIDS Coordinator (S/GAC).

***Emergency shipment of ARVs to fill gaps.*** On several occasions, GHSC-PSM stepped in to support an emergency need when other sources fell through. For example, Zimbabwe faces commodity funding gaps against expanding program requirements to increase the supply of ARVs in response to the rollout of test and treat. Financial challenges decreased the government of Zimbabwe's access to the U.S. dollars that it uses to procure commodities internationally, delaying shipments. To mitigate stockouts, GHSC-PSM procured emergency shipments of ARVs for Zimbabwe at the beginning of Q4. In Uganda, there was a funding shortfall in the Global Fund-managed supply chain. To help fill this gap, two orders were placed with GHSC-PSM, one for approximately \$11.5 million in April and one for approximately \$8.6 million in August.

***Hurricane Irma prevention actions.*** GHSC-PSM closely monitored Hurricane Irma to prevent interruption in deliveries. No countries requested emergency commodity delivery support. A closure at the Miami airport delayed six GHSC-PSM commodity shipments — including rapid diagnostic tests, Nevirapine, Metronidazole, and Efavirenz — that were bound for Haiti and were estimated to arrive before any risk of stockout. We followed up regularly with the freight forwarder to prioritize the GHSC-PSM shipments, averting any major supply disruptions.

## B2. MALARIA

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### In Brief

A total of **25 countries** procured malaria commodities, and **23 countries** received systems strengthening support with malaria funding under the contract.

We **refined our quality assurance (QA) approach** to lower costs and lead times, while minimizing risk and ensuring product quality.

We supported distribution of long-lasting insecticide-treated nets (LLINs) to provide **protection from malaria for tens of millions of people**, including 12 million in Nigeria alone.

We continued to provide technical leadership in **promoting malaria commodity market health** for secure supply.

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Under the PMI-funded malaria TO, GHSC-PSM supplies lifesaving prevention and treatment medicines, rapid diagnostic tests (RDTs), and LLINs. We offer partner countries new approaches to strategic planning, logistics, data visibility, analytics, and capacity building. We also provide technical leadership to strengthen global supply, demand, financing, and introduction of new malaria commodities.

In the second half of FY17, we provided procurement support (any procurement activity from order entry to delivery) for 25 countries<sup>7</sup>, procuring \$57.5 million in malaria commodities (see Exhibit 3). We also provided technical assistance to 23 countries to strengthen national supply chains and improve health commodity availability (indicated by an asterisk in the list below Exhibit 3). PMI announced in late September that it is launching new country programs in Cameroon, Côte d'Ivoire, Niger, and Sierra Leone, and expanding its existing program in Burkina Faso. This expansion will benefit an additional 90 million people at risk of malaria. GHSC-PSM has been preparing to provide commodity support in these countries.

#### Procurement of Malaria Commodities

##### FY17 Q3 and Q4:

- \$57.5 million

##### Life of Project:

- \$139 million

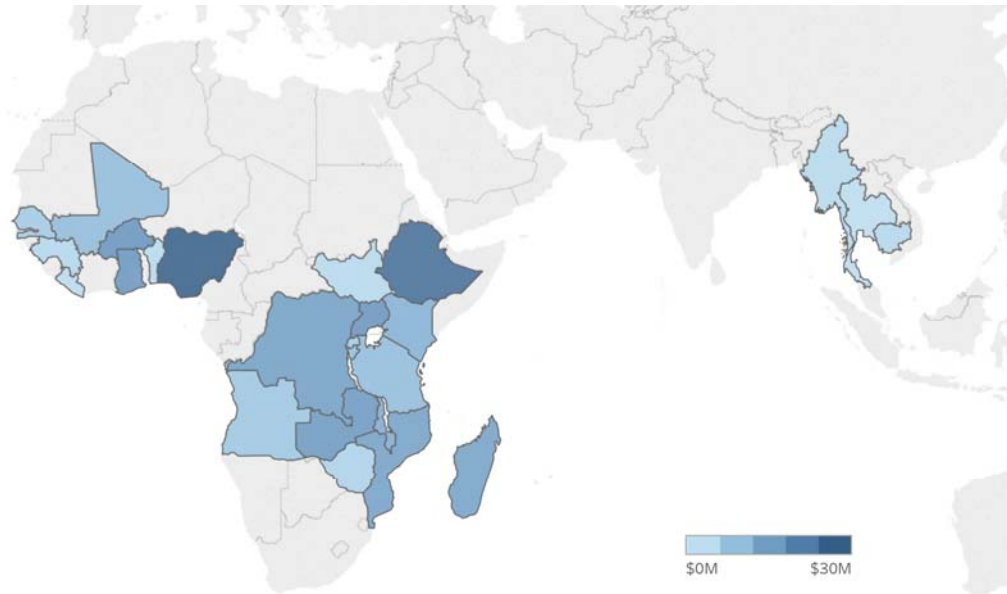
**We have delivered enough antimalarials to treat more than 42.5 million infections.**

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<sup>7</sup> The number of countries for which we procured malaria commodities and which received systems strengthening support include Kenya, which is funded via its own task order.



Exhibit 3. Malaria-Related Procurement Activity in Second Half of FY17



**ASIA:** Burma\*, Cambodia\*, Laos<sup>^</sup>, Thailand\* ▪ **AFRICA:** Angola\*, Benin, Burkina Faso\*, Burundi\*, Democratic Republic of the Congo, Ethiopia\*, Ghana\*, Guinea\*, Kenya\*, Liberia\*, Madagascar\*, Malawi\*, Mali\*, Mozambique\*, Nigeria\*, Rwanda\*, Senegal, Sierra Leone<sup>^</sup>, South Sudan\*, Tanzania, Uganda\*, Zambia\*, Zimbabwe\*

\* Also received technical assistance.

<sup>^</sup> Only received technical assistance with no procurement activity this reporting period. Not shown on map.

### Country Support

GHSC-PSM provided wide-ranging technical assistance in 23 countries over the last half year. As an example, we helped streamline procedures in Liberia that will speed up commodity delivery there. These will help the government deliver commodities quickly in an emergency (see box at right).

Stakeholders in Cambodia are collaborating to strengthen the country’s supply chain and eliminate malaria by 2025. GHSC-PSM and the National Center for Parasitology, Entomology, and Malaria Control launched key initiatives in June. Seventeen stakeholders, including PMI, CHAI, WHO, URC, Cambodia Malaria Elimination Project, United Nations Office for Project Services (UNOPS), and Population Services Khmer, committed to the National Malaria Strategic Plan 2011–2025 and its aim of evidence-based and comprehensive supply chain management for all malaria commodities. GHSC-PSM is providing technical assistance in malaria commodity forecasting, quantification, and supply chain management, including reporting, to reach the plan’s goals.

#### Streamlined Procedures Support Emergency Response

GHSC-PSM advised the Government of Liberia on commodity distribution procedures, reducing the required number of signatures from 11 to three. This, in turn, reduced the commodity order processing time from two months to less than one week. The resident malaria advisor lauded these streamlined procedures that are key to being able to distribute commodities quickly in an emergency.

Technology can be a game changer in maximizing health supply chain efficiencies, from helping estimate procurement needs to ensuring prompt delivery of medicines and supplies. Yet even the most cutting-edge tools can be rendered ineffective if staff cannot use them. Such was the case in Madagascar, where warehouse staff were using a software program called Malagasy Channel that automates order tracking and enables users to send reports and requisition orders to the central warehouses. After the original rollout and training in April, only 28 percent of Madagascar’s districts were using the system to record and report data. GHSC-PSM specialists observed that the software was complicated to use, especially for people with limited information technology knowledge. We worked with the Ministry of Health to simplify the program by reducing unnecessary functions and then revised the training curricula, modules, and job aids to better match district pharmacy staff competencies. The Madagascar data reporting rate for Malagasy Channel increased from 28 percent before our support to more than 80 percent by the end of July.

## Distribution Support

GHSC-PSM successfully supported several critical distributions of malaria commodities over the last half year. Our work in many countries included building country capacity to manage campaigns, as shown in the box at right. Additional detail on LLIN distributions is provided in Section C2a.

**Emergency support.** Malaria is an acute disease with the rapid onset of life-threatening consequences in susceptible populations. Malaria outbreaks typically follow increased rainfall and natural disasters, such as flooding. This results in increased demand for malaria commodities that create supply chain challenges within the country, for last-mile distribution, and for additional emergency commodity procurements. In the last half year, GHSC-PSM’s supply chain often demonstrated the agility and flexibility to secure and deliver emergency malaria commodities for those who need them.

In early March, Madagascar battled a powerful storm that brought 145 mph winds and heavy rainfall. This left behind large amounts of standing water, creating a breeding ground for malaria parasite-carrying mosquitoes. To prepare for an expected increase in malaria, in April, GHSC-PSM delivered 5.3 tons of critical antimalarial commodities to 26 remote districts. These included more than 25,000 ACT treatments for infants; more than 28,000 ACT treatments for children under 5; more than 19,000 ACT treatments for children between 6 and 13 years old; almost 25,000 ACT treatments for adults; and more than 208,000 RDTs. Without this emergency delivery, these districts would not have received additional antimalarial commodities until their normally scheduled replenishment in June.

In early April, due to heavy rain and floods in Malawi’s Karonga district, about 5,500 residents were moved into temporary camps. The district health office issued an emergency call for LLINs due to an increase in standing water and lack of sanitation facilities. Other donors could not supply the LLINs due to long lead times to procure transport services, during which time the

### Helping Protect 12 Million People from Malaria — Now and Into the Future

The GHSC-PSM team in Nigeria supported the LLIN mass replacement campaigns in Kogi and Oyo states, **reaching 12 million people**. We also helped state and local government personnel understand the role of the LLIN in malaria prevention. We built capacity at state and local levels in campaign planning, implementation, and monitoring and in LLIN logistics management, emphasizing accountability and transparency.

displaced population would be unprotected and vulnerable to malaria. GHSC-PSM acted quickly and, with the help of a local distribution services provider, delivered 3,500 nets within 48 hours.

Also, GHSC-PSM supported the distribution of more than 2 million ACTs and almost 500,000 RDTs to 46 health districts in Burundi. These were an emergency contribution to the malaria epidemic response plan to ensure there were no stockouts of these commodities during a crucial time in the peak season.

***Innovative distribution approach.*** In just a four-week period, 1.4 million school children in Ghana found themselves newly protected from malaria, thanks to GHSC-PSM's innovative approach to distributing LLINs. Collaborating with the USAID VectorWorks project and the National Malaria Control Program, we contracted four private sector companies to support distribution to 23,000 primary schools. This approach improved delivery time, increased accountability, and cut costs. For the most recent distribution period, the distributors reached and documented the delivery of LLINs to 100 percent of the targeted schools.



GHSC-PSM's innovative approach to distributing LLINs in Ghana reached 23,000 schools in one four-week period. Photo credit: GHSC-PSM

## **Commodity Procurement, Sourcing, and Delivery**

GHSC-PSM's provision of malaria commodities over the last half year has included procurement, QA, deliveries, support for transferring/redistributing stocks, and response to emergencies, as summarized below.

***Procurement.*** Since the start of the project, GHSC-PSM has procured malaria commodities for 27 countries (all of the PMI countries plus three USAID-designated malaria countries). Over the life of the project, we have procured \$139 million in malaria commodities, including \$24 million in Q4. With the expansion of PMI's presence, GHSC-PSM will be procuring commodities for 31 countries and expanding our presence in Burkina Faso, while adding Cameroon, Côte d'Ivoire, Niger, and Sierra Leone to the project's malaria portfolio.

GHSC-PSM has USAID approval to serve as a procurement agent for other entities. For example, we started our first procurement for Malaria No More (artemether-lumefantrine [ALu] for Kenya) in June. This shipment is scheduled for delivery to Kenya in early 2018.

**Quality assurance.** GHSC-PSM is directly responsible for assuring the quality of malaria commodities that we deliver.<sup>8</sup> In the last half year, we undertook several studies to guide refinements to our QA approach.

In line with industry best practices, we have proposed a risk-based approach to third-party testing for the most commonly procured ACTs. While maintaining quality standards, a risk-based approach to QA testing can decrease costs and lead times. With PMI's approval, we are collaborating with suppliers to perform statistical trending analysis on third-party testing data to ensure decisions around testing are supported by facts.

LLIN manufacturers assert that exposure to environmental conditions at sea does not compromise product quality and integrity. At PMI's request, in Q4, GHSC-PSM implemented a post-shipment quality control testing strategy on a sample of LLIN shipments upon arrival at their destination. This testing is ongoing. We will compare the pre- and post-shipment quality control results to evaluate LLIN quality and integrity.

**Visibility to react quickly.** The PPMRm provides quarterly data on central-level stock availability for critical malaria commodities in 23 countries. These data on upcoming shipments and stock on hand provide PMI and GHSC-PSM visibility into the current and projected stock status of countries on a gross level. More importantly, they allow PMI and our project to take critical actions to address stock availability challenges. To illustrate, in this reporting period, through PPMRm data, PMI identified a large overstock of artesunate injectable in Ghana. PMI and GHSC-PSM are exploring reallocation of this overstock to Burundi or Thailand, which are experiencing shortages.

#### **Lower Prices Enable More Malaria Treatment**

Through careful negotiations with a major supplier of ALu, our highest-volume malaria product, GHSC-PSM decreased unit prices by 7 to 15 percent (depending on presentation).

**Technical leadership to strengthen markets.** GHSC-PSM continued working to strengthen markets for malaria commodities. We provide examples related to treatment and LLINs below.

GHSC-PSM is moving to source malaria commodities through long-term agreements. With terms and conditions agreed to in advance, these reduce the administrative burden on GHSC-PSM and suppliers compared to spot tendering, and thus reduce overall cycle time. In this reporting period, we put in place indefinite delivery, indefinite quantity (IDIQ) contracts for ALu, the malaria commodity that we procure in the highest volume (see the box at right). This will enable cost savings and reduce cycle time.

**Injectable antimalarials** are critical treatments for patients with severe malaria. Injectables require long production and QA lead times due to the complexity of these parenteral products. This makes it all the more important to procure through suppliers that are in compliance with internationally accepted standards for safety, quality, and efficacy. While several global manufacturers exist, none are approved by a stringent regulatory authority and only one is

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<sup>8</sup> Quality assurance for other GHSC-PSM-procured commodities is provided by the GHSC-QA contract, which is implemented by FHI 360.

prequalified through the WHO Prequalification Programme. As part of our efforts to ensure supply of this key product, we met with the WHO-prequalified manufacturer and, in May, decided to establish a sole-source IDIQ for the product with this supplier (as opposed to procuring through a wholesaler, historically how these products have been procured for PMI). The agreement, now with the supplier for signature, will reduce the sourcing cycle time and will provide greater visibility into the status of every order.

The **LLIN market** is characterized by a high degree of order customization, which limits supply chain efficiencies and exacerbates the manufacturing challenges of this product. GHSC-PSM assessed the major costs and lead-time drivers for LLIN production (including size, shape, material composition, insecticide selection, artwork, and packaging) and recommended improving standardization of net characteristics for PMI's consideration. Reducing the number of stock-keeping units we procure and minimizing order customization could smooth production at the manufacturing site, reduce cycle time, allow interchangeability between countries, and save money. This work is in progress, and we will report progress in subsequent quarterly reports.

## Addressing Challenges in the Global Commodity Environment

To help facilitate the flow of malaria commodities globally, GHSC-PSM worked to address product registration and prequalification challenges.

**Product registration.** Product registration is a major issue for malaria pharmaceuticals, particularly for products such as sulfadoxine-pyrimethamine (SP), chloroquine, quinine, and primaquine. These are low-cost products with limited indications for use and fragmented registration profiles. There are very few global manufacturers, with most production being done by local manufacturers. This is a particular challenge for SP, which is a critical antimalarial medication used for intermittent preventive treatment of malaria in pregnancy (IPTp), one of PMI's key intervention strategies. GHSC-PSM mostly procures SP to fill gaps for PMI focus countries where government budgets cannot meet the need. Currently, there is no WHO-prequalified source of SP for IPTp.<sup>9,10</sup> To ensure access to this critical health commodity, GHSC-PSM is working with suppliers to inventory and encourage country registration and is exploring alternative sources of SP, including local and regional suppliers.

**Aligning procurement policy with WHO programmatic changes.** WHO has announced programmatic changes that will affect how procurers define minimum eligibility criteria for RDTs and LLINs. These new criteria for prequalification will have a major impact on our suppliers. To mitigate the impact on the quality of the RDTs and LLINs that GHSC-PSM procures, to secure supply, and to maintain affordability, we are working closely with PMI and vendors to ensure that operations are not impacted by WHO's policy shifts.

## Global Strategic Engagement

Due to the scale, scope, and complexity of malaria as a global health challenge, it is essential to recognize the interconnectedness of our work across sectors and the importance of collaboration. By sharing information, resources, activities, and capabilities, we can achieve things together that we could never achieve alone. Since the start of the project, GHSC-PSM has engaged with groups that are actively addressing malaria commodity production and procurement challenges.

Artemisinin is the active pharmaceutical ingredient (API) in all artemisinin-based combination therapies and in several severe malaria preparations. This API is extracted as a natural (vegetal) source, making the market for this ingredient highly volatile, which creates variability in availability and pricing. To develop a complementary source of nonseasonal, high-quality, and affordable artemisinin to supplement the current plant-derived supply, GHSC-PSM and PMI have been collaborating with the Bill & Melinda Gates Foundation. We provided process chemistry and pharmaceutical expertise as part of an advisory committee to promote semisynthetic artemisinin (SSA) production. The goal is to develop a manufacturing process that is more cost competitive in the API market than the fermentation currently being used to manufacture SSA.

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<sup>9</sup> Historically, Fansidar® was approved for marketing by the USFDA, a stringent regulatory authority, but was cost-prohibitive for procurement. Currently, it is no longer approved for marketing in the United States.

<sup>10</sup> There are two antimalarial finished pharmaceutical preparations approved by the WHO Prequalification Programme, both of which contain SP in a co-blistered presentation. Neither product is indicated for use as IPTp.

Developing an affordable and sustainable manufacturing process for SSA will bring stability to the market.

GHSC-PSM continues to support conversations with global working groups such as the Malaria RDT Global Working Group. We provided this group with critical evidence showing that the RDT market is in an unhealthy state. We are addressing issues of product interchangeability, appropriate use, and long-term contracting with the group. By aligning our efforts with global procurers of RDTs on a strategy that can be implemented at the country level, we can help limit overreliance on specific manufacturers and testing protocols that ultimately reduce our ability to sustain a healthy and competitive market. By working together to promote diversity of suppliers of quality-assured products, we can better achieve secure supply.

GHSC-PSM is a member of the Roll Back Malaria – Malaria in Pregnancy Working Group. This group plays an important role in policy development, advocacy, research dissemination, and country support. GHSC-PSM provides the voice of the supply chain to the group, offering insights into the logistics implications of policy and programming changes so that they can be addressed at the outset, before they become challenges. To that end, GHSC-PSM participated in the group’s annual meeting in September.

### **B3. FAMILY PLANNING AND REPRODUCTIVE HEALTH**

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#### **In Brief**

**24 countries procured FP/RH commodities and 23 countries received systems strengthening support with FP/RH funding in the second half of FY17.**

GHSC-PSM continued to play a **global leadership role**, such as chairing the Reproductive Health Supplies Coalition’s (RHSC) Systems Strengthening Working Group and serving on the People that Deliver board.

Our work addressing **core priorities** included providing market analysis, tracking contraceptive security, enhancing visibility of FP/RH supplies, and assuring the quality of commodities.

#### **Procurement of FP/RH Commodities**

##### **FY17 Q3 and Q4:**

- \$23.4 million

##### **Life of Project:**

- \$32.1 million

**We have delivered enough contraceptives to provide 9.4 million CYP**

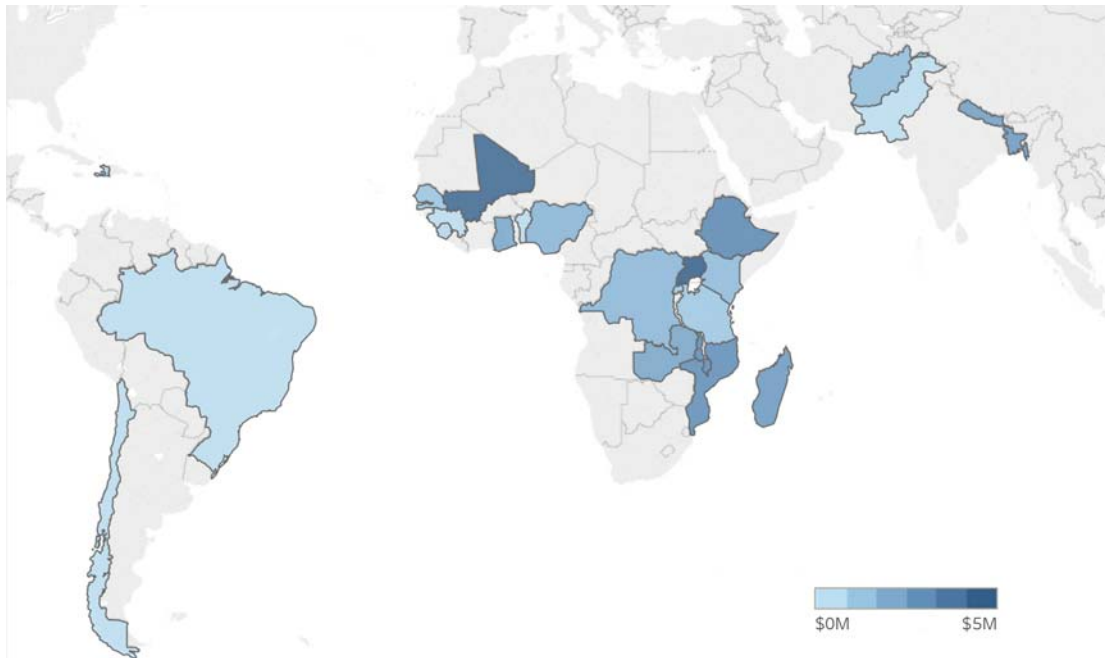
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The FP/RH TO serves as the primary vehicle through which USAID: procures and provides FP/RH commodities for USAID health programs; offers technical assistance to improve supply systems and commodity security in partner countries; and provides technical leadership to strengthen the global supply, increase financing, and introduce FP/RH commodities. In the



second half of FY17, we procured \$23.4 million in FP/RH commodities<sup>11</sup>. We provided procurement support (any procurement activity from order entry to delivery) for 24 countries<sup>12</sup> (see Exhibit 4). We also provided technical assistance to 23 countries to strengthen national supply chains and improve health commodity availability (indicated by an asterisk in the list below Exhibit 4).

Exhibit 4. FP/RH-Related Procurement Activity in the Second Half of FY17



**AMERICAS:** Brazil, Chile, El Salvador<sup>^</sup>, Guatemala<sup>^</sup>, Haiti<sup>\*</sup>, Honduras<sup>^</sup>, Panama<sup>^</sup> ▪ **ASIA:** Afghanistan, Bangladesh, Laos<sup>#</sup>, Nepal<sup>\*</sup>, Pakistan<sup>\*</sup> ▪ **AFRICA:** Angola<sup>^</sup>, Benin, Burundi<sup>^</sup>, Democratic Republic of the Congo, Ethiopia<sup>\*</sup>, Ghana<sup>\*</sup>, Guinea<sup>\*</sup>, Kenya<sup>\*</sup>, Liberia<sup>#</sup>, Madagascar<sup>\*</sup>, Malawi<sup>\*</sup>, Mali<sup>\*</sup>, Mozambique<sup>\*</sup>, Nigeria<sup>\*</sup>, Rwanda<sup>\*</sup>, Senegal, Sierra Leone, South Sudan<sup>^</sup>, Tanzania, Uganda<sup>\*</sup>, Zambia<sup>\*</sup>

<sup>\*</sup> Also received technical assistance

<sup>^</sup> Only received technical assistance with no procurement activity this reporting period. Not shown on map.

<sup>#</sup> Had condom procurement activity only. Per USAID guidance, condom procurement is counted under HIV/AIDS TO. Not shown on map.

## Country Support

Below, we highlight some of the technical assistance that GHSC-PSM provided to strengthen in-country supply chains for FP/RH commodities this reporting period.

**Data visualization.** In Kenya, the team developed an Excel-based tool, the Stock Status County Dashboard, to facilitate visualization and comparison of stock status data across county health facilities. The GHSC-PSM Kenya Supply Chain System Strengthening (KSCSS) TO introduced the

<sup>11</sup> Per USAID guidance, all condom procurements are counted under the HIV/AIDS task order.

<sup>12</sup> The number of countries for which we procured malaria commodities and which received systems strengthening support include Kenya, which is funded via its own task order.



tool to commodity managers in Turkana County, where most adolescents and young women of reproductive age are at risk of unplanned pregnancies, due in part to sporadic FP commodity supply. The dashboard readily identified FP commodities that are overstocked, understocked, or stocked out. Turkana County commodity managers, with support from KSCSS, visited all health facilities overstocked or out of stock of FP commodities, and conducted a commodity redistribution exercise, paving the way for ensuring FP commodities are available in the future wherever they are needed.

**Strategy and planning.** GHSC-PSM assisted the Ministry of National Health Services Regulations and Coordination in Pakistan by conducting a situation analysis for contraceptive manufacturing in the country. We developed a comprehensive report that identified potential revenue to be generated until 2030 through local production of FP commodities. Based on the data, the federal government will motivate local industry to invest in FP commodity production. Of additional note are GHSC-PSM's advocacy efforts, which resulted in an allocation of \$23.9 million by provinces for FY17–18 for FP procurement and transportation.

**FASP and procurement.** In Pakistan, the project supported development of five-year FP commodity forecasts for all provinces. Specifically, in the Khyber Pakhtunkhwa (KP) province, GHSC-PSM conducted a procurement performance assessment of the provincial Department of Health and Population and Welfare based on the Organization for Economic Cooperation and Development's Methodology for Assessing Procurement Systems indicators. We also developed a procurement performance management tool for the KP government.

**Warehousing and distribution.** The GHSC-PSM Pakistan team provided technical assistance to the Government of Sindh for sustainable solutions for distributing FP commodities from Central Warehouse and Supplies to the subdistrict level. The team developed a costed distribution plan for lady health workers in Sindh. The team further ensured FP commodity security through providing technical assistance to the central warehouse of Karachi for executing quarterly distribution plans. In Balochistan, the project provided technical assistance to the government for improved use of existing warehouse space in the province. We developed a comprehensive report providing viable options for use of available space and shared it with the Department of Health Balochistan for implementation.

**Increased government ownership.** We supported increased ownership by the Zambian government of forecasting, quantification, procurement, and supply planning. We helped the Ministry of Health standardize and streamline FASP processes and practices, form quantification core teams, and develop terms of reference for the groups as well as FASP standard operating procedures (SOPs) based on best practices from different program areas. The amount of in-person meeting days required to complete the annual quantification process was streamlined from 14 days to five.

## **FP/RH Core Program**

USAID provides core funding to GHSC-PSM for several FP/RH initiatives, reflecting the three focus areas of the USAID/Office of Population and Reproductive Health: global leadership in FP/RH policy, planning, and advocacy services; knowledge management in response to program needs; and support to the field in implementing effective and sustainable FP/RH programs.

**Research market dynamics.** In FY17, GHSC-PSM conducted market dynamics research to explore generic acceptability and uptake of oral contraceptives (OCs), advanced the agenda for introducing a second supplier of two-rod implants, and assessed expected growth in implant use and the resulting impact on demand for other methods.

We also developed a supplier risk assessment framework consisting of up to 15 weighted metrics across product quality, supply stability, financial stability, and business continuity. This framework can be used to inform key decisions, such as award of business, scale-up of volumes with suppliers, and risk mitigation actions. Based on risk assessment results, we have identified actions that could help mitigate supplier risk.

**Track contraceptive security.** Global and national program managers, advocates, and decision makers track countries' progress toward improving access to contraceptives and identify areas requiring strengthening using two tools: the Contraceptive Security Indicators and the Contraceptive Security Index. GHSC-PSM combined these two tools into a single assessment tool that streamlines and strengthens data collection and aligns the resulting tool with the Total Market Approach. We are working to ensure that the combined tool continues to fill the need for objective, standardized, and repeatable contraceptive security data. We are collecting feedback on the revised tool from key informants and increasing awareness and use of the tool through a robust marketing and dissemination strategy.

**Conduct landscape analysis.** GHSC-PSM conducted a landscape analysis in four countries<sup>13</sup> to design supply chain reform interventions. These interventions relate to: 1) operational research on ongoing supply chain reforms in public health supply chains to strengthen the evidence base for best practices and to promote systematic incorporation of operations research activities into supply chain interventions; 2) alignment of incentives in supply chains, including understanding the political economy of supply chains, reform of supply chain designs, performance-based financing, continuous performance improvement, and improved personnel management systems; and 3) social accountability to identify potential grassroots advocacy mechanisms that have enhanced government follow-through on commitments to ensure availability of contraceptive options. The researchers conducted country-specific literature reviews and interviewed technical experts and field office, USAID/Washington, and mission staff from those countries. We are working with stakeholders to narrow



A counselor in Madagascar describes the benefits of some of the contraceptives supplied by GHSC-PSM. *Photo credit: Lan Andrian*

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<sup>13</sup> Guatemala, Malawi, Rwanda, and Zambia

the potential interventions based on the needs and interest displayed by field offices and missions.

**Collaborate with global stakeholders.** We sought to build global partners' awareness of and support for the U.S. Government's priorities and programs. We hosted "meet and greets" with external partners such as the RHSC and FP2020. We maintained key leadership positions such as chair of the RHSC's Systems Strengthening Working Group and a seat on the People that Deliver board, attending meetings and providing technical support to global initiatives.

**Enhance visibility of data on family planning supplies.** For the RHSC, GHSC-PSM is helping conceive and plan for the Global Family Planning Visibility and Analytics Network (Global FP VAN) (see the box at right). Project staff attended the Bill & Melinda Gates Foundation-funded VAN Jumpstart Workshop in South Africa. Since then, we have supported several task forces and hosted a process-mapping retreat for the Coordinated Assistance for Reproductive Health Supplies (CARhs) Group and the RHSC Coordinated Supply Planning members. These identified significant duplication of effort between GHSC-PSM's PPMR administrators and the RHSC Coordinated Supply Planning Group. Under the FY18 core work plan, we will work toward a structure that ultimately eliminates inefficiencies in data gathering, avoids duplication of effort, and creates a better environment for data-based decision making.

### A Significant Step for Global Collaboration

In FY17, the reproductive health community agreed to increase collaboration to make good decisions for RH inventory allocations and purchases, especially for constrained products. These purchases and their journey from the manufacturer to the country need to be visible so countries can properly plan their supply and take necessary action when product arrives. This collaborative supply planning and inbound visibility make up what will now be called the *Global Family Planning Visibility Analytics Network*, or *Global FP VAN*. Led by the RHSC, GHSC-PSM has advised the steering committee on management information systems capabilities and participated in workshops and the newly formed task forces.

**Increase understanding of health system dynamics.** GHSC-PSM hosted a team from Virginia Polytechnic Institute and State University to facilitate the Beer Distribution Game<sup>14</sup> for the RHSC Systems Strengthening Working Group at its biannual meeting. The goal of the simulation was to demonstrate the effect of system structures on people's behavior. The exercise helped Coalition members better understand the dynamics that drive health system behavior and explore how we can better structure health systems to prevent dysfunction. The discussion among the members focused on how partners can better collaborate in the field to improve supply chain function and contraceptive availability through increased information sharing. We

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<sup>14</sup> The beer distribution simulation is an experiential learning business simulation game created by professors at the Massachusetts Institute of Technology Sloan School of Management to demonstrate key principles of supply chain management. The purpose of the simulation is to understand the distribution-side dynamics of a multi-echelon supply chain used to distribute a single item (in the simulation, cases of beer).

are preparing to facilitate the simulation for RHSC membership at the General Membership Meeting.

**Meet QA needs.** GHSC-PSM attended the United Nations Population Fund's (UNFPA's) RH Procurers meeting in May. FP/RH procurers have largely harmonized their QA policies to prioritize stringent regulatory authority approval, WHO prequalification, and WHO Expert Review Panel recommendations. To manage situations in which they must procure products that do not yet meet international quality standards, most FP/RH procurers have a risk-based framework/approach. Many key FP/RH procurers/partners are insufficiently resourced for QA and seek to collaborate and share QA data. GHSC-PSM will seek harmonized action on this with partners in the coming year.

### **Global Collaboration to Allocate Scarce Product**

The PPMR continued to serve a vital role in reducing the risk of stockouts and minimizing waste in 38 countries for 53 different FP/RH programs. In the second half of FY17, the global community<sup>15</sup> took 10 actions related to FP/RH commodities (from transferring products between countries to expediting shipments) based on information gleaned from the PPMR. Over the last six months, we also enhanced the PPMR database. GHSC-PSM created an Excel-based tool that automatically generates graphs displaying historical and current months of stock, average monthly consumption, and stock-on-hand to enable more efficient analysis. These graphs also visually highlight any previous errors in the data and are shared with data providers to improve their data quality and reporting.

We collaborated with other FP/RH procurers to develop allocation plans when products were scarce. For example, currently, the supplier of one-rod implants has limited production capacity. GHSC-PSM brought this issue to the RHSC Coordinated Supply Planning Group, where major procurers agreed on allocation schemes that will avoid stockouts.

### **Contraceptive Availability Changing Lives**

With a steady supply of a wide range of USAID-funded family planning products, the number of clients accessing family planning services in Nkhata Bay district of Malawi has increased. A health-care worker on the frontline there sees the difference this is making:

*“Previously, the lack of family planning commodities in our district resulted in a lot of unplanned pregnancies among the youth and this contributed to high school dropout...we commend USAID for the constant supply of family planning commodities...This will help us to ensure a healthy young population in the district and keep our girls in school.”*

*- Phillimon Nyondo, Nurse  
Nkhata Bay District Hospital*

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<sup>15</sup> Dozens of donors, NGOs, working groups, universities, suppliers, and implementing partners use the PPMR data, including USAID/Washington and USAID missions, UNFPA, the West African Health Organization, RHSC, FP2020, Implants Access Program, Savana Press Access Initiative, CHAI, CARhs, and others.

## Commodity Procurement

Over the life of the project, GHSC-PSM has supplied contraceptive methods that would provide 9.4 million CYP. One story describing the impact of steady availability of contraceptives is provided in the box at right.

We released global tenders for injectables, implants, and OCs, and established long-term agreements with the main sources of FP/RH contraceptives. We currently are negotiating contracts for OCs and standard days methods. These contracts shorten the procurement and production lead times compared to spot procurements, secure product supply, and help minimize production shortages due to unforeseen events. GHSC-PSM also used our regional distribution centers strategically to fulfill countries' orders.

**Address importation challenges.** Commodity importation has remained challenging due to regulatory requirements (such as product registration) and extensive lead times to clear shipments. We are supporting development of guidance to manage registration and will continue to work with USAID and manufacturers to prioritize registration issues for strategic intervention.

**Manage one-off procurements.** In addition, the project responded to specific country needs for products that are not in our core catalog. We procured the injectable norethisterone enanthate (Noristerat) for Nigeria and implant consumables kits for Liberia. Because these items are not standard offerings, GHSC-PSM had to manage comprehensive procurement actions (e.g., release tenders, evaluate offers, negotiate contracts) to fulfil these needs.

## B4. MATERNAL, NEWBORN, AND CHILD HEALTH

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### In Brief

**GHSC-PSM supported MNCH in 14 countries.**

In the last half of FY17, we procured more than **\$382,000 in MNCH commodities.**

In year 1 for the MNCH TO, GHSC-PSM **increased awareness of key supply chain challenges** for MNCH commodities among internal and external partners.

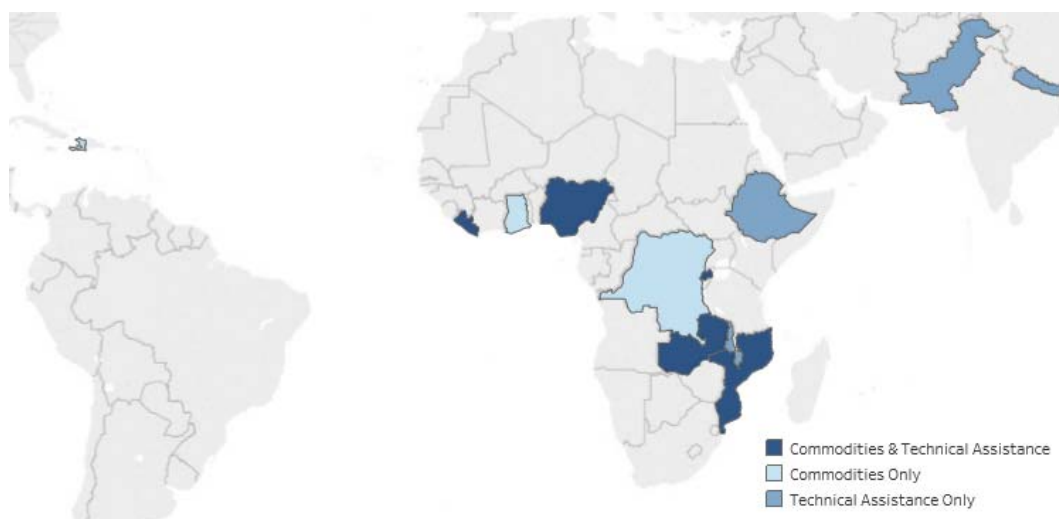
GHSC-PSM provided **global technical leadership** to increase availability of quality-assured MNCH commodities.

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In 2016, GHSC-PSM was awarded a new TO for maternal, newborn, and child health. We work to help end preventable child and maternal deaths by increasing access to quality-assured medicines and supplies for MNCH. We provide global technical leadership on MNCH commodities and ensure that supply chain management considerations are included in global dialogue and initiatives. GHSC-PSM focused on three key areas during this reporting period: commodity quality, data availability, and coordination with other MNCH partners.

GHSC-PSM supports MNCH programs in 14 countries, as shown in Exhibit 5.

Exhibit 5. GHSC-PSM Support for MNCH Programs



**Commodities & Technical Assistance:** Liberia, Madagascar, Mozambique, Nigeria, Rwanda, Zambia ▪

**Commodities Only:** Democratic Republic of the Congo, Ghana, Guatemala, Haiti ▪ **Technical**

**Assistance Only:** Ethiopia, Malawi, Nepal, Pakistan

## Quality

GHSC-PSM supported three quality-focused activities over the last six months. We organized two technical meetings this year with organizations working on quality. We also collaborated with WHO's Prequalification of Medicines Programme to create a tracker of the registration status of WHO-prequalified MNCH products in the 25 USAID priority MNCH countries. From this exercise, we learned that many prequalified products are not registered in the priority countries. Moving forward, GHSC-PSM will continue to coordinate with WHO to increase awareness of its prequalification program among manufacturers and regulatory authorities to streamline registration, which facilitates importation of these products.

Additionally, over the last six months, GHSC-PSM has been preparing for a large stakeholder convening to discuss major issues that compromise the quality of oxytocin, which is used to reduce maternal death caused by post-partum hemorrhage. The purpose of the meeting is to translate the complicated and sometimes unclear scientific evidence around oxytocin quality into clear, actionable recommendations for national regulatory authorities, procurement agencies, and other key decision makers. GHSC-PSM's MNCH lead chairs the Maternal Health Supplies Caucus of the RHSC. During the semiannual meeting of the Caucus, GHSC-PSM proposed holding a technical consultative meeting to develop state-of-the-art guidance on management of oxytocin. The Caucus agreed to such a meeting and, in collaboration with the Caucus, we currently are planning an October meeting, to be financed by USAID.

Finally, in an effort to assist procurement agencies in countries to source quality-assured MNCH commodities, in Q4 we initiated work on a guidance document through a subcontract with Concept Foundation. The guidelines will consolidate and harmonize advice on procuring MNCH commodities, provide product specifications, and address a range of considerations in procuring these essential health medicines.

## Data Availability on MNCH Commodities

Another key focus of GHSC-PSM's MNCH activities is to increase availability and use of data on MNCH commodities. To this end, we have been assessing the feasibility of including MNCH commodities in countries' end-use verification (EUV) surveys. These surveys verify availability of commodities at a sample of service delivery points. We reviewed data on MNCH commodities from four countries (Ghana, Madagascar, Mozambique, and Nigeria) to see which commodities were included and how data on these commodities were collected. Based on these findings, we



Data from EUV surveys help health authorities ensure service delivery points have the needed MNCH commodities.

*Photo credit: Lan Andrian*



will develop guidance for other countries that are interested in using EUV surveys to increase visibility of data on MNCH commodities.

### **Supporting USAID Partner Organizations**

At GHSC-PSM's 2017 Supplier Summit, we introduced suppliers for the first time to the global MNCH agenda and to possible opportunities for providing those commodities.

We also provided technical support to a variety of USAID-supported initiatives. We:

- Served as a technical resource to organizations developing implementation research strategies as countries scale up the new WHO guidelines on possible severe bacterial infection in newborns where referral to higher-level facilities is not possible
- Contributed to developing a situational analysis tool for small and sick newborn care, focusing on the commodity section

In the next fiscal year, GHSC-PSM will continue to act as a liaison with implementing partners, manufacturers, and other key actors to promote high-quality MNCH commodities at all levels.

## **B5. OTHER EMERGING HEALTH THREATS**

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### **In Brief**

GHSC-PSM procured **1.1 million condoms for prevention of sexual transmission of Zika** in the second half of FY17.

We **sourced mosquito repellent** for use by pregnant women.

We supported **in-country commodity distribution to health facilities** in five countries to ensure that pregnant women have access to the needed commodities.

We provided **technical assistance and procured commodities with Ebola funding** in Liberia.

We are partnering with the government of Madagascar to aggressively **respond to the pneumonic plague outbreak**.

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GHSC-PSM is working to build resilient supply chains that are equipped to face the challenge of emerging public health threats when they arise. Specifically, this year, GHSC-PSM supported countries dealing with three recent threats: Ebola, Zika, and pneumonic plague.

### **Support for the Response to Zika**

Our work to help countries address Zika, a virus that threatens child survival, included commodity procurement, logistics, and information support. We procured more than 5 million



condoms for targeted countries in Latin America and the Caribbean (Dominican Republic, El Salvador, Guatemala, Haiti, and Honduras), including 1.1 million in the second half of FY17. We also sourced mosquito repellent for five countries, received orders, and are preparing to support distribution of repellent to service delivery points next year.

GHSC-PSM also provided technical assistance to ready supply chains for Zika commodities in key countries in Latin America. We worked with USAID missions and ministries of health to determine if the product required registration or waivers, where product would be stored, and who would be responsible for distribution, as well as reviewing the forecast with national stakeholders. In short, we completed the preparatory work to receive, store, and distribute the products to service delivery points. Specific support included:

- Supply chain technical assistance in Haiti for commodity distribution planning
- Logistics support for delivery of Zika commodities in the Dominican Republic, El Salvador, Guatemala, and Honduras
- Drafting of informational materials in English, Spanish, and Creole on appropriate storage, use, and disposal of repellent to be distributed along with the repellents

### **Support for the Response to Ebola**

For Ebola, we provided technical assistance and procured commodities with Ebola funding in Liberia. We also are managing procurement of essential medicines for the NGO Advancing Partners & Communities' program for Ebola survivors in Guinea, Liberia, and Sierra Leone.

### **Support for the Response to the Pneumonic Plague**

An outbreak of deadly pneumonic plague started in Madagascar during Q4. GHSC-PSM worked with the Ministry of Health to ensure that commodity orders, requisitions, and distribution from the central medical warehouse to districts all continue. Our field office is supporting the plague epidemic response through coordination with the Ministry of Health, WHO, UNICEF, and other stakeholders to quantify and analyze gaps in commodities, including in post-exposure prophylaxis for families and health-care providers, and coordinating distribution of these lifesaving commodities to hospitals to test and treat plague cases.

## PROGRESS BY OBJECTIVE

In this section, we summarize our activities, achievements, challenges, lessons learned, and adaptation under each of GHSC-PSM's three functional objectives: global commodity procurement and logistics, country programs and systems strengthening technical assistance, and global collaboration. Under each objective, we discuss several M&E indicators that were closely monitored and that reflected priorities over the last half year. We present the complete set of our performance and context indicators in Annex A.

### CI. GLOBAL COMMODITY PROCUREMENT AND LOGISTICS

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#### In Brief

**1,151 line item orders were delivered** in Q4, with a value of **\$157 million**.

**31 percent of line items were delivered on time (OTD)**, based on the defined on-time window (within the period 14 days before or 7 days after the agreed delivery date). Further, **43 percent were delivered within 30 days of the agreed delivery date**, with a value of \$73 million, in Q4.

We delivered 2,476 shipments over the past six months, a **250 percent increase** over the 987 shipments delivered in the previous six months. On average, this means that GHSC-PSM **delivered a shipment approximately every two hours** over the last six months.

In the **second half of FY17, we procured \$373.8 million** in health commodities. Procurement values have reached **\$674.3 million for total life of project**.

**4,187 line item orders were in process** at the end of Q4.

We **improved the structure of our global supply chain** and **streamlined our end-to-end processes** to reduce handoffs and positively impact OTD, cycle time, and cost.

We integrated and implemented an information system, ARTMIS, that moves toward **user-friendly order entry, improves data visibility, and enables supply chain analytics** that we can use to improve OTD and cycle time.

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#### CIa. Activities, Achievements, Lessons Learned, and Adaptation

In the last six months, GHSC-PSM built out the organizational structure, staffing, systems, and processes to provide health commodities for USAID's, PEPFAR's, and PMI's health programs on

#### The Global Supply Chain At a Glance

59 countries serviced

5,100+ products provided by 325 suppliers in the catalog

Five international freight forwarders responsible for 600 shipping lanes

Five regional distribution centers (moving to three centers) with inventory for rapid response to orders

an unprecedented scale. Our global supply chain is summarized in the box at right. Following our strategy of continuous quality improvement, we reengineered many aspects of our approach to the global supply chain to ensure better performance and customer service.

