USAID GLOBAL HEALTH SUPPLY CHAIN PROGRAM
Procurement and Supply Management

FISCAL YEAR 2022

ANNUAL REPORT

OCTOBER 1, 2021, TO SEPTEMBER 30, 2022

USAID FROM THE AMERICAN PEOPLE

PEPFAR U.S. President's Emergency Plan for AIDS Relief

PMI U.S. PRESIDENT'S MALARIA INITIATIVE LED BY USAID FROM THE AMERICAN PEOPLE CDC

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Contract No. AID-OAA-I-15-00004

The USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project is funded under USAID Contract No. AID-OAA-I-15-00004. GHSC-PSM connects technical solutions 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 create a healthier future for all. The project purchases and delivers health commodities, offers comprehensive technical assistance to strengthen national supply chain systems and provides global supply chain leadership.

GHSC-PSM is implemented by Chemonics International, in collaboration with Arbola Inc., Axios International Inc., IDA Foundation, IBM, IntraHealth International, Kuehne + Nagel Inc., McKinsey & Company, Panagora Group, Population Services International, SGS Nederland B.V., and University Research Co., LLC. To learn more, visit ghsupplychain.org.

Contents

ACRONYMS

3HP	isoniazid and rifapentine (combination treatment for tuberculosis)
3PL	third-party logistics
4PL	fourth-party logistics
ABC	activity-based costing
ABM	activity-based management
ACT	artemisinin-based combination therapy
AFMS	Air Filter Maintenance Services
AL	artemether-lumefantrine
AMF	Against Malaria Foundation
API	active pharmaceutical ingredient

APWG	ARV/3HP Procurement Working Group
ARPA	American Rescue Plan Act
ART	antiretroviral therapy
ARTMIS	Automated Requisition Tracking Management Information System
ARV	antiretroviral
ARVFAST	Antiretroviral Forecasting and Supply Planning Tool
ASACO	community health association
BHA	Bureau of Humanitarian Assistance
BMGF	Bill & Melinda Gates Foundation
CHAI	Clinton Health Access Initiative
CHTF	Child Health Task Force

CMS	central medical store
CAPA	corrective and preventive action
cLMIS	computerized logistics management information system
COC	combined oral contraceptive
CO2	carbon dioxide
COP	country operational plan
CPAP	continuous positive airway pressure
CS	contraceptive security
CSCOM	community health association
DAP	Delivered at Place
DBS	dried blood spot

DCP	decentralized procurement
DDP	Delivered Duty Paid
DNO	diagnostic network optimization
DPM	Directorate of Pharmacy and Medicine
DRC	Democratic Republic of the Congo
DSC-S&A	Digital Supply Chain Strategy and Architecture
DRF	Drug Revolving Fund
DT	dispersible tablet
DTG	dolutegravir
ECR	electronic client record
EID	early infant diagnosis

eLMIS	electronic logistics management information system
EMMR	Environmental Mitigation and Monitoring Report
ENAP	Every Newborn Action Plan
EPI	Expanded Program on Immunization
EPSS	Ethiopian Pharmaceuticals Supply Service
EUV	end-use verification
FASP	forecasting and supply planning
FLARE	First-Line ARV Reporting and Evaluation
FP/RH	family planning/reproductive health
FTO	Francophone Task Order
FY	fiscal year

GAD	goods availability date
GDSN	Global Data Synchronization Network
GHS	Ghana Health Service
GHSC-PSM	USAID Global Health Supply Chain Program-Procurement and Supply Management project
GHSC-QA	USAID Global Health Supply Chain Program-Quality Assurance project
GHSC-RTK	USAID Global Health Supply Chain Program-Rapid Test Kit project
GHSC-TA	USAID Global Health Supply Chain Program-Technical Assistance project
GIS	geographic information system
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit (The German Society for International Cooperation)
GTIN	Global Trade Item Number

HDP	hypertensive disorders of pregnancy
HSS	Health System Strengthening project
ICFP	International Conference on Family Planning
IDIQ	indefinite delivery, indefinite quantity
IRS	indoor residual spraying
ITN	insecticide-treated net
IUD	intrauterine device
KPI	key performance indicator
KSM	key starting material
LAC	Latin America and the Caribbean
LLIN	long-lasting insecticide-treated net

LMIS	logistics management information system
LOX	liquid oxygen
LQAG	LLIN Quality Assurance Group
MCH	maternal and child health
mCPR	modern contraceptive prevalence
MEDS	Mission for Essential Drugs and Supplies
MHSC	Maternal Health Supplies Caucus
MIS	management information system
MMD	multi-month dispensing
MMV	Medicines for Malaria Venture
MNCH	maternal, newborn, and child health