## Restructuring Supply Chain Functions

To improve on-time deliveries, in Q3 and Q4, we reorganized the Global Supply Chain team and revised many of our processes to streamline steps, gain efficiencies, and increase accountability.

- **Demand and supply planning.** We conducted or supported forecasting and supply planning events within each GHSC-PSM-supported country for the full range of commodities, including ARVs, RTKs, laboratory, malaria pharmaceuticals, RDTs, and FP/RH commodities. We then aggregated the data to develop global demand and supply plans. This critical information is used to plan inventory across our network of regional distribution centers and to generate market forecasts for our supply community. In the next year, we plan to leverage FASP information to move toward a more proactive order management system, which will improve cycle time.
- **Integrated supply chain managers and commodity teams.** We assigned ownership of each line item from order entry to delivery and supplier payment to a Commodity team to bridge previously siloed functions and to enhance accountability and results. The streamlined processes, increased training, and enhanced use of tools with this organizational alignment reduces handoffs in our supply chain process, ensuring ownership of each order.
- **Support for non-field office countries.** We developed a Non-Field Office Support team to provide focused support to missions in countries where we do not have field offices.
- **Supplier relationship management.** We continued to work closely with our suppliers. We conducted several supplier events, implemented a supplier scorecard system with more than 50 suppliers as a basis for continual improvement (see Annex A for more details on supplier scorecards), and deployed aggressive supplier management actions to mitigate supplier delays in providing goods and the documentation that is critical for registration and duty import waivers.
- **Deliver/return management.** We continued to consolidate our regional distribution center network from seven to three centers. The two new regional distribution centers in Belgium and Dubai opened in August, with inventory being transferred from the Netherlands and Singapore, respectively. We are on track for closing the Netherlands and Singapore centers by the end of 2017. We are dispatching inventory from the soon-to-be-closed Ghana and Kenya warehouses to countries; any remaining inventory will be transferred to South Africa. Our new regional distribution centers will reduce costs to the U.S. government and decrease lead time for countries in need.
- **Transition to ARTMIS.** In Q4, we uploaded, linked, and cleaned data from the manual tracking systems that we had used for different commodities and by different parts of our supply chain team into ARTMIS. This moves us toward achieving full end-to-end visibility into the commodity global supply chain. We can now better track orders,

streamline processes, capture key documents, identify bottlenecks, and prioritize actions to improve OTD and cycle time.

- **Order promise tool.** We developed an order promise tool that we use with USAID missions to set mutually agreed delivery dates more realistically than in the past. The order promise tool is informed by a wide range of regularly updated information, including information on country requirements.
- **Visual early warning system.** We created a visual early warning system/dashboard that we use to track an order that is falling behind, facilitating tight management cadence to ensure action is taken to push the order along.

The results of these many adaptations are starting to be observable in our performance in major supply chain functions.

### **Procurement and Deliveries**

GHSC-PSM procured \$373.8 million in commodities in the last half year, including more than \$173.1 million in Q4. In accordance with normal commercial practices, our supply chain focuses its efforts around line item orders as the basis for operational management and performance. We managed a large number of line items — 3,500 line items in the last half year, including 2,000 line items in Q4 alone — that have to be tracked and monitored at each step by our global supply chain team.

Further, we saw a significant increase of 254 percent in shipping volume, from 974 deliveries in the first half of the year to 2,476 deliveries in the second half. This volume can be attributed to three factors: enhanced on-time deliveries, increased number of orders, and delivery of backlog items.

On any given day, we have about 4,000 orders in process. Our efforts to optimize deliveries and warehousing have continued to improve this reporting period.

### **Strategic Sourcing**

Strong sourcing strategies deliver better value to USAID and countries, improve cycle times, and support OTD. We have emphasized contracting strategies, increasing the share of total procurement managed under long-term agreements and reducing reliance on spot tendering.

Our cross-functional Commodity Councils continued to produce solid results for our seven primary commodity groups. At periodic Commodity Council meetings, attended by USAID and project staff, we provided a holistic view of the market and supplier base to gain consensus on sourcing strategies. We then implemented the strategy for each commodity group, tracking cost savings and other benefits. Highlights of our strategic sourcing achievements, by commodity group, include:

#### ***HIV/AIDS pharmaceuticals***

- We executed framework contracts with major suppliers for all ARVs, valid through March 2018, with several contracts including firm pricing and volume commitments.

- Working with USAID and our field offices, we initiated transition planning for new ARV adoption.

#### **Laboratory equipment and supplies for HIV testing**

- We created a robust sourcing strategy based on comprehensive market, spend, and cost analysis. We developed a network procurement approach for viral load and early infant diagnosis testing in countries, taking into account the diversity of testing platforms within and across countries, as well as the potential to procure bundled equipment, supplies, and services.
- We improved visibility into prices offered by suppliers across countries, developed ordering tools for countries, and better monitored order status, contributing to more coordinated stakeholder engagement.

#### **VMMC kits**

- GHSC-PSM launched a Commodity Council focused solely on VMMC kits that is developing a sourcing strategy to streamline our supplier base, address lead time concerns, and lower the costs of VMMC kits. This will be accomplished by following best practices used by other commodity groups, which may include tiered pricing, guaranteed volumes, and vendor-managed inventory services, among others.

#### **Malaria pharmaceuticals**

- **ACTs.** We negotiated prices of a key ACT therapy resulting in FY17 savings of nearly \$400,000 and potential annual savings of about \$1 million. We entered into long-term agreements with our ALu suppliers and are executing strategic contracts with our artesunate + amodiaquine (ASAQ) suppliers. These will reduce overall sourcing cycle time and enhance the security of emergency supply.
- **Severe malaria.** We are entering into a strategic contract for a critical severe malaria treatment. The agreement is expected to yield about 2 percent in annual savings and reduce lead times by up to four to six weeks per order.

#### **LLINs and RDTs**

- **LLINs.** We developed a sourcing strategy approach for LLINs that includes rationalization of stock-keeping units, reduced customization of orders, negotiations with suppliers, optimization of Goods Available Dates, and a strategic contract with a “best value” award method.
- **RDTs.** We developed a contracting strategy for RDTs that encourages supply diversity to protect against supply risk, while still capturing competitive pricing and significantly reducing overall sourcing cycle time.

#### **RH pharmaceuticals and devices**

- **Oral contraceptives.** To expand the number of OC suppliers, GHSC-PSM managed an OC sourcing event in Q3. This added two generic suppliers to the OC supply base for the first time in USAID history. We are finalizing contracts with three manufacturers for additional product offerings, including emergency contraceptives and trade-

#### **An Important First**

Recent sourcing activities added generic OC suppliers to the OC supply base for the first time in USAID history.

packaging services for social marketing partners. In addition to strengthening supply security, these contracts will generate potential cost savings of \$0.02 to \$0.04 per cycle, representing an approximate 7 to 15 percent price reduction per cycle (depending on product type).

- **Injectable contraceptives.** Expansion of the supply base is also a key objective for injectable contraceptives, along with costs savings. In FY17, we renegotiated a contract with the existing sole-source supplier of depot medroxyprogesterone acetate intramuscular (DMPA IM). We also are actively engaging with generic suppliers of DMPA IM in the WHO prequalification pipeline to introduce generic supplier(s) into the DMPA IM supply base next year. In addition, we added a two-month contraceptive injectable, norethisterone enanthate, to the product catalog.
- **Contraceptive implants.** We established supply contracts for one- and two-rod implants with two suppliers, and are working to expand the base of quality-approved implant kit suppliers to reduce lead times and supply risk. In addition, we have been working with USAID and UNFPA to assess the value proposition of a new WHO-prequalified two-rod implant supplier.

#### **Condoms and personal lubricants**

- **Condom and lubricant procurement.** In the second half of FY17, we procured almost 400 million condoms (see the box at right).
- **Male condoms.** To improve sourcing flexibility, reduce lead times, and deliver cost savings, we held a sourcing event for male condoms and personal lubricants during Q3. We are negotiating supply contracts with three suppliers that, combined, offer seven manufacturing facilities, a broader product portfolio, and vendor-managed inventory services for No Logo male condoms. We estimate these new contracts will deliver an 8 percent price reduction for male condoms and 23 percent price reduction for lubricants while providing more varied product and packaging options. Vendor-managed inventory services will allow us to shift a portion of safety stock from our regional distribution centers to a supplier's warehouse to improve predictability and response time for incoming orders.

**Condom and Lubricant Procurement**

In Q3 and Q4, GHSC-PSM procured the following condoms:

- \$9.4 million in male condoms (392.5 million condoms)
- \$1.7 million in female condoms (3.3 million condoms)
- Almost \$400,000 of personal lubricants (9.3 million sachets)

Our market analyses and strategic sourcing activities have generated many of the project's cost savings to date, which are summarized in the box on the next page.

#### **Decentralized Commodity Procurement**

GHSC-PSM's procurement strategy seeks to reduce response/cycle times, lead times, and transaction costs; increase on-time deliveries; and balance price, delivery, and quality (i.e., best value). Decentralized commodity procurement (DCP) (or procurement by a GHSC-PSM field office rather than headquarters) is a key component of this overall strategy.

Field offices that have adequate staff capacity, can maintain appropriate segregation of duties, have been trained in ARTMIS and GHSC-PSM procurement procedures, and comply with other criteria are conducting their own procurement. To date, nine countries are procuring their own products under our DCP program: Burundi, Ethiopia, Haiti, Mozambique, Nigeria, Rwanda, Uganda, Zambia, and Zimbabwe. Initially, DCP was restricted to sourcing and procurement from local eligible vendors that are on the GHSC-QA (FHI 360)-approved product/vendor list. In this reporting period, eligible field offices have been authorized to

### **Decentralized Procurement Hits Its Stride**

The nine countries approved for DCP procured \$32.9 million in the second half of FY17, including \$26.3 million in Q4 alone. These comprised 28 percent (by number of orders) and 5 percent (by value) of all orders purchased under GHSC-PSM.

### Reducing Costs to Buy More Health Products

GHSC-PSM brings advanced analytic techniques and commercial practices to achieve cost reductions that can be used to save more lives. We have achieved direct savings through our commodity procurement, new regional distribution center network, and, at the country level, through introducing system efficiencies.

**Cost savings from commodity procurement.** We have negotiated contracts that are expected to yield significant savings, including:

- \$8 million in savings in one year for one of the most important treatments for HIV (the first-line ARV combination, TLE), secured by negotiating contracts with a higher volume in exchange for lower prices
- \$1.3 million in negotiated savings for viral load tests for selected countries, with the potential to extend these savings to other countries
- \$1 million per year in negotiated savings for a malaria medication (ACT), secured by price negotiations with the supplier

**Cost savings from optimized distribution centers.** Based on our analysis, our new regional distribution centers are projected to save about \$38 million over six years through a combination of reduced warehousing and transportation costs.

**Cost savings from more efficient national supply chains.** We have helped countries implement efficiencies in their supply chains. In Nigeria alone, we have directly supported storage and transportation efficiencies that are projected to save about \$2.3 million a year.

source and procure from international vendors as well. Procurements have been expanded to agreements with vendors of supplies/consumables, instruments, reagents, and some other lab commodities that do not require GHSC-QA testing and the related logistics arrangements and terms/conditions in the vendor contract.

The DCP-authorized field offices use GHSC-PSM's centralized, negotiated long-term agreements with vendors, which establish the basic terms and conditions between the project and the supplier. This allows the field offices to benefit from the competitive pricing in our long-term agreements. At the same time, the field offices have the authority and flexibility to manage their own procurements and to directly arrange desired delivery dates and adjust quantities with the international holders of the long-term agreements or their local authorized distributors. By using a long-term agreement with agreed terms and conditions with a supplier, the field office can follow a simplified process for awarding a purchase order, which reduces contracting level of effort and cycle time.



## Continuing Adaptation

To continue to improve our procurement and supply chain functions, and especially to increase OTD and to reduce cycle time, in the next quarter we will implement a proven and aggressive program to achieve at least 60 percent OTD in December 2017 and 80 percent OTD early in FY18. We will launch the following new activities:

- Implement an early warning stock system that captures in-country inventory levels and alerts GHSC-PSM that an order is needed to replenish the inventory.
- Continue streamlining sourcing and administrative processes to reduce handoffs.
- Expedite strategic contracts in several commodity groups that will minimize the two sourcing events that take place on every order today, enable healthy markets, reduce commodity unit costs, and reduce response cycle times.
- Institute pro-forma waivers to minimize the duty waiver process that often delays shipments.
- Implement a proactive order placement strategy.
- Leverage demand and supply planning information to better plan for order fulfillment approaches.
- Develop and use a transportation optimization tool that codifies business rules for International Commercial Terms, transportation mode, and shipment size. This will enable continual improvement of OTD and reduced cost.

## C1b. Project Performance

In this section, we summarize findings on key indicators of global supply chain performance. Additional detail on these indicators is provided in Annex A.

### On-Time Delivery

In FY17, GHSC-PSM delivered low OTD rates. As these became apparent, GHSC-PSM conducted root-cause analysis to understand the issues. We determined that unrealistic commitments, a lengthy and siloed process with many handoffs, delays in supplier manufacturing and documentation, prolonged timelines for obtaining waivers, poor accuracy of data on order status, and unresponsive issue escalation and resolution were all contributing to the low OTD rates. We agreed with USAID on an aggressive action plan that included significant restructuring of staffing and processes, as summarized in the previous section on *Restructuring Supply Chain Functions*. Q3 marked a turning point for the project as we started to reduce the backlog and improve OTD performance.

GHSC-PSM used OTIF as the performance metric for timeliness through Q4. We observed that most orders were delivered in full (97 percent or higher for HIV/AIDS, malaria, and FP/RH commodities). Given that “in full” was not a significant issue, and to help focus attention and better monitor progress on the pressing issue of timeliness, USAID determined that, starting in Q4, our performance metric would include OTD, while still measuring OTIF.

GHSC-PSM measures on-time delivery in two ways. OTIF reflects the number of on-time deliveries as a percentage of all **actual deliveries** in that period. OTD is the number of on-time deliveries as a percentage of **expected deliveries** in that period. OTD is a more accurate reflection of recent performance, while OTIF suppresses performance as late orders from previous months get delivered. To illustrate, assume the project committed to 10 deliveries in

each of two months. In the first month, two of the committed deliveries were made on time. In the second month, eight of the committed deliveries were made on time and the eight remaining deliveries from the first month were delivered late.

- Based on OTIF calculations, the first month is 100 percent (two of the two deliveries were on time) and the second month is 50 percent (eight of the 16 total deliveries were on time).
- Based on OTD calculations, the first month is 20 percent (two of 10 committed deliveries were on time) and the second month is 80 percent (eight of the 10 committed deliveries were on time).

In this example, the issue was the eight missed deliveries in the first month, but the metric does not show the negative trend until the second month in the OTIF metric, as it does not highlight the problem until the deliveries are made, while the OTD metric captures this issue in the month of the problem, the first month. While we work to deliver the backlog of late orders, we will continue to track both metrics, but we do believe that the OTD metric captures a more real-time view of our performance during each month, and we will pay more attention to that indicator moving forward.

Exhibit 6. OTIF over the Last Three Quarters

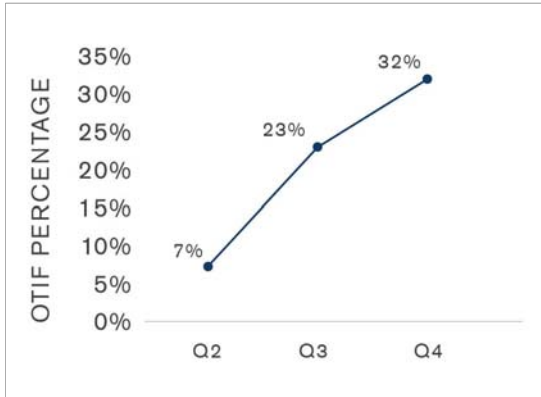
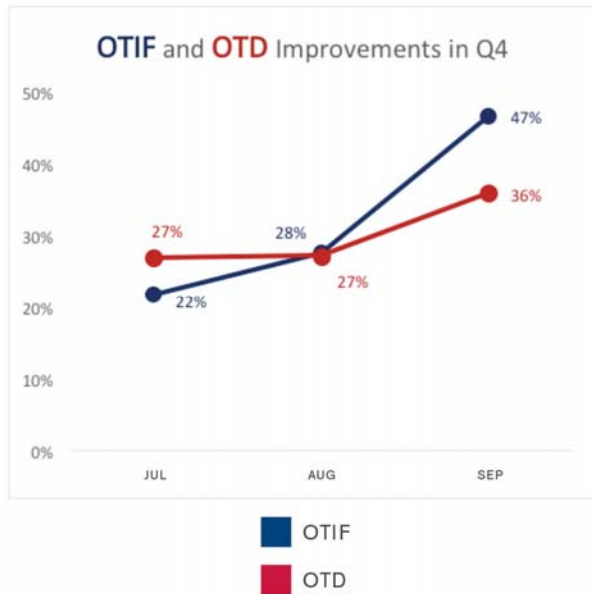


Exhibit 6 shows our OTIF over the last three quarters. Our Q4 OTIF of 32 percent is a continued improvement over our Q3 OTIF of 23 percent. Both our September OTIF of 47 percent and our September OTD of 36 percent were strong increases from our August numbers. These provide evidence of the success of our process improvements, including integration of the order promise tool, supplier relationship management program, and rapid issue escalation process.

Exhibit 7. OTIF and OTD Improvements in Q4

Exhibit 7 shows our OTIF and OTD in Q4 for the project overall. In absolute terms, we had a greater number — our highest ever — of on-time deliveries in September. At the same time, we had a high number of expected deliveries in September, which lowered our OTD rate.<sup>16</sup> As



we move forward, we expect OTD, the more timely metric for actual performance, will increase as we deliver a larger number of backlog orders. While these measures do not yet meet our expectation of 80 percent on a sustainable basis, we have seen notable progress. In addition to our quarterly improvement, we also see progress within the quarter, as our September OTIF was 47 percent — a 19 percentage point improvement over August. This metric also demonstrates that our organizational, process, and system improvements are achieving the expected results. Indeed, they exceeded our initial projections for September. From Q4 OTD of 31 percent, we are on track and remain committed to achieving 60 percent OTD in December 2017.

Given the relatively lengthy procurement process, solutions implemented in Quarters 3 and 4 will continue to come to fruition, further improving our timeliness in FY18.

<sup>16</sup> The high number of expected deliveries in September increased the denominator for OTD, which lowered the OTD rate.

**Availability of medicines.** USAID and GHSC-PSM have paid close attention to the impact of low OTD rates on availability of medicines for the many patients who rely on our global health supply chain. GHSC-PSM's role is to deliver commodities to central warehouses in each country. These central warehouses provide commodities to regional warehouses, which provide commodities to the point of care. Generally, a country holds two to six months of inventory as a buffer against the normal variations in the global supply chain to support the points of care. Countries draw down this inventory when needed, so late orders within a reasonable timeframe do not interrupt patient regimens or ability to access family planning products.

GHSC-PSM has had a low percentage of stockouts at the central level. For late orders or orders that are projected to be late, we have direct access to central-level inventory and work with field teams in country to monitor and validate country inventory levels. If the field teams confirm a likely stockout at the time of anticipated arrival in country, we obtain details on the level/s of the system impacted (i.e., nationwide, central, intermediate, and/or service delivery point) and prioritize the order for expedited action. If we do not have a field office, we work closely with the local authorities and USAID implementing partners to understand inventory at the central level and the downstream impact of a late delivery and work to mitigate any potential impact to patients served.

## Cycle Time

Cycle time is the industry's standard indicator of supply chain responsiveness, measuring how long it takes for a customer's order to be delivered once the order has been received. For GHSC-PSM, cycle time is the time from order entry to receipt of goods by the consignee (in most cases to a country's central warehouse). We use this indicator to identify bottlenecks in the fulfillment process that may impact our ability to deliver orders on time and to identify opportunities for improving efficiency.

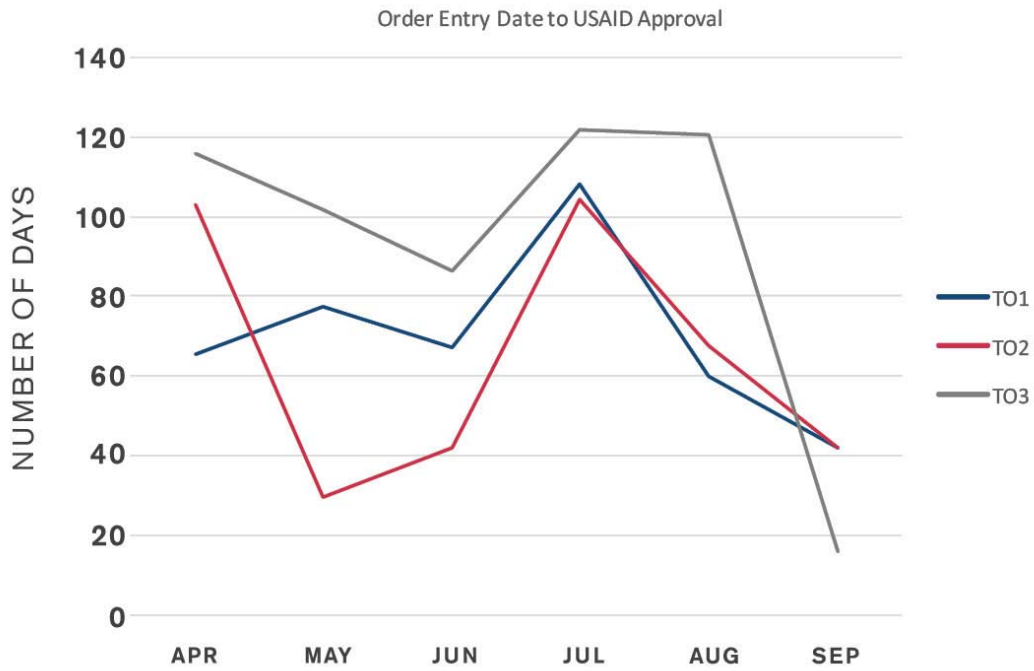
### Reductions in Cycle Time

We achieved a **41 percent reduction** in cycle time for core sourcing functions (order entry through initial sourcing) in the last six months.

Overall end-to-end cycle time for shipments delivered this quarter remains longer than desired, averaging 200 days across all health areas. Backlog orders continue to impact the performance on this indicator; nearly one third (31 percent) of orders delivered this quarter were entered in 2016. As GHSC-PSM continues to draw down on this backlog, we expect overall cycle times to improve. To illustrate, for **line items delivered on time** this quarter, the average cycle time across all items and health areas was **173 days**.

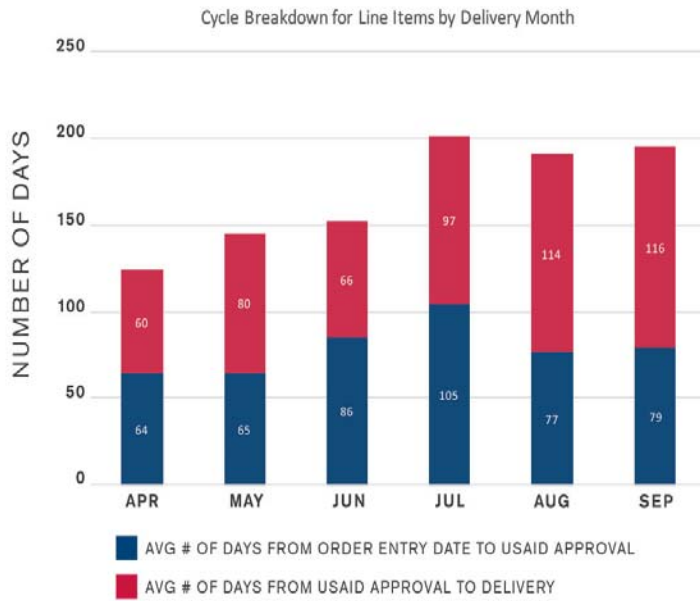
Despite these long overall cycles, targeted analysis of detailed process segments has begun to show the outcomes of actions the project has taken to shorten cycle times. The time from initial order entry to final USAID approval of the order — which includes all order clarification, sourcing, and contracting actions — has declined in the last six months, from an average of 70 days in April to 41 days in September (see Exhibit 8). Implementation of the streamlined processes, more effective use of ARTMIS, and our simplified structure enabled more effective initial sourcing, which are key to this time segment.

Exhibit 8. Average Number of Days from Order Entry to USAID Approval, by USAID Approval Month



Despite these gains, overall cycle time for delivered shipments has continued to grow. Exhibit 9 illustrates that growth in cycle time is tending to occur in the stages following USAID order approval, which include purchase order process time, supplier manufacture or preparation time, waiver processes, pickup, and shipping. Cycle times for these actions have increased, from 60 days for shipments delivered in April to 116 days for shipments delivered in September. (Note that Exhibit 8 illustrates line items that have been approved by USAID in a given month and Exhibit 9 illustrates line items that have been delivered in a given month. Gains in sourcing time illustrated in Exhibit 8 will not appear in the corresponding month in Exhibit 9.)

Exhibit 9. Cycle Breakdown for Shipments by Delivery Month



We have achieved improvements for some actions in this stage. For example, the time to release a distribution order at a regional distribution center is now in the single digits (nine days in September). Areas for action include reducing the cycle time between release of a purchase order to a supplier to the time from goods availability until pick-up by our freight forwarder. The project is implementing improvements to address delays in this time segment, including working with suppliers to reduce their

manufacturing response time, streamlining capture of timely and accurate supplier documentation that is necessary for import waivers, and minimizing pick-up times through our upgraded logistics processes.

## C2. SYSTEMS STRENGTHENING TECHNICAL ASSISTANCE

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### In Brief

We updated and validated our **technical approaches to 11 key elements of supply chains** with our country director colleagues and USAID counterparts, providing a unified vision and robust, harmonized guidance to systems strengthening. Our specialists are using these approaches to systematically strengthen supply chains in the countries we support. Systems strengthening technical working groups comprising GHSC-PSM and USAID counterparts began addressing three early priorities: warehousing and distribution, workforce development, and FASP.

Field offices grew to **1,064 staff that span 38 countries in 30 country-specific or regional field offices**. These staff interface with headquarters staff to facilitate procurement, provide technical assistance and training to host country supply chain entities, and, in some cases, are embedded within ministries (e.g., Lesotho) or directly manage parts of the national supply chain (e.g., Nigeria).

We established **new teams and procedures to enhance information sharing between our Global Supply Chain team and the field** and to streamline communications with USAID missions, in-country authorities, and service providers. These teams and procedures are key to customizing our commodity procurement support to country-specific requirements and to reducing cycle time.

Short-term **technical assistance more than doubled** between the first and second halves of the year, evidence of these offices transitioning from start up to technical work. Through this technical assistance, we are rolling out our systematic approaches to systems strengthening.

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A strong national health system requires a supply chain that consistently provides affordable, high-quality medicines and other health products at all health service delivery points. GHSC-PSM maintains field offices to facilitate procurement and delivery of commodities and to provide technical assistance to ministries of health and other key stakeholders in 38 countries. This will help us realize our vision for every country to have a government-led health supply chain that is:

- Integrated, optimized, accountable, agile, lean, and able to sustainably supply quality products to all citizens
- Focused on automated data capture, real-time end-to-end visibility, pharmaceutical-grade infrastructure, and efficient distribution
- Managed by supply chain professionals in a culture of quality improvement

### C2a. Activities, Achievements, Lessons Learned, and Adaptation

Below we summarize the work of our Country Programs team and field offices; our new approaches to better integrating our headquarters-based procurement activities and our field offices to maximize health commodity availability; and the diverse systems strengthening support that we provided in the second half of FY17.

## **Country Programs**

At the end of Q4, GHSC-PSM was providing support to 38 countries through 30 country-specific or regional field offices. We have 1,064 field staff, with the number of staff in each of our field offices (in units of 10) shown in Exhibit 10. In the coming year, USAID missions largely are funding the same or higher levels of support as in FY17, with two new countries — Mali and Sierra Leone — buying into the contract for technical assistance and commodity procurement. The growing portfolio demonstrates the value that USAID missions place on GHSC-PSM's support to their countries.



Exhibit 10. Number of Staff in Field Offices (as of end of Q4)

GHSC-PSM led a variety of initiatives that strategically aligned with our FY17 goals, with select, country-driven activities captured below.

**Providing in-country storage solutions.** GHSC-PSM directly provides permanent storage solutions. For example, to address ongoing storage space needs at health facilities throughout **Malawi**, we are helping USAID and DFID procure and install 233 prefabricated storage units, with off-grid sites supported by a solar power system, and on-grid sites equipped with a back-up



generator. GHSC-PSM completed site assessments, a solar assessment, and an environmental compliance assessment. Soon, we will issue a request for proposals for the units. In **Nigeria**, one of the few countries where GHSC-PSM directly implements all aspects of the donor supply chain, we opened state-of-the-art central warehouses in Abuja and Lagos that have increased storage capacity and improved supply management, security, and delivery. We also introduced an innovative modular warehouse that has been a game changer for the country's storage gap.

Our field offices have stepped in to address emergency storage needs. For example, on August 19, a fire destroyed the Manica Provincial warehouse in Mozambique and most of the health commodities housed in it. Within 10 days of the incident, a five-person team from the GHSC-PSM field office assisted the central medical store in establishing a new provincial warehouse. GHSC-PSM assessed the new warehouse's infrastructure, delivered pallets and shelving, delineated pallet positions, and installed stock management software on computers. Project staff also transported health commodities from regional warehouses to the new warehouse and conducted an inventory.

**Addressing HIV/TB co-infection.** In many countries, GHSC-PSM has capitalized on HIV/AIDS funding to support activities to diagnose, treat, and thus prevent the risk of co-infection with tuberculosis (TB). In **Botswana**, GHSC-PSM provided technical assistance for procuring and installing a biosafety level three TB laboratory. This lab will increase Botswana's ability to diagnose co-infection of TB in patients who are on ART. GHSC-PSM in **Angola** is spearheading improvements to warehouse management for the TB/HIV co-infection reference hospital to better manage stocks of ARVs and handle expired goods. GHSC-PSM supported the development of **Indonesia's** national HIV laboratory strategy, with emphasis on HIV and TB commodities. We also hosted a national coordination meeting to develop HIV specimen transport strategies.

**Engaging National Malaria Control Programs in LLIN distributions.** In each of the PMI-supported countries, our field offices work closely with National Malaria Control Programs (NMCPs) in all activities, with clear accomplishments in FY17 in procuring and distributing LLINs. The project supported the procurement and/or delivery of:

- 2.8 million LLINs to five provinces for a national campaign in **Angola**
- 5.3 million LLINs from 122 districts to beneficiary communities in **Ethiopia**
- 2,507 bales of LLINs to 14 county depots in **Liberia**, including door-to-door health facility distribution in one county
- Almost 1 million LLINs from the central level to service delivery points, and 900,000 LLINs to the community level in **Rwanda**
- 900,000 LLINs for the 2017 mass distribution in Luapula province of **Zambia**

Also, we provided LLINs on an emergency basis to a displaced persons camp in **Malawi** and successfully carried out the LLIN mass replacement campaign in Kogi and Oyo states in **Nigeria**, reaching 12 million people, as described in Section B2.

## **Bridging Headquarters and Field Offices to Maximize Commodity Availability**

In the second half of FY17, after carefully analyzing root causes of delayed deliveries and striving to better ensure commodity availability, GHSC-PSM undertook several major organizational changes in our headquarters-based Country Programs team. We added a new commodity procurement manager position to improve our procurement support to field offices, and a Non-Field Office team to improve support directly to missions in countries where we do not have a field presence. We also created a Commodity Security team to better integrate our various activities to enhance commodity security. Finally, we held a country directors' meeting to strengthen linkages between headquarters and the field offices and among country directors, and to support cross-country fertilization. These initiatives are described below.

**Commodity procurement managers.** GHSC-PSM created the commodity procurement manager position to provide field offices with a single point of contact for commodity orders, address siloed procurement and delivery processes, and improve issue escalation. Commodity procurement managers:

- Clarify and validate requisition orders and facilitate the dialogue sometimes required to ensure that requisition orders get finalized and signed
- Help steer the requisition through the Plan team (if the item is stocked in a regional distribution center) or the Commodity team for sourcing (if the item must be purchased directly from a supplier)
- Promote order prioritization by providing country context (e.g., months of stock data)
- Serve as the main point of contact for the order with the mission, field offices, and the Global Supply Chain team
- Monitor and track orders until receipt of proof of delivery

While commodity procurement managers were added to the Country Programs team at the end of FY17, they are already serving as advocates for their assigned countries — facilitating the flow of information between field offices and the Global Supply Chain team.

**Non-Field Office team.** We developed a Non-Field Office (NFO) team to provide focused support to missions in countries where we do not have field offices.<sup>17</sup> The NFO team will access resources that we use to assist countries where we have field offices, such as the FASP and Lab teams. After submitting its first-draft NFO strategy at the end of Q4, the team is finalizing plans with USAID. The NFO team will work with USAID missions and their stakeholders as a single point of contact for managing procurements and all activities that are involved in completing them. This includes interacting with authorities and service providers (e.g., customs agents) to expedite deliveries of procured commodities. Also, for each NFO country, the Deliver/Return team participates in biweekly or weekly calls with the field to review the status of upcoming shipments. In these calls, many bottlenecks are relieved through joint problem solving and

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<sup>17</sup> Countries supported by the NFO team are: Afghanistan, Bangladesh, Benin, Bolivia, Brazil, Cape Verde, Caucasus, Central African Republic, Central Asia Region (Kazakhstan, Kyrgyz Republic, Tajikistan, Turkmenistan, Uzbekistan), Chad, Chile, Colombia, Comoros, Côte d'Ivoire, DRC, Djibouti, Dominican Republic, Equatorial Guinea, Eritrea, Gambia, Georgia, Guinea-Bissau, India, Jordan, Mali, Nicaragua, Niger, Senegal, Sierra Leone, South Africa, Swaziland, Tanzania, Togo, and Ukraine. Note that Mali and Sierra Leone are transitioning to field office countries in the next fiscal year.

assignment of tasks. These may include determining if the quantities and formulations on orders are correct, clarifying the documents needed to obtain importation waivers, or various other logistical issues.

**Commodity Security team.** The Commodity Security team, formed in March, promotes sustained, country-level access to health commodities by enhancing internal systems, processes, and linkages — with a focus on the interface between the Country Programs and the Global Supply Chain teams. The Commodity Security team leads efforts to identify gaps, conduct root-cause analyses, promote active use of data, and design efficient and effective processes and systems that support the timely procurement and delivery of commodities. Key accomplishments to date are as follows:

- Oversaw a data merger initiative to incorporate projected inventory levels from country supply plans into global supply chain order reports for key line items. This process helped alleviate the months of stock reporting burden on field offices and has provided an initial data point to facilitate dialogue between the Global Supply Chain team and the field office for order review and prioritization. This process also serves as the foundation for developing a similar order prioritization system within ARTMIS.
- Promoted timely order entry by field offices against established lead times and validated supply plans. The Commodity Security team disseminated country-specific lead time tables to field offices and non-field presence counterparts; ensured that the FASP team incorporates lead time information into its supply plan reviews; and reviewed country adherence to GHSC-PSM’s published lead times. The team also developed a tailored lead time table for malaria commodities.
- Standardized the process for GHSC-PSM’s management and updating of country profiles, helping to ensure the Global Supply Chain team has access to country-specific information necessary for commodity procurement and delivery (e.g., importation requirements, labeling requirements, required shipping documentation, remaining shelf life requirements).
- Developed and rolled out a shelf-life requirements matrix, supplying the Global Supply Chain team with requirements, back-up documentation, and historical context on country-specific remaining shelf-life requirements.
- Advocated for and supported processes to increase and improve data integration into ARTMIS — including country profiles, lead time, supply plans, and order management data — to increase work flow efficiency and effectiveness.
- Facilitated transition of the client relations function from the Global Supply Chain team to the Country Programs team with the new commodity procurement manager position. The Commodity Security team developed standardized processes and tools, and promoted integration of commodity procurement managers with Country Program teams to ensure GHSC-PSM field offices have a single point of contact for all headquarters support — inclusive of commodity procurement. The team developed training material to ensure Country Program staff are adequately prepared to absorb the commodity procurement manager scope of work.

In short, the Commodity Security team has worked at the interface between the Global Supply Chain and the Country Programs teams to facilitate timely order processing and delivery, and to help prioritize activities to reduce stockout risk.

### **Working to Avert Stockouts at Multiple Levels**

The ultimate objective of USAID's procurement and supply chain investment is to make sure health commodities are available where they are needed when they are needed. This requires adequate stock — neither too little nor too much — at each level of the health system. This, in turn, requires good planning and fulfillment by multiple donors, a well-calibrated national supply chain, and current inventory data. Below we summarize the many levels and activities, including the work of the Commodity Security team, that GHSC-PSM undertakes to avert stockouts.

On the **global level**, as evidenced by the PPMR, new PPMR-HIV, and the upcoming Global VAN, the global donor community shares and acts on stock-level information to help ensure countries have an adequate supply of health commodities at all levels. GHSC-PSM has worked to help our clients achieve this vision. Through our forecasting and supply planning and our work on the PPMRs, we collect data on countries' central commodity stock levels and orders, and share this information with multiple donors. For FP/RH commodities (and HIV commodities in the future), we facilitate and track decisions to transfer stocks between countries to address shortages or overstocks.

At the **national level**, which is the level affected by GHSC-PSM procurement activities, and based on lessons learned from late deliveries, we started taking several preventive/diagnostic and mitigating actions to ensure a country has adequate stock, described below.

**Preventive/diagnostic actions.** GHSC-PSM engages in forward planning to avert low stock or prevent stockouts. This process begins with developing forecasts and supply plans in country, which are then reviewed and validated at headquarters. Using automated tools, we now ensure that procurement plans reflect the appropriate lead time for each commodity type. We aggregate supply plans to facilitate long-term procurement planning, which includes stocking the regional distribution centers, and to inform negotiations with suppliers. Our Commodity Security team collects and integrates country-level months of stock data, validated by field office staff where possible, with estimated delivery dates for orders. Comparing estimated delivery dates and validated country-level inventory levels allows us to forecast potential stockouts. This information is triangulated at our daily supply chain meetings, in a weekly field-driven analysis, and in a monthly analysis that identifies orders most at risk and then prioritizes them for mitigating action. Less complex supply chains in other sectors have been using inventory levels to inform forecasting and prioritization for decades, but this level of visibility and analysis is new to the global health sector.

**Mitigating actions.** Should GHSC-PSM identify an existing or potential stock risk, we now employ key mitigating actions at headquarters and the field office level, including those shown on the following page.

Headquarters	Field Offices
<ul style="list-style-type: none"> <li>• Identifies available stock in regional distribution centers for expedited shipment</li> <li>• Identifies and intensively expedites orders most at risk, including expediting GHSC-PSM processes</li> <li>• Identifies alternative sources of supply (i.e., other donors or suppliers)</li> <li>• Shares or reallocates stock between countries</li> <li>• Expedites deliveries with freight forwarders</li> <li>• Changes from ocean to air transport</li> </ul>	<ul style="list-style-type: none"> <li>• Works with USAID missions and ministries of health to expedite waivers</li> <li>• Coordinates with PEPFAR teams, implementing partners, Global Fund, and other stakeholders to identify and borrow stock</li> <li>• Arranges transfer of stock between facilities to balance inventory levels</li> <li>• Allocates stock to the lower levels at smaller but more frequent volumes</li> <li>• Identifies alternative formulations or treatment options (e.g., prescribing two pills of a lower dosage)</li> </ul>

Our Global Supply Chain team meets every afternoon to review stock levels of commodities for which we have late deliveries. Weekly, we share data on the progress of deliveries to countries with low stocks or stockouts with USAID so that, together, we can closely monitor the situation, establish priorities, and ensure progress.

As noted above, while the Global Supply Chain’s responsibility is to deliver stocks to the central level, in the countries where we have field staff and the ability to plan and support deliveries sub-nationally, our field offices help find and move stocks at lower levels to help ensure availability, if necessary. Stockout rate — as measured by our M&E indicator — identifies health commodities that are not available to beneficiaries when they visit a health facility. This indicator reflects the activities of multiple actors — countless donors, vendors, shipping companies, ministry officials, and supply chain professionals — and wider contextual factors that impact the supply chain for health commodities down to the health facility level once GHSC-PSM has delivered the commodities to a central level. Outcomes that GHSC-PSM can observe vary across countries, products, and levels of project support and are part of the project’s contribution to strengthening in-country supply chains.

Returning to the global nature of health commodity provision, GHSC-PSM regularly works with the Global Fund and many other donors to coordinate planning and fill shortfalls in each other’s deliveries. In fact, GHSC-PSM is relied upon to address emergency situations in countries when others are challenged to meet deliveries. For example, GHSC-PSM maintains PMI’s malaria stockpile, a cache of ACTs (artemether-lumefantrine) that can be quickly allocated to different countries based on need. In May, PMI alerted GHSC-PSM to concerns in Burkina Faso over late ACT procurements from other sources. GHSC-PSM facilitated an emergency order of artemether-lumefantrine from the stockpile, thus alleviating stockout risks.

As we reduce cycle time in the GHSC-PSM global supply chain, we will be even better able to provide stopgap support. As we improve country information on stocks at all levels through our systems strengthening LMIS support, and as we aggregate more information on more commodities through the PPMR and similar processes, we will deliver even greater data visibility and responsiveness. All of this will strengthen our ability to help countries and the global community ensure availability of lifesaving medicines for all.

**Country directors meeting.** The GHSC-PSM country directors meeting in June brought together 19 field office country directors in GHSC-PSM’s headquarters for the first time since the launch of GHSC-PSM. Participants shared lessons learned, exchanged innovative ideas, and created a unified vision to inform work planning and strengthen field implementation. Headquarters staff and country directors worked together to address operational and technical challenges, review roles and responsibilities, and highlight the most promising systems strengthening technical approaches. The meeting was well-received by all participants, who noted that the event was an “impactful, inspirational, and innovative meeting” and they left feeling “energized and happy to be a part of this project.”

## **Systems Strengthening**

The Systems Strengthening team works with field offices, country teams, and health area directors to strengthen national supply chain performance by providing technical assistance based on global best practice in 11 functional areas. Its role is to: 1) establish global technical approaches for the GHSC-PSM project; 2) provide technical assistance, tools, training, and project management expertise to help country teams implement technical activities; 3) engage with the country teams to provide guidance and support; and 4) curate, create, disseminate, and publish content related to technical knowledge in supply chain management.

Through a visioning workshop in Q2 and the country directors meeting in Q3, the Systems Strengthening team, along with our field office and USAID counterparts, began work toward technical deliverables to ensure progression, innovation, and dissemination of best practices. This included two-page global technical approaches for the 11 technical areas that our field offices used in their FY18 work planning. The team also successfully launched technical working groups, piloted in the areas of warehousing and distribution, workforce development, and FASP. The team provided technical support to country directors throughout the FY18 work planning process to ensure work plans aligned with the technical approaches endorsed by the team. These cross-cutting initiatives informed not only work planning, but also the technical support we provided to country programs through in-country short-term technical assistance and remote support.

The number of trips to provide short-term technical assistance to countries more than doubled between the first and second halves of FY17. Highlights of our work in the second half of FY17 are provided below.

**Strategy and design.** GHSC-PSM supported data-driven strategy and design initiatives in several countries this reporting period. For example, we helped the **Ethiopia** field office conduct a gender analysis to determine the number of women who are in supply chain leadership positions. The Ethiopian Pharmaceuticals Fund and Supply Agency is now using these results to develop strategies to promote nondiscrimination, equal opportunity, and gender equality in the supply chain workforce and leadership positions. In **Malawi**, we worked with the Malawi Pharmacy and Medicines and Poisons Board to design a roadmap for strengthening the national pharmacovigilance program, including establishing a National Pharmacovigilance Center.

**Forecasting and supply planning.** The project provided technical assistance in **Burkina Faso, Cameroon, Guinea, Haiti, Jamaica, Lesotho, Madagascar, Malawi, Nepal, Rwanda, Uganda, Zambia, and Zimbabwe**, and remote mentoring and training to **Angola, Burundi, and Jamaica**. In line with our aim of harmonizing quantification approaches across health areas,

in **Madagascar**, we helped establish use of Quantimed to forecast malaria commodity requirements, with specific attention to seasonality. Our forecasts and supply plans are regularly used by many stakeholders, as shown in the box at right.

As another example, GHSC-PSM in **South Sudan** supported the quantification of HIV/AIDS commodities for the integrated supply chain, which included commodities funded by PEPFAR and the Global Fund for 2018–2020. And, in coordination with the NMCP in **Burkina Faso**, we reviewed the malaria commodities quantification and funding gap analysis, and supported development of a grant application to the Global Fund.

**Procurement.** We helped countries strengthen capacity, procedures, and efficiency under their own legal frameworks for procurement that is predominantly financed by their own national budgets. We helped the **Guyana** Ministry of Health restructure and recruit a new procurement team, and trained the new staff and managers on a reinvigorated procurement process. In **Rwanda**, we reviewed and recommended several analytic tools to be used to identify procurement bottlenecks and other areas for improvement. In **Burma**, we undertook a joint mission with the World Bank at the start of a year-long program of procurement reforms that includes a new Presidential Directive on Procurement, a new procurement law, and development of new national standard bidding documents for goods, works, and medical supplies. Our comprehensive support helped **Vietnam** achieve an important first, as summarized in the box at right.

**Warehousing and distribution.** We have used systematic data-driven decision making to enhance warehousing and distribution actions to improve supply of health commodities. For example, in **Zimbabwe**, we did initial planning and data collection for warehouse and inventory optimization, which will be followed by a route optimization. In **Namibia**, we assessed the distribution schedule and helped the field office procure third-party logistics (3PL) services. Other technical assistance activities included a transportation assessment and use of a scheduling tool in **Ethiopia**, and distribution assessments in **Guyana** and **Lesotho**. We also provided remote technical support related to warehousing and distribution to field offices in **Cameroon, Ghana, Haiti, and Malawi**.

### Multiple Stakeholders Act on FASP Outputs

In Zimbabwe, the forecasts and supply plans inform procurements by the government of Zimbabwe, U.S. government, Global Fund, UK Aid/Department for International Development (DFID), UNICEF, and UNFPA, among others. GHSC-PSM supported the quantification of HIV/AIDS, TB, malaria, FP/RH, nutrition, and essential medicines and medical supply commodities.

### Supporting a First in Vietnam

GHSC-PSM in Vietnam supported the drafting and approval of the FY17 Annual Procurement Plan, development of the national forecast for ARV drugs for 2018–2020, and estimation of ARV drug demand in 2018 to inform the first-ever centralized procurement using the Social Health Insurance Fund.

### Reaching Thousands of Facilities in Nigeria

Optimization and use of cutting-edge technology are felt on a massive scale in Nigeria, where we provide last-mile delivery of HIV/AIDS, malaria, and FP/RH commodities to **an average of 7,000 facilities** bimonthly.



To optimize the national network of warehouses and transportation assets in **Nigeria**, GHSC-PSM is using cutting-edge technology with our distribution partners, including electronic proof of delivery, temperature logging, and real-time GPS tracking of fleets (see box at right). These improvements have an impact on a large scale, as Nigeria is one of the few countries where GHSC-PSM is responsible for distribution at all levels.

The team continues to support a 5S<sup>18</sup> lean approach to supply chains, network optimization, and activity-based costing to enhance warehousing and distribution in **Lesotho**. Implementation of a cross dock to serve facilities in the Northern Districts of Lesotho will reduce the delivery transportation distance by at least 30 percent. The advantage of bundling a 5S lean approach to supply chains, network optimization, and activity-based costing, as seen in Lesotho, has already been appreciated and is being applied by other early adopters such as **Ethiopia, Namibia, and Zimbabwe**.

Using strategic HIV/AIDS core funding, GHSC-PSM continues to look at innovative ways to improve distribution, including the use of unmanned aerial vehicles (UAVs) for moving health commodities. In the last half of FY17, we consulted with other leaders in the UAV field, conducted a field visit to establish the feasibility of conducting a pilot in a country that had expressed interest, and competed a contract for UAV services.

Our warehousing and distribution support in **Ghana** had notable success in the latter half of FY17:

- *Warehousing:* We leveraged private-sector capacity and, through a competitive process, reduced cost and pricing for central-level warehousing. We forecast a cost savings of 39 percent for FY18.
- *Last-mile distribution:* With GHSC-PSM interventions, the proportions of last-mile health facilities reached were 79.4 percent and 86.9 percent in the Eastern and Northern regions, comparing favorably to a national average of 36 percent.

**Management information systems.** GHSC-PSM continued to support **Angola, Botswana, Burma, Burundi, Cambodia, Guinea, Haiti, Malawi, Mozambique, Nepal, Pakistan, and Rwanda** with their health and logistics management information systems and continued to support legacy tools used by FASP and Lab teams, namely, PipeLine, Quantimed, ForLAB, and LabEQIP. The benefits of shifting to an electronic system with solid training and support are illustrated in the example of Rwanda, as summarized in the box at right.

In **Nepal**, we helped develop an information and communications technology strategy for the public sector

#### Increasing Data Accuracy

GHSC-PSM supported the transition from a paper-based to an electronic LMIS in Rwanda. After introducing the Quality Management Improvement Approach, e-LMIS data accuracy in district pharmacies increased to 95 percent.

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<sup>18</sup> 5S is one of the most widely used and fundamental components of lean manufacturing. It stands for two sets of words: one in Japanese and one in English. In English, they are *sort, set in order, shine, standardize, and sustain*.

health supply chain. This strategy will help the government, donors, and other stakeholders make key decisions in technology investments to increase data visibility and automation in a sustainable manner. We competed and awarded a contract for a commercial off-the-shelf (COTS) solution. The innovative COTS approach will support rapid implementation, be flexible enough to adapt to a changing government structure, and use local vendors to go to scale, which enhances sustainability. In **Mozambique**, we supported the rollout and scale-up of SIGLUS, a tablet-based, open-source inventory management tool that is the first GHSC-PSM in-country electronic tool to track actual consumption.

### Technology Firsts

This reporting period, GHSC-PSM supported first use of several technologies that hold promise for many countries:

- A commercial off-the-shelf LMIS
- SIGLUS, a tablet-based inventory management tool
- OpenLMIS v3.0

In **Malawi**, we helped the field office facilitate and streamline data reporting from the new LMIS system, OpenLMIS v3.0. Malawi is the first country in the world to start using the new OpenLMIS v3.0, which provides visualization of stock levels to help trigger shipments to health facilities. The system went live, at scale, in less than nine months.

While there is strong interest and many countries are moving to full-fledged eLMIS, with GHSC-PSM support, we also collaborate with countries that cannot make that leap right now. As one example, in **Cameroon**, GHSC-PSM learned from a baseline survey that there were no data on the supply chain for viral load and early infant diagnosis commodities.



Checking stock cards. Photo credit: Lan Andrian

Forecasting and distribution of these commodities were based solely on targets and did not take into consideration site test capacity. Working with the National AIDS Control Committee, the eight viral load and early infant diagnosis laboratories across the country, and other stakeholders, by June, the project had developed an easy-to-use Excel-based stock monitoring tool and an inventory of all viral load and early infant diagnosis test commodities. In **Haiti**, GHSC-PSM found that 120 FP/RH sites have no internet access — indeed, many have no electricity — to submit their monthly LMIS report on time. To address this, GHSC-PSM has created the *Smartphone for Reporting* initiative, which will provide a smartphone, basic internet plan, and training on smartphone use to increase the reporting rate of FP/RH sites.

**Workforce development.** In the last half of FY17, GHSC-PSM launched a workforce development community of practice with more than 400 USAID and project members; renewed engagement with the International Association of Public Health Logisticians; worked with People that Deliver and USAID to draft a theory of change for human resources management within

health supply chains in developing countries; and submitted a draft academic paper on this topic to USAID for initial review.

In **Burma**, we promoted development of a human resources strategy and advocated for creating a Supply Chain Management Directorate, which has since been established by decree. We conducted staff motivation studies in **Nepal**. We worked in **Malawi** on pharmacovigilance and curriculum development and in **Burkina Faso** on university curriculum mapping. GHSC-PSM helped integrate lab training into the formal curriculum at biomedical schools in **Zambia**; for the first time, this will be an examinable component required for graduation of biomedical specialists.

In **Mozambique**, we supported submission of a professional supply chain cadre dossier, which was requested by the government as it considers introducing a professional supply chain cadre across all government ministries. This dossier is the first in any GHSC-PSM-supported country. In **Pakistan**, we facilitated discussions to introduce a professional cadre of supply chain workers in two states, successfully conducted the first-ever supply chain management curriculum development workshop with university faculty, and conducted a workshop to explore the supply and demand of supply chain management cadres across private, government, and humanitarian sectors.

In June, we led a well-received supply chain course at headquarters for USAID staff from four countries and from USAID/Washington. The course built knowledge and understanding of supply chain management to enable USAID field staff to better monitor and support supply chain activities across a variety of health programs. We also developed a course on emerging trends in supply chain management for USAID staff that will be delivered in December.

**Governance and leadership.** GHSC-PSM promoted new cohesive institutional structures to manage all supply chain management and logistics activities. As an example, in **Ghana**, GHSC-PSM is working toward establishing a Logistics Management Unit. In **Lesotho**, we support the supply management unit by embedding logistics officers in the Ministry of Health teams at the district level to regularly visit last-mile health clinics. These logistics officers undertake a governance role and provide supportive supervision to prevent stockouts and improve data quality. In **Malawi**, GHSC-PSM has embedded an officer to assist the Ministry of Health and audit authorities in documenting reports of inconsistencies in pharmaceutical stock levels.

**Laboratory networks.** GHSC-PSM supported a variety of lab-related activities in the second half of FY17. We led workshops to support national quantification and forecasting for laboratory commodities to inform supply plans in **Burma, Cameroon, Haiti, and Nigeria**. We held training workshops on the LabEQIP optimization tool in **Rwanda**. Our more sustained support in several countries is summarized below.

Like many of the countries we serve, **Mozambique** is actively working to scale up its viral load and early infant diagnosis capacity, but faces challenges with referring samples to testing centers and the return of the test results to the patients (i.e., return logistics). The government seeks to place new point of care (POC) platforms strategically within the national laboratory network so that it has an optimal mix of conventional, near-POC, and at-POC services that will increase access, increase return of results, and decrease time for return of results. GHSC-PSM is working with the Ministry of Health and PEPFAR implementing partners to address these issues and to optimize the HIV/AIDS laboratory network for CD4, viral load, and early infant diagnosis testing by building on the outputs of a LabEQIP workshop that we supported in Q3. This workshop

helped the Ministry of Health use LabEQIP to enhance its conventional laboratory strategy and to validate proposed POC deployment strategies. Our models showed that optimizing the network to increase equipment use would take the place of adding 22 new machines. With data on realistic transit times, we are prepared to assist with scaling down the CD4 program, expanding the viral load program, and reviewing any upcoming equipment placement/replacement plans.

Lab support was a major focus of our work in **Nigeria**. In July, we shared information on several milestones at a U.S. government interagency workshop in Lagos that was based on an extensive LabEQIP exercise. We:

- Developed an optimized laboratory network and referral linkages for HIV, reducing the number of viral load-supported sites from 19 to 11, which will result in direct cost savings to U.S. government programming
- Drafted a national policy on establishment of the National Integrated Sample Referral Network, operational guidelines, SOPs, a policy on records management and use, and a governance structure for oversight and management of the network
- Followed up with PEPFAR implementing partners for additional detail on their sites and the current hub assignments to inform network and route optimization
- Discussed the inclusion of TB specimens with stakeholders
- Reviewed 3PL expressions of interest for prequalification of suitable transport vendors

**VMMC.** GHSC-PSM led a quantification workshop in **Uganda**, which is the country with the project's largest VMMC program. We trained the field office, Ministry of Health Quantification Procurement and Planning Unit, and Warehouse and Logistics teams to use Quantimed and PipeLine for VMMC forecasting. The workshop yielded a three-year national forecast and two-year supply plan to be used in planning commodity procurements.

**Health-care waste management.** GHSC-PSM, in collaboration with country governments, supported improvements to the health-care waste management and general environmental hygiene systems in numerous countries. With our support, **Guinea** and **Nigeria** now collect, treat, and dispose of unusable medical products. In **Ethiopia**, we developed technical specifications for procurement of incinerator units for managing hazardous waste within the supply chain and health-care system.

**Benefits of integrated support.** As can be seen from the above discussion, GHSC-PSM has improved national supply chains by working with national governments and many other country stakeholders on discrete

#### **Multipronged Support Felt Down to the Service Delivery Point**

The project improved the availability of HIV commodities at the service delivery level in four PEPFAR-supported regions in Cameroon. Because of better monitoring of stock levels and better delivery to sites through use of third-party logistics, stockouts of the most-used second-line adult ARV were reduced from 38 percent in Q1 to 2.3 percent by the end of Q4. The most-used first-line adult ARVs are currently stocked according to plan at 90 percent of PEPFAR-supported sites.

aspects of the supply chain. Our impact is amplified as we integrate and layer our interventions, as shown in the box at right.

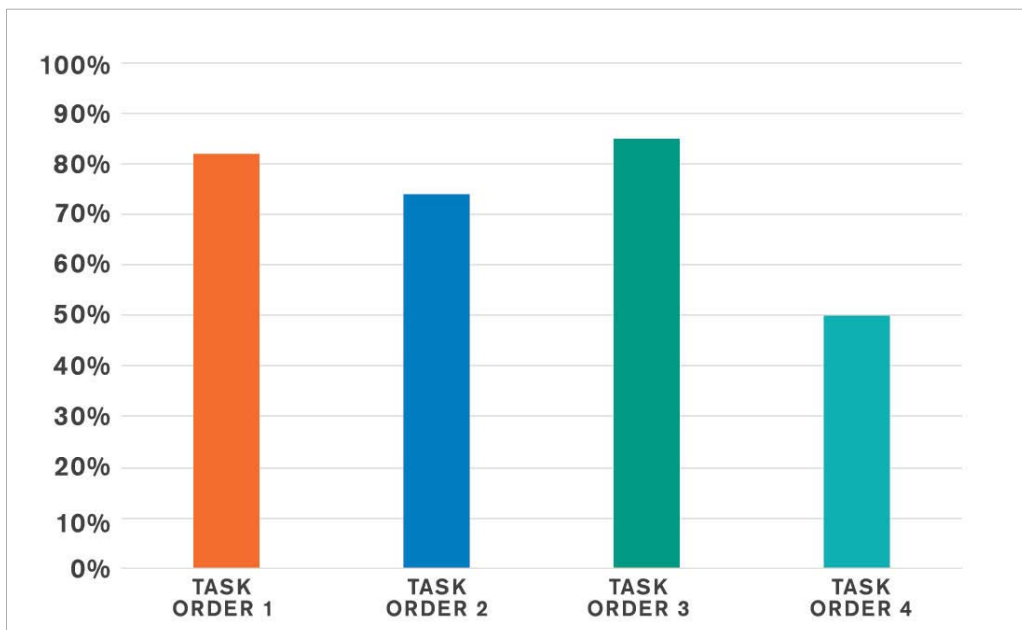
## C2b. Project Performance

GHSC-PSM collects and analyzes data on a variety of indicators of national supply chain system health to understand the environments in which we operate and to help us calibrate our work accordingly. These context indicators also help establish priorities for our systems strengthening support and, over time, will allow us to assess the outcomes of our technical assistance. Values for these context indicators are provided in Annex A. Below we discuss two indicators — percentage of countries conducting annual forecasts and percentage of countries conducting quarterly supply plan updates — that are critical to ensuring procurements are planned well ahead and that adequate stock levels are maintained in the supply chains that we support.

### Percentage of Countries Conducting Annual Forecasts

Exhibit 11. Percentage of Countries Conducting Annual Forecasts by Health Area

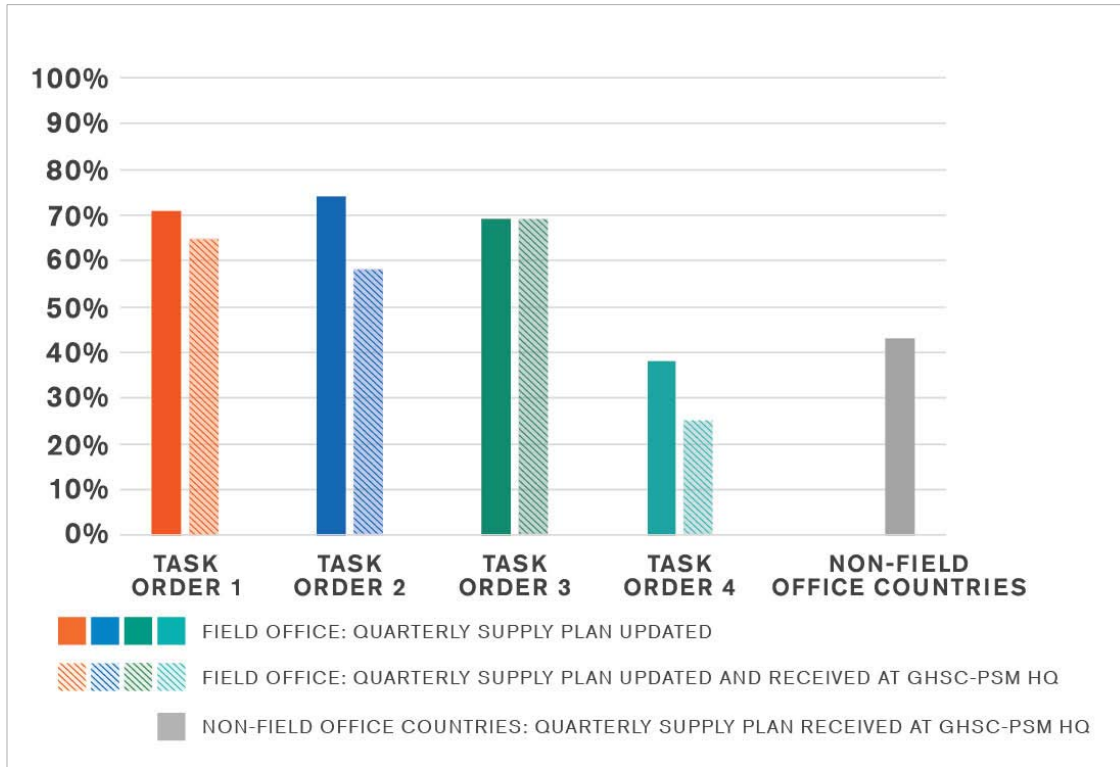
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indicator measures the extent to which GHSC-PSM supported countries conduct annual multiyear forecasts for the various commodity groups relevant to their TO responsibilities. These forecasts are a key step in effective supply planning as well as medium-term procurement planning and resource mobilization. The figures in Exhibit 11 reflect, in part, the history of U.S. government support to health programs, both financially and technically, with FP/RH having the longest history and the highest percentage, followed closely by HIV. Even in those countries for which GHSC-PSM is not procuring commodities, we are beginning to inculcate the established paradigm of annual forecasts and quarterly supply planning and monitoring to avoid stock imbalances. The extent to which our counterparts are leading and managing quantification activities, with GHSC-PSM logistical, technical, and sometimes financial inputs, is particularly encouraging.

## Percentage of Countries Conducting Quarterly Supply Plan Updates

Exhibit 12. Percentage of Countries Conducting Quarterly Supply Plan Updates



Under the quantification paradigm supported by GHSC-PSM, supply plans take a regularly updated, forward-looking view of demand for 18 months. This comprehensive, systematic, and long-term approach to supply planning provides visibility into monthly demand even if a single quarterly update is not submitted. Performance has been consistent over the year, indicating that there are still gains to be made. In Q4, working through the FASP Technical Working Group, GHSC-PSM began a baseline survey to establish which countries and for which commodity categories GHSC-PSM should be producing quarterly supply plans. The outcome will be a verified reference point in determining supply plan expectations, an increase in the number of supply plans produced and the number submitted to GHSC-PSM for analysis and use, and the identification of countries on which to focus technical assistance to improve performance.

## C3. GLOBAL COLLABORATION

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### In Brief

We conducted market dynamics research for HIV/AIDS, malaria, and FP/RH to **identify ways to strengthen markets for key commodities**.

We developed and made significant progress in implementing a plan to **incorporate global standards** throughout our supply chain. This will help improve efficiency, reduce costs, and improve end-to-end data visibility.

We initiated knowledge management work at the central level and **knowledge management/communications support** for field offices.

We held an official launch campaign for the project website, **ghsupplychain.org**, to start building its presence as a global hub of health supply chain information and activity.

The global collaboration **team was realigned** to better serve the project's strategic engagement objectives.

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### C3a. Activities, Achievements, Lessons Learned, and Adaptation

GHSC-PSM's global collaboration activities support USAID's leadership and participation in important global supply chain fora, provide cutting-edge research to help shape global markets for health commodities, share our supply chain information with other donors and collaborators as a global good, ensure that our supply chain stays current with emerging requirements, and effectively manage and share knowledge of best practices and lessons learned.

#### Market Dynamics

We conduct market analysis to build healthier markets — not only to achieve immediate results but also to ensure stronger, healthier, more sustainable markets in the long run. This year, we rigorously evaluated high-priority product markets along critical market dimensions, specifically:

- **Global capacity** — to help develop a pool of global suppliers with the capacity to produce enough quality-assured product to meet forecast global demand for the next two to five years
- **Affordability and funding** — to ensure that product prices reflect their cost of manufacture, the degree of market competition, and availability of donor and country funding to finance projected demand
- **Reduced supply risk** — to proactively identify and mitigate against supply risks such as quality issues, raw material shortages, suppliers exiting the market, supply chain delays, or geographic vulnerabilities to ensure uninterrupted flow of product to countries
- **Product quality and appropriateness** — to ensure products meet users' and health workers' needs, regulators set appropriate quality levels, users have appropriate choice,



and a robust innovation pipeline is in place to bring new and improved products to market

Our baseline market assessments and market health heat maps were used by GHSC-PSM, USAID, and S/GAC to evaluate priorities. Across the project's health areas, these analyses show that implementing healthier markets could result in more than \$200 million of cost savings for USAID alone from 2017 to 2021.

A fair, competitive, and sustainable market is as important as cost savings. If justified, we have recommended short-term price rationalization (which could be a price increase) to help ensure sustainability and competition for the next five years. We also seek long-term operational efficiencies to achieve shorter lead times, reduce wastage, and streamline supply chains.

We have presented information on our health area-specific market dynamics work elsewhere in the report. Below we summarize highlights of cross-cutting analysis over the last half year.

***Latin America reproductive health commodity private sector data collection and assessment.*** To better understand the availability of contraceptive supplies in countries where USAID does not have a mission, especially those that have graduated from USAID family planning assistance, GHSC-PSM purchased sales data from the retail pharmacy channels for pills (including emergency contraceptives), injectables, intrauterine devices, implants, and condoms. We reviewed data from Brazil, the Dominican Republic, Honduras, Guatemala, and Nicaragua. This view into how markets function on their own showed that retail pharmacy CYP increased in 2015 in Zika-affected areas in Brazil; short-acting commodities increased in the Dominican Republic; CYP increased in all countries, with injectables and OCs dominating; and the market for contraceptives in Latin America is increasing, with the private sector playing a key role in ensuring availability.

***HIV and malaria rapid test products market assessments.*** We completed detailed assessments of the markets for HIV and malaria rapid test products. While the HIV and malaria rapid test markets have many similarities, they behave in distinctly different ways. In both markets, as countries adopt more generic guidelines that allow for product interchangeability, developing win-win contracting policies, such as long-term agreements, will lead to significant market health improvements. The benefit in the malaria market relates to ensuring sustainability and preventing long-term market issues. In the HIV market, wide-scale adoption of the recommendations could save as much as \$30 million by 2021.

***Global collaboration for healthier markets.*** GHSC-PSM shared market reports and insights and held discussions with key partners including the Global Fund, the Bill & Melinda Gates Foundation, CHAI, Unitaid, DFID, the Government of South Africa, and others. These conversations create opportunities for collaboration and information exchange, and help us move markets with our key procurement partners. We also provided data and technical inputs to numerous global working groups. For example, for the Malaria RDT Working Group, we provided critical evidence that the market is unhealthy, and contributed to the discussion about interchangeability between tests.



GHSC-PSM collaborates with many donors to promote USAID's, PEPFAR's, and PMI's global health goals. *Photo credit: Lan Andrian*

Over the year, GHSC-PSM visited several manufacturing facilities and attended Convention on Pharmaceutical Ingredients conferences to meet with senior-level industry executives. We discussed manufacturer prioritization of products and research and development, manufacturing challenges, raw material costs, the impact of procurement decisions on production lead times, and how local policies in the manufacturer's country of origin impact operational capabilities and pricing.

**Steering committee of Medicines for All initiative.** We participated in the first steering committee meeting for this initiative, providing expertise in chemistry manufacturing and knowledge of market trends for ARVs. This input helped identify priority target molecules for which Virginia Commonwealth University's Medicines for All Institute will seek to develop cost-saving manufacturing techniques.

### **Global Standards I (GSI)**

For decades, use of global standards has been a strategic enabler of supply chain efficiency, effectiveness, and innovation for numerous industries across the globe. Accordingly, USAID has been investigating the use of global standards to improve the management of health commodity procurements. In April, USAID directed GHSC-PSM to develop a strategic and coordinated approach to adopting global standards, namely GSI health-care standards, for product identification, data capture, and data sharing across our global and in-country activities. Adoption of global standards has become a central part of the entire GHSC program to reduce costs, improve efficiency, and improve the availability of health commodities worldwide.

In May, GHSC-PSM developed a strategic vision and a two-year work plan to implement GSI global standards across the GHSC program. In June, we launched the Global Standards Technical Council, a multistakeholder forum across USAID and GHSC projects that meets monthly to discuss progress in meeting key work plan objectives and advises on priorities and direction. Significant progress has been made since the launch of the initiative. We:

- Developed and disseminated procurement requirements for product identification, labeling, and data exchange
- Surveyed GHSC-PSM's top 30 suppliers by spend to develop a baseline
- Awarded a contract for GHSC-PSM's GSI Global Data Synchronization Network™ (GDSN®) data pool provider
- Developed a guidance document on GSI global standards to inform country work planning efforts and started advising countries on implementation

- Worked with USAID, the Global Fund, the National Department of Health South Africa, and GSI South Africa to align master data for HIV/AIDS commodities and to inform development of harmonized regulation and implementation timelines among highest-spend generic HIV/AIDS pharmaceutical procurers

## Advocacy

As demonstrated throughout this report, GHSC-PSM staff led or were active participants representing global supply chain perspectives in a wide range of important global health fora, including at the country level, as described in the box at right. GHSC-PSM also conducted a formative assessment of priorities for advocacy campaigns, interviewing USAID and GHSC-PSM staff and representatives of global stakeholders to inform planning.

### Effective Advocacy for Contraceptive Security in Pakistan

Advocacy efforts of GHSC-PSM with provincial governments in Pakistan resulted in an allocation of \$23.9 million for procurement and transportation of family planning commodities.

## Knowledge Management and Communications

Centrally, we made presentations to familiarize all headquarters staff with the basics of knowledge management and how it can be applied to GHSC-PSM. We created a community of knowledge management and communication (KMC) champions, and developed a protocol for project staff participation in conferences and large global meetings. We are developing a knowledge management strategy for the project and creating communities of practice around systems strengthening. In Q4, GHSC-PSM also ramped up support for KMC activities in the field offices. This included working closely with KMC staff in the Ethiopia office to develop its communications strategy, which will be used as a model for other country programs.

In August, GHSC-PSM had an official launch campaign for our website, doubling traffic to the website on a sustained basis.

## C3b. Project Performance

### People Trained

A key performance measure related to global collaboration and cross-cutting activities is the number of people trained. The “people trained” indicator provides a basic illustration of where the project is focusing its capacity-building resources and where it might expect related supply chain outcomes to improve.

Q4 had the highest number of individuals trained in a quarter to date, with a total of 7,628 trainees (5,236 men and 2,392 women). Ethiopia alone trained 4,592 people (3,491 men and 1,101 women).

Most trainings were cross-cutting, meaning they addressed topics relevant to multiple health areas. For funding source, 48.5 percent were trained with HIV/AIDS funding; 32.4 percent with malaria funding; 10.2 percent with FP/RH funding; and 7.6 percent with MNCH funding.

The focus of trainings was:

- 33 percent on warehousing and inventory management
- 14 percent on governance and finance
- 11 percent on human resources capacity development
- 11 percent on MIS
- 10 percent on M&E
- 7 percent on quality assurance
- 6 percent on forecasting and supply planning
- 3 percent on transportation and distribution
- 0.2 percent on strategy and planning

# MANAGEMENT AND OPERATIONS PROGRESS

## Program Management and Operations

Effective project management and operations are crucial to the project's overall ability to support 30 country/regional offices with critical procurement and supply chain systems and processes. With more than a year of operations under our belt, GHSC-PSM has critically assessed our structure and systems — from finance and contract management to operational structure and recruitment — to ensure that they fit the project's unique needs.

## Organizational Structure Review and Staffing

In Q4, GHSC-PSM undertook organizational changes to meet commitments laid out in our action plan. In addition to changes described elsewhere in this report, the project:

- Added surge support of 25 people across several teams to clear the backlog of orders for health commodities, keep pace with current orders, address data gaps, and expedite process improvements.
- Elevated Systems Strengthening to its own unit to serve as a center of technical excellence. The Market Dynamics team and GSI Strategic Task Force were rolled into this center of excellence.
- Merged the M&E and KMC teams to combine all data, analytics, and external-facing elements of the project for greater synergies and control over data quality and information.

Robust recruitment efforts continued at headquarters and in field offices.

## Finance and Risk Management

We integrated the risk management and finance functions and staffing into the Finance and Compliance Division to better serve GHSC-PSM. Both the Risk Management team and the GHSC-PSM Finance team now will have more streamlined support from Chemonics units, reducing work redundancy and creating better communication flows.

In Q4, we continued to focus on finance data and process. We worked to improve freight and logistics payments, creating computer-to-computer connections to decrease the staff time needed to execute freight invoices and to reduce data-entry errors. We also created a database to make recording expenses and time easier and more accurate. This new system will automate allocation by activity, and is being rolled out in the headquarters and field offices over the next several months.

We submitted a draft budget for FY18. The new GHSC-PSM budgeting system, Anaplan, provides more visibility into the support that different teams are providing to our field offices. It

allows us to collect data automatically across all work plans and to export work plans for uploading directly into the Business Intelligence & Analytics (BI&A) system.

Our Risk Management team worked closely with the Global Supply Chain and Country Programs teams to renew country warehousing and transportation agreements, develop and disseminate updated contract language in ARTMIS, support the issuance of increased delegations of authority to country directors, and manage the transition of regional distribution center warehouses to the new platforms in Belgium and Dubai. The Risk Management team also helped develop requests for proposals and contracts for modular storage and warehousing options and supported negotiations with suppliers on long-term contract terms, specifically targeting the molecular diagnostic commodity category.

### **Monitoring and Evaluation**

Late in Q4, as part of our reorganization, GHSC-PSM merged our data-driven support functions, specifically the M&E staff and KMC staff, into one unit that also includes a new data team. This unit will lead data governance activities, provide cross-cutting data analysis, promote evidence-based learning within the project, and share our information, knowledge, and learning with external audiences.

### **Conclusion**

Over the past six months, GHSC-PSM continued to serve as the primary vehicle through which USAID provides commodities for its priority health programs, procuring \$373.8 million in HIV/AIDS, malaria, FP/RH, and MNCH commodities. We provided supply chain leadership for important health commodity issues and transitions, helped shape markets, and responded to emergencies. We finished building out our organizational structure, staffing, systems, and processes to provide health commodities on an unprecedented scale. We carefully analyzed root causes of procurement and delivery issues, implemented an aggressive action plan to improve performance, and are seeing the results of these changes. We continued to expand our field presence to meet USAID missions' requirements. We provided systems strengthening technical assistance and training to dozens of countries to help them achieve high-performing supply chains. We continued to support USAID in exercising leadership of health commodity issues in numerous global forums.

It has been a year of enormous challenges. With continued insightful guidance and prioritization from USAID and the dedication of our staff in Washington and around the world, we are confident that we have laid a solid foundation for even greater contributions to global health in the coming years.



**USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM**  
Procurement and Supply Management

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United States



[ghsupplychain.org](http://ghsupplychain.org)





# USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM

## Procurement and Supply Management

### Annex A. M&E Indicators

GHSC-PSM tracks a full array of performance indicators that span commodity procurement and logistics, global collaboration, and several cross-cutting issues (e.g., training). Our commodity procurement and logistics indicators capture efficiency, effectiveness, quality, and cost of our service delivery, in line with the industry-standard Supply Chain Operations Reference (SCOR) model. Other indicators reflect performance of project partners (e.g., vendors), providing insight into how we plan, procure, and deliver high-quality health commodities through our management of subcontractors. Our global collaboration and cross-cutting indicators track contributions to the global community as well as project-wide services and contributions (e.g., number of innovations developed). Finally, our context indicators provide information on the country supply chain environments in which we operate to inform decision making and monitor critical assumptions.

#### Data Use

GHSC-PSM understands that access to appropriate data is essential for accountability, transparency, and evidence-based management. In the following tables, we capture the obligations this program has to report our activities and results, as specified in the project's Monitoring and Evaluation Plan.

The GHSC-PSM field offices and headquarters use the data captured here to continuously improve results. The overall goal of the program is to ensure uninterrupted supplies of health commodities, and the data that inform these indicators contribute to this. We have moved progressively closer to achieving full end-to-end visibility into the commodity global supply chain as we have improved system integration and added new features to ARTMIS. Improvements in our global supply chain structure and processes streamlining, based on evidence from this system, have led to reductions in handoffs and have positively impacted on-time delivery, cycle time, and cost. These data are assessed at daily supply chain meetings, in weekly field-driven analyses, and in monthly analyses which identify orders most at risk for prioritization of mitigating action. A visual management system of our progress (updated and utilized daily) allows managers to hone in on, and troubleshoot, these individual orders.

At the country level, we use data to improve performance by ensuring visibility into stock levels to help prevent overstocks and stockouts and also to support supply chain visibility to further enable host governments to sustain and improve their own supply chains. Countries carry out indicator review meetings to assess the data and glean insights that contribute to management's decision making. The Lesotho, Cameroon, and Ethiopia programs are strong examples of this process. Across all field offices, GHSC-PSM and our partners and counterparts actively use ARTMIS and in-country LMIS data to monitor stock levels and inform procurement planning.

#### Indicators Reported the First Time

We are reporting a number of indicators for the first time in this report because they are annual indicators or, in a few cases, we reached agreement with USAID on how to report the indicator this quarter. Indicators reported for the first time are:

1. A1b. On-time delivery
2. A4. Inventory turns
3. A5. Total landed cost (total cost of all supply chain operations and expenses associated with delivering product to customers)
4. A12. Percentage of price variance between the median unit price paid during the quarter and the median unit price paid over the life of the project
5. B4. Average rating of in-country data confidence at the central, subnational, and SDP level
6. B5. Percentage of countries conducting annual forecasts
7. B7. Percentage of total spent or budgeted on procurement of commodities for public sector services by the host government, U.S. government, the Global Fund, or other sources

8. B9. Supply chain workforce loss ratio
9. B10. Percentage of countries that have a functional logistics coordination mechanism in place

## Methodology Notes for Measuring Impact

In this report, we share the following results, each based on products delivered between the start of the project and September 30, 2017:

### 1. Number of years of ARV treatments delivered by GHSC-PSM

This report only includes TLE and NLZ. Doses for calculating both adult and pediatric treatments are based on WHO-recommended treatment guidelines. The calculation of patient-years allows GHSC-PSM to monitor effectiveness and efficiency by a standard unit.

### 2. Number of full doses of malaria treatment

Includes malaria treatments delivered over the life of the project, with “full dose” based on WHO-recommended treatment guidelines. Specific medicines counted are limited to those used only for treatments, and not primarily as prophylaxis. Specifically, it includes only Artemether/Lumefantrine and Artesunate/Amodiaquine formulas.

### 3. Number of Couple Years Protection (CYP) provided by delivered contraceptives

CYP is a standard indicator calculated by multiplying the quantity of each contraceptive method distributed by a conversion factor, to yield an estimate of the duration of contraceptive protection provided per unit of that method. The CYP for each method is then summed for all methods to obtain a total CYP figure. CYP conversion factors are based on how a method is used, failure rates, wastage, and how many units of the method are typically needed to provide one year of contraceptive protection for a couple. The calculation takes into account that some methods, e.g., condoms and oral contraceptives, may be used incorrectly and then discarded, or that IUDs and implants may be removed before their life span is realized. This GHSC-PSM measure includes all condoms, IUDs, and hormone (oral, injectable, and implantable) contraceptives delivered over the life of the project, with the conversion factor provided by USAID/MEASURE (see <https://www.usaid.gov/what-we-do/global-health/family-planning/couple-years-protection-cyp> for details).

## Data Limitations During the Reporting Period

Data for the project’s core logistics indicators were fully generated using ARTMIS and LMIS reports this quarter. This includes all data for both OTIF and OTD, cycle time, total landed costs, and price variance. While data cleaning remains an ongoing process, manual trackers are no longer in use for any order management. The Global Supply Chain team is actively using system-generated data on a daily basis. When a user identifies inaccurate data, they report the necessary changes to the ARTMIS HelpDesk. Progress for resolving data-quality tickets is reviewed twice a week.

Delivery data presented in this report reflect orders captured in the system and marked as delivered at the time that the data were analyzed (October 24, 2017). Because GHSC-PSM continues to clean and update the data in the system daily, data pulled at a different point in time for the same time period (Q4: July, August, and September 2017) may reflect additional updates. GHSC-PSM will continue to push for timely data entry; however, some degree of data lag is inherent in the global supply chain data system. Similarly, note that year-to-date performance is calculated using all data currently available. Due to data-cleaning efforts over the last few quarters, this current figure may differ slightly from a calculation derived from previously-reported data. In this report, annual data have been calculated from the full year of current data. However, to maintain consistency across reports, we have been careful to leave the previously reported quarterly data unchanged in this report. Also, please note that the data reported for Q4 include procurements led by GHSC-PSM field offices, also known as non-field office procurement.

In GHSC-PSM’s field offices, M&E teams collected data for annual indicators for the first time and encountered data limitations on some metrics. In many cases, collection for indicators “B7. Percentage of total spent or budgeted on procurement of commodities for public sector services, by funder” and “B9. Supply Chain Workforce Loss Ratio” were hampered by a lack of centralized databases for tracking procurements across funders and health areas and reporting on the public sector supply chain workforce. All required targets will be set using a full year’s worth of performance data and will be reported in Q1 FY18.

Each quarter, the field offices face an expedited data collection, reporting, and analysis schedule. They must submit their indicator data within five working days of the period end. Once the data are transmitted by field offices, the GHSC-PSM headquarters M&E team conducts a systematic review to validate the data before additional analysis and aggregation can be done. Working closely with technical and M&E staff in the field, we ensure that each data point is uniformly high quality and can be harmonized across the project. This schedule allows us to be responsive to the quick turnaround required for appropriate document review and finalization. However, it makes it difficult for teams to digest the results, incorporate evidence, and report on the usage of indicator data in this document. Moving forward, we expect to incorporate additional feedback measures that will contribute to even greater usage.

## **Summary of Performance**

In the tables that follow, we report indicator values for all performance indicators, including providing values for each quarter, health area, and tracer product, as relevant. We also report on context indicators, providing values by country. With each indicator table, we provide a definition of the indicator, our analysis, and known data limitations.

## **Context Indicators**

Context indicators are meant to provide high-level insight into the public health commodity supply chain systems that GHSC-PSM and our partners are working to strengthen. They guide strategic direction for stakeholders (including GHSC-PSM field offices, ministries of health, donors, NGOs, and others) working to improve supply chain performance. GHSC-PSM will routinely monitor these indicators to identify areas where systems strengthening is needed and to assess the effectiveness of system strengthening approaches. With the collective contribution of GHSC-PSM and other key stakeholders, we expect to see improvements in these indicators over time. For example, high health facility stockout rates that exist in a number of countries are symptomatic of the systemic weaknesses in the public health commodity supply chain that underlie this project's mission. GHSC-PSM is committed to mobilizing resources and attention towards policy, organizational, and capacity improvements that ultimately will improve the availability of commodities for patients.

The majority of context indicators are compiled from existing in-country data platforms such as LMIS and warehouse management systems, which GHSC-PSM is working to strengthen in many countries to enable governments to more fully use the data for supply chain decision making. GHSC-PSM compiles context indicator data for all countries in which the project maintains a field office, regardless of the extent of the project's engagement in the country. Therefore, the results in a given country, for a specific point in time, are not solely a consequence of GHSC-PSM's activities, but rather are reflective of the many stakeholders and elements that influence in-country supply chain performance.

Beyond system strengthening activities, these contextual data (including data from PPMR, PPMRm, Pipeline, and other platforms, in addition to GHSC-PSM's context indicators) are the basis for the GHSC-PSM-led regional approach to address commodity imbalances across countries. GHSC-PSM works with the international donor community to identify and respond immediately to shortages of life-saving commodities.

## Section A: Fiscal Year 2017 Key Performance Overview-IDIQ

Reporting Period (Quarter) Start Date		10/01/2016	01/01/2017	04/01/2017	07/01/2017	10/01/2016	
Reporting Period (Quarter) End Date		12/31/2016	03/31/2017	06/30/2017	09/30/2017	09/30/2017	
Summary Performance to Date		FY2017 Q1	FY2017 Q2	FY2017 Q3	FY2017 Q4	FY2017	
<b>Global Supply Chain</b>							
A1a.	Percentage of line items delivered on time and in full, within the minimum delivery window – %	31%	7%	23%	32%	31%	
A1b.	Percentage of line items delivered on time, within the minimum delivery window – %				31%	NA	
A3.	Cycle Time (average) – # (days per shipment)	86	174	166	200	155	
A4.	Inventory Turns (average number of times inventory cycles through GHSC-PSM-controlled global facilities) – ratio					2.9	
A5.	Total Landed Cost (commodity related costs) – %					9%	
A13.	Percentage of batches of product showing non-conformity (out of specification percentage) – %	0%	0%	0%	2%	<1%	
<b>In-Country</b>							
B1.	Stockout Rate at SDPs – %	20%	16%	24%	22%	20%	
B2.	Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in supply system – %	11%	17%	11%	22%	21%	
B3.	SDP reporting rate to the Logistics Management Information System (LMIS) – %	79%	86%	82%	82%	82%	
B8.	Percentage of initially GHSC-PSM-supported supply chain functions carried out by national authorities without external technical assistance – %	<b>Annual, to be reported beginning Year 2</b>					
<b>Cross-cutting</b>							
C2.	Number of people trained – # (people)	TO-Specific Trainings Combined	194	416	1110	1375	3096
		Cross-TO Trainings	569	1108	2872	6253	10802
		All Trainings (TO-Specific & Cross-TO)	763	1524	3982	7628	13898

**Important: Key performance metrics on this page are intended to provide an overall snapshot of the project's performance. They may conceal nuances between TO performance and must be interpreted in the light of individual TO performance or granular data.**

## Section B: Fiscal Year 2017 Key Performance Overview by Task Order

### Performance to Date

	TO1 Annual Target	Task Order 1				TO2 Annual Target	Task Order 2				TO3 Annual Target	Task Order 3				TO4 Annual Target	Task Order 4				
		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4	
Global Supply Chain																					
A1a	Percentage of line items delivered on time and in full, within the minimum delivery window – % <i>(in parentheses: Total number of line items delivered)</i>	N/A	29% (138)	6% (348)	25% (809)	35% (985)	N/A	0% (2)	13% (32)	15% (125)	14% (108)	N/A	54% (13)	22% (9)	5% (20)	28% (57)	N/A	N/A	N/A	0% (1)	100% (1)
A1b	Percentage of line items delivered on time within the minimum delivery window – % <i>(in parentheses: Total number of ADDs in the month)</i>	N/A	N/A	N/A	N/A	31% (1181)	N/A	N/A	N/A	N/A	19% (77)	N/A	N/A	N/A	N/A	59% (29)	N/A	N/A	N/A	N/A	50% (2)
A2	Percentage of QA processes completed within the total estimated QA lead times - %	N/A					N/A	N/A	N/A	81%	74%	N/A					N/A				
A3	Cycle Time (average) – # (days per line item delivered)	N/A	74	171	154	185	N/A	166	206	234	313	N/A	200	177	220	250	N/A	N/A	N/A	310	26
A4	Inventory Turns (average number of times inventory cycles through GHSC-PSM-controlled global facilities) – ratio	N/A	3.3				N/A	2.0				N/A	2.1				N/A				
A5	Total Landed Cost (commodity related costs) – %	N/A	7%				N/A	15%				N/A	14%				N/A	2%			
A6	Absolute Percent Error, with variants Mean Absolute Percent Error (MAPE) and Forecast Bias – %	See A6 indicator pages for detailed data for this indicator																			
A7	Percentage of line items imported using a temporary registration waiver (Temporary Waiver Percentage) – %	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	35%	65%	N/A	N/A	N/A	N/A	N/A
A8	Average percentage of shelf life remaining for warehoused commodities, weighted by the value of each commodity's stock (Product at Risk Percentage) – %	N/A	76%	78%	77%	79%	N/A	72%	66%	61%	61%	N/A	70%	67%	65%	75%	N/A				

A2 (QA lead times) is not reported for TO1, TO3, or TO4. Reason: QA processes for these TOs are managed by the GHSC-QA project.

A7 (Temporary waiver percentage) is not reported for TO1 and TO2 at this time. Reason: The project is still operationalizing sources and indicator calculations for these TOs.



**Performance to Date**

Indicator	TO1 Annual Target	Task Order 1				TO2 Annual Target	Task Order 2				TO3 Annual Target	Task Order 3				TO4 Annual Target	Task Order 4				Annual Target	Cross-Cutting				
		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4	
A10	Percentage of product procured using a framework contract (Framework Contract Percentage) – %	N/A	77%	79%	82%	74%	N/A	0%	0%	0.1%	11%	N/A	98%	99%	100%	98%	N/A	N/A	N/A	N/A	85%	N/A				
A12	Percentage of price variance between the median unit price paid during the quarter and the median unit price paid over the life of the project – %	See A12 indicator page for detailed data for this indicator																								
A13	Percentage of batches of product showing nonconformity (out of specification percentage) – %	N/A					N/A	0%	0%	0%	2%	N/A					N/A					N/A				
A14	Average Vendor Rating Score – rating	Suppliers	N/A	N/A	89%	91%	87%	N/A	N/A	96%	90%	94%	N/A	N/A	87%	85%	94%	N/A	N/A	N/A	N/A	N/A				
		Laboratory QA	N/A				N/A		73%	76%	46%	N/A						N/A				N/A				
		Freight Forwarders	N/A				N/A					N/A						N/A				N/A	N/A	N/A	69%	64%
A15	Percentage of QA investigation reports submitted within 30 days of outcome determination (QA investigation report submission) - %	N/A				N/A			100%	67%	N/A						N/A					N/A				
<b>In-Country Performance and Sustainability</b>																										
B1	Stockout rate at SDPs – %	N/A	10%	8%	8%	5%	N/A	13%	11%	21%	19%	N/A	29%	25%	31%	29%	N/A	N/A	N/A	N/A	N/A					
B2	Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in supply system – %	N/A	30%	27%	29%	35%	N/A	8%	22%	13%	21%	N/A	16%	16%	10%	14%	N/A	8%	8%	5%	30%	N/A				
B3	SDP reporting rate to the Logistics Management Information System (LMIS) – %	N/A	87%	91%	91%	90%	N/A	80%	84%	85%	83%	N/A	79%	86%	79%	80%	N/A	74%	85%	77%	78%	N/A				
B4	Average rating of in-country data confidence at the central, subnational, and SDP levels – rating	N/A	5.4				N/A	5.9				N/A	6.3				N/A	5.7				N/A				

A9 and A11 have been dropped from the GHSC-PSM M&E plan with approval from USAID.

A13 (out of specification percentage) is not reported for TO1, TO3, or TO4. Reason: QA processes for these TOs are managed by the GHSC-QA project.

A14 (average vendor rating score) is not reported for QA vendors for TO1, TO3, or TO4. Reason: QA processes for these TOs are managed by the GHSC-QA project.

A15 (QA investigation report submission) is not reported for TO1, TO3, or TO4. Reason: QA processes for these TOs are managed by the GHSC-QA project.

**Performance to Date**

Indicator		Task Order 1				Task Order 2				Task Order 3				Task Order 4				Cross-Cutting									
		TO1 Annual Target	2017 Q1	2017 Q2	2017 Q3	2017 Q4	TO2 Annual Target	2017 Q1	2017 Q2	2017 Q3	2017 Q4	TO3 Annual Target	2017 Q1	2017 Q2	2017 Q3	2017 Q4	TO4 Annual Target	2017 Q1	2017 Q2	2017 Q3	2017 Q4	Annual Target	2017 Q1	2017 Q2	2017 Q3	2017 Q4	
B5	Percentage of countries conducting annual forecasts – %	N/A	82%				N/A	74%				N/A	85%				N/A	50%				N/A					
B6	Percentage of countries conducting quarterly supply plan updates – %	N/A	91%	87%	59%	71%	N/A	70%	47%	53%	74%	N/A	100%	67%	71%	69%	N/A	33%	33%	36%	38%	N/A				43% (NFO)	
B7	Percentage of total spent or budgeted on procurement of commodities for public sector services by the government, USG, the Global Fund, or other sources – %	See B7 indicator page for detailed data for this indicator																									
B8	Percentage of initially GHSC-PSM-supported supply chain functions carried out by national authorities without external technical assistance – %	Data for this indicator will be reported beginning in Year 2, per the GHSC-PSM M&E Plan																									
B9	Supply Chain Workforce Loss Ratio – ratio	See B9 indicator page for detailed data for this indicator																									
B10	Percentage of countries that have a functional logistics coordination mechanism in place – %	N/A	80%				N/A	92%				N/A	93%				N/A	70%				N/A					
B11	Percentage of leadership positions in supply chain management that are held by women (in countries where GHSC-PSM is providing technical assistance related to workforce development) – %	N/A	16%		53%		N/A	28%		33%		N/A	N/A		41%		N/A	N/A		46%		N/A	19%		23%		
B12	Absolute percent consumption forecast error, with MAPE and forecast bias variants - %	See B12 indicator pages for detailed data for this indicator																									
C1	Number of innovations (including operations research studies) that were developed, implemented, or introduced and are related to the health commodity market or supply chain best practices – #	N/A	N/A	1	1	4	N/A	N/A	2	1	1	N/A	N/A		1	2	N/A	N/A					N/A	N/A	2	1	5
C2	Number of people trained – #	N/A	162	299	680	1056	N/A	33	17	430	305	N/A				14	N/A					N/A	569	1108	2872	6253	

C3 has been dropped from the GHSC-PSM M&E plan with approval from USAID.

**Performance to Date**

Indicator	TO1 Annual Target	Task Order 1				TO2 Annual Target	Task Order 2				TO3 Annual Target	Task Order 3				TO4 Annual Target	Task Order 4				Annual Target	Cross-Cutting			
		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4		2017 Q1	2017 Q2	2017 Q3	2017 Q4
C4	Percentage of required files submitted to BI&A in the reporting period – %	N/A				N/A					N/A					N/A					N/A				
C5	Percentage of required files timely submitted to BI&A in the reporting period – %	N/A				N/A					N/A					N/A					N/A				
C6	Percentage of sampled 'accurate' submissions reported to BI&A in the reporting period - %	N/A				N/A					N/A					N/A					N/A				
C7a	Percentage of product lost due to expiry while under GHSC-PSM control (Product Loss Percentage - Expiry) – %	See C7a indicator page for detailed data for this indicator																							
C7b	Percentage of product lost due to theft, damage, or other causes while under GHSC-PSM control (Product Loss Percentage - Theft, Damage, Other) – %	See C7b indicator page for detailed data for this indicator																							
C8	Number of global advocacy engagements in support of improved availability of essential health commodities – #	N/A	7		4	N/A	2	3		N/A	4	6		N/A	0	6		N/A	9	13					
C10	Percentage of GHSC-PSM-procured molecular instruments that remained functional during the reporting period – %	N/A	40%	75%	79%	88%	N/A				N/A					N/A					N/A				

C4, C5 and C6 (submissions to BI&A) are not reported at this time. Reason: The project is still operationalizing sources and indicator calculations.

C9 has been dropped from the GHSC-PSM M&E plan with approval from USAID.

# Performance Indicators

Indicators included in this section:

- A1a. Percentage of line items delivered on time in full, within the minimum delivery window
  - A1b. Percentage of line items delivered on time, within the minimum delivery window
  - A2. Percentage of quality assurance (QA) processes completed within the total estimated QA lead times
  - A3. Average Cycle Time
  - A4. Inventory Turns (average number of times inventory cycles through GHSC-PSM controlled global facilities)
  - A5. Total Landed Cost (commodity-related costs only)
  - A7. Percentage of line items imported using a temporary registration waiver (Temporary Waiver Percentage)
  - A8. Average percentage of shelf life remaining for warehoused commodities, weighted by the value of each commodity's stock (Product at Risk Percentage)
  - A10. Percentage of product procured using a framework contract (Framework Contract Percentage)
  - A12. Percentage price variance between the median unit price paid during the quarter and the median unit price paid over the life of the project
  - A13. Percentage of batches of product showing nonconformity (Out of Specification Percentage)
  - A14. Average vendor rating score
  - A15. Percentage of QA investigation reports submitted within 30 days of outcome determination (QA investigation report submission)
  - B5. Percentage of countries conducting annual forecasts
  - B6. Percentage of countries conducting quarterly supply plan updates
  - C1. Number of innovations that were developed, implemented, or introduced and are related to health commodity market or supply chain best practices
  - C2. Number of people trained by supply chain functional area and sex
  - C7a. Percentage of product lost due to expiry while under GHSC-PSM control (Product Loss Percentage)
  - C7b. Percentage of product lost due to theft, damage, and other causes while under GHSC-PSM control (Product Loss Percentage)
  - C8. Number of global advocacy engagements in support of improved availability of essential health commodities
  - C10. Percentage of GHSC-PSM-procured or supported molecular instruments that remained functional during the reporting period
  - C11. Number of supply chain policies, regulations, strategies, or SOPs developed or updated with GHSC-PSM assistance
- President's Malaria Initiative Standard Indicators for Annual Reporting

All other indicators are presented in the following section: Context Indicators.

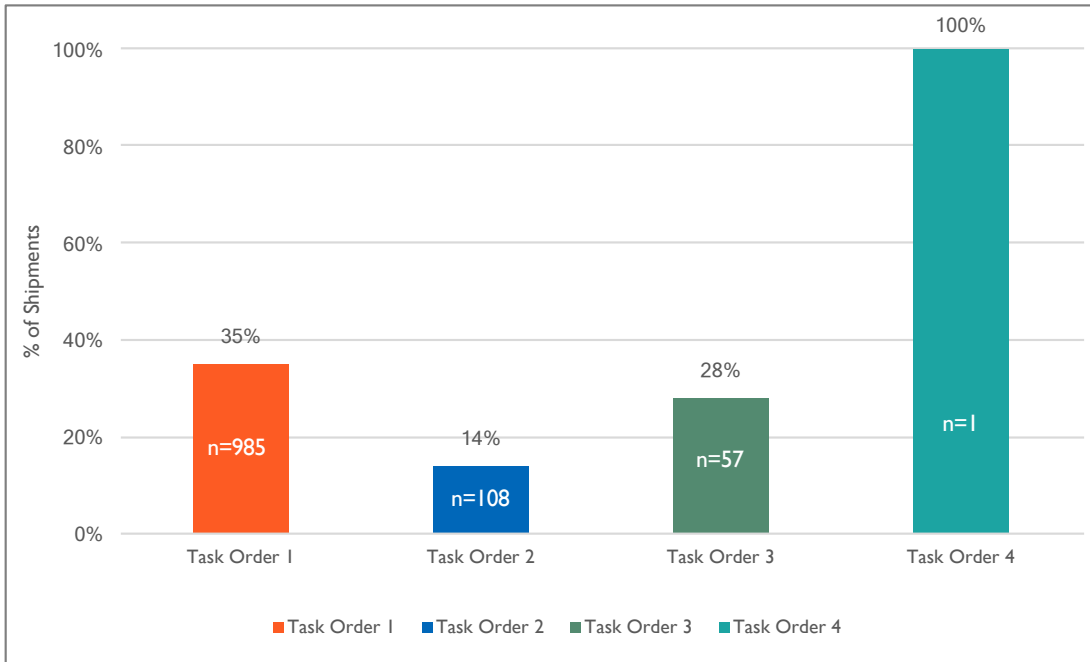
## A1a. Percentage of line items delivered on time in full, within the minimum delivery window

### Measure Definition

**Numerator:** Number of line items delivered to the consignee on time and in full during the quarter.

**Denominator:** Total number of line items delivered to the consignee during the quarter.

### Indicator Performance



Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date*
TO1	N/A	35%	33%
TO2	N/A	14%	15%
TO3	N/A	28%	20%
TO4	N/A	100%	17%
All TOs	N/A	32%	31%

### Analysis

- ▶ On time in full delivery rates have been low throughout fiscal year 2017. As these became apparent, GHSC-PSM conducted root-cause analysis to understand the issues. We determined that unrealistic commitments, a lengthy and siloed process with many handoffs, delays in supplier manufacturing and documentation, prolonged timelines for obtaining waivers, poor accuracy of data on order status, and unresponsive issue escalation and resolution were all contributing to the low OTIF rates. We agreed with USAID on an action plan that included significant restructuring of staffing and processes.
- ▶ OTIF performance began to improve in Q3 and has continued to rise this quarter, reaching 32% overall. This improvement provides evidence of the success of our process improvements, including integration of the order promise tool, supplier relationship management program, and rapid issue escalation process.

### Data Notes

- ▶ Line items are considered on time if they are delivered between 14 calendar days before and up to 7 calendar days after the Agreed Delivery Date.
- ▶ All male and female condom and lubricant deliveries are reported under TO1.
- ▶ \*Year to Date Performance is calculated using all data currently available. Due to data-cleaning efforts over the last few quarters, this current figure may differ slightly from a calculation derived from previously-reported data.

**A1a. Percentage of line items delivered on time and in full, within the minimum delivery window (Tracer Product Category)**

HIV	Malaria			PRH - Method Level			Maternal and Child Health								
	Total number of line items delivered	Number of line items delivered on time and in full	On time in full (%)	Total number of line items delivered	Number of line items delivered on time and in full	On time in full (%)	Total number of line items delivered	Number of line items delivered on time and in full	On time in full (%)						
Task Order 1	985	342	35%	Task Order 2	108	15	14%	Task Order 3	57	16	28%	Task Order 4	1	1	100%
Adult ARVs	151	35	23%	ACTs	43	12	28%	Injectable Contraceptives	13	6	46%	Laboratory			
Pediatric ARVs	58	19	33%	RDTs	9	2	22%	Implantable Contraceptives	19	6	32%	Other Pharma			
Laboratory	556	236	42%	Sulphadoxine-pyrimethamine				Combined Oral Contraceptives	19	2	11%	Other Non-pharma	1	1	100%
Condoms	41	5	12%	Severe Malaria Medicines	4	0	0%	Copper-bearing Intrauterine Devices	2	1	50%				
VMMC	33	2	6%	Other Pharma	4	0	0%	Emergency Oral Contraceptives							
Other Pharma	72	13	18%	LLIN	42	1	2%	Progestin-only Pills	1	0	0%				
Food and WASH	3	0	0%	All Other Non-pharma	6	0	0%	Standard Days Method	2	0	0%				
HIV RTK								All Other TO3 Products	1	1	100%				
Other RTK	4	3	75%												
Prefab															
Vehicles and Other Equipment															
Other Non-pharma	67	29	43%												

Blank rows indicate that no line items for these product categories were delivered this quarter.

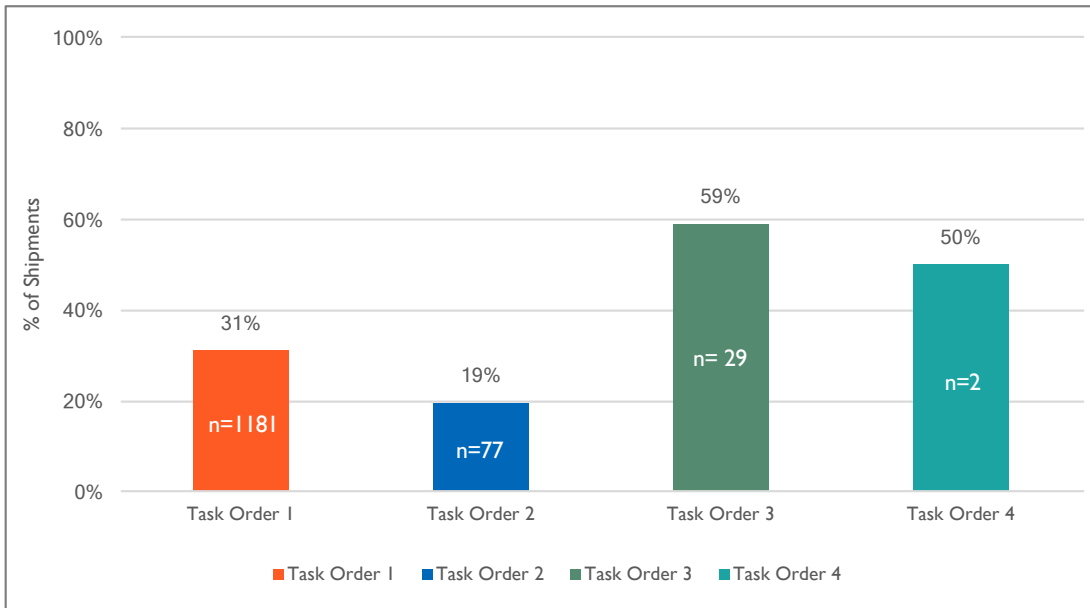
## A1b. Percentage of line items delivered on time, within the minimum delivery window

### Measure Definition

**Numerator:** Number of line items with an Agreed Delivery Date during the quarter that were delivered to the consignee on time.

**Denominator:** Total number of line items with an Agreed Delivery Date during the quarter.

### Indicator Performance



### Achievement

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	31%	N/A
TO2	N/A	19%	N/A
TO3	N/A	59%	N/A
TO4	N/A	50%	N/A
All TOs	N/A	31%	N/A

### Analysis

- ▶ This quarter, the project is introducing an additional measure of On Time Delivery (OTD), showing the number of line items delivered on time as a percentage of all expected deliveries in the period (i.e., line items with Agreed Delivery Dates during the reporting period). The OTD metric has the benefits of focusing on on time performance (given that not-in-full performance has not been a significant issue), and of highlighting challenges in a more timely manner than OTIF, capturing late deliveries as soon as they are missed.
- ▶ While Q4 performance on this indicator does not yet meet our expectation of 80% on a sustainable basis, we have seen notable progress. Within the quarter, overall OTD performance improved from 22% in July to 47% in September. We are on-track and remain committed to achieving 60% OTD in December 2017 and to achieving and maintaining 80% OTD in the long run.

### Data Notes

- ▶ Line items are considered on time if they are delivered between 14 calendar days before and up to 7 calendar days after the Agreed Delivery Date.
- ▶ All male and female condom and lubricant deliveries are reported under TO1.

**A1b. Percentage of line items delivered on time, within the minimum delivery window (Tracer Product Category)**

HIV	Malaria			PRH - Method Level			Maternal and Child Health								
	Total number of line items with ADDs in the quarter	Number of line items with ADDs in the quarter delivered on time	On Time Delivery (%)	Total number of line items with ADDs in the quarter	Number of line items with ADDs in the quarter delivered on time	On Time Delivery (%)	Total number of line items with ADDs in the quarter	Number of line items with ADDs in the quarter delivered on time	On Time Delivery (%)						
Task Order 1	1181	368	31%	Task Order 2	77	15	19%	Task Order 3	29	17	59%	Task Order 4	2	1	50%
Adult ARVs	138	37	27%	ACTs	34	13	38%	Injectable Contraceptives	10	5	50%	Laboratory			
Pediatric ARVs	60	19	32%	RDTs	6	2	33%	Implantable Contraceptives	10	7	70%	Other Pharma	1	0	0%
Laboratory	690	251	36%	Sulphadoxine-pyrimethamine	2	0	0%	Combined Oral Contraceptives	5	2	40%	Other Non-pharma	1	1	100%
Condoms	43	5	12%	Severe Malaria Medicines	16	0	0%	Copper-bearing Intrauterine Devices	1	1	100%				
VMMC	24	8	33%	Other Pharma	3	0	0%	Emergency Oral Contraceptives							
Other Pharma	109	14	13%	LLIN	9	0	0%	Progestin-only Pills							
Food and WASH	2	0	0%	All Other Non-pharma Products	7	0	0%	Standard Days Method	1	0	0%				
HIV RTK								All Other TO3 Products	2	2	100%				
Other RTK	7	3	43%												
Prefab															
Vehicles and Other Equipment	4	0	0%												
Other Non-pharma	104	31	30%												

Blank rows indicate that no line items for these product categories were delivered this quarter.



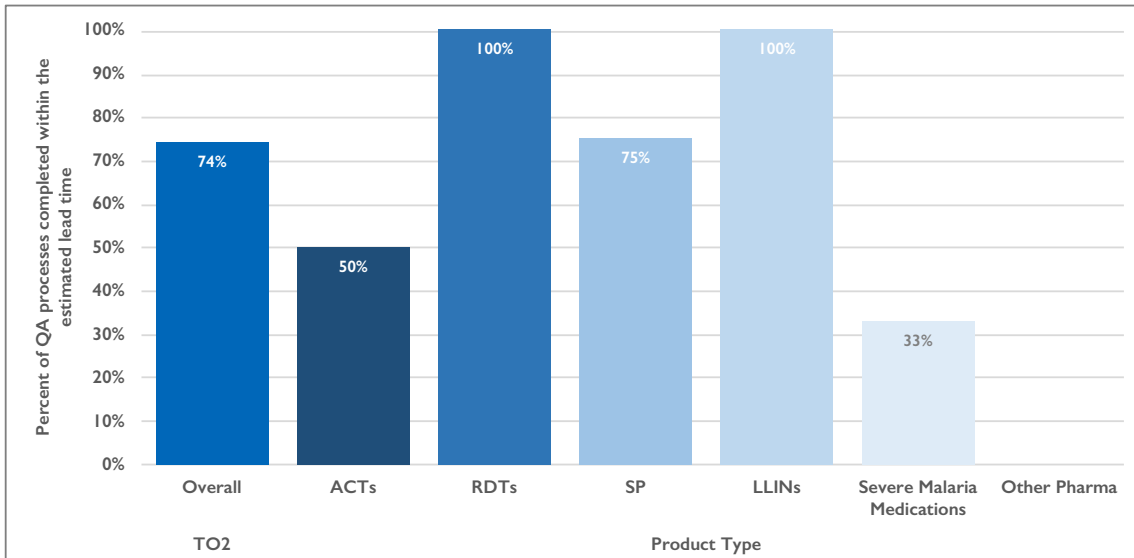
## A2. Percentage of quality assurance (QA) processes completed within the total estimated QA lead times

### Measure Definition

**Numerator:** Number of shipments complying with the pre-established QA lead times during the quarter.

**Denominator:** Total number of shipments requiring QA processes that were cleared for shipment during the quarter.

### Indicator Performance



### Achievement

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A		
TO2	N/A	74%	78%
TO3	N/A		
TO4	N/A		
All TOs	N/A	74%	78%

### Analysis

- ▶ Overloading of QA labs has led to delays in some shipments. For example, two orders of ACTs were delayed this quarter when 67 batches of product arrived at the lab at the same time. The project's QA team is working closely with the Procurement team to improve visibility into upcoming shipments. With a clear pipeline of upcoming orders, the QA team can provide an accurate forecast of test requests to enable better planning and improved compliance with contractual lead times for QA processes. TO2 QA is in process of performing additional Method Transfers at second labs to mitigate risk of overloading labs.
- ▶ Some delays have been linked to poor lab performance in meeting contractually-obligated timeframes. As part of the process of managing subcontracted labs, TO2 QA is continuously evaluating the performance of the lab network and has clearly communicated to those labs with poor performance that changes in operations will be implemented if poor performance persists in FY18.

### Data Notes

- ▶ Total number of shipments requiring QA processes that were cleared for shipment this quarter is 34 (10 ACTs, 8 RDTs, 4 SP, 8 LLINs, 3 severe malaria medications, and 1 other pharma).
- ▶ Exceptional procedures outside of routine QA testing and clearance have been excluded from the indicator. This includes shipments requiring QA investigations, method transfers, non-PMI procurements, post-shipment quality control, and LLIN shipments requiring witnessing of loading and/or sealing of goods.
- ▶ All QA activities for TO2 are conducted by GHSC-PSM. All QA activities for TOs 1, TO3, and TO4 are managed by the USAID GHSC-QA contract. GHSC-QA may be contacted for data related to these TOs.

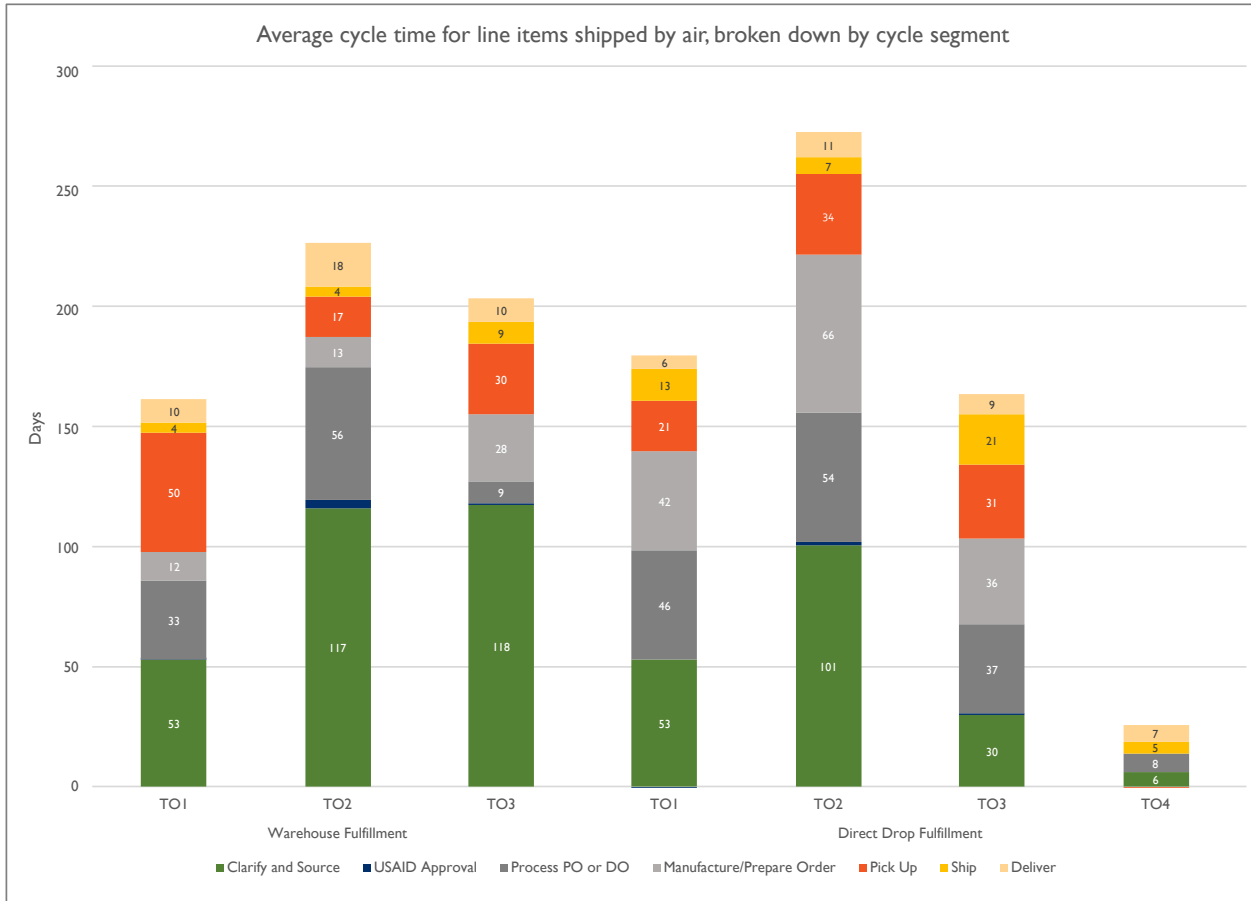
### A3. Average Cycle Time

#### Measure Definition

**Numerator:** Sum of lead times for all line items delivered during the quarter.

**Denominator:** The count of all line items delivered during the quarter.

#### Indicator Performance



Task Order	Annual Target	Achievement (All Modes)	
		FY2017 Q4	Year to Date*
TO1	N/A	185 (n=985)	143
TO2	N/A	313 (n=108)	263
TO3	N/A	250 (n=57)	224
TO4	N/A	26 (n=1)	220
All TOs	N/A	200 (n=1,151)	155

#### Analysis

- Overall GSC cycle times have increased since the previous quarter for TOs 1, TO2, and TO3. A contributing factor to these long cycle times is the ongoing delivery of backlogged items. Nearly one-third (32%) of line items delivered this quarter have Order Entry Dates in 2016.
- Targeted analysis of specific segments shows some improvements in the early activities in the cycle, including RO clarification, sourcing, and USAID approval. The time from order entry to USAID approval has fallen 41%, from an average of 70 days for line items approved in January to 41 days for line items approved in September (see narrative for chart).
- Cycle times have increased for segments following USAID approval, from an average of 60 days from USAID approval to final delivery for items delivered in April to 116 days for items delivered in September. These segments include PO processing, manufacture time, and all logistics. They may be impacted by supplier delays, waiver delays, natural disasters, and other delays outside of GHSC-PSM's manageable control. Management of goods-availability dates and shipping documentation is a key focus for cycle-time improvements.
- Clarification and sourcing time for Task Order 3 warehouse fulfillments appear long due to line items being placed on hold during this segment (see Data Notes below). Long segment times are expected to persist in future quarters as items placed on hold earlier in the year are delivered, but we expect this segment time to decline as new orders flow through the process without being placed on hold. Current monthly analysis indicates that the time for this segment has already dropped to 22 days for items completing this segment in September.

#### Data Notes

- Additional milestones and cycle segments are defined in the GHSC-PSM M&E Plan. Data for additional segments will be included as the quality and completeness of ARTMIS milestone data improves.
- Please note that overall cycle time data presented in this report is inclusive of all days from Order Entry Date to Actual Delivery Date, including all manufacture time and any time an order spends on hold. The MIS and GSC teams are working on procedures to apply hold flags to line items in ARTMIS when appropriate, so that hold time may be excluded from future cycle time calculations, per the project M&E plan. The manufacturing segment (PO Release Date - Actual Goods Availability Date) has not been excluded because it relies on a data point (Actual GAD) that is only 45% complete for line items delivered this quarter. Once data completeness for this milestone has improved, the project will present a version of overall cycle time less manufacture time, as requested by USAID.
- Data on overall cycle start and end dates are complete for all line items delivered this quarter. However, internal milestone data are not complete for some line items (as with the GAD example mentioned previously). In these cases, line items with incomplete data are excluded from the segment averages. For this reason, the sum of all segments may not be equal to the overall average per task order and fulfillment channel.
- \*Year to Date Performance is calculated using all data currently available. Due to data-cleaning efforts over the last few quarters, as well as normal lags in the receipt of Proofs of Delivery at the end of each quarter, this current figure may differ slightly from a calculation derived from previously-reported data.

### A3. Average Cycle Time

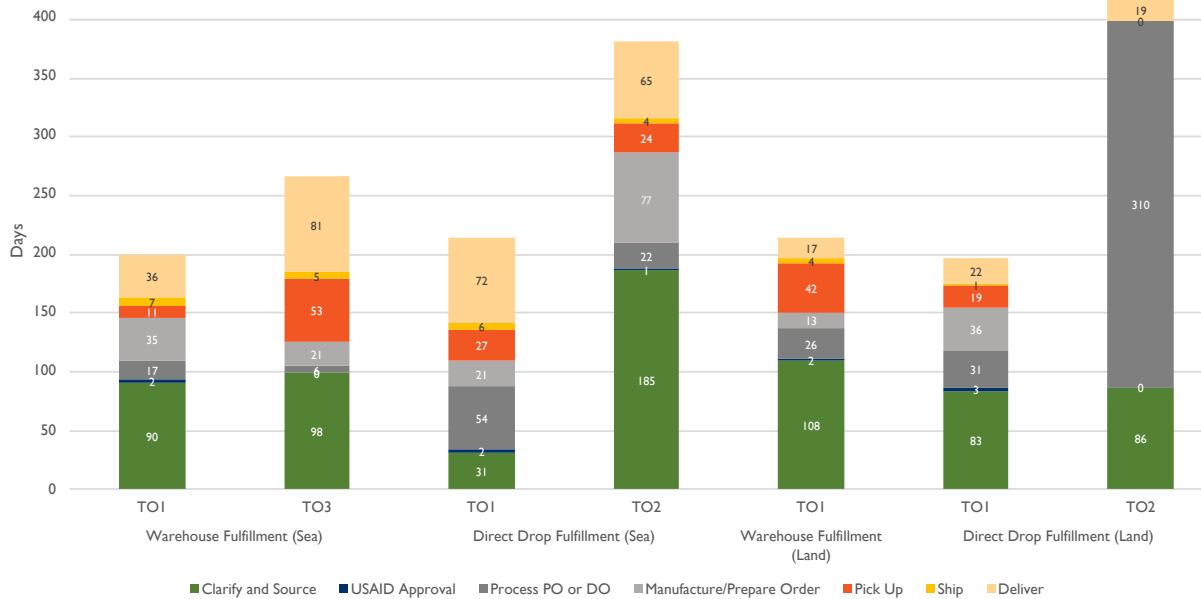
#### Measure Definition

**Numerator:** Sum of lead times for all line items delivered during the quarter.

**Denominator:** The count of all line items delivered during the quarter.

#### Indicator Performance

Average cycle time for line items shipped by sea and land, broken down by cycle segment



Task Order	Annual Target	Achievement (All Modes)	
		FY2017 Q4	Year to Date*
TO1	N/A	185 (n=985)	143
TO2	N/A	313 (n=108)	263
TO3	N/A	250 (n=57)	224
TO4	N/A	26 (n=1)	220
All TOs	N/A	200 (n=1,151)	155

#### Analysis

► See above.

#### Data Notes

- Additional milestones and cycle segments are defined in the GHSC-PSM M&E Plan. Data for additional segments will be included as the quality and completeness of ARTMIS milestone data improves.
- Please note that overall cycle time data presented in this report is inclusive of all days from Order Entry Date to Actual Delivery Date, including all manufacture time and any time an order spends on hold. The MIS and GSC teams are working on procedures to apply hold flags to line items in ARTMIS when appropriate, so that hold time may be excluded from future cycle time calculations, per the project M&E plan. The manufacturing segment (PO Release Date - Actual Goods Availability Date) has not been excluded because it relies on a data point (Actual GAD) that is only 45% complete for line items delivered this quarter. Once data completeness for this milestone has improved, the project will present a version of overall cycle time less manufacture time, as requested by USAID.
- Data on overall cycle start and end dates are complete for all line items delivered this quarter. However, internal milestone data are not complete for some line items (as with the GAD example mentioned previously). In these cases, line items with incomplete data are excluded from the segment averages. For this reason, the sum of all segments may not be equal to the overall average per task order and fulfillment channel.
- \*Year to Date Performance is calculated using all data currently available. Due to data-cleaning efforts over the last few quarters, as well as normal lags in the receipt of Proofs of Delivery at the end of each quarter, this current figure may differ slightly from a calculation derived from previously-reported data.

### A3. Cycle Time (Average) - Tracer Product Category

HIV	All channels and modes	Air		Sea		Land		Unknown	Malaria	All channels and modes	Air		Sea		Land	Unknown	PRH - Method Level	All channels and modes	Air		Sea		Maternal and Child Health	All channels and modes	Air
		Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment			Direct Drop Fulfillment	Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment			Direct Drop Fulfillment	Warehouse Fulfillment	Direct Drop Fulfillment	Warehouse Fulfillment			Direct Drop Fulfillment
# of Line Items Delivered	985	36	494	32	42	44	4	333	# of Line Items Delivered	108	16	50	0	21	1	20	# of Line Items Delivered	57	14	10	33	0	# of Line Items Delivered	1	1
Task Order 1	185	150	184	190	236	212	192	180	Task Order 2	312	234	275		389	433	379	Task Order 3	250	205	206	283		Task Order 4	26	26
Adult ARVs	190	144	197		215	193			ACTs	237	234	239					Injectable Contraceptives	198	144	180	238		Other Non-pharma	26	26
Pediatric ARVs	190	122	178		168	257			RDTs	291		291					Implantable Contraceptives	259	169	330	306				
Laboratory	181		176		402		72	184	Sulphadoxine-pyrimethamine								Combined Oral Contraceptives	288	308		286				
Condoms	200	65		172	240				Severe Malaria Medicines	489		489					Copper-bearing Intrauterine Devices	328	328						
VMMC	176	199	87	215	210			7	Other Pharma	243		149					Emergency Oral Contraceptives								
Other Pharma	206		199		350		232	237	LLIN	378		203		389	433	379	Progestin-only Pills	296	296						
Food and WASH	202		173		216				All Other Non-pharma	347		223		524			Standard Days Method	142		142					
HIV RTK																	All Other TO3 Products	64		64					
Other RTK	203		203																						
Prefab																									
Vehicles and Other Equipment																									
Other Non-pharma	172		201					153																	

Blank rows indicate that no line items for these product categories were delivered this quarter.

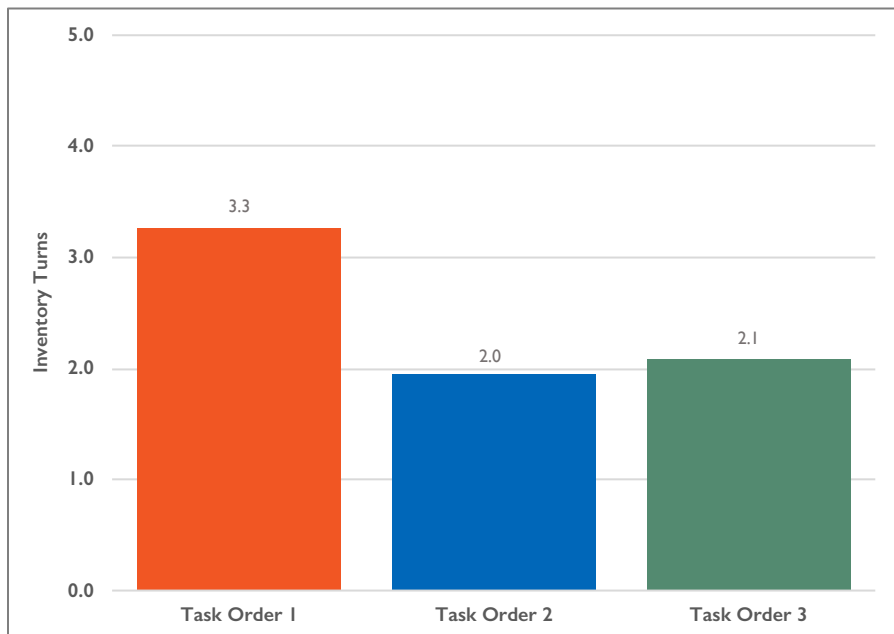
## A4. Inventory Turns (average number of times inventory cycles through GHSC-PSM controlled global facilities)

### Measure Definition

**Numerator:** Total ex-works cost of goods distributed from GHSC-PSM-controlled global inventory stocks (in USD) in a single 365-day year.

**Denominator:** Average daily inventory balance (in USD) over a specified time period.

### Indicator Performance



Task Order	Annual Target	Achievement
		FY2017
TO1	N/A	3.3
TO2	N/A	2.0
TO3	N/A	2.1
TO4	N/A	N/A
All TOs	NA	2.9

### Analysis

- ▶ ARVs, which represented 86 percent of GHSC-PSM's Task Order 1 average inventory for the year, are stocked according to country supply plans. Inventory turns are impacted by changes in demand. The Global Supply Chain is implementing new business rules and setting expectations with customers to limit order changes and cancellations, which should result in improvements to both inventory turns and available shelf life.
- ▶ Inventory turns for Task Order 2 were driven down by the stock of AL 6x3, which was transferred to the project with only 47 percent of the shelf life remaining. Low uptake of this product, which has now expired, resulted in reduced turns.
- ▶ Task Order 3 and condoms stocks are created based on the global demand forecasts created at GHSC-PSM headquarters using country supply plans. Demand for four out of six stocked contraceptives (two combined oral contraceptives, progestin only pills, and copper IUDs) was lower than forecasted, driving low turns. The project also inherited an excess of injectables, which took more than three quarters to deplete.
- ▶ GHSC-PSM also maintains safety stocks of contraceptives and condoms. However, safety stock levels are only updated once per year, or in response to significant shifts in demand. These stock requirements can drive additional replenishment, even if demand is low. The project is exploring ways to update the safety stock more frequently, so that it is in line with expected demand.

### Data Notes

- ▶ GHSC-PSM does not hold any inventory for Task Order 4.
- ▶ Average inventory balance is calculated using the ending balance at the close of each month. Average monthly inventory balances for each task order are as follows: Task Order 1 (including all condoms): \$31,989,185; Task Order 2: \$2,408,909; Task Order 3: \$13,808,828.

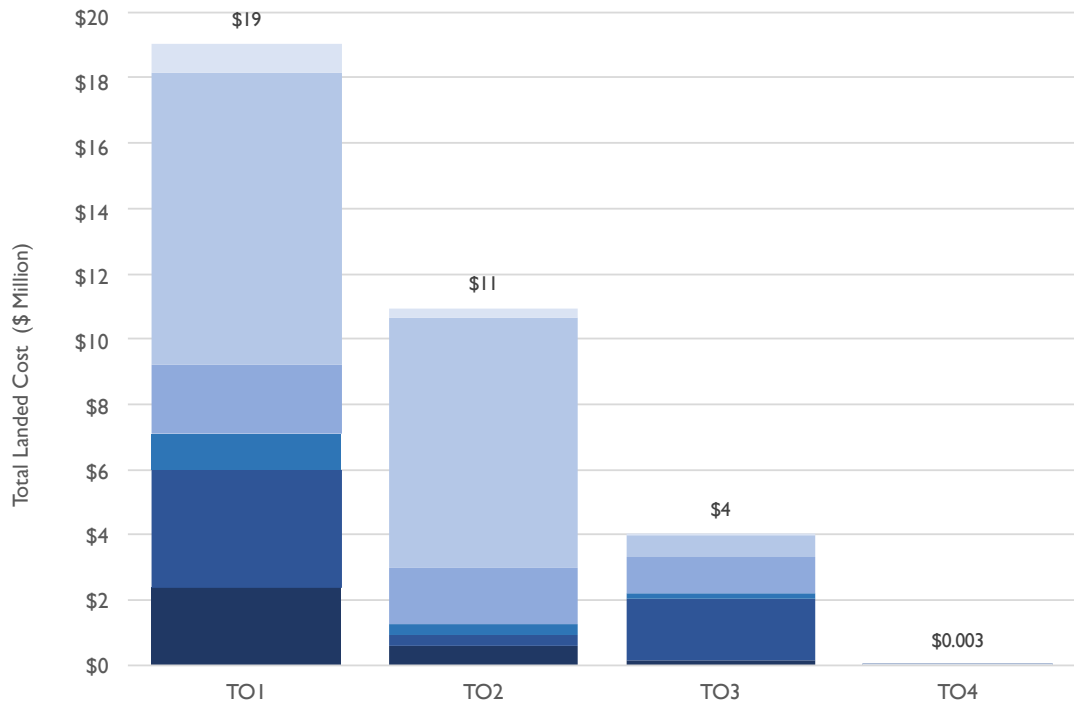
## A5. Total Landed Cost (commodity-related costs only)

### Measure Definition

**Numerator:** Sum of all commodity-related costs (in USD) paid by GHSC-PSM during the reporting period.

**Denominator:** Total value of commodities delivered to customers during the reporting period.

### Indicator Performance



Task Order	TO1	TO2	TO3	TO4
Total Landed Cost as a % of Comm. Value:	6.6%	14.7%	13.7%	2.3%

Task Order	TO1	TO2	TO3	TO4
Total Value of Commodities Delivered:	\$291 m	\$75 m	\$30 m	\$120,457

Legend: Inbound Freight, Warehousing, Loss, Insurance, Outbound Freight, Drop Ship Freight, Other costs

### Achievement

Task Order	Annual Target	FY2017
TO1	N/A	7%
TO2	N/A	15%
TO3	N/A	14%
TO4	N/A	2%
All TOs	N/A	9%

### Analysis

- ▶ Total landed cost, as a percentage of total value of commodities delivered, is 9% across all TOs. It is generally low for TO1, where costs are spread across a larger volume of commodities delivered. Absolute costs are lower for TOs 2 and 3, but this translates to higher cost-per-dollar delivered because of the smaller delivery volumes for malaria and FP products.
- ▶ The largest cost category for TOs 1 and 2 is outbound freight, which reflects the freight costs associated with direct drop shipments from suppliers to customers. Warehousing costs are also a significant portion of the costs for TOs 1 and 3, reflecting the greater use of the regional distributions centers to store these products.
- ▶ Total landed costs for TO4 are quite low, although it should be recognized that only six TO4 deliveries have been made this year.
- ▶ Per agreement with USAID, QA costs are not included in this indicator, since GHSC-PSM does not manage QA across all TOs. For TO2, where QA is managed by GHSC-PSM, the total landed cost with QA costs included is \$11.6 million (up from \$11.0 million). As a percentage of commodities delivered, total landed costs rises from 15% to 16% with QA costs included.

### Data Notes

- ▶ Total landed costs include all costs paid between October 2016 and September 2017, per Chemonics' Financial Management Information System. Total value of commodities delivered includes total value of all line items delivered to customers with an ADD during the same period, per ARTMIS. The indicator includes both GSC and Decentralized Procurement costs and delivery values.
- ▶ Condom and lubricant deliveries and freight costs are reported under the TO that funded them.

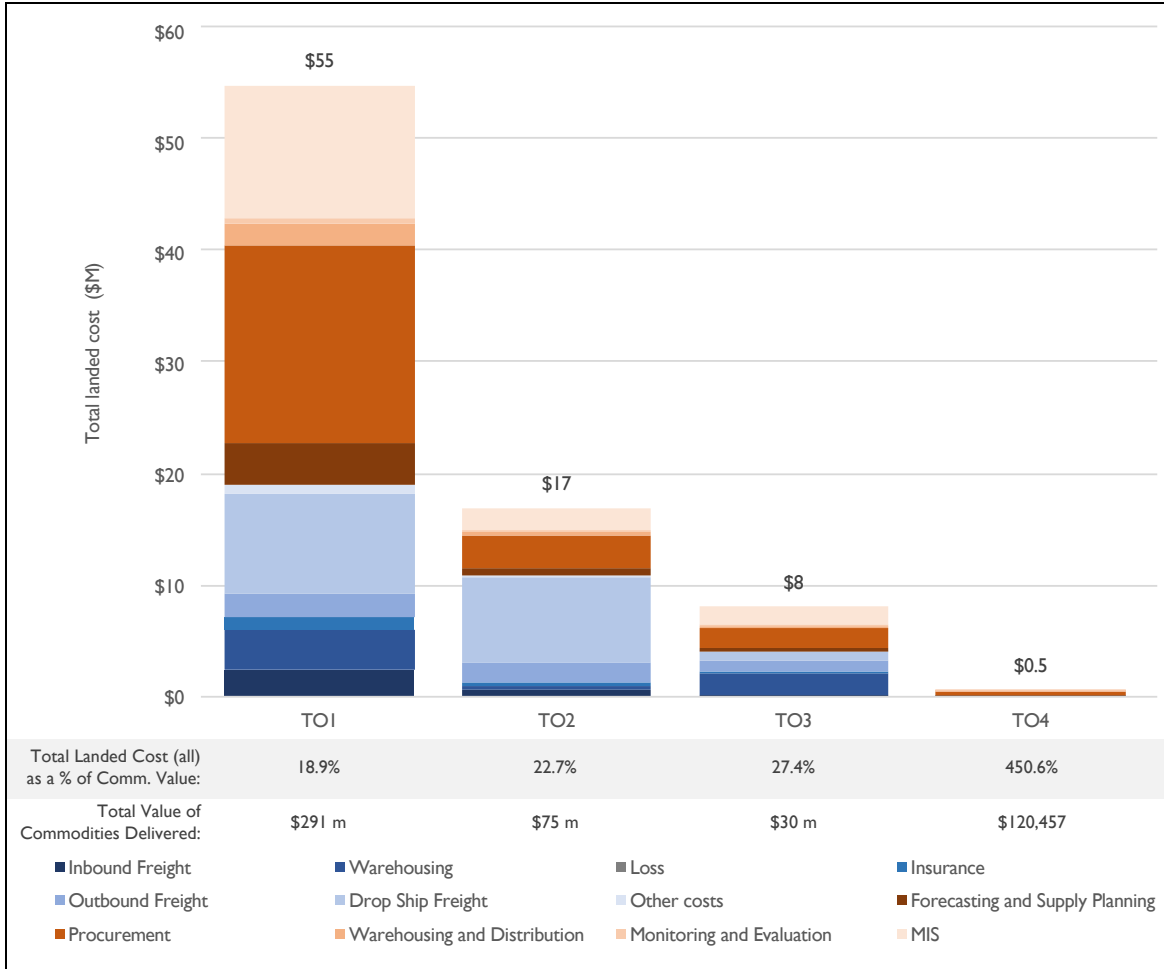
## A5. Total Landed Cost (commodity-related and HQ operations costs)

### Measure Definition

**Numerator:** Sum of all commodity-related and HQ operations costs (in USD) paid by GHSC-PSM during the reporting period.

**Denominator:** Total value of commodities delivered to customers during the reporting period.

### Indicator Performance



### Achievement

Task Order	Annual Target	FY2017
TO1	N/A	19%
TO2	N/A	23%
TO3	N/A	27%
TO4	N/A	451%
All TOs	N/A	20%

### Analysis

- ▶ When headquarters supply chain operations costs are factored into total landed costs, the cost-per-dollar delivered increases to 20% of total value delivered.
- ▶ For all TOs, procurement costs make up the largest proportion of HQ supply chain operations costs. These costs are in line with the project's organization to meet core objectives, with the GSC team focused on all aspects of procurement, including client relations, contracting, fulfillment, and supplier management.
- ▶ For FY17, headquarters costs also included the development of the management information system ARTMIS. The costs to build this system were front-loaded at the beginning of the project by design. As MIS activities have shifted from the development phase to the operations and maintenance phase, costs in this category are expected to drop in FY18.
- ▶ Per agreement with USAID, QA costs are not included in this indicator, since GHSC-PSM does not manage QA across all TOs. For TO2, where QA is managed by GHSC-PSM, the total landed cost with QA costs (both logistical and HQ operations) included is \$18.2 million (up from \$17.0 million). As a percentage of commodities delivered, total landed costs rises from 23% to 24% with QA costs included.
- ▶ **Indicator A6:** Please see indicator "A6. Absolute percent forecast error" below, in the Contextual Indicators section of this annex.

### Data Notes

- ▶ Total landed costs includes all costs paid between October 2016 and September 2017, per Chemonics' Financial Management Information System. Total value of commodities delivered includes total value of all line items delivered to customers with an Actual Delivery Date during the same period, per ARTMIS. The indicator includes both GSC and Decentralized Procurement costs and delivery values.
- ▶ Condom and lubricant deliveries and freight costs are reported under the TO that funded them.

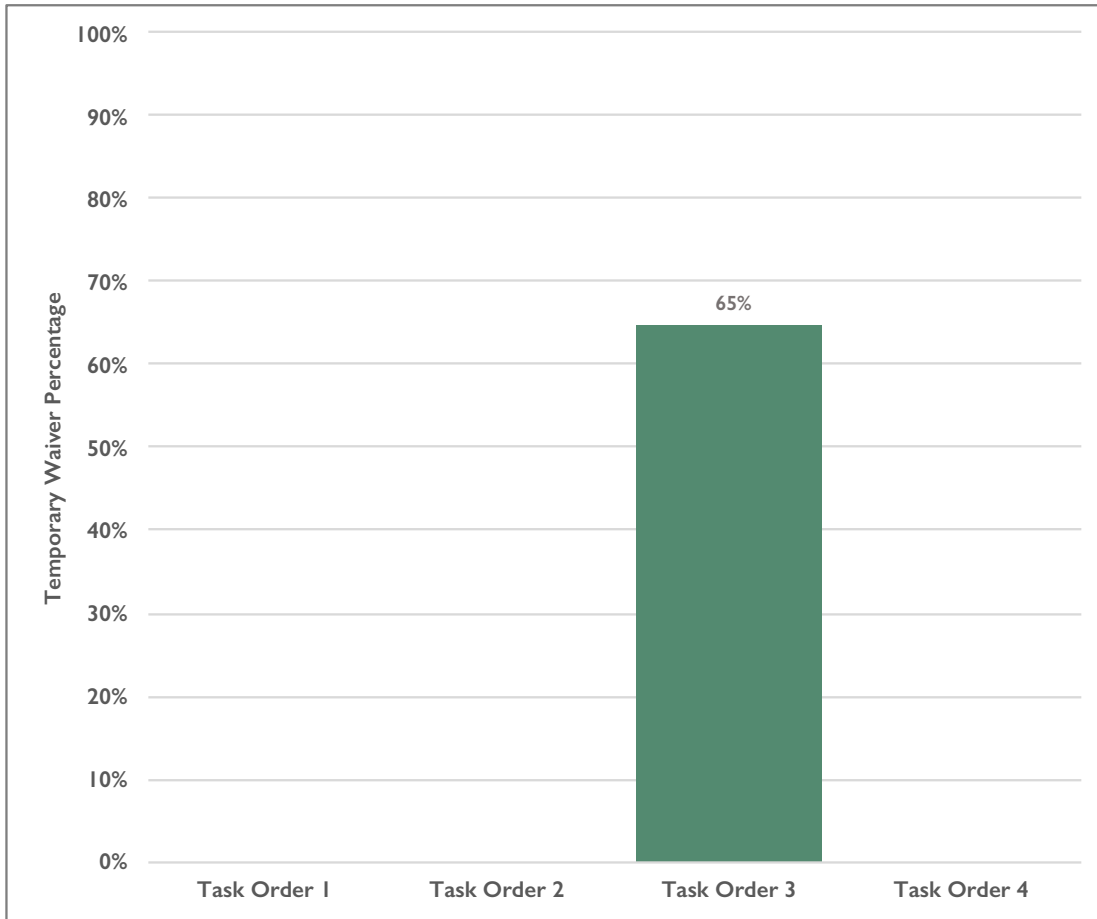
## A7. Percentage of line items imported using a temporary registration waiver (Temporary Waiver Percentage)

### Measure Definition

**Numerator:** Line items imported using a temporary registration waiver during the quarter.

**Denominator:** Total line items delivered during the quarter.

### Indicator Performance



### Data Notes

- ▶ Data for TOs 1, 2, and 4 are not available. GHSC-PSM will continue to work on a systematic method for tracking registration data.
- ▶ The Year to Date figure represents only Q3 and Q4 deliveries for TO3.

### Achievement

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	N/A	N/A
TO2	N/A	N/A	N/A
TO3	N/A	65%	57%
TO4	N/A	N/A	N/A
All TOs	N/A	65%	57%

### Analysis

- ▶ TO3 had a total of 57 line items delivered this quarter, 37 of which were delivered using registration waivers. Data was only available for Qs 3 and 4, which indicated 57% of TO3 products were imported using a waiver.
- ▶ In the case of Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle in Afghanistan, registration is not possible due to lack of a regulatory system in country, however importing this product is possible using a waiver as the product is on the essential drug list.
- ▶ A temporary registration waiver was used in Mozambique for Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle due to country language requirements on the packaging. No alternative quality-assured product was available for sourcing and supply.
- ▶ Combination 3 Aclar (Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle) and Microgynon Alcar (Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle) changed packaging 1.5 years ago. More recently Sayana Press changed its packaging and shelf life information. Both instances required products to be reregistered in many countries resulting in the use of temporary registration waivers.



## A7. Percentage of line items imported using a temporary registration waiver (Temporary Waiver Percentage)

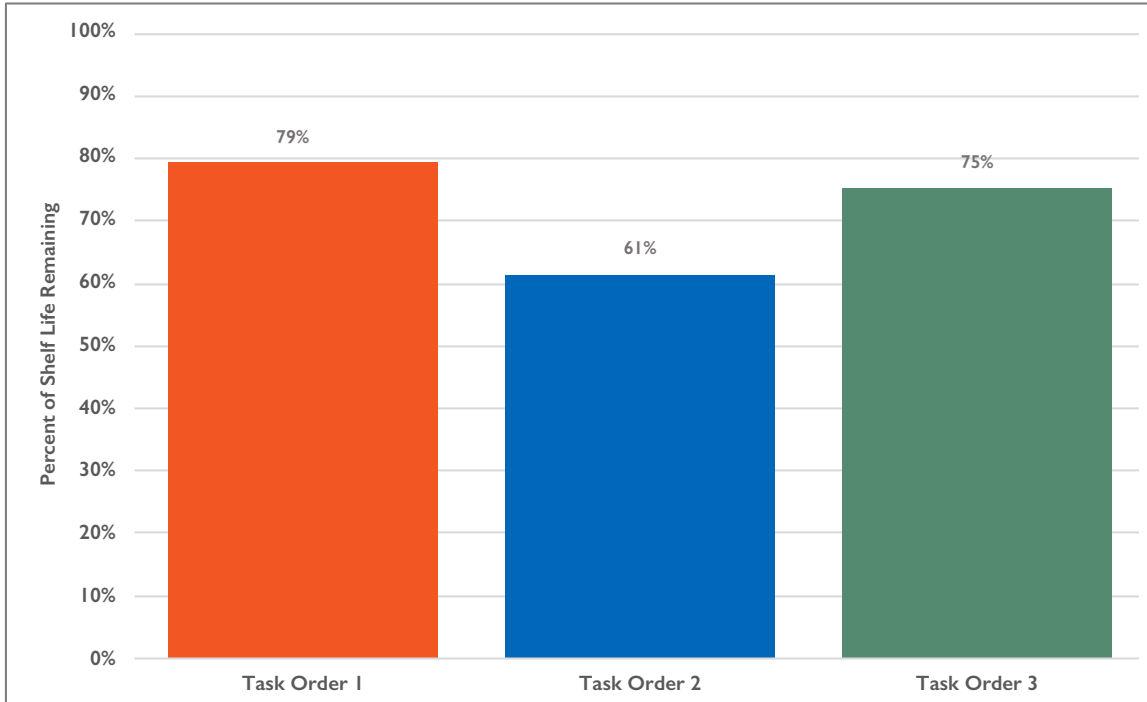
PRH		
Country	Product Requiring Registration	Number of Line Items
Afghanistan	Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle	2
Bangladesh	Levonorgestrel 75mg/Rod, 2 Rod Implant	1
Haiti	Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle	1
	Depot Medroxyprogesterone Acetate 150 mg/mL (1 mL) Vial	1
	Levonorgestrel 75mg/Rod, 2 Rod Implant	2
Malawi	Levonorgestrel 75mg/Rod, 2 Rod Implant	1
Mali	Levonorgestrel 75mg/Rod, 2 Rod Implant	2
	Depot (IM) Medroxyprogesterone Acetate 150 mg/mL (1 mL) Vial	1
Mozambique	Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle	12
	Levonorgestrel 75mg/Rod, 2 Rod Implant	8
	Copper TCu380A Intrauterine Device	1
	Depot Medroxyprogesterone Acetate 104 mg/0.65 mL	1
Pakistan	Depot Medroxyprogesterone Acetate 104 mg/0.65 mL	1
Rwanda	Levonorgestrel 75mg/rod, 2 Rod Implant	1
Senegal	Etonogestrel 68 mg/Rod, 1 Rod Implant	1
Uganda	Levonorgestrel 75mg/Rod, 2 Rod Implant	1

## A8. Average percentage of shelf life remaining for warehoused commodities, weighted by the value of each commodity's stock (Product at Risk Percentage)

### Measure Definition

**Numerator:** Percentage of shelf life remaining, weighted by value of commodities, summed across all products.  
**Denominator:** Total value of commodities, summed across all products, at the end of the quarter.

### Indicator Performance



### Achievement

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	79%	77%
TO2	N/A	61%	65%
TO3	N/A	75%	68%
TO4	N/A	N/A	N/A
All TOs	N/A	78%	74%

### Analysis

- ▶ Average percentage of shelf life remaining for TOs 1 and 2 is in line with shelf life trends reported in previous quarters.
- ▶ Shelf life percentage for TO3 increased this quarter, from 65% in Q3 to 75% in Q4. This was due in large part to the distribution of injectable contraceptives inherited from the previous project, which had reduced shelf life. The stock of this product has been drawn down by 95% since the previous quarter. Inbound replenishment orders of implantable contraceptives and copper-bearing intrauterine devices have also contributed to the shelf life increase.
- ▶ TO2 shelf life is driven down by stock of AL 6x4 that was transferred from the previous project in November 2016, with shelf life remaining between 65% and 78% at the time. GHSC-PSM has managed to rotate this stock according to first expired, first out (FEFO) processes, distributing nearly 80% of it before the end of September. The remaining 6,846 packs have been allocated and will be shipped, which is expected to improve overall shelf life beginning next quarter.

### Data Notes

- ▶ Total value of stock on hand as of September 30, 2017 is as follows: TO1: \$36,457,692; TO2: \$822,921; and TO3: \$7,755,419.
- ▶ TO1 stock on hand includes all condoms. No inventory is kept for TO4.
- ▶ Some expiries for TOs 1 and 2 occurred this quarter. These quantities are excluded from the numerator and denominator of this indicator, as this stock was not available for allocation at the end of the quarter. See indicator C7a (percent of product loss due to expiry) for reporting on these expirations.

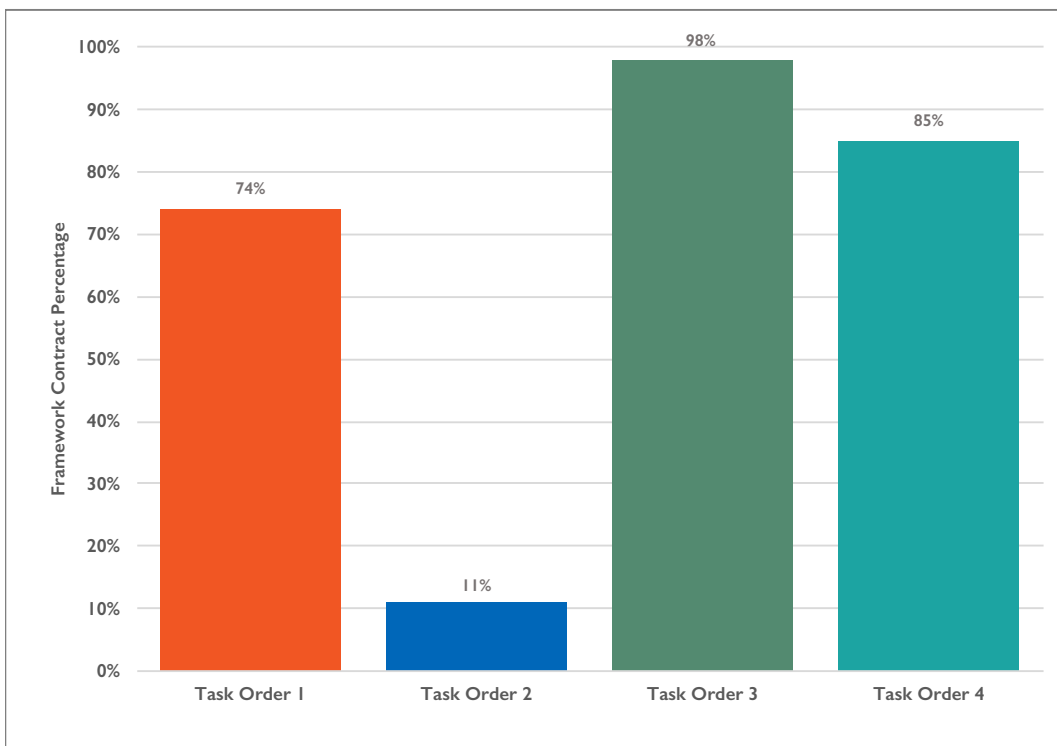
## A10. Percentage of product procured using a framework contract (Framework Contract Percentage)

### Measure Definition

**Numerator:** Value of product purchased through framework contracts during the quarter.

**Denominator:** Total value of commodities purchased during the quarter.

### Indicator Performance



Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date*
TO1	N/A	74%	78%
TO2	N/A	11%	2%
TO3	N/A	98%	98%
TO4	N/A	85%	60%
All TOs	N/A	66%	63%

### Analysis

- ▶ TO1 framework contract percentage dropped slightly from the previous quarter, driven by procurement in non-standard product categories such as laboratory, HIV and other RTKs, other pharma, vehicles, and other equipment. Framework contracting for ARVs, condoms, and VMMC remains close to 100%. The project also increased its use of BOAs for other pharma products (essential medicines), increasing from 0% to 42% framework contracting for these items since last quarter.
- ▶ TO2 framework contract percentage increased this quarter. This is due mainly to replenishment orders destined for the stockpile, which were fulfilled under an IDIQ. A few orders of SP, other pharma, and other non-pharma were also procured under BOAs.
- ▶ TO3 framework contracting has remained consistently high, in line with the sourcing approach. A handful of orders were purchased under one-off contracts, including norethisterone, syringes, and standard days methods for Nigeria.
- ▶ TO4 purchased pharmaceuticals for Haiti and Zambia this quarter, using a BOA. Lab items for Ghana were purchased using a simplified purchase agreement.

### Data Notes

- ▶ Data source for this quarter shifted from a manual tracker to ARTMIS and Emptoris data, with some missing data points filled in manually from procurement files. New procedures have enabled linking of ARTMIS and Emportis data, which is expected to reduce and eventually eliminate manual effort in future quarters.
- ▶ Commodities are considered "purchased" during the quarter if the "PO Released for Fulfillment Date" in ARTMIS is between July 1 and September 30, 2017.
- ▶ Framework contracts include indefinity delivery, indefinite quantity contracts (IDIQs), blanket purchase agreements (BPAs), and basic ordering agreements (BOAs). Non-framework contracts include firm fixed price and fixed unit price subcontracts, simplified purchase agreements, and other types of one-off purchase order.
- ▶ This indicator is calculated for GSC procurements only at this time. Total value of GSC purchase orders released for fulfillment this quarter is as follows: TO1 (including all condoms): \$108,045,578; TO2: \$24,493,170; TO3: \$13,865,498; and TO4: \$382,241. Total value of decentralized procurements this quarter is \$26,299,115.
- ▶ Year to date performance is calculated using exact data reported in previous quarters. This may exclude some procurements that were made in previous quarters but not reported at the time due to the use of manual tracking. A full recalculation of annual performance was not possible in time for this report because of the manual effort necessary to calculate the numerator. However, updated total procurement values (denominators) for the fiscal year can be determined using system reports, and are as follows: TO1 (including all condoms and decentralized procurement): \$501,409,804; TO2: \$139,290,770; TO3: \$30,783,047; and TO4: \$659,075.

## A10. Percentage of product procured using a framework contract (Framework Contract Percentage) - Tracer Product Category

HIV			Malaria			PRH - Method Level		
	Total value of all product procured	Framework contract percentage		Total value of all product procured	Framework contract percentage		Total value of all product procured	Framework contract percentage
Task Order 1	\$108,045,578	74%	Task Order 2	\$24,493,170	11%	Task Order 3	\$13,865,498	96%
Adult ARVs	\$58,045,679	99.7%	ACTs	\$3,413,251	43%	Injectable Contraceptives	\$6,989,970	97%
Pediatric ARVs	\$5,119,273	100%	RDTs	\$2,281,653	0%	Implantable Contraceptives	\$6,763,484	100%
Laboratory	\$19,881,965	0.2%	Sulphadoxine-pyrimethamine	\$550,992	90%	Combined Oral Contraceptives		
Condoms	\$5,752,297	97%	Severe Malaria Medicines	\$87,000	100%	Copper-bearing Intrauterine Devices		
VMMC	\$6,111,677	100%	Other Pharma	\$3,157,648	24%	Emergency Oral Contraceptives		
Other Pharma	\$10,751,787	42%	LLIN	\$14,897,731	0%	Progestin-only Pills		
Food and WASH	\$296,879	100%	All Other Non-pharma	\$104,895	0%	Standard Days Method	\$93,720	0%
HIV RTK	\$1,830	0%				All Other TO3 Products	\$18,324	0%
Other RTK	\$104,845	0%				<b>Maternal and Child Health</b>		
Prefab						Task Order 4	\$382,241	85%
Vehicles and Other Equipment	\$1,090,140	0%				Laboratory	\$57,500	0%
Other Non-pharma	\$889,207	3%				Other Pharma	\$324,741	100%

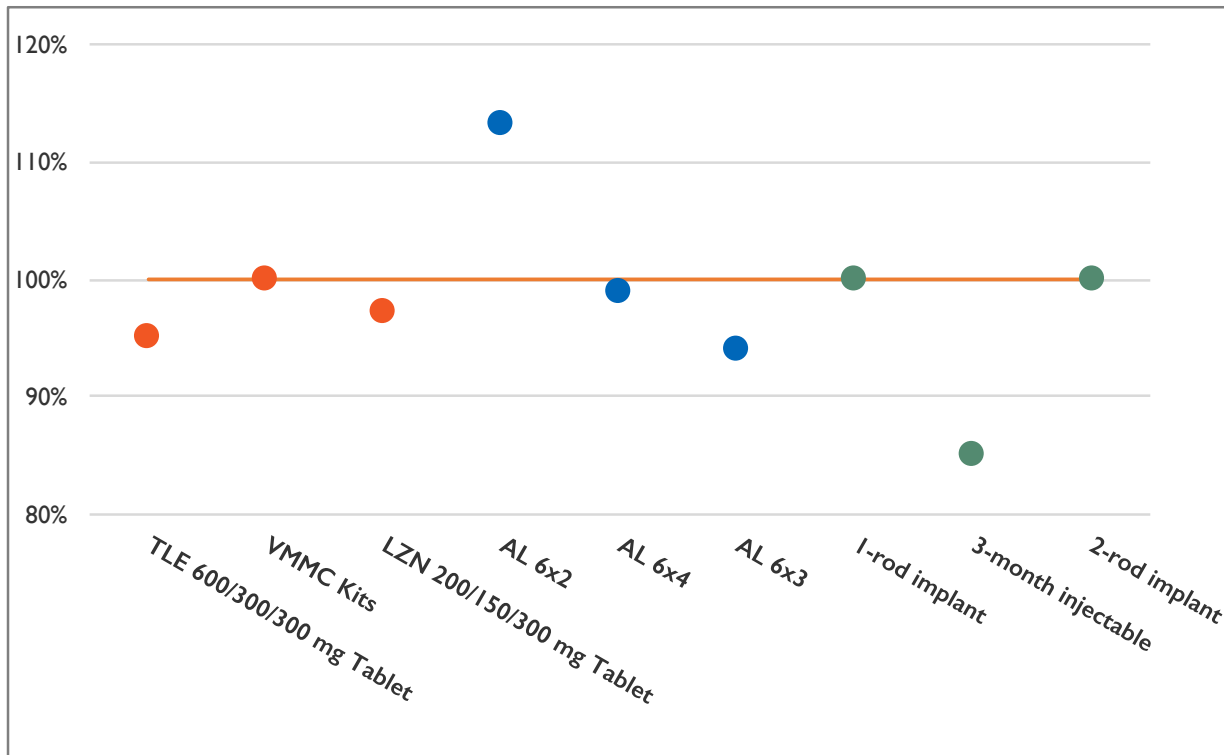
## A12. Percentage price variance between the median unit price paid during the quarter and the median unit price paid over the life of the project

### Measure Definition

**Numerator:** Median price paid per base unit of measure during the quarter.

**Denominator:** Median price paid per base unit of measure over the life of the project.

### Indicator Performance



### Analysis

- ▶ This quarter, GHSC-PSM paid a unit price at or below the life-of-project median price for eight out of nine of the project's most frequently ordered products.
- ▶ Data is presented for the top three most frequently ordered products per TO over the course of the fiscal year.
- ▶ Prices for 1- and 2-rod implants have remained stable since 2013 due to the multi-donor volume guarantee agreements put in place between manufacturers and procurers, such as USAID and UNFPA, who place orders on behalf of a list of eligible developing countries. Prices are expected to remain at this level until at least the end of calendar year 2018, per the terms of the volume guarantee.

### Data Notes

- ▶ Life of project median unit prices are as follows: Efavirenz/Lamivudine/Tenofovir DF 600/300/300 mg Tablet, 30 Tablets, \$7.10. MC Kit, Sterile, Single Use, Forceps Guided Procedure, 1 Kit, \$9.44. Nevirapine/Lamivudine/Zidovudine 200/150/300 mg Tablet, 60 Tablets, \$6.09. Artemether/Lumefantrine 20/120 mg Dispersible Tablet, 30 x 6x2 Blister Pack Tablets, \$22.50. Artemether/Lumefantrine 20/120 mg Tablet, 30 x 6x4 Blister Pack Tablets, \$19.20. Artemether/Lumefantrine 20/120 mg Tablet, 30 x 6x3 Blister Pack Tablets, \$15.94. Etonogestrel 68 mg/rod, 1 Rod Implant, 1 Each, \$8.50. Depot (SC) Medroxyprogesterone Acetate 104 mg/0.65 mL, Pre-Filled Uniject Device, 1 Syringe, \$1.00. Levonorgestrel 75mg/rod, 2 Rod Implant, 1 Each, \$8.50.

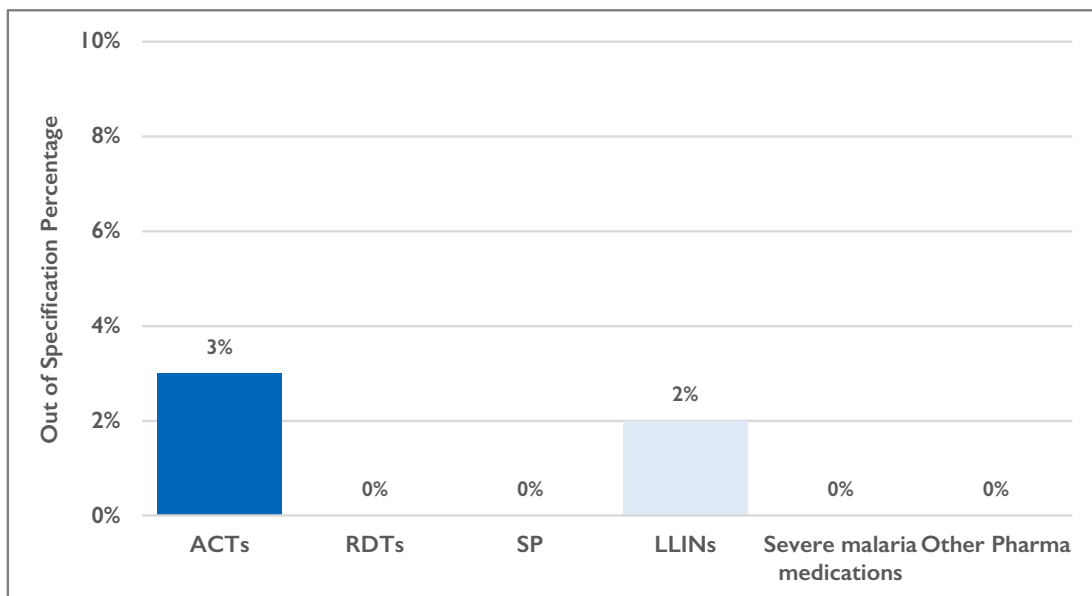
## A13. Percentage of batches of product showing nonconformity (Out of Specification Percentage)

### Measure Definition

**Numerator:** Total number of batches of product showing nonconformity during the quarter.

**Denominator:** Total number of batches tested during the quarter.

### Indicator Performance



### Achievement

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A		
TO2	N/A	2%	>1%
TO3	N/A		
TO4	N/A		
All TOs	N/A	2%	>1%

### Analysis

- ▶ Four batches of ASAQ bound for Burundi and one batch of LLINs for Malawi had a confirmed out of specification finding.
- ▶ Both vendors have agreed to provide replacement batches. The LLINs have already been provided and cleared by QA. The ASAQ will be provided in December 2017.

### Data Notes

- ▶ Total number of batches of malaria products tested this quarter is 296.
- ▶ All QA testing for TO2 is conducted by GHSC-PSM. All testing for TOs 1, 3, and 4 is conducted via the USAID GHSC-QA contract. GHSC-QA may be contacted for out of specification data for these TOs.

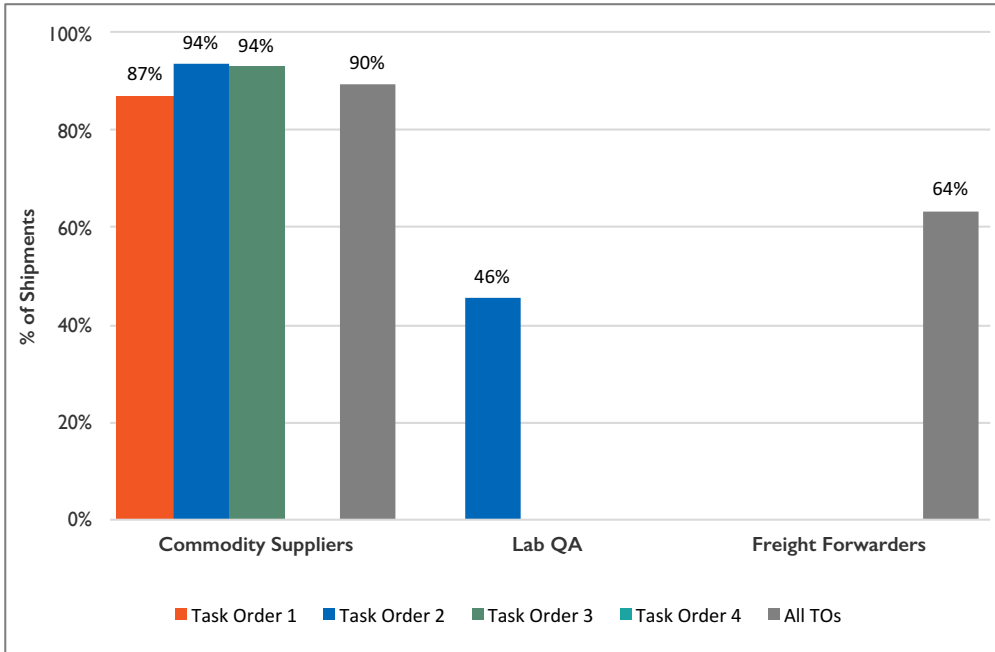
## A14. Average vendor rating score

### Measure Definition

**Numerator:** Sum of all vendor ratings.

**Denominator:** Number of vendors from whom GHSC-PSM procured products/commodities, lab testing services, or freight forwarding during the quarter.

### Indicator Performance



### Data Notes

- ▶ Data for the 3PL and commodity supplier scorecard are calculated on a one-quarter lag, therefore these data are for FY17 Q3 (April to June 2017).
- ▶ Commodity suppliers: TO1 suppliers: 42; TO2 suppliers: 18; and TO3 suppliers: 5
- ▶ Lab QA vendors (all TO2): 2
- ▶ Freight forwarders (no TO disaggregation): 5 3PLs.

### Achievement

Task Order	Annual Target	FY2017 Q4 Comm. Suppliers	FY2017 Q4 Lab QA	FY2017 Q4 Freight Forwarders
TO1	N/A	87%		
TO2	N/A	94%	46%	
TO3	N/A	94%		
TO4	N/A	N/A		
All TOs	N/A	90%	45%	64%

### Analysis

- ▶ **Commodity suppliers:** Overall supplier scores remained the same since last quarter at 90%, with order fulfillment (on time and in full goods availability) remaining constant at 82%. Customer service, a qualitative measure, fell slightly from 81% to 79%, while product quality improved from 98 to 99%, and invoice accuracy improved from 93 to 95%.
- ▶ **Freight forwarders:** The overall score for freight forwarders saw a marginal 1.5% increase to 63.6% from the previous quarter. While there was an overall performance improvement, it was not on par with the project's expectations and had an impact on the project's on time performance. The two KPIs for on time performance are responsiveness and reliability. While Q3 saw improvements in a few areas, there are opportunities to improve our performance in other areas. For example, while the door-to-door reliability of delivered shipments increased from 5 to 50%, it decreased from 89 to 53% for air. There was a 77% increase, quarter to quarter, in the percentage of shipments booked on time. GHSC-PSM continues to conduct monthly and quarterly reviews with all 3PLs where key areas of improvements were identified and corrective actions discussed. These corrective actions have already yielded results and should reflect in next quarter's performance.
- ▶ **QA laboratories:** Poor lab performance was primarily due to delays in receiving test results (Certificate of Analysis (CoA)). Lab A experienced delays primarily due to poor performance and inadequate communication. Lab B experienced delays due to poor planning and human resource issues, which caused a significant backlog and delays in issuance of CoAs. TO2 QA will continue to evaluate the performance of both labs and, if necessary, will implement changes in operations due to poor performance. TO2 QA has informed PMI of these issues and has been proactively working with the labs to resolve these issues.

#### A14. Average Vendor Rating Score - further score breakdowns by component

##### Commodity Suppliers

	Result (Total Score)	Product Quality	Order Fulfillment (On Time In Full)	Invoicing Accuracy	Service
TO1 (n=42)	87%	100%	76%	92%	78%
TO2 (n=18)	94%	94%	96%	100%	81%
TO3 (n=5)	94%	100%	88%	100%	84%
All TOs	90%	98%	82%	95%	79%

##### QA Lab Vendors (TO2 Only)

Criteria	Reliability (Timeliness of Service)	Responsiveness		Completeness (of Documentation)	Cost	Service	Total
Title	Does the lab provide on-time provision of completed test reports?	Does the lab provide prompt response after receipt of GHSC-PSM request for testing?	On-time confirmation of receipt of samples for analysis	Frequency of modification to Certificates of Analysis (CoAs)	Submitted invoices for routine testing adhere to set IDIQ pricing	Qualitative: Adherence to other terms and conditions (not related to reliability, responsiveness, completeness, and cost)	
Weight	43%	10%	10%	18%	15%	5%	100%
Average Score (n=2)	42%	28%	70%	93%	13%	0%	46%

##### 3PL Vendors (n=5)

#	Component	Numerator		Score	Indicator Weight	Component Weight	Weighted Score
I-Reliability (Timeliness of Service)							
1a	Estimated ship date versus actual ship date (within 3 days)	Number of shipments during the reporting period for which the actual ship date was within 3 calendar days of the estimated ship date.	Number of shipments during the reporting period	73%	20%	50%	30%
		362	493				
1b	Port-to-door ship time reliability (Percentage of shipments that arrive within the required lead time for port-to-door shipping based on shipping lane and channel) (Disaggregated by ocean and air)	Number of shipments delivered during the reporting period which arrived within the approved window of the required lead time for the shipping lane per the GHSC-PSM lead time table	Number of shipments delivered during the reporting period				
		OCEAN (+7/-12 calendar days window)	57	114	50%		
		AIR (+3/-10 calendar days window)	224	424	53%	15%	



3PL Vendors (n=5)							
#	Component	Numerator		Score	Indicator Weight	Component Weight	Weighted Score
2-Responsiveness							
2a	Percentage of shipments for which booking to waiver initiation cycle time was within 4 business days (waiver shipments only)	Number of waiver shipments during the reporting period for which the booking date to waiver initiate date period was less than or equal to 4 business days	Number of waiver shipments during the reporting period	23%	10%	20%	11%
		151	669				
2c	Percentage of shipments for which booking was confirmed on time (within 2 business days)	Number of shipments booked during the reporting period for which booking was confirmed by the 3PL within 2 business days	Number of shipments booked during the reporting period	85%	10%		
		568	669				
3-Quality of Shipment							
3a	Percentage of shipments delivered without OSD (overages, shortages, or damages) (Cargo Integrity) (When investigation finds 3PL at fault) (Measure at end of investigation) historical	Number of shipments delivered without OSD	Number of shipments delivered during the reporting period	99%	10%	10%	10%
		528	531				
4-Invoice Accuracy							
4a	Invoice accuracy compared to contract price	Number of invoices received during the reporting period which had no (cost) rating errors	Number of invoices received during the reporting period	70%	10%	10%	7%
		432	613				
5-Compliance							
5a	Percentage of NCRs (non-conformance reports) adequately resolved within allotted timeframe (no NCRs = 100%)	Number of NCRs received for which an adequate response occurred within the allotted timeframe	Number of NCRs received	57%	10%	10%	6%
		4	7				
Total Score						63.6%	

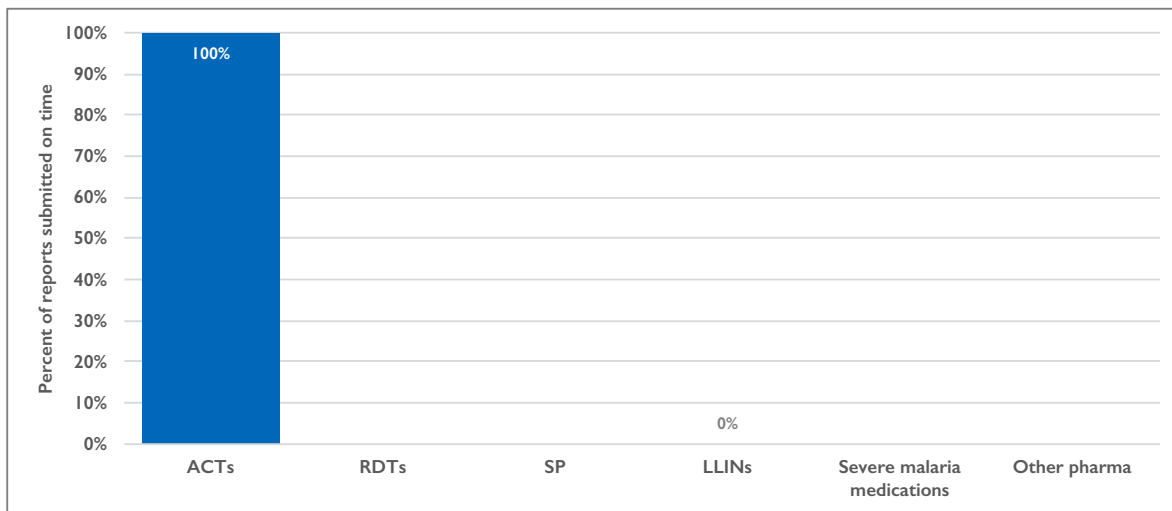
## A15. Percentage of QA investigation reports submitted within 30 days of outcome determination (QA investigation report submission)

### Measure Definition

**Numerator:** Total number of QA investigation reports submitted to PMI within 30 days of outcome determination.

**Denominator:** Total number of QA investigation reports due during the quarter.

### Indicator Performance



Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A		
TO2	N/A	67%	75%
TO3	N/A		
TO4	N/A		
All TOs	N/A	67%	75%

### Analysis

- ▶ Reports on ACT QA investigations were submitted to PMI on time. The Out of Specification report for Malawi LLINs is still pending and will be submitted in the first quarter of FY18.

### Data Notes

- ▶ Total number of reports due this quarter is three (2 for ACTs, one for LLINs). Given the small number of reports due each quarter, GHSC-PSM will report this indicator semi-annually starting in FY18, as agreed with PMI.
- ▶ All QA activities for TO2 are conducted by GHSC-PSM. All QA for TOs 1, 3, and 4 is managed by the USAID GHSC-QA contract. GHSC-QA may be contacted for data related to these TOs.

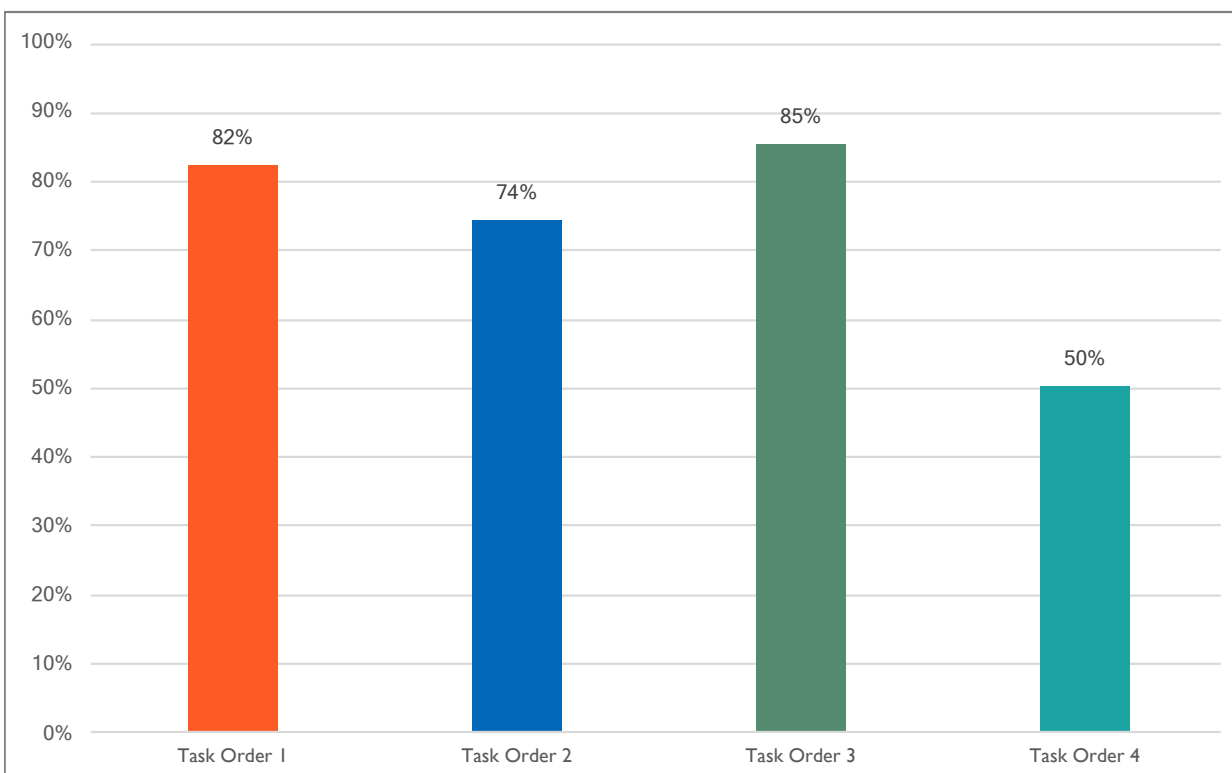
## B5. Percentage of countries conducting annual forecasts

### Measure Definition

**Numerator:** Number of all GHSC-PSM-supported countries that conducted annual forecasts.

**Denominator:** Total number of GHSC-PSM-supported countries.

### Indicator Performance



Task Order	Achievement	
	Annual Target	FY2017
TO1	N/A	82%
TO2	N/A	74%
TO3	N/A	85%
TO4	N/A	50%
All TOs	N/A	75%

### Analysis

- ▶ GHSC-PSM supported countries reported that 75% of annual forecasts were conducted in FY17. This ranged from 85% for TO3 to 50% for TO4.
- ▶ Countries reporting that no annual forecast was conducted in FY17 include:
  - TO1: Ghana, Lesotho, and Malawi
  - TO2: Ghana, Liberia, Madagascar, and Rwanda
  - TO3: Madagascar and Uganda
  - TO4: Ghana, Liberia, Madagascar, and Nigeria

### Data Notes

- ▶ The denominator is based on the number of countries in a particular TO where supply plans are expected to be updated, and therefore we would expect to have visibility into whether or not an annual forecast was conducted (TO1: 17; TO2: 19; TO3: 13; and TO4: 8). This includes countries that have not started reporting regular M&E data but are regularly procuring commodities (Botswana, Burma, Cambodia, Guinea, RDMA [Laos, Thailand], and South Sudan).
- ▶ The FASP technical working group is conducting a supply plan expectation exercise to further clarify what countries are expected to submit supply plans to GHSC-PSM for particular commodities, and therefore where we expect to have visibility into annual forecasts. This exercise is expected to be completed in Q1 of FY18 and may result in a change to the denominator in subsequent fiscal years.

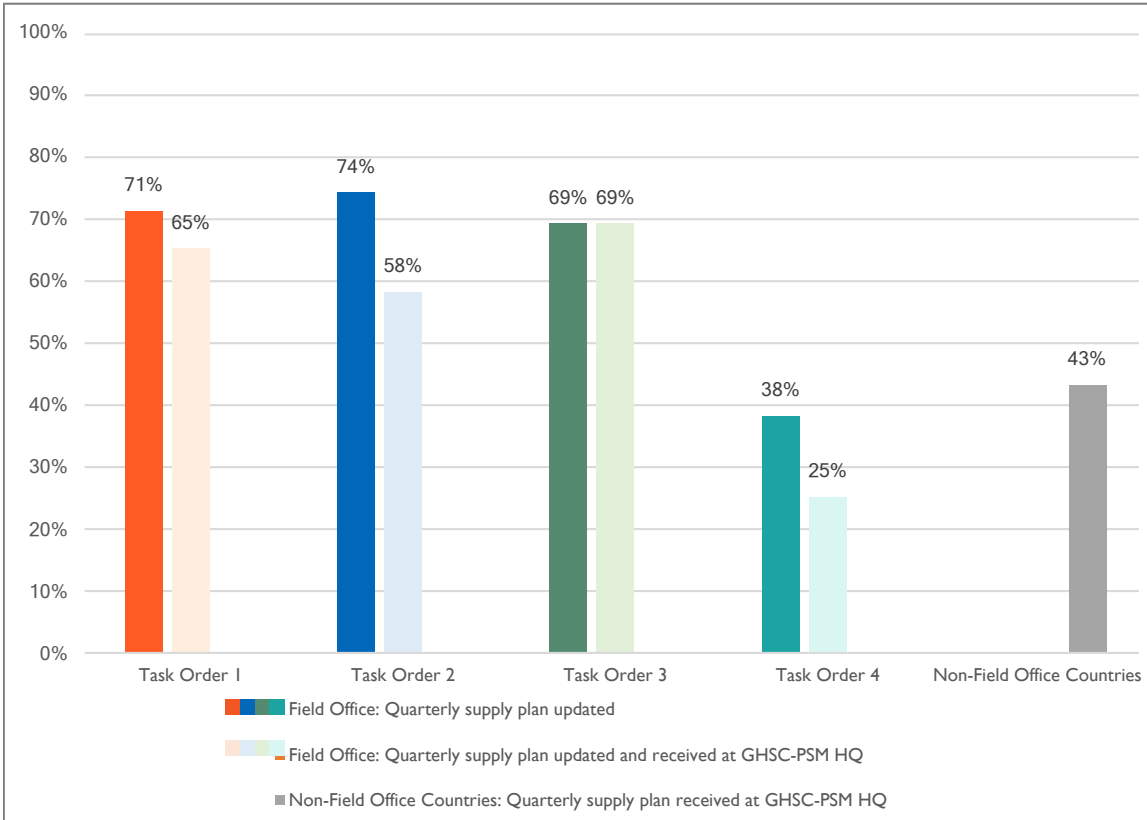
## B6. Percentage of countries conducting quarterly supply plan updates

### Measure Definition

**Numerator:** Number of all GHSC-PSM-supported countries that conducted supply plan updates in each quarter.

**Denominator:** Total number of GHSC-PSM-supported countries.

### Indicator Performance



### Achievement

Task Order	Annual Target	FY2017 Q4	Year to Date
TO1	N/A	71%	74%
TO2	N/A	74%	63%
TO3	N/A	69%	75%
TO4	N/A	38%	36%
NFO*	N/A	43%	50%
All TOs**	N/A	67%	65%

\*Percentage of countries that submitted supply plan updates to GHSC-PSM

\*\*Does not include NFO countries

### Analysis

- ▶ In Q4, 67% of required supply plans were updated, ranging from 74% for TO2 to 38% for TO4. In FY17, 65% of all required supply plans were updated.
- ▶ Countries not having updated supply plans per TO for this quarter include:  
 TO1: Botswana, Cameroon, Lesotho, Malawi, and South Sudan  
 TO2: Ethiopia, Liberia, Madagascar, RDMA, and South Sudan  
 TO3: Liberia, Madagascar, Nigeria, and Uganda  
 TO4: Ghana, Haiti, Liberia, Nigeria, and Zambia
- ▶ Fifty-six percent of required supply plans were submitted to GHSC-PSM, including three of the seven Direct Partner Support countries.
- ▶ While no updating was done for TO1, South Sudan noted that supply plan update discussions were initiated for TO2 in Q4. However due to a leadership gap at the National Malaria Control Program, they were not finalized.
- ▶ In Cameroon, a supply plan update was planned for July, however it was postponed until October. A supply plan update is expected in the following quarter.
- ▶ In Uganda, GHSC-PSM is working with the quantification unit in order to start using the pipeline software and to develop quarterly supply plans for TO3.
- ▶ The FASP technical working group is conducting a supply plan expectation exercise to further clarify what countries are expected to submit supply plans to GHSC-PSM for particular commodities. This exercise is expected to be completed in Q1 of FY18 and may result in a change to the denominator in subsequent quarters.

### Data Notes

- ▶ The denominator for supply plan updates is based on the number of countries in a particular TO where supply plans are expected to be updated and shared to GHSC-PSM HQ as of FY17 Q4 (TO1: 17; TO2: 19; TO3: 13; and TO4: 8). This includes countries that have not started reporting regular M&E data but are regularly procuring commodities (Botswana, Burma, Cambodia, Guinea, RDMA [Laos, Thailand], and South Sudan). Namibia has received USAID approval to be excluded from this indicator.
- ▶ Non-Field Office (NFO) countries are countries that order commodities where the USAID mission has not bought into the GHSC-PSM single award, or countries that have bought into the single award but have limited commodity funding, field presence, and staff (NFO: 6). The denominator for NFO countries for this indicator does not include countries where GHSC-PSM has facilitated a one-off procurement or where procurement is not sufficient to warrant a supply plan.

## CI. Number of innovations that were developed, implemented, or introduced and are related to health commodity market or supply chain best practices

### Measure Definition

An innovation refers to new technologies, new products, new approaches, and/or operational research studies developed, implemented, or introduced during the period of reporting.

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	4	6
TO2	N/A	1	4
TO3	N/A	2	3
TO4	N/A	N/A	N/A
Cross-Cutting	N/A	5	8
All TOs	N/A	12	21

Description of Innovation		
Country	Type of Innovation	Brief Description
<b>TO1</b>		
Ethiopia	Operations Research	GHSC-PSM Ethiopia implemented multiple interventions and conducted four rounds of assessments over 10 months in 457 health facilities in 20 high-yield “hot spot” priority towns to improve the RTK supply chain performance, ensure RTK availability, and avoid RTK stockouts. GHSC-PSM worked with the ministry and regional health bureaus to (1) improve RTK allocation to regions and health facilities, (2) support selected regions to develop an operating manual for management of HIV RTK, (3) customize reporting and requisition forms, (4) initiate the use of new SOP and requisition forms, (5) implement an incident reporting system, (6) provide distribution support for RTKs, (7) facilitate the redistribution of RTKs, (8) track Stock on Hand using IVR (Interactive Voice Response) mobile technology, (9) provide supportive supervision on RTK utilization, (10) improve facilities’ internal RTK management, and (11) conduct consultative workshops on RTK management. The project supported health bureaus in identifying major reasons for discrepancies between the RTK utilization/tested vs distributed.
Guyana	New Technology	GHSC-PSM Guyana implemented a transport and distribution initiative to support the last mile distribution of health commodities, particularly in hard to reach areas of Guyana. This involved the application of GIS technology to map the location of health facilities in Guyana and to determine the best possible routing by road, air, or water to reach these facilities. Eighty-five percent of health facilities have now been located with the objective to utilize this information as part of an outsourcing exercise to be initiated in FY18.
Zambia	New Approach	GHSC-PSM Zambia successfully integrated Logistics System (LS) training curriculum at two levels-the Training of Trainers (TOT) and LS end users. For TOT, the curriculum for essential medicines, ARV, and HIV test kit logistics systems were integrated, reducing the number of days of training from 30 to 10 days. Additionally, trained staff are now able to train in all three systems, which has reduced training costs. The integration of the three systems for end users has reduced the number of days a provider needs to be absent from a facility, which causes an interruption of service delivery.

Description of Innovation		
Country	Type of Innovation	Brief Description
Zambia	Operations Research	GHSC-PSM Zambia conducted a pre-service Supply Chain Management (SCM) impact assessment in biomedical sciences institutions and public health facilities. The overall goal of the assessment was to provide a basis for any further intervention to improve the SCM pre-service program in vocational institutions. One major finding concluded that SCM was not institutionalized or incorporated into biomedical sciences schools' diploma curriculum. In response, GHSC-PSM held a stakeholders meeting to address the findings and recommendations of the assessment report. SCM now has been incorporated into the curriculum of the diploma program and has become an examinable component for both the Degree and Diploma programs in biomedical science institutions in Zambia.
<b>TO2</b>		
Burkina Faso	New Approach	GHSC-PSM Burkina, in collaboration with the MOH, introduced a competition awarding a prize to the top three performing health districts in term of malaria commodity logistics management based on (1) stockout rates at SDPs, (2) stockout rates at the district pharmacy, (3) SDP and district pharmacy reporting rate to the LMIS/ENDOS, and (4) percent of product lost due to theft, damage, or expiry. GHSC-PSM Burkina used this new initiative to create competition among the districts to improve malaria commodity management throughout the supply chain.
<b>TO3</b>		
Pakistan	New Technology	In Q4, GHSC-PSM Pakistan's MIS team disseminated Release 3 of the Vaccine Logistics Malmanagement Information System (vLMIS) and Contraceptive Logistics Malmanagement Information System (cLMIS). This release incorporated the updates/enhancement for public sector users working in the supply chain at various levels. The main highlights include (1) a District Stock Sufficiency Dashboard, which aims to review FP commodity sufficiency at district and SDP levels, (2) a Stock Out Analysis Reports, which allow for the analysis of stock status information at the sub-district, province, and SDP level by provincial decision makers, (3) an M&E Dashboard, which captures consumption trends, months of stock, yearly consumption, and stock availability analysis at a district or health facility level, (4) the ease of use and navigation features, (5) an inventory management module, and (6) a cold chain equipment management module.
Pakistan	Operations Research	Upon request by the Pakistan Professional Wing (PPW) and the Ministry of National Health Services, Regulation and Coordination (MoNHSR&C), GHSC-PSM undertook a situation analysis of the local manufacturing of contraceptives in Pakistan. Based on the data provided by the PPW and data extracted from cLMIS, GHSC-PSM analyzed the data and generated a projection of demand (including method mix) until 2030 for public, private, and commercial sectors, keeping in view Pakistan's FP2020 commitments, National Health Vision-2025, and SDG-3 targets.
<b>Cross-Cutting</b>		
Ethiopia	New Approach	In Q4, GHSC-PSM in Ethiopia took a new approach to capacity building through targeted efforts to support the health supply chain in the country's emerging regions. These emerging regions are characterized by harsh weather conditions, remoteness, and limited infrastructure. In addition to a shortage of skilled health supply chain professionals, high staff turnover, poor motivation, and poor performance negatively affected the services of health facilities in these states. Based on a request from the Federal MOH, GHSC-PSM developed a contextualized curriculum for training health professionals in Benishnagul-Gumuz and Afar. The curriculum included skills-based training for good dispensing practices, pharmaceutical management, and the use of essential logistics data for supply chain decisions. Strengthening capacity in these regions will help improve the overall health coverage in the country by addressing priority health problems in these areas.

Description of Innovation		
Country	Type of Innovation	Brief Description
Ethiopia	Operations Research	<p>Several assessments at SDPs revealed poor utilization of standard treatment guidelines, which not only affects treatment outcomes but also supply chain efficiency. GHSC-PSM provided orientation training to 186 professionals from 67 selected hospitals. Twenty-two hospitals conducted an ABC/VEN analysis, a method used to classify items according to their costs relative to public health value, while 15 hospitals assessed their drug use practice using a WHO indicator-based study and drug-use evaluation approach. The indicator-based studies showed that antibiotic use is much higher than the 20-30% maximum threshold of WHO in some facilities (50% of prescriptions included antibiotics), while in other facilities, an examination of antimalaria medicines and drugs for opportunistic infections indicated that medicine use was not following the national guidelines. Further intervention by the facilities is needed.</p> <p>The study also looked at the extent to which pharmaceutical budgets properly addressed priority medicines. The results of the ABC analysis (80/20 rule) showed that some of pharmaceutical budgets should be revisited, as products appeared to be overused and costly. For instance, in some hospitals the largest budget item was examination gloves, which merits further investigation.</p> <p>Subsequent to these studies, health facilities implemented interventions aimed at improving prescribing practices for antimicrobials as per the national treatment protocols and identified the top cost drivers of their medicine budget. This operations research study demonstrated that drug use studies in resource-limited settings is possible and have the potential to provide tremendous data to inform decision making.</p>
Mozambique	New Technology	<p>GHSC-PSM in Mozambique supported the central medical stores with a country-wide scale up implementation strategy for the tablet-based OpenLMIS system that will not only provide visibility into logistics data, but will also help manage drugs at the health facility. GHSC-PSM in Mozambique ensured funds for expansion to 124 new health facilities across four provinces in the next year. Implementation included training of end users on the use of the system. Visibility of data at the higher level through web portal reports and interoperability with existing systems gives a more comprehensive understanding of the supply chain, thus helping to close the gap on data visibility.</p>
Mozambique	New Approach	<p>GHSC-PSM in Mozambique actively collaborated with Project Last Mile (PLM) to strengthen the communication with the Central Medical Store and provide access to strategic logistic information, both of which were needed to implement transport and route optimization in the Tete, Gaza, and Inhambane provinces. In addition, GHSC-PSM started working on a possible contractual mechanism with PLM and initiated planning for a route optimization activity to be implemented in the second quarter of FY18 in the provinces of Nampula and Sofala.</p>
Mozambique	New Approach	<p>In the context of the National Pharmaceutical Logistics Strategic Plan (PELF) implementation and innovative reforms, GHSC-PSM in Mozambique initiated the planning for and coordination of the procurement and installation of three pre-engineered modular storage facilities to be used as intermediate warehouses. GHSC-PSM and USAID worked jointly to find contractual mechanisms, develop a timeline, and define the scope of work with minimum requirement and technical specification.</p>

## C2. Number of people trained by supply chain functional area and sex

### Measure Definition

**Number of people trained.** “People trained” refers to any type of participant, student, or learner in a training event, regardless of its duration. People trained may refer to different categories of participants (e.g., physicians, nurses, social workers).

### Indicator Performance

C2. Number of people trained		Central	Sub-National Level I	SDP
<b>HIV</b>	<b>Task Order 1</b>			
	Forecasting and Supply Planning	6	20	14
	Procurement		70	
	Quality Assurance			272
	Warehousing and Inventory Management	61	53	141
	Transportation and Distribution			
	MIS	4	145	33
	Governance and Financing			
	Human Resources and Capacity Development		219	
	Monitoring and Evaluation	2		
Strategy and Planning	6	10		
<b>Malaria</b>	<b>Task Order 2</b>			
	Forecasting and Supply Planning	12		
	Procurement			
	Quality Assurance			
	Warehousing and Inventory Management		26	
	Transportation and Distribution		148	
	MIS		119	
	Governance and Financing			
	Human Resources and Capacity Development			
	Monitoring and Evaluation			
Strategy and Planning				
<b>PRH</b>	<b>Task Order 3</b>			
	Forecasting and Supply Planning			
	Procurement		14	
	Quality Assurance			
	Warehousing and Inventory Management			
	Transportation and Distribution			
	MIS			
	Governance and Financing			
	Human Resources and Capacity Development			
	Monitoring and Evaluation			
Strategy and Planning				

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	1,056	2,197
TO2	N/A	305	885
TO3	N/A	14	14
TO4	N/A	N/A	N/A
Multiple TOs	N/A	6,253	10,802
All TOs	N/A	7,628	13,898

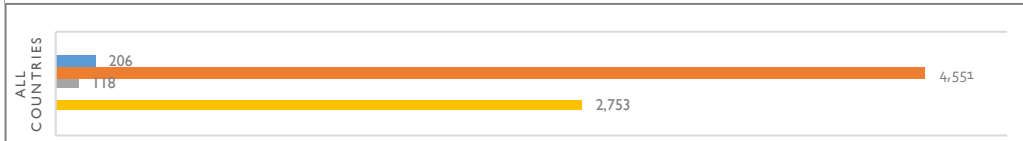
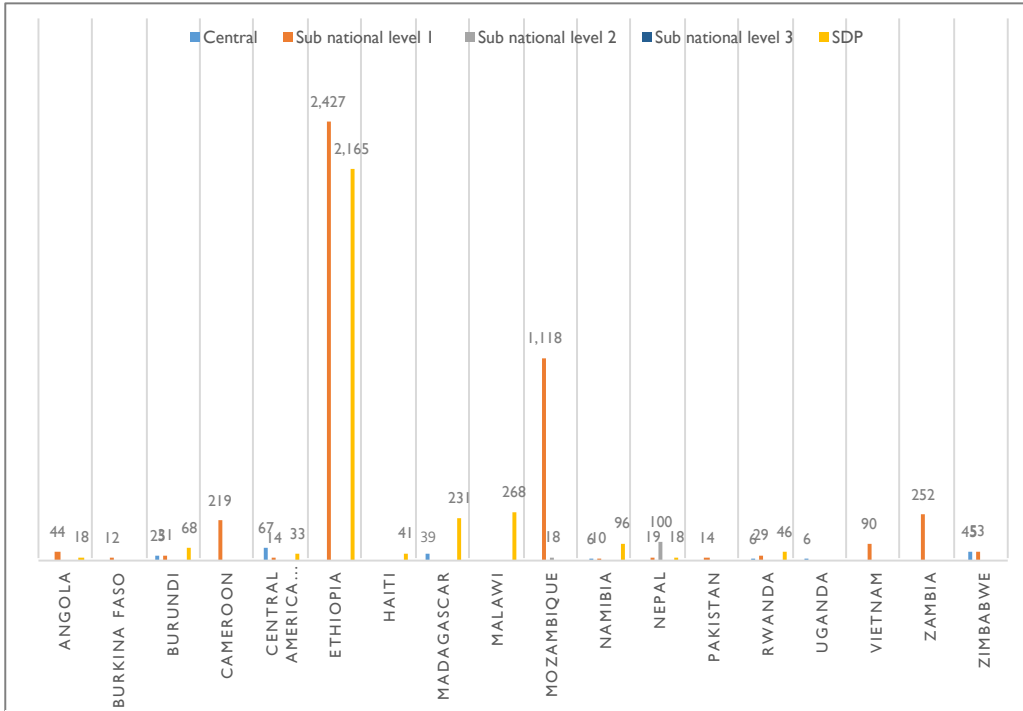
C2. Number of people trained		Central	Sub-National Level I	Sub-National Level 2	SDP
<b>MCH</b>	<b>Task Order 4</b>				
	Forecasting and Supply Planning				
	Procurement				
	Quality Assurance				
	Warehousing and Inventory Management				
	Transportation and Distribution				
	MIS				
	Governance and Financing				
	Human Resources and Capacity Development				
	Monitoring and Evaluation				
Strategy and Planning					
<b>Multiple TOs</b>	<b>Multiple</b>				
	Forecasting and Supply Planning	19			386
	Procurement		14	69	10
	Quality Assurance	6	29		257
	Warehousing and Inventory Management	65	1879	49	483
	Transportation and Distribution		57		
	MIS		427		114
	Governance and Financing		138		905
	Human Resources and Capacity Development		468		138
	Monitoring and Evaluation	25	715		
Strategy and Planning					

### Data Notes

- ▶ The number of participants in trainings that were TO-specific are presented in the TO boxes, while trainings that covered multiple TOs are presented as such.
- ▶ To demonstrate the number of people trained by funding source, participants in trainings that covered multiple TOs were divided according to the TO funding split in each country. Those participants were added to the TO-specific participants to determine the number of people trained by funding source. These data are presented on the following page.

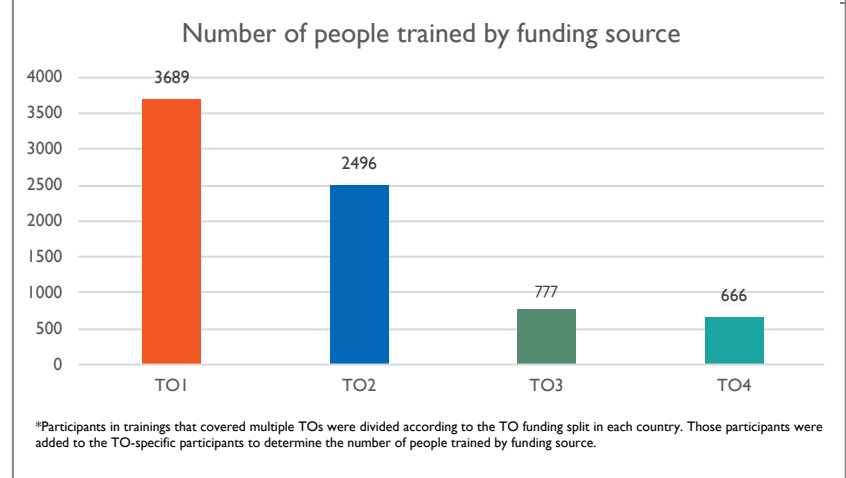


## C2. Number of People Trained by Task Order, Country, Sex, and Funding Source



### Analysis

- ▶ FY17 Q4 had the most number of individuals trained in a quarter to date, with a total of 7,628 (4,548 men and 1,705 women).
- ▶ Most trainings were cross-cutting (6,253), meaning that topics covering multiple TOs were addressed. When examining trainings by funding source, 3,689 individuals were trained using TO1 funding; 2,496 with TO2 funding; 777 with TO3 funding; and 666 with TO4 funding.
- ▶ A little more than 1/3 of the trainings were on Warehousing and Inventory Management, while about 14% of the trainings covered Governance and Finance; 11% covered Human Resources Capacity Development; 11% covered MIS; 10% covered M&E; 7% covered QA; 6% covered Forecasting and Supply Planning; 3% covered Transportation and Distribution; and 0.2% covered Strategy and Planning.
- ▶ Ethiopia alone trained 4,592 people (3,491 men and 1,101 women) covering a range of topics including the fundamentals of logistics management, the proper management of laboratory reagents, health supply chain management M&E skills, good dispensing practices, and management of pharmaceuticals, as well as the use of essential logistics data for supply chain decisions.
- ▶ An additional 1,136 people (649 men and 487 women) were trained in Mozambique in 36 different trainings at both the provincial and district levels.



\*Participants in trainings that covered multiple TOs were divided according to the TO funding split in each country. Those participants were added to the TO-specific participants to determine the number of people trained by funding source.

## C7a. Percentage of product lost due to expiry while under GHSC-PSM control (Product Loss Percentage)

### Measure Definition

**Numerator:** Total value of product lost due to expiry during the quarter.

**Denominator:** Average inventory balance (in USD) during the quarter.

### Indicator Performance

Task Order	Country	Supply Chain Level	Site of Loss	Total Value of Loss (USD)	Loss Denominator (USD)	Loss Percentage
TO1 - HIV/AIDS	RDC	Global	Storage	755	33,787,798	0.002%
TO1 - HIV/AIDS	Haiti	Central	Storage	46,680	11,608,773	0.40%
TO1 - HIV/AIDS	Nigeria	Central	Storage	69,881	59,953,598	0.12%
TO1 - HIV/AIDS	Vietnam	Central	Storage	40	5,124,786	0.001%
TO2 - Malaria	RDC	Global	Storage	327,000	1,149,921	28%

#### Analysis

- ▶ TO1 expiries at the RDCs were limited to small quantities of adult and pediatric ARVs (\$405 and \$350, respectively).
- ▶ In September 2016, the project inherited stock of artemether-lumefantrine 6x3 with only 47% of shelf life remaining. Despite multiple attempts to offer this stock to several countries, demand was negligible, resulting in wastage of this product. TO2 inventory is kept as an emergency stockpile with relatively low stock levels, resulting in the large loss percentage.
- ▶ Haiti recorded additional TO1 expiries this quarter, a continuing legacy of Ministry of Health policy changes that is expected to continue. Nigeria and Vietnam also reported small percentages of expiries compared to overall stock levels.

#### Data Notes

- ▶ Losses are reported during the quarter that the loss value was determined, which may be later than the period when the loss occurred.
- ▶ There were no losses due to expiry for products under GHSC-PSM control for Task Orders 3 and 4 this quarter.

## C7b. Percentage of product lost due to theft, damage, and other causes while under GHSC-PSM control (Product Loss Percentage)

### Measure Definition

**Numerator:** Total value of product lost due to theft, damage, and other causes during the quarter.

**Denominator for losses in storage:** Average inventory balance (in USD) during the quarter.

**Denominator for losses in transit:** Total value (in USD) of product delivered during the quarter.

### Indicator Performance

Task Order	Country	Supply Chain Level	Site of Loss	Type of Loss	Total Value of Loss (USD)	Loss Denominator (USD)	Loss Percentage
TOI - HIV/AIDS	Nigeria	Global	Transit	Damage	448	8,850,350	0.005%
TOI - HIV/AIDS	Kenya RDC	Global	Transit	Damage	32	2,307,904	0.001%
TOI - HIV/AIDS	Kenya RDC	Global	Transit	Damage	22	7,948,700	0.000%
TOI - HIV/AIDS	Haiti	Global	Transit	Other (Missing product)	403	3,001,228	0.013%
TOI - HIV/AIDS	Nigeria	SDP	Transit	Other (Missing product)	20	87,415,210	0.00002%
TOI - HIV/AIDS	Haiti	Central	Storage	Damage	84,884	11,608,773	0.7%

### Analysis

- ▶ The majority of losses in the Global Supply Chain this quarter were small damages during transit to customers and regional distribution centers.
- ▶ Incident investigations related to a delivery of EID products that arrived wet to Nigeria and a missing pallet of ARVs destined for Haiti have resulted in claims with the relevant insurance and freight forwarders, as well as corrective actions to tighten internal procedures for incident reporting, product receiving, and order reviews.
- ▶ Nigeria reported a small shortfall of cotrimoxizole on a delivery to a SDP in Ogun state.
- ▶ Haiti reported small damage incident (under \$30), as well as a larger cold chain incident at the central warehouse that resulted in the loss of several cold chain items. Repairs to the cold room have been completed and additional equipment will be purchased and installed. GHSC-PSM has also reviewed protocols for overnight incidents with the warehouse security provider.

### Data Notes

- ▶ Losses are reported during the quarter that the loss value was determined, which may be later than the period when the loss occurred.
- ▶ No losses due to theft, damage, or other causes were reported for products under GHSC-PSM control for Task Orders 2, 3, or 4 this quarter.

## C8. Number of global advocacy engagements in support of improved availability of essential health commodities

### Measure Definition

Number of global advocacy engagements. This measures the number of engagements of any kind at the global level that involve improved availability of essential health commodities.

Task Order	Annual Target	Achievement	
		FY2017 Q3-Q4	Year to Date
TO1	N/A	4	11
TO2	N/A	3	5
TO3	N/A	6	10
TO4	N/A	6	6
Cross-cutting	N/A	13	22
All TOs	N/A	32	54

Description of Advocacy Engagement	
Name of Engagement	Brief Description
<b>Task Order I - HIV</b>	
Participation in ARV Procurement Working Group	The ARV Procurement Working Group brings together global partners involved in the procurement of ARVs in limited supply, limited demand, or affected by a guidelines transition. GHSC-PSM provides market insights on the relevant products and participates in the discussion by helping to develop approaches that ensure these products do not stock out at the country level. In the case of products in short supply, GHSC-PSM works with other members of the group to develop a protocol and recommendations for how countries should approach procurement. For example when LPV/r sprinkles, a pediatric formulation, was in short supply, guidance was provided to the field.
Participation in USAID VMMC Technical Working Group	Participation by Mary Lyn Nguer, GHSC-PSM TOI Director, and William Bayer, GHSC-PSM VMMC Manager.
Participation in the Steering Committee of Medicines for All initiative (M4All)	On July 25, two representatives from GHSC-PSM (market dynamics and process chemistry) participated at the first Steering Committee meeting for M4All in Richmond, Virginia. GHSC-PSM provided expertise in chemistry manufacturing, as well as knowledge of market trends and analyses for ARVs. GHSC-PSM's participation supports decision making around which molecules the lab at Virginia Commonwealth University should focus on for improving the manufacturing process. Once developed, these processes will be shared with manufacturers globally.
PPMR-HIV	PPMR for HIV (PPMR-HIV) is a commodity stock database that reports and analyzes stock-level data from the central and district/regional medical stores in participating countries. Working with local and global partners, the data provided by participating countries are used to monitor stock levels in order to identify and prevent potential stockouts and overstocks of key commodities as well as to help plan future procurement and shipments. Currently the PPMR-HIV includes first and second-line ARVs (adult and pediatric) and HIV RTKs with the potential to expand to other commodities in the future. The PPMR-HIV is a partnership of PEPFAR, GHSC-BI&A, and the GHSC-PSM projects. PPMR-HIV is currently being piloted in Ghana, Cameroon, Tanzania, and Zambia, with an anticipated evaluation of the pilot at the end of 2017.

Description of Advocacy Engagement	
Name of Engagement	Brief Description
<b>Task Order 2 - Malaria</b>	
Participation in Roll Back Malaria - Malaria in Pregnancy Working Group	GHSC-PSM provides the RBM Partnership with strategic advice on best practices to accelerate MiP programming in both control and elimination settings. GHSC-PSM participates in quarterly conference calls and represents the voice of the supply chain.
Novel Approaches to Manufacturing Semi-synthetic Artemisinin (SSA)	Bill & Melinda Gates Foundation investments will facilitate the development of novel approaches through the proof of concept stage for the manufacturing of artemisinin and/or its analogs as a starting material or intermediate to prepare artemisinin-based active pharmaceutical ingredients. These approaches should demonstrate the potential (with a high probability of success) to meet aggressive cost targets when being practiced at a pharmaceutical manufacturing facility at commercial scale. It is anticipated (but not guaranteed) that successful awardees will be requested to submit a further proposal for additional development work, scale up to pilot scale and generation of the necessary materials (e.g., cell banks), and technology transfer packages to enable manufacturing at multiple existing manufacturing facilities. GHSC-PSM's process chemist Dr. Catherine Uitz was invited to join the Gates Foundation Proposal Review Committee to review and provide expertise on scientific aspects of proposal evaluation. Dr. Catherine Uitz is a senior subject matter expert and pharmaceutical process manager with pharmaceutical/biopharmaceutical technical leadership in process development, manufacturing operations, and quality assurance. The first round review of the proposal committee concluded on August 14, 2017.
Roll Back Malaria - Malaria in Pregnancy Working Group Annual Meeting in Geneva, September 18-20, 2017	Samantha Salcedo-Mason, Global Collaborations Manager for Malaria, attended this meeting, whose goals were the following: <ul style="list-style-type: none"> <li>a. To review current working group priorities, structure, and activities</li> <li>b. To debrief on the dissemination and implementation of WHO's new ANC recommendations</li> <li>c. To share best practices in MiP programming from countries</li> <li>d. To present and discuss key research in MiP programming</li> </ul>

Description of Advocacy Engagement	
Name of Engagement	Brief Description
Task Order 3 - PRH	
Participation in the Visibility and Analytics Networks Jumpstart Workshop in Johannesburg, April 5-7, 2017	Represented the project in workshop activities supporting moving the Global Family Planning VAN initiative forward.
Quality Reproductive Health Medicines & Contraceptive Devices: 2017 Annual Meeting of Procurers in Copenhagen, May 15-16, 2017	Erin Seaver, GHSC-PSM Procurement and Market Analyst, attended on behalf of GHSC-PSM.
Advance Family Planning 2017 Partners Meeting. Baltimore, Maryland, March 28, 2017	Ellen Tompsett and Becky Ling attended on behalf of GHSC-PSM.
Participation in Reproductive Health Global Traceability Advisory Group (RH GTAG)	IAPHL held an Advisory Board meeting in September, attended by Jay Heavner, GHSC-PSM HIV/AIDS Global Collaboration Manager. The meeting discussed current funding plans and outlined the FY18 workplan for IAPHL. GHSC-PSM health system strengthening specialists will make use of the relevant professional conversations within the discussion forum to share their expertise, while the HSS team will further explore how to increase IAPHL membership from within the project.
People that Deliver	Ellen Tompsett, GHSC-PSM Global Collaboration Manager for Population and Reproductive Health, represented the RHSC on the Board at the in-person board meeting on June 6, 2017.
Task Order 4 - MNCH	
Maternal Health Supplies Caucus, Semi-annual meeting, April 2017	Beth Yeager, GHSC-PSM TO4 Director, facilitated the meeting when progress on the Caucus workplan was reviewed, and the decision to hold a technical consultation on Oxytocin later in the year was made.
Maternal, Newborn, and Child Health Commodities Sourcing Strategy Partners' Meeting	GHSC-PSM under TO4 hosted a two-day meeting to discuss QA strategies for procurement of MNCH commodities. Participants included WHO, UNFPA, UNICEF, other implementing partners, and colleagues from USAID.
Multi-Country Situational Analysis of Care for High Risk and Sick Newborns	Beth Yeager, GHSC-PSM TO4 Director, participated in meetings and provided technical input into the design and data-collection tools of a situational analysis of care of small and sick newborns.
USAID Global Health Bureau Possible Severe Bacterial Infection in Infants (PSBI) Co-creation Workshop in Zambia	Beth Yeager, GHSC-PSM TO4 Director, was asked to participate in a meeting on design of implementation research on the new WHO guidelines for management of PSBI.
Post-Partum Hemorrhage Community of Practice technical meeting: "An Unfinished Agenda in Maternal Health," June 2017	Beth Yeager, GHSC-PSM TO4 Director, participates in the PPH community of practice, and was asked to present on commodity-related issues and supply chains for MNCH supplies at the technical meeting, "An Unfinished Agenda in Maternal Health."
Participation in Chlorhexidine Working Group meetings. February 15 and July 31, 2017.	The Chlorhexidine Working Group (CWG) is an international collaboration of organizations committed to advancing the use of 7.1% chlorhexidine digluconate (delivering 4% chlorhexidine) for umbilical cord care through advocacy and technical assistance. GHSC-PSM supports the CWG through ongoing participation in the working group, including representing GHSC-PSM in two in-person meetings on February 15 and July 31, 2017.

Description of Advocacy Engagement	
Name of Engagement	Brief Description
	Cross-cutting
Bi-annual meeting of the Reproductive Health Supplies Coalition (RHSC) Systems Strengthening Working Group, April 25-26, 2017, Washington, DC	(TO 3 & 4) Ellen Tompsett attended on behalf of GHSC-PSM.
Annual UNHCR UNHCR Suppliers Meeting, Copenhagen, Denmark, September 18-21, 2017	(TO 1, 2, & 3) Erin Seaver (TO3), Robert Staley (TO1), Alexandra Tamarillo (TO2), and Adrian Barojas (TO2) attended on behalf of GHSC-PSM.
Contribution to the WHO Global Price Reporting Mechanism	(TO 1 & 2) The Global Price Reporting Mechanism (GPRM) is a database recording international transactions of HIV, tuberculosis, and malaria commodities purchased by national programs in low- and middle-income countries.
Administrating the Procurement Planning and Monitoring Reports for malaria and reproductive health	(TO 2 & 3) The Procurement Planning and Monitoring Report (PPMR) describes stock status of health commodities on a country-by-country basis. It is an essential mechanism for countries and donors to monitor stock status, improve data visibility, strengthen in-country coordination, and address critical stock imbalances in countries all over the world.
Health and Humanitarian Logistics Summit, Copenhagen, Denmark, June 7-9, 2017	(All TOs) Ellen Tompsett attended on behalf of GHSC-PSM.
Attendance at GSI Global Healthcare Conference in Berlin, Germany, April 2017	(TO 1, 2, & 3) The Global GSI Healthcare Conference is a key event for sharing information to the GSI Healthcare community. Held twice per annum, healthcare leaders from private industry and government agencies join and present the progress of worldwide efforts to implement GSI standards that improve patient safety and supply chain security and efficiency. GHSC-PSM participants attended to discuss the implications of implementing GSI standards for GHSC-PSM suppliers of commodities. The event also included an International Government Healthcare Think Tank where representatives from global health organizations and national drug regulatory authorities discussed opportunities and challenges for global standards regulation implementation in currently environments that have not been subject to globally harmonized identification and labeling regulation to date. GHSC-PSM participation in this event was supported by TOs 1, 2, and 3, with attendance by Kaitlyn Roche, Kyle Duarte, and Sam Oh from GHSC-PSM HQ and the Pakistan and Burma field offices.
Participation in the Global Steering Committee for Quality Assurance of Medicines, December to September 2017	(All TOs) The Global Steering Committee, chaired by the World Bank, brings together representatives across donor agencies and the private sector via a Private Sector Advisory Council to identify and escalate approaches to improving quality assurance of medicines in developing markets. Kaitlyn Roche attends and contributes to coordinated presentations on USAID and GHSC-PSM's approach to implementation of global standards for pharmaceuticals and progress to date. The purpose of the forum is to align with other global donors for a harmonized strategy for GSI procurement requirements and country technical assistance, taking into account the ability of the private sector to implement.
Participation in the advisory group for the International Association of Public Health Logisticians	(All TOs) The International Association of Public Health Logisticians was established in 2007 to promote the professionalization of the field of public health logistics through education and information sharing. The association supports logisticians worldwide by providing a forum where members can network, exchange ideas, and improve professional skills. Members come from nearly 140 countries, a variety of professional backgrounds, and represent all levels of the supply chain.
Center for Global Development, Working Group on the Future of Global Health Procurement	(All TOs) This is a new group sponsored by the Center for Global Development, with funding from the Bill and Melinda Gates Foundation. Other participating organizations include USAID, Global Fund, WHO, UNICEF, GAVI the Vaccine Alliance, Population Services International, PATH, World Bank, and organizations from Thailand, India, Mexico, China, the Philippines, England, and other countries. Met July 25 in Washington, D.C.
HRH2030	(All TOs) Andrew Brown, GHSC-PSM Workforce Development Specialist, is supporting the HRH2030 project to deliver a leadership course for health supply chain managers, preparing with HRH2030 to attend the WHO HRH conference in November 2017, and jointly finalizing a Theory of Change document for human resources in health supply chains.
USAID-GF-SA NDOH Collaboration Meetings	(All TOs) GHSC-PSM participated in the USAID-led collaboration calls with Global Fund and the South Africa National Department of Health, which aims to align around the implementation of global standards for product identification and master data classification. GHSC-PSM presented our strategy for implementation and, with USAID, successfully advocated for harmonization around procurement requirements and implementation timelines. This effort resulted in a draft regulation for a phased implementation of GSI DataMatrix barcodes on pharmaceuticals, fully aligned with the GHSC-PSM requirement.

Description of Advocacy Engagement	
Name of Engagement	Brief Description
Developed key partnership to support global collaboration for healthier markets	(TO 1, 2, & 3) Shared market reports and insights and held discussions with key partners including the Global Fund, the Bill and Melinda Gates Foundation, CHAI, Unitaid, DFID, government of South Africa, and others. These conversations create opportunities for collaboration and information exchange and ensure that GHSC-PSM can move markets with our key procurement partners. In addition, the market dynamics team has supported conversations with global working groups including the Malaria RDT Global Working Group, the ARV Working Group, and others. In the Malaria RDT working group, the market dynamics team provided critical evidence that the market is in an unhealthy state and raised the question of practical implementation of interchangeability between tests. Over the course of the year, the market dynamics team visited several manufacturing facilities and attended CPHi conferences to meet with senior level industry executives. These meetings resulted in discussions around manufacturer prioritization of products and R&D, insights into manufacturing challenges and raw material costs, understanding of the impact of procurement decisions on production lead-times, and understanding of local policy environment for manufacturers in country of origin which impacts operational capabilities, as well as pricing and other factors.
Global working group advocating for market health improvement	(TO 1 & 2) GHSC-PSM provided critical market analysis to support improvements to availability of quality-assured, affordable commodities. These analyses were shared with a variety of global stakeholders to advocate for improved procurement practices and country-level policies. In particular, the market dynamics team supported global working groups related to malaria rapid diagnostic tests and antiretroviral therapies.



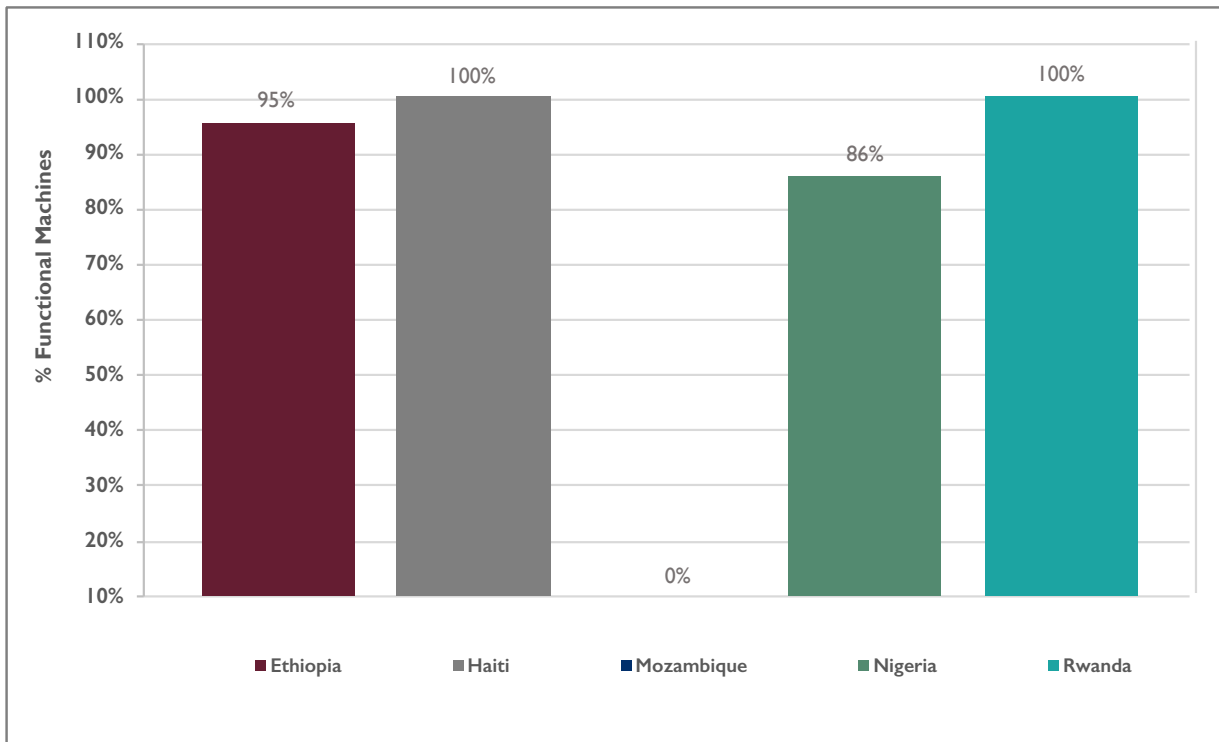
## CI0. Percentage of GHSC-PSM-procured or supported molecular instruments that remained functional during the reporting period

### Measure Definition

**Numerator:** Total number of GHSC-PSM procured or supported molecular instruments that remained functional for the entire reporting period.

**Denominator:** Total number of GHSC-PSM procured or supported molecular instruments.

### Indicator Performance



TOI	Achievement		
	Target	FY2017 Q4	Year to Date
	N/A	88%	86%

### Analysis

- ▶ Ethiopia and Haiti achieved strong performance in maintaining molecular instruments, sustaining rates of 95, and 100% of instruments functional for the entire quarter. Rwanda, which began reporting on this indicator the first time this quarter, also reported 100% functionality for its 19 supported instruments.
- ▶ Mozambique reported periods of interruption at all four supported instruments, including 27 days due to lab contamination at one site. Despite these interruptions, instruments were in service 88% of the time during the quarter. The project maintains a close process of monitoring, including bi-weekly reporting to the U.S. government and Mozambique Ministry of Health.
- ▶ In Nigeria, most instruments that had a breakdown during the quarter have been repaired. One instrument has experienced persistent breakdowns throughout the year and requires a spare part. However, the manufacturer is struggling with a customs clearance issue to import the part. GHSC-PSM is also continually coordinating with the provider on an action plan to improve data and service quality for PCR machines.

### Data Notes

- ▶ Total number of supported instruments for each country is as follows: Ethiopia - 20; Haiti - 6; Mozambique - 4; Nigeria - 42; and Rwanda - 19.

## CI I. Number of supply chain policies, regulations, strategies, or SOPs developed or updated with GHSC-PSM assistance

Country	Description of supply chain policy, regulation, strategy, or SOP developed or updated
Madagascar	As part of the FANOME recovery plan, the opportunity was taken to integrate program inputs into the public network (distribution plan). As a result, GHSC-PSM is an integral part of this small technical committee (during this quarter, the TOR and Action Plan for this committee were developed).
Haiti	<p>SOPs developed or updated (temperature control, incident management)</p> <ul style="list-style-type: none"> <li>▶ Guides developed (material qualification, transport, and temperature control).</li> <li>▶ Draft Handbook of Procedures GHSC-PSM in Haiti. The draft of this manual has been shared with heads of GHSC-PSM technical units for review.</li> <li>▶ Safety and fire inspection program developed.</li> <li>▶ Review of SOPs by the consultant started.</li> <li>▶ Acquisition of the ISO 9001: 2015 standard from the Haitian Ministry of Commerce, Haitian Bureau of Standardization to strengthen compliance with international standards.</li> <li>▶ Sharing WHO's Good Distribution Practice Guide with project units.</li> <li>▶ Development of the contingency plan.</li> </ul>
Zambia	The project supported the formulation of the MOH Laboratory Strategic Plan, the formation of MOH FASP core teams, and provided support for the VMMC F&Q and ARVs.
Guyana	Warehouse performance operations were updated based on best practice in warehouse management. The MMU is working to update its SOPs.
Nigeria	GHSC-PSM supported review of SOPs on state LMCUs. The document is still in draft form.
Malawi	The GHSC-PSM project supported the MOH to develop the national laboratory logistics system guidelines and SOP manual. This was later used to conduct a training of trainers for health facility pharmacy staff. The trained staff are expected to roll out the training to reach more staff and improve laboratory management and reporting across all of the TOs.

## President's Malaria Initiative Standard Indicators for Annual Reporting

### Number of Products Purchased with USG Funds

Indicator #	Measure Definition	FY2016	FY2017	FY2018	FY2019
3.1.3.1-3	Number of artemisinin-based combination therapy (ACT) treatments purchased with USG funds	5,939,540	50,933,485		
3.1.3.1-6	Number of malaria rapid diagnostic tests (RDTs) purchased with USG funds	4,850,000	53,414,100		
3.1.3.2-2	Number of insecticide-treated nets (ITNs) purchased with USG funds	6,358,974	33,997,513		
3.1.3.4-2	Number of sulfadoxine-pyrimethamine (SP) tablets purchased with USG funds	3,233,050	39,269,800		

### Number of Products Purchased by Other Partners that Were Distributed with USG Funds

Indicator #	Measure Definition	FY2016	FY2017	FY2018	FY2019
3.1.3.1-2	Number of artemisinin-based combination therapy (ACT) treatments purchased by other partners that were distributed with USG funds	50	11,379,319		
3.1.3.2-1	Number of insecticide-treated nets (ITNs) purchased by other partners that were distributed with USG funds	0	1,540,543		

### Number of Products Purchased in Any Fiscal Year with USG Funds that Were Distributed in this Reported Fiscal Year

Indicator #	Measure Definition	FY2016	FY2017	FY2018	FY2019
3.1.3.1-4	Number of artemisinin-based combination therapy (ACT) treatments purchased in any fiscal year with USG funds that were distributed in this reported fiscal year	6,087,841	26,921,679		
3.1.3.1-8	Number of rapid diagnostic tests (RDTs) purchased in any fiscal year with USG funds that were distributed in this reported fiscal year	3,659,010	28,623,609		
3.1.3.2-3	Number of insecticide-treated nets (ITNs) purchased in any fiscal year with USG funds that were distributed in this reported fiscal year	414,950	16,490,065		
3.1.3.4-5	Number of sulfadoxine-pyrimethamine (SP) tablets purchased in any fiscal year with USG funds that were distributed in this reported fiscal year	797,000	22,194,161		

#### Data Notes

► Data presented is for GHSC-PSM-supported countries only.

# Context Indicators

Indicators included in this section:

A6. Absolute Percent Forecast Error, with variants Mean Absolute Percent Error (MAPE) and Forecast Bias

B1. Stockout rate at SDPs

B2. Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in supply system

B3. Service Delivery Point (SDP) reporting rate to the Logistics Management Information System (LMIS)

B4. Average rating of in-country data confidence at the central, subnational, and SDP levels

B7. Percentage of total spent or budgeted on procurement of commodities for public sector services by the government, USG, or other sources

B9. Supply chain workforce loss ratio

B10. Percentage of GHSC-PSM-supported countries that have a functional logistics coordination mechanism in place

B11. Percentage of leadership positions in supply chain management that are held by women

B12. Absolute Percent Consumption Forecast Error

## A6. Absolute Percent Forecast Error, with variants Mean Absolute Percent Error (MAPE) and Forecast Bias (TO1)

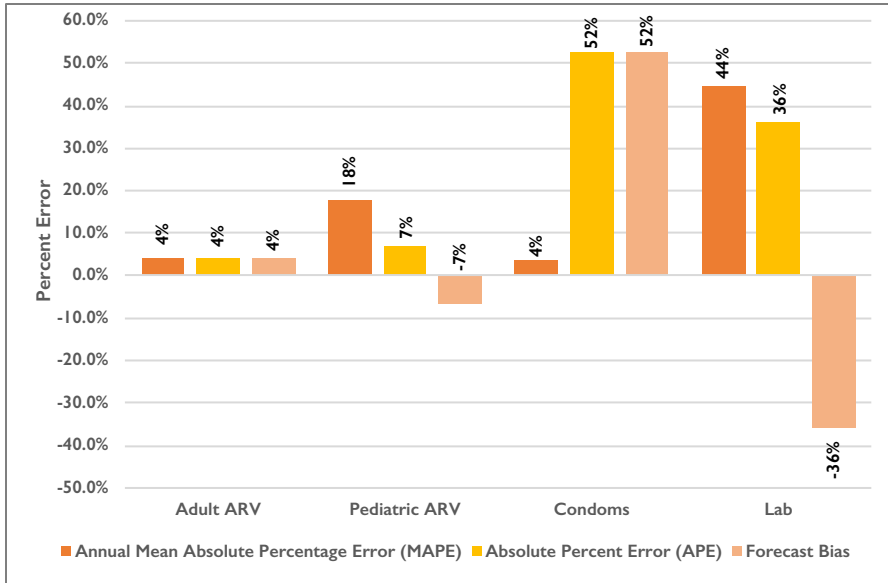
### Measure Definition

**Numerator:** Absolute value of the differences between the actual quantities desired to be delivered during the period minus the forecasted values.

**Denominator:** Sum of the actual quantities desired to be delivered.

See *Data Notes* below for variant definitions.

### Indicator Performance



Product	Target Annual		FY2017 Q4		Year to Date	
	Annual MAPE (%)	Forecast Bias (%)	APE (%)	Forecast Bias (%)	Annual MAPE (%)	Forecast Bias (%)
Adult ARV	N/A	N/A	4%	4%	4%	4%
Pediatric ARV	N/A	N/A	7%	-7%	18%	-18%
Condoms	N/A	N/A	52%	52%	4%	4%
Lab	N/A	N/A	36%	-36%	44%	44%
All	N/A	N/A				

### Analysis

- ▶ Ordered quantities for Adult ARVs exceeded the forecast due to a gap fill order placed for the Uganda national medical store.
- ▶ Lab commodity forecasts include CD4, EID, viral load, and other molecular testing products. The Demand Planning team is working closely with the Lab team to identify effective measures for communication with the field offices around supply plan differences.
- ▶ A large volume of condom orders was placed with fewer than 90 days between the Order Entry Date and the Requested Delivery Date, pushing actual ordered quantities above the forecast.

### Data Notes

- ▶ Forecasted quantities are drawn from the GHSC-PSM global demand forecasts for each product, which are based on an aggregation of country supply plans submitted in the prior quarter. Actual quantities are derived based on the Requested Delivery Dates for products included in customer ROs submitted to ARTMIS.
- ▶ Mean Absolute Percent Error is calculated in the same manner as Absolute Percent Forecast Error, using the cumulative totals of forecasted and actual quantities over the course of the fiscal year.
- ▶ Forecast bias is calculated using the real difference between actual and forecasted quantities in the numerator, rather than the absolute value. Negative forecast bias indicates fewer products requested compared to the forecast. Positive forecast bias indicates more products ordered than forecasted.
- ▶ At the present time, GHSC-PSM does not create demand forecasts for TO2 or TO4.

## A6. Absolute Percent Forecast Error, with variants Mean Absolute Percent Error (MAPE) and Forecast Bias (TO3)

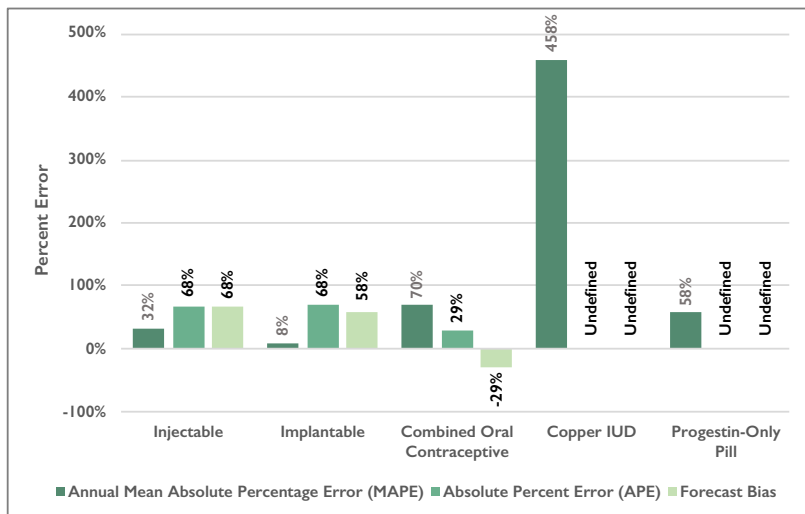
### Measure Definition

**Numerator:** Absolute value of the differences between the actual quantities desired to be delivered during the period minus the forecasted values.

**Denominator:** Sum of the actual quantities desired to be delivered.

See *Data Notes* below for variant definitions.

### Indicator Performance



Product	Target Annual		FY2017 Q4		Year to Date	
	Annual MAPE (%)	Forecast Bias (%)	APE (%)	Forecast Bias (%)	Annual MAPE (%)	Forecast Bias (%)
Injectable	N/A	N/A	68%	68%	32%	32%
Implantable	N/A	N/A	68%	68%	8%	8%
Combined Oral	N/A	N/A	29%	-29%	70%	-70%
Copper IUD	N/A	N/A	Undefined	Undefined	458%	-458%
Progestin Pill	N/A	N/A	Undefined	Undefined	58%	-58%
All	N/A	N/A				

### Data Notes

- ▶ All forecasted orders for copper IUDs and progestin only pills were cancelled or pushed to FY18 Q1 this quarter, resulting in zero quantities desired to be delivered. APE and forecast bias are therefore undefined for these products, due to zeroes in the denominators.
- ▶ A large volume of orders of implants and injectables was placed with fewer than 90 days between the Order Entry Date and the Requested Delivery Date, pushing actual ordered quantities above the forecast.
- ▶ Forecast accuracy improved for combined oral contraceptives since the previous quarter, with an order of 2 million cycles for Uganda, reducing the unconsumed forecast for the quarter.

### Data Notes

- ▶ Forecasted quantities are drawn from the GHSC-PSM global demand forecasts for each product, which are based on an aggregation of country supply plans submitted in the prior quarter. Actual quantities are derived based on the Requested Delivery Dates for products included in customer ROs submitted to ARTMIS.
- ▶ Mean Absolute Percent Error is calculated in the same manner as Absolute Percent Forecast Error, using the cumulative totals of forecasted and actual quantities over the course of the fiscal year.
- ▶ Forecast bias is calculated using the real difference between actual and forecasted quantities in the numerator, rather than the absolute value. Negative forecast bias indicates fewer products requested compared to the forecast. Positive forecast bias indicates more products ordered than forecasted.
- ▶ At the present time, GHSC-PSM does not create demand forecasts for TO2 or TO4.

## BI. Stockout rate at SDPs

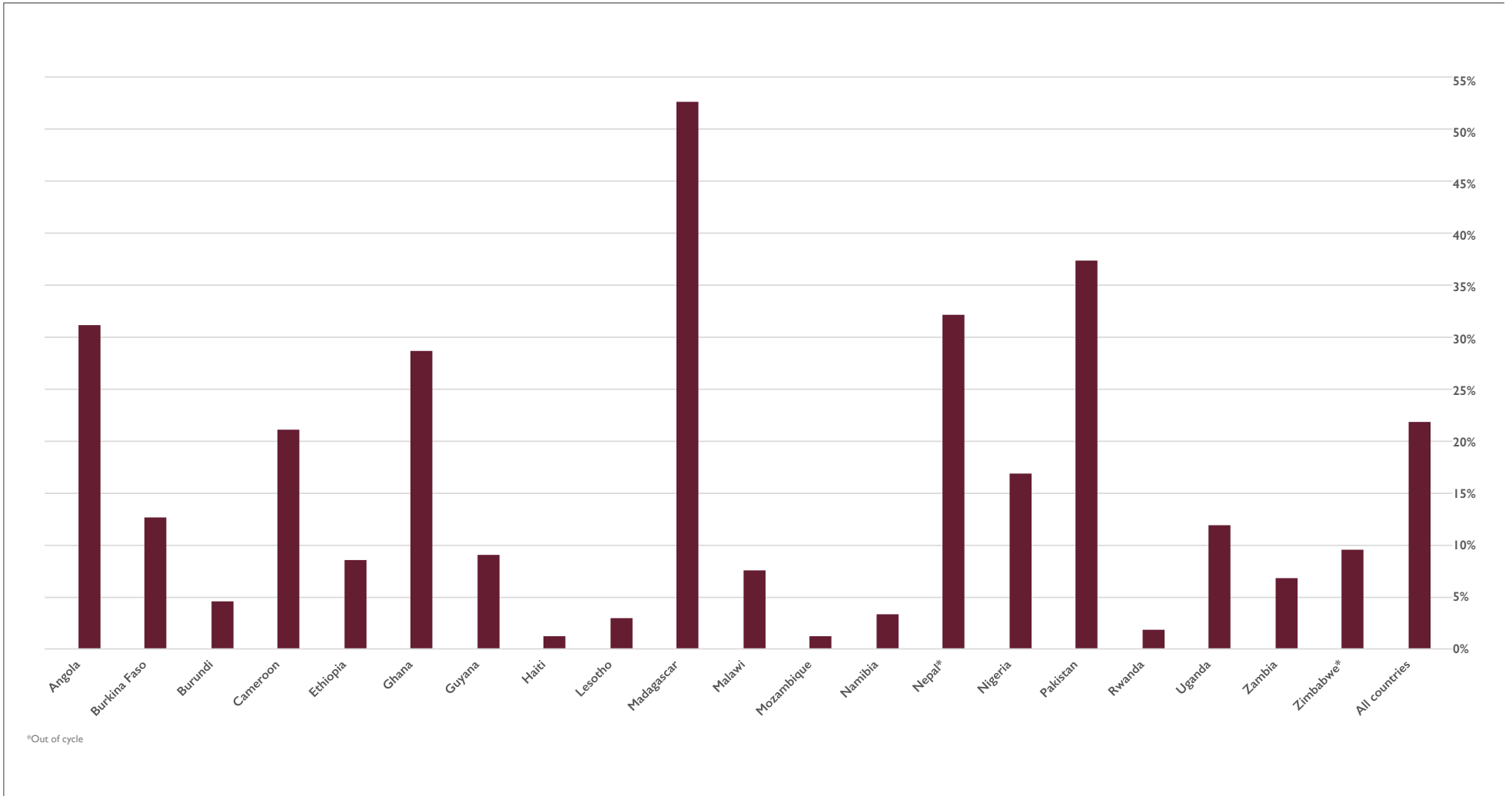
### Measure Definition

**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 that offer the tracer product.

Task Order	Annual Target	Overall Stockout Rate	
		FY2017 Q4	FY2017
TO1	N/A	5%	7%
TO2	N/A	19%	16%
TO3	N/A	29%	30%
All TOs	N/A	22%	20%

### Overall Stockout Rate by Country



Out of cycle countries are not counted toward overall totals.

Stockout rates presented are for all key products offered in each country, irrespective of the funder of those products.

Note also that GHSC-PSM does not provide technical support to all levels of the supply chain in all countries

## B1. Percentage of SDPs with Stockouts of Tracer Products

Countries		Angola	Burkina Faso	Burundi	Cameroon	Ethiopia	Ghana	Guyana	Haiti	Lesotho	Madagascar	Malawi	Mozambique	Namibia	Nigeria	Rwanda	Uganda	Zambia	*Zimbabwe (FY17 Q3)
HIV	Task Order 1	17%		11%	21%	8%	18%	9%	2%	3%		4%	1%	3%	7%	1%	21%	5%	4%
	First Line Adult ARVs	0%		7%	0%	2%	13%	0%	4%	0%		0%	0%	0%	5%	0%	13%	10%	0%
	Second Line Adult ARVs	22%		0%	2%	5%	18%	0%	3%	2%			2%	0%	8%	0%		10%	11%
	First Line Pediatric ARVs	0%			2%	4%		57%	4%	1%			2%	12%	7%	0%	15%	9%	5%
	First RTKs	44%		18%	9%	14%	5%		1%	4%		2%		10%	6%	7%	17%	6%	3%
	Second RTKs	33%		23%	11%	29%	25%		2%	3%				0%	8%	0%	24%	3%	
	Tie-breaker RTKs					49%				6%				0%	11%		17%		5%
	Male Condoms**	0%		3%	93%	7%	32%		1%	4%			9%	0%	8%	2%		4%	1%
	Female Condoms**	11%		3%						0%			7%	0%	6%	2%		4%	7%
	EID Consumables					N/A							0%		5%	0%	0%		
	EID Reagents					21%				0%			0%		10%	0%	0%	9%	
	Viral Load Consumables					N/A							0%		5%	0%			
	Viral Load Reagents					0%				0%			0%		0%	0%	0%	64%	
	Ready-to-use Therapeutic Foods (RUTF)					10%				8%								63%	
Malaria	Task Order 2	53%	13%	3%		8%	34%				37%	11%			24%	0.6%	2%	11%	19%
	First-line ACTs (AL 6X1)	80%	14%			8%						2%			18%	0%		15%	20%
	First-line ACTs (AL 6X2)	40%	19%			9%						4%			23%	0%		13%	18%
	First-line ACTs (AL 6X3)	60%				9%						5%			39%	0%		12%	23%
	First-line ACTs (AL 6X4)	30%				7%	25%					2%			26%	0%		13%	26%
	First-line ACTs (AL inability to treat)	20%	8%			2%									9%	0%	4%	3%	4%
	First-line ACTs (AS/AQ 100/270mgx3)		15%	0%								36%			24%				
	First-line ACTs (AS/AQ 100/270mgx6)		14%	0%								31%			30%				
	First-line ACTs (AS/AQ 25/67.5mg)			1%			57%					37%			25%				
	First-line ACTs (AS/AQ 50/135mg)			2%			42%					34%			20%				
	Rapid Diagnostic Tests for Malaria		6%	5%		6%	30%					30%	4%		21%	3%	1%	1%	15%
	Sulphadoxine-pyrimethamine (SP)		14%	9%			20%					59%	22%		19%		1%	12%	4%
	LLINs		7%	2%								49%	34%		15%				

\* Out of cycle

\*\* Male and female condoms are reported under both TO 1 & 3.



## BI. Percentage of SDPs with Stockouts of Tracer Products

	Burundi	Ethiopia	Ghana	Haiti	Madagascar	Malawi	Nigeria	Pakistan	Rwanda	Uganda	Zambia	*Nepal
<b>Countries</b>												
Task Order 3	3%	9%	34%	0%	68%	6%	7%	38%	3%	1%	4%	32%
Copper-bearing Intrauterine Devices	4%	17%		0%	54%	3%	2%	22%	2%		0%	81%
Calendar-based Awareness Methods				0%	80%				0%			
Male Condoms***		7%	32%	1%	61%	9%	8%	16%	2%		4%	7%
Female Condoms***					84%	7%	6%		2%		4%	
<b>Injectable Contraceptives</b>	2%	4%	32%	0%	79%	3%	2%	17%	5%	1%	0.3%	4%
Depot Medroxyprogesterone Acetate 104 mg/0.65 mL												
Depot Medroxyprogesterone Acetate 150 mg Vial, SR	2%	4%	32%	0%	79%	3%	4%	17%	5%	1%	5%	4%
Norethisterone Enanthate							11%				4%	
<b>Implantable Contraceptives</b>	0%	7%	38%	1%	34%		5%				0.4%	73%
Etonogestrel 68 mg/Rod, 1 Rod Implant		13%			34%	8%	14%		2%		1%	
Levonorgestrel 75mg/Rod, 2 Rod Implant	0%	7%	38%	1%		4%	8%		2%		6%	73%
<b>Combined Oral Contraceptives</b>	5%	5%	36%	0%	76%	7%	5%	16%	6%		14%	8%
Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg, 28 Tablets/Cycle	5%	5%	36%	0%	76%			16%	6%		14%	8%
Levonorgestrel/Ethinyl Estradiol 150/30 mcg 28 Tablets/Cycle						7%	5%					
<b>Emergency Oral Contraceptives</b>	8%	13%				9%		82%				
Levonorgestrel 0.75 mg, 2 Tablets	8%	13%				9%		82%				
Levonorgestrel 1.5 mg, 1 Tablet												
<b>Progestin Only Pills</b>	0%	11%			63%	3%		87%	5%		3%	
Levonorgestrel 30 mcg 35 Tablets/Cycle	0%	11%			63%	3%		87%	5%		3%	

\* Out of cycle

\*\* The PRH "method level" refers to the percent of facilities stocked out of all products the facility offers within a given method. A stockout at the "product level" refers to the number of sites stocked out of that particular product (depending on what is offered at a particular facility). A facility could be stocked out of one product and not stocked out at the method level.

\*\*\* Male and female condoms are reported under both TO 1 & 3.

## BI. Stockout Rate - Granular Level Analysis

### Analysis

GHSC-PSM compiles context indicator data for all countries in which the project maintains a field office, regardless of the extent of the project's engagement in the country. Therefore, the results in a given country, for a specific point in time, are not solely a consequence of GHSC-PSM's activities, but rather, are reflective of the many stakeholders and elements that influence in-country supply chain performance.

Overall, the stockout rate improved slightly from 24% in Q3 to 22% in Q4. The largest improvement was in HIV/AIDS commodities, which decreased from 8% to 5%. Malaria commodity stockout rates decreased from 21% to 19%, while PRH commodity stockout rates decreased from 31% to 29%. The year-to-date value remained at 20%. Five countries reported overall stockout rates below 5%: Haiti, Lesotho, Mozambique, Namibia, and Rwanda. Madagascar and Pakistan continued to experience high stockout rates. Angola's stockout rate appears artificially high due to the small number of sites reporting (9), affected most heavily by stockouts of all presentations of the antimalarial Artemether Lumefantrine (AL).

### Country Analysis

Angola	High stockouts in the 9 health centers and 10 hospitals in which GHSC-PSM works in Angola were primarily in ACTs (reporting from the 10 hospitals only) supplied by the National Malaria Control Program. These stockouts occurred despite availability of the products at the central warehouse. Delays in submitting requisitions at NMCP and approvals from NMCP and the National Directorate of Public Health for the requisitions were identified as the main factors for stockouts. GHSC-PSM's malaria technical advisor is working with both parties to accelerate distribution by assisting facilities to analyze their consumption and make orders.
Burkina Faso	Burkina Faso has persisted at a 13% stockout rate since last quarter. However, the percent of facilities stocked out of all presentations of AL ("inability to treat") decreased from 12% to 8% this quarter. A large shipment of SP (14% of SDPs stocked out) is expected in November, and GHSC-PSM will work with the central warehouse, CAMEG, to ensure its timely distribution to facilities. Delays in government and other donor-funded shipments have contributed to the stockouts in the system, especially for AL and SP.
Cameroon	Cameroon, which receives TOI funding only, saw its stockout rate improve from 32.8% last quarter to 21.2% this quarter. Stockouts of ARVs dropped dramatically, from 7% to 0% for first-line adult ARVs, 64% to 2% for second-line adult ARVs, and 45% to 2% for first-line pediatric ARVs. Stockouts of first RTKs (Determine), however, increased from 0 to 9%, and male condoms, which were not reported last quarter, were stocked out in 93% of facilities reporting. These are managed by the family planning department and are not distributed for free at SDPs, as is the case with ARVs. Stockouts in the South West region were due to sites that do not systematically request condoms, and others that do not report on them.
Ethiopia	Ethiopia's overall stockout and TO-level stockout rates stayed constant since Q3 at approximately 9%. While stockouts of ARVs were all below 5%, stockouts of RTKs were high at 14%, 29%, and 49% for first, second, and tie-breaker RTKs, respectively. However, the HIV RTK performance was inconsistent with an assessment conducted in August (the same month where these LMIS data are from) in PEPFAR-supported towns showing high availability of all types of RTKs (99%, 90%, and 64% availability of first, second, and tie-breaker RTKs, respectively). This shows that GHSC-PSM support to improve RTK supply management likely contributed to the change in availability of RTKs in PEPFAR-supported sites. SDPs with stockouts were addressed by emergency deliveries and route prioritization during refill. For those SDPs facing actual stockouts, the primary reasons included unexpected consumption, product shortages at subnational warehouses, and poor reporting data quality and timeliness. The very high stockout rate of tie-breaker RTKs was due to the fact that the MOH policy restricts distribution to only a few SDPs.
Ghana	Ghana's stockout data is produced from its early warning system, which is designed to collect data from 770 out of 4,000 SDPs, but with low reporting rates, actually shows data from a smaller sample of sites. The stockout rate reported through this system remained constant since last quarter at approximately 29%. GHSC-PSM is supporting a scale up of last mile distribution from two to four regions, in addition to supporting resolutions to central to regional-level distribution delays. These interventions are expected to improve product availability over time.
Haiti	Haiti, while still representing one of the lowest stockout rates (1.2% overall), saw a slight uptick in stockouts for HIV/AIDS commodities (to 2.3%) due to the rollout of multi-month scripting, which has increased consumption. For PRH commodities, awareness-raising activities also have increased consumption of some products.

Country Analysis	
Madagascar	This quarter, GHSC-PSM only received emergency commodity orders for malaria products, due to shipment delays by other donors. For population and reproductive health products, GHSC-PSM only procures commodities for the social marketing sector. GHSC-PSM plans to order MNCH commodities in the future. Madagascar's stockout rates have worsened in the last four quarters, from 16% to 31% to 47% to 52% this quarter. Several recently-arrived shipments were not yet reflected in these latest numbers, however. There have been severe shortages in antimalarial and reproductive health products at the central level due to delayed shipments from various donors. Further, the district and commune-level warehouses have struggled to establish their average monthly consumption. Orders from the commune warehouses to the district warehouses do not yet take into account community health worker needs. Quantification exercises were conducted for the first time in April for malaria commodities, in May for PRH commodities, and in June for MNCH commodities. Since this time, orders have been placed and supply plans monitored.
Nigeria	Nigeria's stockout rate stayed nearly the same as last quarter, at 7% for HIV/AIDS commodities, 23.5% for malaria commodities, and 7% for PRH commodities. Slightly elevated stockouts of RTKs were due to the increased utilization due to Test and Treat. Limited allocation of RTKs funding in December 2016 (compared to the demand of the implementing partners) resulted in the temporal suspension of the orders that was placed by GHSC-RTK. When funding was made available in latter part of FY 17, the procurement proceeded, but there was a gap due to scale up of HIV testing services. Stockouts of AL and AS/AQ persist at high rates due to chronic shortages of these products at the central level over the last few quarters. Budgetary provisions at the state level have not matched the real consumption need. In the case of AL though, this has not heavily impacted the ability to treat, as only 9% of facilities were stocked out of all presentations of AL. Implanon NXT is the largest contributor to the stockout rate due to short supply in country. GHSC-PSM is responsible for procuring Implanon NXT for TO3, however the delayed decision of USAID/Washington on the support for TO3 commodities resulted in delayed procurement and delivery of these products.
Nepal	PRH and MNCH commodities continue to show high stockout rates as SDPs continue to report 0 as the ending balance despite not providing the service/commodity. This is a known data quality issue in Nepal, and GHSC-PSM is advocating for this policy change. GHSC-PSM's technical assistance is focused only at the central level. Activities underway to improve stockout rates include building the forecasting capacity of the Logistics Management Division, completing and updating supply plans, and advocating for more capacity building for health facility staff in LMIS reporting. In FY18, GHSC-PSM Nepal plans to provide technical assistance in warehousing refurbishment, transportation and distribution, and e-bidding assistance.
Pakistan	GHSC-PSM only provides technical assistance in Pakistan and does not procure commodities or provide transportation financing to the public sector. Both contraceptive commodity and transportation financing are looked after by the federal and provincial governments in a decentralized environment. The project is providing strategic technical assistance, which is limited to the federal and provincial governments. The project does not provide inventory management/capacity building inputs at the district and facility levels, which require severe overhauling and workforce capacity development. The overall stockout rate is 38%. The products with the lowest stockout rates were condoms (16%), combined oral contraceptives (16%), and injectable contraceptives (17%). Products like POP and ECP are not supply chain-driven. There is no demand for them, warranting a different set of interventions. Three month injection, IUCD, COC, and condoms are the main pillars of Pakistani family planning supply chain in the public sector. Providers for implants are limited in number, and SayanaPress (not a tracer product) is at the very initial phase of introduction.
Zambia	Zambia's stockout rate decreased from 8.2% to 6.8%, Stockouts can be attributed, at least in part, to central level stockouts. Some ARV stockouts were also partially due to late facility reporting as health facility staff were on leave. Several GHSC-PSM shipments are expected in October and December, which will help avert central level stockouts and hence facility stockouts.
Zimbabwe	Zimbabwe reports on a quarter lag; therefore the data are from Q3. Between Q2 and Q3, Zimbabwe's stockout rate increased slightly from 8.5% to 9.6%. The highest product stockout rates were for ACTs; however the percentage of facilities stocked out of all AL presentations was only 4%. Stockouts of second line adult ARVs (ATV/r, 11% of SDPs stocked out) could be attributed to a combination of order processing delays and shipment delays at the central level.
Data Notes	
<ul style="list-style-type: none"> <li>▶ Stockout rates presented are for all key products offered in each country, irrespective of the funder of those products.</li> <li>▶ Note also that GHSC-PSM does not provide technical support to all levels of the supply chain in all countries.</li> </ul>	

## B2. Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in supply system (tracer products)

### Measure Definition

**Numerator:** Number of stock status observations for a tracer commodity that were within the designated minimum and maximum quantities at storage sites.

**Denominator:** Total number of stock status observations for a tracer commodity at storage sites.

### Indicator Performance

	Central	Sub-National Level I
<b>Task Order 1</b>	39%	34%
First-line Adult ARVs	55%	51%
Second-line Adult ARVs	44%	55%
First-line Pediatric ARVs	33%	50%
First RTKs	52%	42%
Second RTKs	35%	29%
Tie-breaker RTKs	0%	22%
Male Condoms	33%	14%
Female Condoms	10%	8%
RUTF	75%	28%
EID Consumables	75%	N/A
EID Reagents	44%	N/A
Viral Load Consumables	80%	N/A
Viral Load Reagents	33%	N/A
<b>Task Order 2</b>	31%	20%
First-line ACTs (AL 6X1)	37%	27%
First-line ACTs (AL 6X2)	61%	27%
First-line ACTs (AL 6X3)	22%	26%
First-line ACTs (AL 6X4)	17%	23%
First-line ACTs (AS/AQ 100/270mgx3)	0%	16%
First-line ACTs (AS/AQ 100/270mgx6)	20%	14%
First-line ACTs (AS/AQ 25/67.5mg)	11%	15%
First-line ACTs (AS/AQ 50/135mg)	33%	13%
RDTs for Malaria	38%	18%
Sulphadoxine-pyrimethamine (SP)	25%	18%
LLINs	54%	58%

\* Stocked according to plan rates presented are for all key products offered in each country, irrespective of the funder of those products.

\*\* The PRH "method level" refers to the percent of facilities stocked out of all products the facility offers within a given method. A stock out at the "product level" refers to the number of sites stocked out of that particular product (depending on what is offered at a particular facility). A facility could be stocked out of one product and not stocked out at the method level.

Task Order	Achievement		
	Annual Target	FY2017 Q4	Year to Date
TO1	N/A	35%	30%
TO2	N/A	21%	19%
TO3	N/A	14%	15%
TO4	N/A	30%	21%
All TOs	N/A	22%	21%

	Central	Sub-National Level I
<b>Task Order 3</b>	24%	14%
Injectable Contraceptives	35%	19%
Depot Medroxyprogesterone Acetate 104 mg/0.65mL	N/A	N/A
Depot Medroxyprogesterone Acetate 150 mg Vial, SR	45%	22%
Norethisterone Enanthate	0%	6%
Implantable Contraceptives	32%	12%
Etonogestrel 68 mg/Rod, 1 Rod Implant	30%	12%
Levonorgestrel 75mg/Rod, 2 Rod Implant	38%	13%
Combined Oral Contraceptives	40%	28%
Levonorgestrel/Ethinyl Estradiol 150/30 mcg +Fe 75 mg, 28 Tablets/Cycle	43%	28%
Levonorgestrel/Ethinyl Estradiol 150/30 mcg 28 Tables/Cycle	33%	N/A
Emergency Oral Contraceptives	15%	4%
Levonorgestrel 0.75 mg, 2 Tablets	29%	6%
Levonorgestrel 1.5 mg, 1 Tablet	0%	0%
Progestin Only Pills	6%	19%
Levonorgestrel 30 mcg 35 Tablets/Cycle	6%	19%
Copper-bearing Intrauterine Devices	5%	13%
Calendar-based Awareness Methods	0%	1%
Male Condoms	32%	11%
Female Condoms	13%	6%
<b>Task Order 4</b>	29%	30%
Oxytocin (10 IU Injectable)	13%	32%
MgSO4 (50% Injectable)	13%	46%
Injectable Gentamicin	38%	32%
ORS+zinc (Together)	0%	17%
Chlorhexidine Gel	0%	20%
Amoxicillin (125 mg or 250 mg Dispersible Tablets)	43%	40%
Zinc (Alone)	50%	19%
ORS (Alone)	50%	19%
PCV Vaccine	N/A	N/A

## B2. Percentage of stock status observations in storage sites where commodities are stocked according to plan, by level in supply system (tracer products for out of cycle country - Nepal)

### Indicator Performance

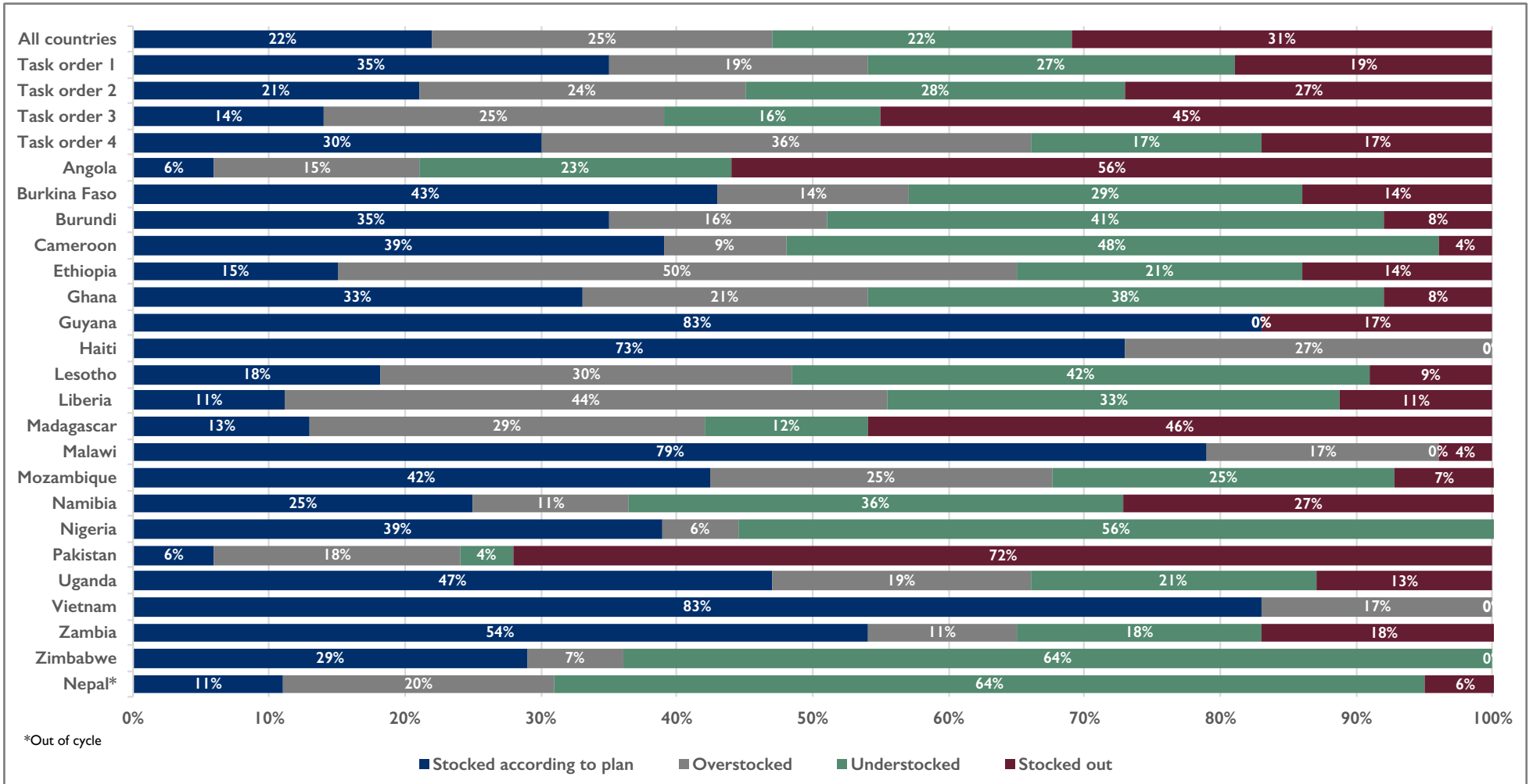
	Central	Sub-National Level I
<b>Task Order 3</b>	0%	N/A
Injectable Contraceptives	0%	25%
Depot Medroxyprogesterone Acetate 104 mg/0.65mL	N/A	25%
Depot Medroxyprogesterone Acetate 150 mg Vial, SR	0%	N/A
Norethisterone Enanthate	N/A	N/A
Implantable Contraceptives	0%	0%
Etonogestrel 68 mg/Rod, 1 Rod Implant	N/A	N/A
Levonorgestrel 75mg/Rod, 2 Rod Implants	0%	0%
Combined Oral Contraceptives	0%	0%
Levonorgestrel/Ethinyl Estradiol 150/30 mcg +Fe 75 mg, 28 Tablets/Cycle	0%	0%
Emergency Oral Contraceptives	N/A	N/A
Levonorgestrel 0.75 mg, 2 Tablets	N/A	N/A
Levonorgestrel 1.5 mg, 1 Tablet	N/A	N/A
Progestin Only Pills	N/A	N/A
Levonorgestrel 30 mcg 35 Tablets/Cycle	N/A	N/A
Copper-bearing Intrauterine Devices	0%	0%
Calendar-based Awareness Methods	N/A	N/A
Male Condoms	0%	33%
Female Condoms	N/A	N/A

\* Stocked according to plan rates presented are for all key products offered in each country, irrespective of the funder of those products.

\*\* The PRH "method level" refers to the percent of facilities stocked out of all products the facility offers within a given method. A stock out at the "product level" refers to the number of sites stocked out of that particular product (depending on what is offered at a particular facility). A facility could be stocked out of one product and not stocked out at the method level.

	Central	Sub-National Level I
<b>Task Order 4</b>	0%	14%
Oxytocin (10 IU Injectable)	0%	33%
MgSO4 (50% Injectable)	N/A	N/A
Injectable Gentamicin	N/A	0%
ORS+zinc (Together)	N/A	N/A
Chlorhexidine Gel	0%	0%
Amoxicillin (125mg or 250mg Dispersible Tablets)	N/A	33%
Zinc (Alone)	0%	0%
ORS (Alone)	0%	40%
PCV Vaccine	N/A	N/A

## B2. Percentage of stock status observations in storage sites, where commodities are stocked according to plan, by stock status (countries)



## B2. Stocked according to plan - granular level analysis

### Analysis

- ▶ GHSC-PSM compiles context indicator data for all countries in which the project maintains a field office, regardless of the extent of the project's engagement in the country. Therefore, the results in a given country, for a specific point in time, are not solely a consequence of GHSC-PSM's activities, but rather, are reflective of the many stakeholders and elements that influence in-country supply chain performance.
- ▶ Overall, 22% of tracer products were stocked within the minimum and maximum levels at storage sites this quarter. This is an increase from an 11% overall rate in the previous quarter and consistent with the F Y17 Year to Date percentage of 21.
- ▶ Tracer products were more likely to be stocked according to plan at the central level than at the sub-national level I for HIV/AIDS, malaria, and PRH commodities (TO1: 39% central, 34% sub-national I; TO2: 31% central, 20% sub-national I; TO3: 24% central, 14% sub-national I), while MNCH commodities had almost the same stocked according to plan rate at the central and sub-national I level (29% and 30%, respectively). This is consistent with Q3 data.
- ▶ HIV/AIDS products were stocked according to plan 35% of the time, up from 29% in Q3. The products most likely to be stocked according to plan include viral load consumables (80% at the central level) and EID consumables (75% at the central level), although the number of observations for these commodities were low (5 and 4, respectively). First-line adult ARVs were stocked according to plan 55% of the time at the central level and 51% of the time at the sub-national I level; second-line adult ARVs were stocked according to plan 44% of the time at the central level and 55% of the time at the subnational I level; and first-line pediatric ARVs were stocked according to plan 33% of the time at the central level and 50% of the time at the sub-national I level.
- ▶ Malaria products were stocked according to plan 21% of the time, up from 13% in Q4. The products most likely to be stocked according to plan include LLINs (54% central level, 58% sub-national I level), followed by AL 6X2 (61% central level, 27% sub-national I level), AL 6X1 (37% central level, 27% sub-national I level), AL 6X3 (22% central level, 26% sub-national I level), and AL 6X4 (17% central level, 23% sub-national I level).
- ▶ PRH products were stocked according to plan 14% of the time, up from 10% in Q3. The products most likely to be stocked according to plan include Levonorgestrel/Ethinyl Estradiol 150/30 mcg 28 Tablets/Cycle (33% central level), Levonorgestrel/Ethinyl Estradiol 150/30 mcg + Fe 75 mg (43% central level, 28%, sub-national I level), 28 Tablets/Cycle, and Depot Medroxyprogesterone Acetate 150 mg Vial, Intramuscular (45% central level, 22% sub-national I level).
- ▶ MNCH products were stocked according to plan 30% of the time, up from 5% in Q3. The products most likely to be stocked according to plan include MgSO4 (50% injectable) (13% central level, 46% sub-national I level), Amoxicillin (125 mg or 250 mg dispersible tablets) (43% central level, 40% sub-national I level), and injectable gentamicin (38% central level, 32% sub-national I level).

### Data notes

- ▶ Q4 data and Year to Date data do not include sub-national Level 2 observations as the data were deemed not complete enough to be included.
- ▶ Data from Rwanda have not been included for Q4, due to a recent change in staff and limited time for training on GHSC-PSM indicators and our data collection tools and SOPs.
- ▶ Stocked according to plan rates presented are for all key products offered in each country, irrespective of the funder of those products.

## B2. Stocked according to plan - country level analysis

Country Analysis	
Angola	Similar to Q3, products in Angola were stocked according to plan only 6% of the time at storage facilities, while products were stocked out 56% of the time at storage facilities. For HIV/AIDS commodities, a new quantification exercise is taking place in the coming weeks to revisit plans and targets. In addition, GHSC-PSM is conducting advocacy work with other procurement partners regarding ordering timelines. For malaria and PRH products, commodity shipments are expected to arrive in November and December. A distribution plan has been drafted with the National Malaria Control Program in expectation of these arrivals, and for PRH products, priority has been given to plan the distribution of Depo-Provera and Postinor as injectable contraceptives, which were stocked out 86% of the time, and emergency oral contraceptives were stocked out 88% of the time. Additionally, the Department of Reproductive Health supported by GHSC-PSM is planning the training of logistics staff and provincial supervisors in RH commodities management and data reporting.
Ethiopia	Ethiopia's stocked according to plan rate is nearly the same in Q4 (15%) as in Q3 (14%), although it is a marked increase from previous quarters (9% in Q2 and 7% in Q1).
Guyana	While the number of products and the number of stock status observations for Guyana is low (3 products and 6 observations), these products were stocked according to plan 100% of the time at the central level warehouse and 67% of the time at the sub-national I level, with pediatric ARVs being out of stock at the West Demerara Regional Warehouse. GHSC-PSM Guyana will provide technical support to the Ministry of Public Health to strengthen the distribution of pharmaceuticals and health commodities through the development of a proposal for the outsourcing of transportation, as outlined in the FY18 work plan. This will help continue to ensure that transportation and distribution issues do not result in stockout situations.
Haiti	Stocked according to plan rates continue to remain high in Haiti at 73% in Q4. Eighty percent of observations for HIV/AIDS commodities and 67% of observations for PRH commodities showed products stocked within the minimum and maximum levels. No products were stocked out, however 27% were overstocked. In the case of Unigold, two orders were received at the same time related to a delay in one order, and for calendar-based awareness methods and copper-bearing IUDs, products were inherited from the previous project while consumption remains low.
Liberia	Liberia completed its first stock count at storage facilities this quarter. While stocked according to plan rates were low (11%), 44% of products were overstocked. This is due to the fact that multiple central level storage facilities were recently combined into one facility, and thus many products were overstocked.
Lesotho	Stocked according to plan rates in Lesotho have increased from 6% in Q3 to 18% in Q4. The only product stocked out was tie-breaker RTKs and the Central Medical Store has placed an order to replenish stock.
Madagascar	Products in Madagascar were stocked according to plan only 13% of the time and were stocked out 46% of the time at storage facilities. This shows a similar trend as previous quarters. At the central level, products were stocked out 63% of the time due to late shipments from other funders. No late GHSC-PSM shipment affected central level stockouts for any products. For malaria commodities, GHSC-PSM has developed a distribution plan based on requisition orders from facilities to ensure that products are distributed effectively once the late shipments arrive in country. For TO3 products, GHSC-PSM Madagascar is working with other partners to try to fulfill emergency orders and is exploring options for reallocating stock from countries with overstock of key products.
Malawi	Most products in Malawi were stocked according to plan with 100% of HIV/AIDS and malaria commodities within minimum and maximum levels, 67% of PRH and MNCH commodities (79% overall, a notable increase from 57% in Q3). GHSC-PSM will continue to support the distribution of commodities and to support the Ministry of Health to conduct ongoing supply planning and pipeline analysis to ensure stock availability remains high.
Namibia	Namibia's stocked according to plan rate decreased this quarter to 25%. GHSC-PSM is working with a Global Fund MSH consultant stationed at the Central Medical Store to develop a supply chain strategy for CMS and the pharmaceutical system in general and to implement short-term operational improvements.
Nepal	Stocked according to plan rates remained low in Nepal (11%). At the sub-national level, the number of observations was quite low due to lack of a balance or issue data for some storage sites in the reporting period. GHSC-PSM Nepal will continue to advocate the need to calculate monthly consumption/issue quantity for all storage sites. It will also emphasize the need to follow the stock level guidelines for each level of storage sites. Since stock status is also interrelated to warehousing practices and storage space, GHSC-PSM Nepal is working with selected storage sites to facilitate the warehousing practices and functions in FY18.
Pakistan	Pakistan continues to experience low stocked according to plan rates (6%). Low performance in this indicator is due to ineffective distribution and storage practices prevailing at district stores. Supply chain integration, network optimization, and strategic distribution are expected to contribute to procurement and transportation efficiencies for Punjab and KP, while the project also continues advocacy for domestic financing for the remaining parts of Pakistan. These efforts will work towards making gradual improvements in the stocked according to plan rates over time in collaboration with the government.
Vietnam	While the number of products and the number of stock status observations for Vietnam is low (2 products and 6 observations), their products were stocked according to plan 83% of the time at the central level, and they had no stockouts.
Zimbabwe	Stocked according to plan rates in Zimbabwe remained the same as reported in Q3, at 29% while 64% of products are understocked. One reason for understocking is the delay of a large male condoms shipment. Additionally, Tenofovir/Lamivudine/Efavirenz Zidovudine/Lamivudine/Nevirapine was understocked, however this product is being phased out so low stock levels are expected.
Data Notes	
▶	Countries highlighted for this analysis included those with the highest stocked according to plan rates (above 70 percent) and with the lowest stocked according to plan rates (below 30 percent).



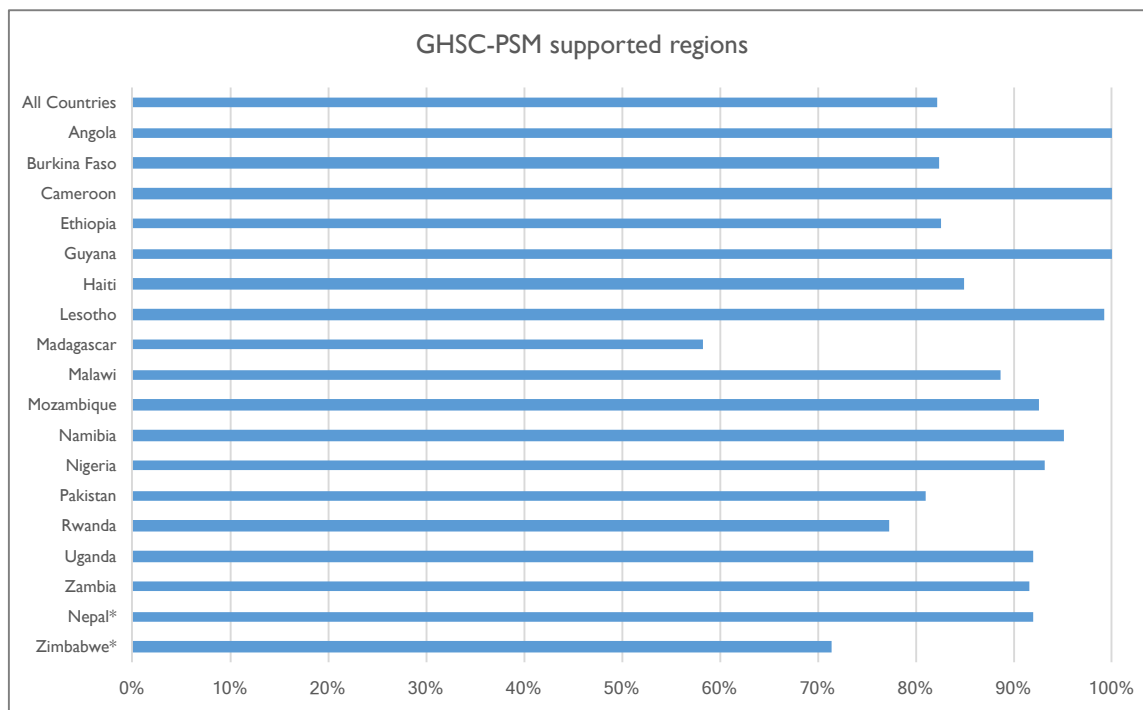
### B3. Service Delivery Point (SDP) reporting rate to the Logistics Management Information System (LMIS)

#### Measure Definition

**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 that should be reporting.

#### Indicator Performance



Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	90%	90%
TO2	N/A	83%	82%
TO3	N/A	80%	80%
TO4	N/A	78%	75%
All TOs	N/A	82%	82%

#### Analysis

- ▶ Service delivery point reporting rates to the LMIS remained consistent at 82% in Q4, with the highest reporting rates continuing for TO1 products (90%) and the lowest reporting rate for TO4 products (78%).
- ▶ Cameroon and Guyana both had 100% reporting rates, with Lesotho at 99%. Angola also had a 100% reporting rate, but only includes the 9 TO1 facilities and 10 TO2 facilities. Other strong-performing countries included Namibia (95%), Nigeria (93%), Mozambique (93%), and Zambia (92%).
- ▶ Madagascar had the lowest rate, at 58%. It is in the process of transitioning to a new official LMIS, Channel, which has been rolled out successfully at the central and district levels (recently demonstrating an 80% reporting rate from the district, PhaGDis, to the central level). The final rollout of Channel to the lowest level (commune, or PhaGeCom) is anticipated to be complete within approximately six months.
- ▶ Mozambique, with a high overall reporting rate, experienced a drop in the reporting rate for lab products, due to new lab technicians who had not been trained. GHSC-PSM is providing monthly technical assistance and encouraging the MOH to communicate standard operating procedures and deadlines for LMIS reporting.

#### Data Notes

- ▶ \* Out of cycle countries are not counted toward overall totals.

### B3. Service Delivery Point (SDP) reporting rate to the Logistics Management Information System (LMIS)

Country SDP Reporting Rates by Task Order		Angola	Burkina Faso	Cameroon	Ethiopia	Guyana	Haiti	Lesotho	Madagascar	Malawi	Mozambique	Namibia	Nigeria	Pakistan	Rwanda	Uganda	Zambia	* Nepal	* Zimbabwe
HIV	TO1	100%		100%	83%	100%	85%	99%		89%	93%	95%	92%		80%	99%	90%		72%
Malaria	TO2	100%	82%		83%				59%	89%			97%		70%	89%	92%		70%
PRH	TO3				83%		85%		59%	89%			89%	81%	65%		92%	92%	
MCH	TO4				83%				57%	89%					94%		92%	92%	

\* Out of cycle

## B4. Average rating of in-country data confidence at the central, subnational, and SDP levels

### Measure Definition

**Numerator:** Sum of all rating scores (0-9 points each) for all sites reporting.

**Denominator:** Total number of sites reporting.

### Indicator Performance

Country	TO1	TO2	TO3	TO4
Angola	8.0	4.7	3.8	
Burkina Faso		4.6		
Burundi	3.0	5.1	5.3	
Ethiopia	5.4	5.7	6.2	5.2
Ghana	9.0	9.0	9.0	9.0
Haiti	6.8		7.8	
Lesotho	8.4			
Madagascar		6.1	6.0	5.1
Mozambique	6.9	7.8	8.0	8.1
Namibia	7.7			
Nepal			7.4	6.8
Nigeria	5.1	6.6	5.6	
Pakistan			7.6	
Zambia	7.3	7.5	6.8	7.3

### Achievement

Task Order	Annual Target	FY2017
TO1	N/A	5.3
TO2	N/A	5.9
TO3	N/A	6.3
TO4	N/A	5.6
All TOs	N/A	5.8

### Analysis

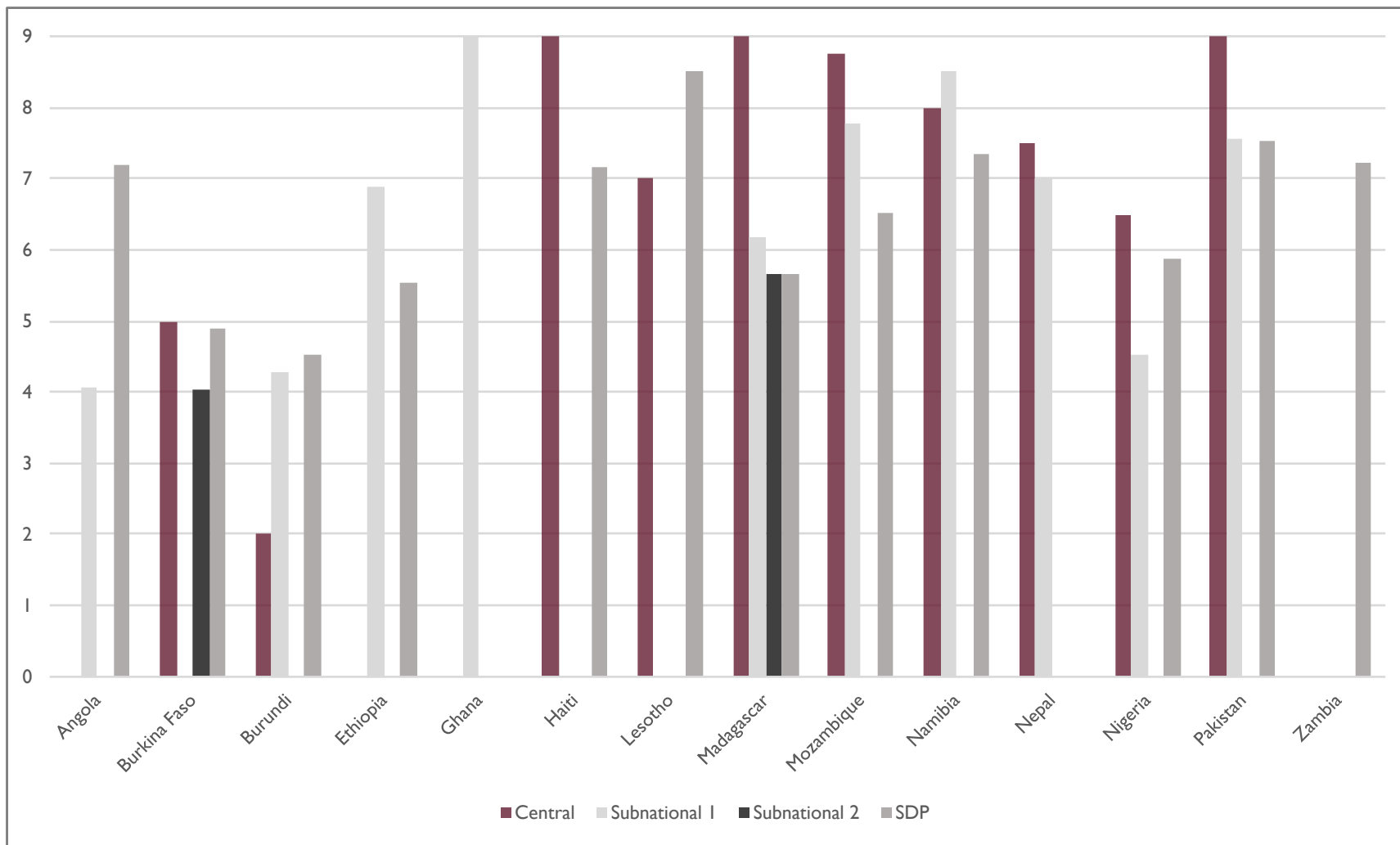
- ▶ Overall data confidence in all reporting countries was 5.8 out of 9, bordering between "fair" and "good," out of which reproductive health (TO3) products represented the highest data quality at 6.3. Data confidence is a measure of the accuracy, completeness, and timeliness of logistics data at the SDP, subnational warehouse, and central warehouse level.
- ▶ While TO4 appears to have relatively strong data confidence at first glance, only six countries rated TO4 data altogether, three of which were at the SDP level, and only 324 sites were rated overall, compared to 561 for TO1, 653 for TO2, and 635 for TO3.
- ▶ Similarly, while TO1 appears to have the lowest level of data confidence, 10 countries rated TO1 product data, including 9 at the SDP level. Burundi brings this score down significantly, with 136 sites reporting at all levels, and with an overall average score of 3 out of 9, interpreted as poor. Burundi rated TO1, TO2, and TO3 products but not TO4 products, leaving TO4 appearing stronger overall.

### Data Notes

- ▶ Data for this indicator was collected using a standardized DQA tool and methodology developed by GHSC-PSM to assess data availability, accuracy, and timeliness.
- ▶ The number of sites visited, the levels of the supply chain assessed, and the extent to which countries were able to conduct representative assessments varied per country. In many instances, the data have limited ability to be generalized outside of the sites visited.

## B4. Average rating of in-country data confidence at the central, subnational, and SDP levels

### Indicator Performance



## B7. Percentage of total spent or budgeted on procurement of commodities for public sector services by the government, USG, or other sources

### Measure Definition

Numerator: Total budgeted or spent on health care commodities by a specific stakeholder in a country.

Denominator: Total budgeted or spent on health care commodities in a specific country.

### Indicator Performance

	Country	Host Country	USG	Global Fund	Other	Total	
HIV/AIDS	Angola	\$19,972,603	\$546,348	\$11,814,779		\$32,333,730	
	Burundi	\$1,409,018	\$1,620,599	\$10,978,068		\$14,007,685	
	Cameroon		\$3,840,861			\$3,840,861	
	Ethiopia	\$0	\$10,746,150	\$78,242,260	\$0	\$88,988,410	
	Ghana	\$16,286,961	\$8,418,777	\$20,599,025		\$45,304,763	
	Guyana		\$272,350	\$296,456,000		\$296,728,350	
	Malawi		\$2,568,895			\$2,568,895	
	Mozambique	\$0	\$30,755,676	\$61,150,844	\$2,448,558	\$94,355,078	
	Namibia	\$31,339,183		\$4,506,028		\$35,845,211	
	Nigeria	\$952,196	\$114,066,260	\$53,399,732		\$168,418,188	
	Rwanda		\$24,325,146	\$14,596,731		\$38,921,877	
	Uganda	\$17,361,308	\$90,049,187	\$73,664,470		\$181,074,965	
	Zimbabwe	\$13,904,166	\$28,369,581	\$89,259,015	\$14,315	\$131,547,077	
	Malaria	Angola	\$3,322,470	\$1,432,142	\$4,145,282		\$8,899,894
		Burkina Faso	\$2,442,370	\$7,971,108	\$6,632,017	\$3,879,342	\$20,924,837
Burundi		\$249,187	\$10,791,728	\$5,176,099		\$16,217,014	
Ethiopia		\$0	\$28,351,864	\$20,345,096	\$0	\$48,696,960	
Ghana		\$0	\$17,139,258	\$20,446,390		\$37,585,648	
Madagascar			\$954,780	\$1,049,062		\$2,003,842	
Malawi			\$8,628,850			\$8,628,850	
Mozambique		\$0	\$6,965,328	\$14,201,193	\$1,793,232	\$22,959,753	
Nigeria			\$23,181,888			\$23,181,888	
Rwanda		\$144,167	\$6,366,482	\$4,717,765		\$11,228,414	
Uganda		\$9,107,595	\$1,905,798	\$17,902,141	\$16,023,014	\$44,938,548	
Zimbabwe			\$1,986,600	\$833,861		\$2,820,461	

	Country	Host Country	USG	Global Fund	Other	Total	
Family Planning and Reproductive Health	Angola	\$491,419	\$23,000		\$576,959	\$1,091,378	
	Burundi	\$46,000		\$893,142	\$191,430	\$1,130,572	
	Ethiopia	\$85,947	\$3,400,000	\$0	\$18,091,247	\$21,577,194	
	Ghana	\$0	\$2,346,004		\$1,700,000	\$4,046,004	
	Malawi		\$1,096,200			\$1,096,200	
	Mozambique	\$0	\$2,879,417	\$0	\$482,496	\$3,361,913	
	Nepal	\$10,592,806				\$10,592,806	
	Nigeria	\$1,000,000	\$5,700,000		\$6,883,661	\$13,583,661	
	Pakistan	\$21,800,000				\$21,800,000	
	Rwanda	\$860,038	\$193,686		\$2,117,281	\$3,171,005	
	Uganda	\$2,341,018	\$10,000,000	\$429,353	\$4,451,147	\$17,221,518	
	Zimbabwe		\$0	\$0	\$4,172,408	\$4,172,408	
	MNCH	Ethiopia	\$0	\$0	\$0	\$2,977,782	\$2,977,782
		Malawi		\$0			\$0
		Mozambique	\$626,243	\$0	\$512,240	\$11,859	\$1,150,342
Other	Nepal	\$1,854,964				\$1,854,964	
	Rwanda	\$264,521	\$383,844		\$2,524,906	\$3,173,271	
	Zambia	\$1,708,805	\$34,762			\$1,743,567	
	Ethiopia	\$58,453,915	\$0	\$0	\$0	\$58,453,915	
	Uganda	\$30,825,100	\$6,499,207			\$37,324,307	

### Data Notes and Analysis

- ▶ In many countries, spending and budgeting records were not available from other funders, especially for health elements in countries where GHSC-PSM is not operating a corresponding TO. Centralized procurement tracking across all funders and commodity types is also not usually available. As a result, data for most countries and health elements cannot be considered complete.
- ▶ Data aggregation for the purpose of producing percentages and other comparative analyses is not possible due to missing data (leading to incomplete totals for denominators), a mix of budget and spending data, and a mix of annual reporting periods across countries (USG fiscal year, local government fiscal year, calendar year, etc.). Some percentage breakdowns for countries with more complete data are shown on the following page.
- ▶ In general, the Global Fund is the largest funder of HIV/AIDS commodities across countries. USG contributes nearly half of all malaria funding (47% of the reported totals), with the Global Fund contributing the second largest amount (38%).
- ▶ Family planning commodities are largely funded by local governments and other donors (36 and 38% of these reported totals, respectively). The most common "other" donor is UNFPA.
- ▶ Empty cells in the table to the left indicate that data is not available or accessible. Funders may or may not have spent or budgeted funds in these countries and health areas.

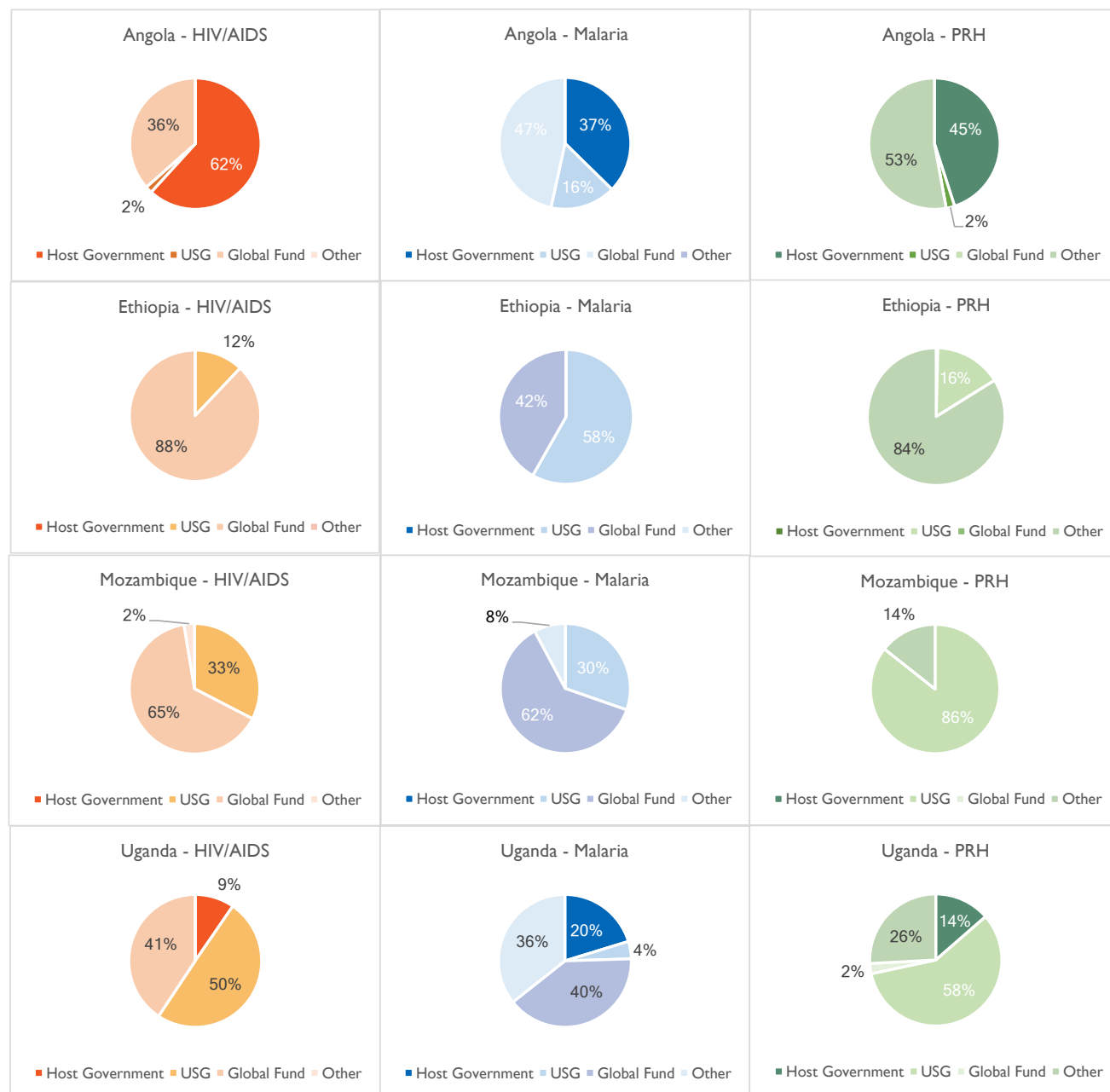
## B7. Percentage of total spent or budgeted on procurement of commodities for public sector services by the government, USG, or other sources

### Measure Definition

Numerator: Total budgeted or spent on health care commodities by a specific stakeholder in a country.

Denominator: Total budgeted or spent on health care commodities in a specific country.

### Indicator Performance



### Analysis

► Angola data shows budgeted figures for calendar year 2017, according to quantification and forecast reports.

► Ethiopia data shows spent figures for USG FY17.  
► 100% of MNCH commodity funding comes from other sources.

► 100% of funding for Other Essential Medicines comes from the government of Ethiopia.

► Mozambique data shows spent figures for USG FY17.

► The government of Mozambique contributed 54% of the spending on MNCH commodities, out of a total of \$1.1 million in MNCH spending this year.

► Uganda data shows spent figures for the government fiscal year ending in June 2016 (July 2016-June 2017). Figures for the fiscal year ending June 2017 have yet to be compiled.

► An additional \$37.3 million was spent by the governments of Uganda and the United States on Other Essential Medicines.

## B9. Supply chain workforce loss ratio

### Measure Definition

**Numerator:** Number of health workers with supply chain expertise who left the active health labor force in the last year.

**Denominator:** Total number of health workers with supply chain expertise at the beginning of the year.

### Indicator Performance

Country	Workforce Loss Ratio
Angola	8%
Burkina Faso	4%
Ethiopia	8%
Guyana	38%
Lesotho	12%
Mozambique	2%
Pakistan	0%
Rwanda	5%
Uganda	1%

Cross-cutting

#### Analysis

- ▶ Pakistan saw a 0% workforce loss ratio for health workers with supply chain expertise across the central, subnational, and subnational 2 levels.
- ▶ While the pharmacy technicians saw a loss in workforce in Uganda, the number of pharmacists and lab staff in the public sector increased.
- ▶ While Guyana showed a 38% loss of its public health supply chain workforce in FY17, the total number of workers with supply chain expertise at the start of the year was only 24 individuals.

#### Data Notes

- ▶ Many countries had difficulty accessing workforce data.
- ▶ This indicator measures the workforce loss ratio for individuals with supply chain expertise and does not represent workforce loss of the public health or health sector workforce at large.

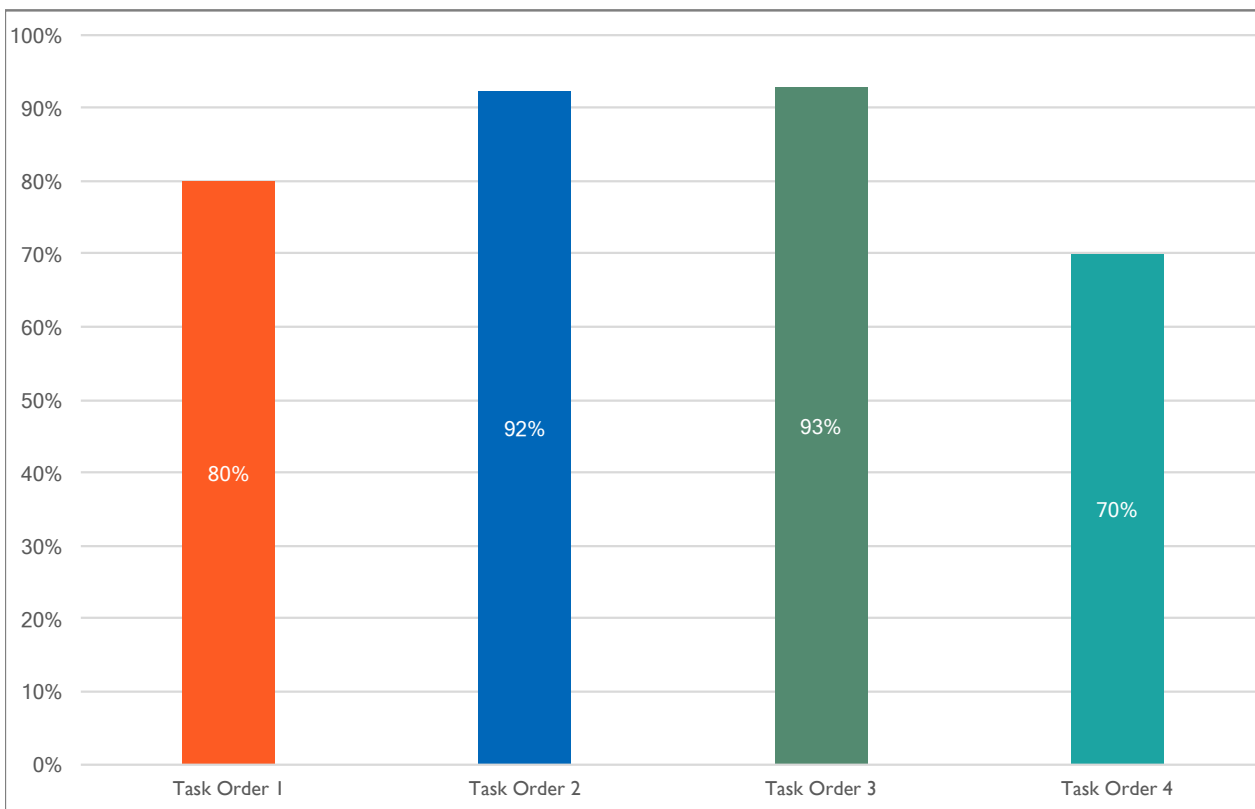
## B10. Percentage of GHSC-PSM-supported countries that have a functional logistics coordination mechanism in place

### Measure Definition

**Numerator:** Total number of countries with a functional logistics coordination mechanism in place as determined by a qualitative assessment.

**Denominator:** Total number of countries supported by GHSC-PSM for technical assistance.

### Indicator Performance



Task Order	Annual Target	FY2017
TO1	N/A	80%
TO2	N/A	92%
TO3	N/A	93%
TO4	N/A	70%
All TOs	N/A	85%

### Analysis

- ▶ Out of the 20 countries who assessed their commodity logistics coordination mechanisms across TOs, 14 were found to be functional across all TOs, while three were found to be functional across some TOs but not all. Twelve countries reported a functional mechanism for HIV/AIDS commodities (out of 15 assessed), 12 for malaria commodities (out of 13 assessed), 13 for PRH commodities, and 7 (out of 10 assessed) for MNCH commodities.
- ▶ In Cameroon, the National HIV Procurement and Supply Chain Committee was revitalized, with an action plan developed at its last meeting held in June 2017.
- ▶ In Uganda, through collaboration, GHSC-PSM handed over the production slot for artesunate injections booked with the manufacturer to Global Fund, preventing loss of funds since only one manufacturer was WHO pre-qualified at that time.

### Data Notes

- ▶ The following criteria were assessed and taken into account when determining whether a country's logistics coordination mechanism is counted as "functional:" (1) participation of the relevant host country government agency (Ministry of Health, National Malaria Control Program, National AIDS Control Program, National Reproductive Health/Family Planning agency or equivalent), central medical stores (or their equivalents), and relevant donors, private sector entities, NGOs, and civil society organizations; (2) holding a meeting at least biannually with good representation from the mechanism's contributing actors; (3) developing policies, procedures, and action plans; and (4) showing evidence of adherence to policies and procedures, implementing action plans, and following up on and addressing issues raised at previous meetings.

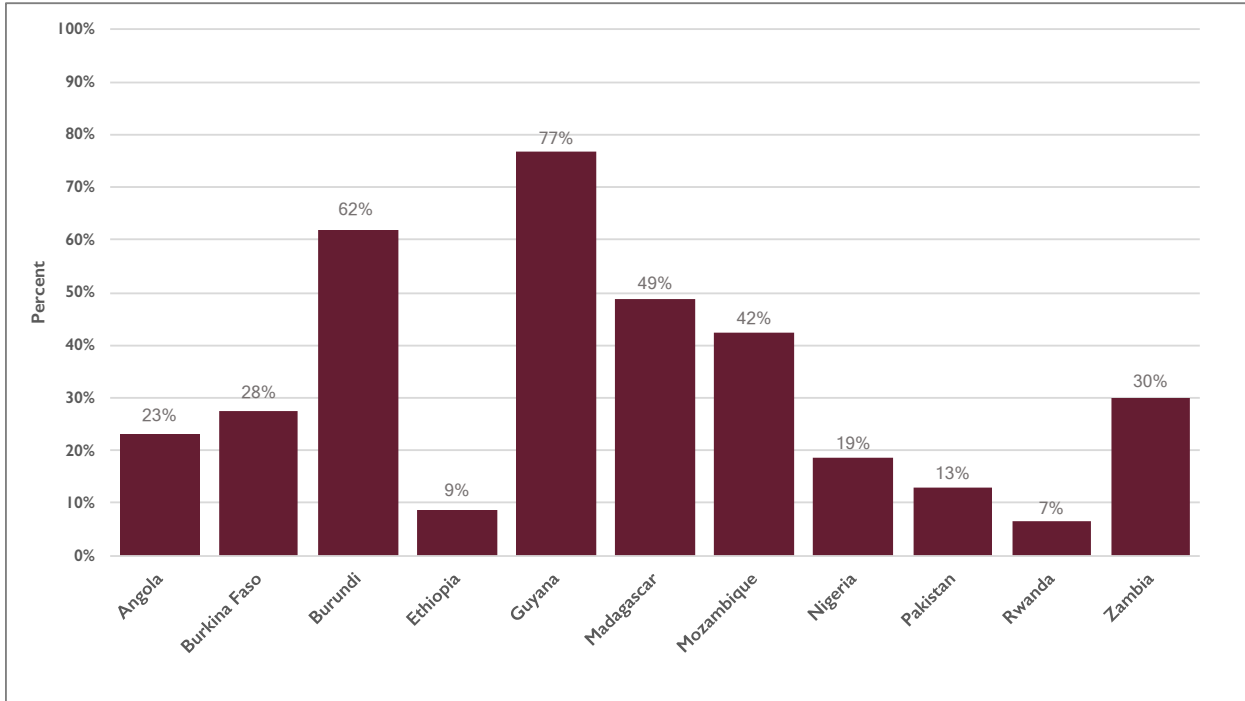


## B11. Percentage of leadership positions in supply chain management that are held by women

**Numerator:** Number of leadership positions in supply chain management that were held by women in a specified time frame in countries where GHSC-PSM is providing technical assistance related to workforce development.

**Denominator:** Total number of leadership positions held in a specified time period in countries where GHSC-PSM is providing technical assistance related to workforce development.

### Indicator Performance



### Data Notes

► "Leadership positions in supply chain management" refers to public sector directors or other heads of units responsible for public health commodity supply chain policy, implementation, or administration at the national level. In countries with decentralized supply chains, where significant autonomy and leadership responsibilities are devolved to lower levels, this definition may also include positions one subnational level below the national level.

Task Order	Annual Target	Achievement	
		FY2017 Q4	Year to Date
TO1	N/A	53%	N/A
TO2	N/A	33%	N/A
TO3	N/A	41%	N/A
TO4	N/A	46%	N/A
Cross-cutting	N/A	23%	N/A
All TOs*	N/A	34%	N/A

### Analysis

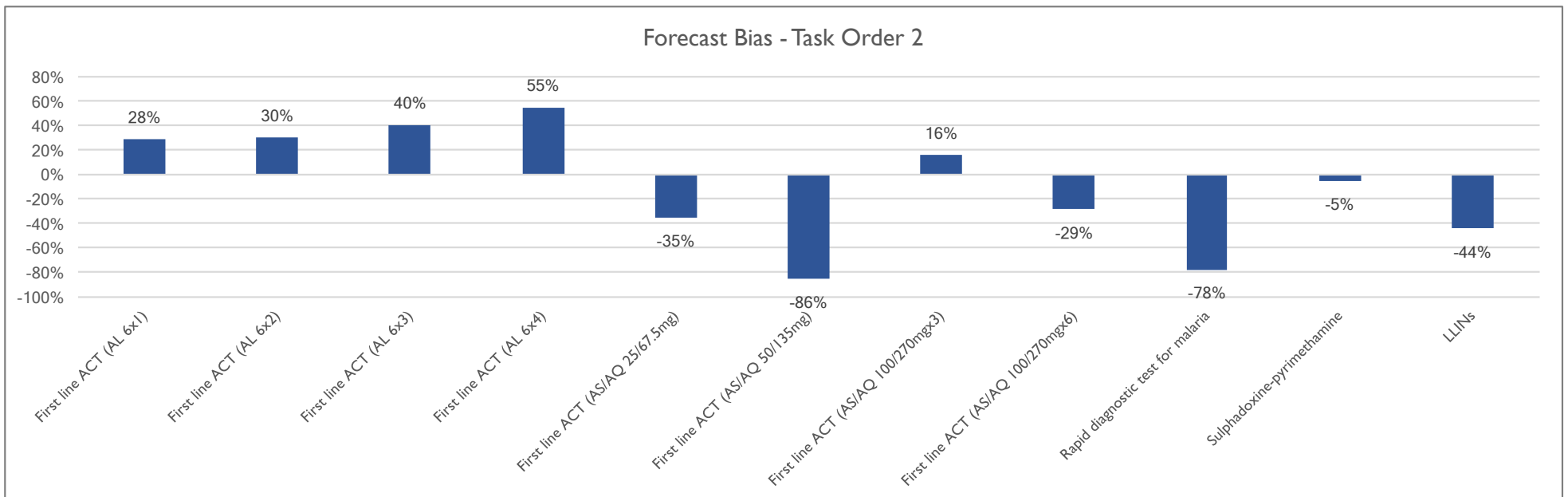
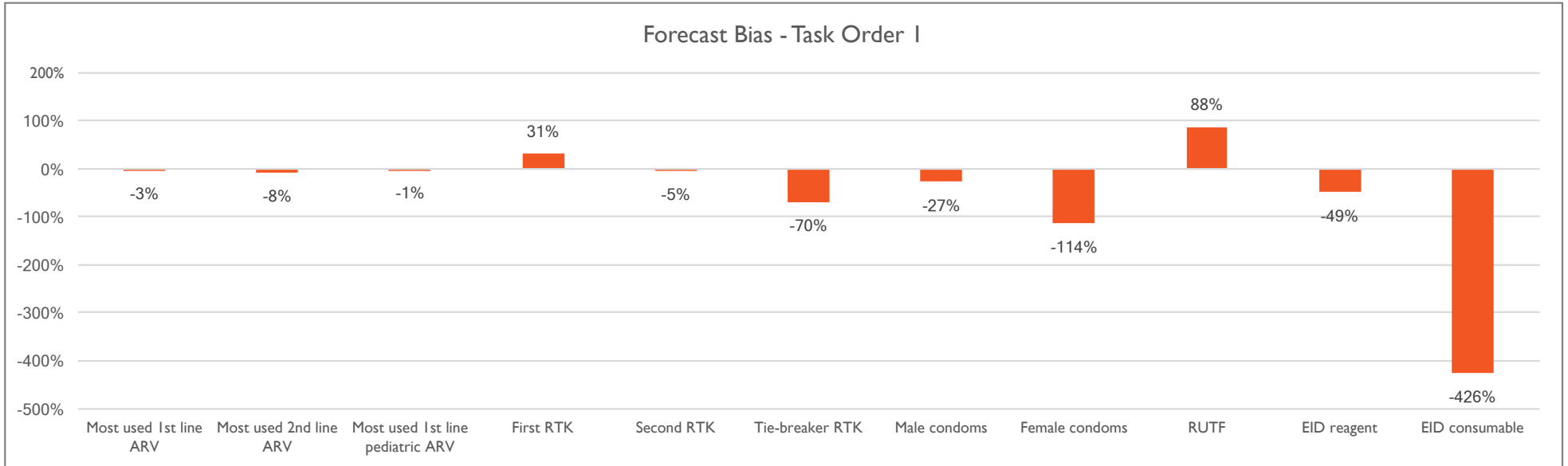
- Eleven countries reported on this indicator for FY17 Q3 and Q4. Across all TOs, 34% of leadership positions in supply chain management were held by women.
- TO1 had the highest percentage of leadership positions filled by women during the six month period (53%), followed by TO4 (46%), then TO3 (41%), TO2 (33%), and, finally, 23% of cross-cutting leadership positions were filled by women.
- Guyana had the highest percentage of women in leadership positions (77%), while Rwanda had the lowest (7%).

## B12. Absolute Percent Consumption Forecast Error

### Measure Definition

**Numerator:** Absolute value of the difference between the actual quantities of products consumed at SDPs during period minus the forecasted consumption.

**Denominator:** Sum of the actual quantities of products consumed. **Variants: Forecast Bias** (calculated using the actual value of the difference between quantities forecasted and quantities consumed at or issued to the SDPs) and **Mean Absolute Percent Error** (MAPE - average absolute percent error over one fiscal year).

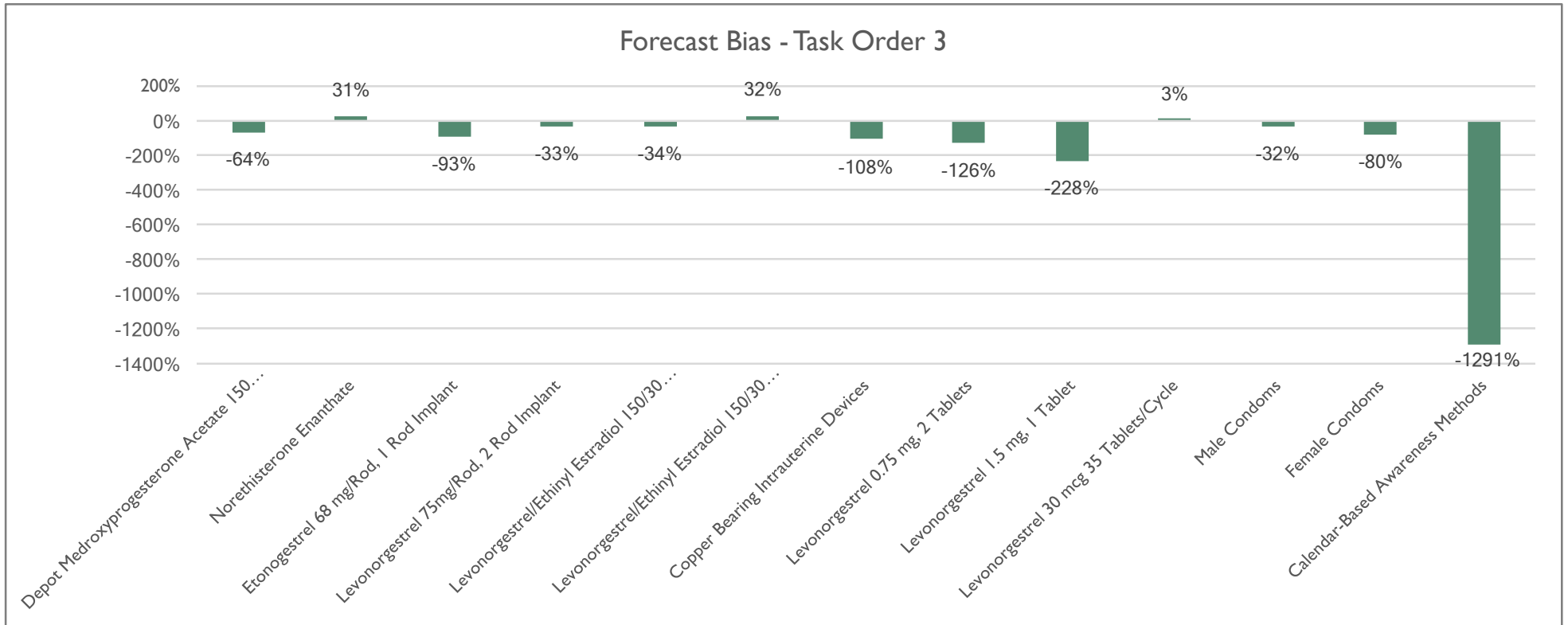


## B12. Absolute Percent Consumption Forecast Error

### Measure Definition

**Numerator:** Value of the differences between the actual quantities consumed or issued to SDPs during the period minus the forecasted values.

**Denominator:** Sum of the actual quantities desired to be delivered. Variants: **Forecast Bias** (calculated using the actual value of the difference between quantities forecasted and quantities consumed at or issued to the SDPs).



## B12. Absolute Percent Error - granular level analysis

### Analysis

In general, countries tend to report underconsumption compared to forecasts, with the greatest variance appearing for low-volume commodities such as calendar awareness-based methods and lab reagents.

### Country Analysis

Angola	Angola reported high variance for nearly all TO1 commodities, especially female condoms (1,015% APE) and pediatric ARVs (774% APE). TO2 performance was better, although AL 6x1 and 6x3 were both underconsumed by more than 200%. Forecast accuracy is expected to improve in the coming year following the recent completion of quantification exercises at the national level.
Haiti	Haiti noted variance in the consumption of RTKs and ARVs due to changes in national protocols and preferred regimens. The forecast has not yet been revised to account for these changes but will be updated during quantification activities in December 2017.
Madagascar	Low reporting rates from Madagascar's SDPs continue to bias the performance toward underconsumption.
Malawi	Malawi reported overconsumption of most products. GHSC-PSM is providing training and support to the Ministry of Health to improve quantifications.
Mozambique	Underconsumption for RTKs was due in part to ambitious targets. Consumption decreased for AL 6x2, AL 6x3, zinc, and chlorhexidine gel due to product shortages, while consumption of TO3 products decreased due to reduced availability of transportation.
Namibia	Namibia noted that the number of planned tests using RTKs was much higher than the actual number of tests conducted or distributed. GHSC-PSM is working with the HIV program to better understand the reasons for this discrepancy.
Nepal	Data is reported from the first 9 months of FY17. Large forecast errors may be the result of weak forecasting methodology, limited procurement due to budget shortfalls, and data quality issues at the SDP level.
Nigeria	Forecast errors were generally within acceptable limits with the following exceptions: RTK consumption is lower than forecast because of funding constraints in procurement and delays in post-market validation. ACT consumption is greater than forecast because forecast figures are constrained by available funding. GHSC-PSM plans to cap supply to some states beginning in November, which should bring consumption closer in line with forecasts. High variance for calendar-based awareness methods is due to long procurement delays by other partners. These products have now been procured and donated by USAID, which should improve consumption in coming quarters.
Pakistan	Forecast bias improved this quarter for most PRH products, due to increased consumption.
Uganda	Forecast accuracy is generally strong for TO1 and TO2 products, for which consumption data are readily available. Variance is greater for TO3 items, especially for I-rod implants and emergency oral contraceptives, both with variance greater than 200%.
Zimbabwe (out of cycle)	Zimbabwe (whose data is reported from FY17 Q3 and is not included in the overall performance presented in the previous pages) noted overconsumption of ACTs due to high incidence of malaria cases recorded in all endemic districts. Consumption of RTK was also high, while error for first-line ARVs was less than one percent.

## D. Denominator Annex

	Countries																	
	Angola	Burkina Faso	Burundi	Cameroon	Ethiopia	Ghana	Guyana	Haiti	Lesotho	Madagascar	Malawi	Mozambique	Namibia	Nigeria	Rwanda	Uganda	Zambia	Zimbabwe (out of cycle)
B1. Stockout Rate at SDPs																		
<b>Tracer Products</b>																		
First-line Adult ARVs	9		89	62	1040	46	22	139	119		501	1228	60	2634	586	196	345	1556
Second-line Adult ARVs	9		6	44	143	44	15	139	117			370	60	498	586		345	1435
First-line Pediatric ARVs	5			47	747		7	139	107			964	60	851	586	150	345	1352
First RTKs	9		99	56	205	57		139	99		543		60	3332	586	223	1766	1692
Second RTKs	9		92	53	155	44			99				60	2741	586	183	1766	1692
Tie-breaker RTKs					70				87				60	1370		187		1692
Male Condoms	9		91	59	684	53		190	56		504		17	1022	586		1951	1747
Female Condoms	9		71						45		217		12	1397	586		1951	1734
Ready-to-use Therapeutic Food (RUTF)					496				103						82	82		
EID Reagents					19				1			5		20	5	1	11	
EID Consumables					122							5		22	5	1		
Viral Load Reagents					19				2			8		22	9	1	11	
Viral Load Consumables					12							8		22	9			
First-line ACTs (AL 6X1)	10	1750			574						553			3033	586		1951	1630
First-line ACTs (AL 6X2)	10	1750			560						555			3091	586		1951	1629
First-line ACTs (AL 6X3)	10				534						547			2399	586		1951	1635
First-line ACTs (AL 6X4)	10				555	53					554			3030	586		1951	1652
AL Inability to Treat	10	1750			685									3165	586	211	1951	
First-line ACTs (AS/AQ 25/67.5 mg)			106			53				1163				2427				
First-line ACTs (AS/AQ 50/135 mg)			106			53				1211				2581				
First-line ACTs (AS/AQ 100/270 mg x 3)		1750	106							1290				2506				
First-line ACTs (AS/AQ 100/270 mg x 6)		1750	106							1355				2364				
Rapid Diagnostic Tests for Malaria		1750	106		279	56				1439				2998	586	239	1951	1338
Sulphadoxine-pyrimethamine (SP)		1750	101			55				589				2716		218	1951	703
LLINs		1750	106							1039				1914				