MOH	Ministry of Health
MPA-IM	medroxyprogesterone acetate-intramuscular
MPA-SC	medroxyprogesterone acetate-subcutaneous
mRDT	malaria rapid diagnostic test
MSF	Médecins Sans Frontières
MTaPS	Medicines, Technologies and Pharmaceutical Services
NHIS	National Health Insurance Scheme
NIH	National Institute of Health
NPC	National Product Catalog
NMCP	National Malaria Control Program
NSCA	National Supply Chain Assessment

OOS	out-of-specification
OTD	on-time delivery
OTIF	on-time, in-full delivery
P&L	profit and loss
PBO	Piperonyl Butoxide
PCMT	Product Catalog Management Tool
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PLHIV	people living with HIV
PMI	U.S. President's Malaria Initiative
PO	purchase order
PPE	personal protective equipment

PPH	postpartum hemorrhage
PPMRm	Procurement Planning and Monitoring Report for malaria
PQM+	Promoting the Quality of Medicines Plus
PrEP	pre-exposure prophylaxis
PSA	pressure swing adsorption
PSBI	possible serious bacterial infection
PWD	Population Welfare Department
Q	quarter
QA	quality assurance
QAT	Quantification Analytics Tool
QC	quality control

RDC	regional distribution center
RFI	request for information
RFP	request for proposal
RHSC	Reproductive Health Supplies Coalition
RMNCH	reproductive, maternal, newborn, and child health
RMS	Rwanda Medical Supply Ltd.
RO	requisition order
RTK	rapid test kit
SC	subcutaneous
SIGLUS	Information and Logistics Management System for Health Units (Sistema de Informação e Gestão de Logistica para Unidades Sanitarias)
SIMAM	Medicines and Medical Articles Information System

	(Sistema de Informação de Medicamentos e Artigos Medicos)
SMC	seasonal malaria chemoprevention
SMO	social marketing organization
SOP	standard operating procedure
SP	sulfadoxine-pyrimethamine
SPAQ	sulphadoxine-pyrimethamine + amodiaquine
SSA	semi-synthetic artemisinin
SSN	small and sick newborn
SSWG	Systems Strengthening Working Group
SUMEVE	Single System for Monitoring and Evaluation of HIV Epidemiological Surveillance
TA	technical assistance
TB	tuberculosis

TE	tenofovir/emtricitabine
TL	tenofovir/lamivudine
TLD	tenofovir/lamivudine/dolutegravir
TO	task order
TPT	TB preventive treatment
TRvST	Traceability and Verification System for Health Products
TWG	technical working group
UAE	United Arab Emirates
UNFPA	United Nations Population Fund
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development

USG	U.S. Government
VAN	Global Family Planning Visibility and Analytics Network
VL/EID	viral load/early infant diagnosis
VMI	vendor-managed inventory
VMMC	voluntary medical male circumcision
VSI	vendor-stored inventory
WHO	World Health Organization

EXECUTIVE SUMMARY

The USAID Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project, funded by the U.S. Agency for International Development (USAID), is pleased to present this report to summarize our work and performance for the fiscal year 2022 (FY 2022). The project provides lifesaving medicines and other health commodities. It builds efficient, reliable, and cost-effective supply chains to deliver these drugs and health supplies for the U.S. President's Emergency Plan for AIDS Relief (PEPFAR), the U.S. President's Malaria Initiative, USAID's programs in voluntary family planning and reproductive health (FP/RH), and the Agency's program in maternal, newborn, and child health (MNCH), which share the cost of the project. USAID's response to the novel coronavirus (COVID-19) is also described in this report.

GHSC-PSM Fast Facts

Over the life of the project, GHSC-PSM has:

- Delivered more than **76.9 million bottles of tenofovir/lamivudine/dolutegravir (TLD) to 33 countries**
- Delivered enough antimalarials to treat **468.2 million infections**
- Delivered enough contraceptives to **provide an estimated 86 million couple-years of protection**
- Procured a total of nearly **$24.92 million in MNCH commodities**
- Supported **50 countries** with technical assistance
- Saved **$73.4 million on warehousing, packaging, and logistics**
- Saved **$586 million on commodity procurement**

INTRODUCTION: REFLECTIONS ON FY 2022

Political unrest, climate change, and the global pandemic continued to shape the supply chain landscape in FY 2022, with such challenges as catastrophic flooding in Pakistan, civil war in Ethiopia, coups d'état in

Burkina Faso and Mali, ongoing security issues in Haiti, and war in Ukraine. Still, GHSC-PSM continued to streamline service delivery to those most in need and to facilitate equitable access to pharmaceuticals and services for those living in the most challenging circumstances. This resilience is a testimony to the adaptability of the project's teams across the globe, and the strength of its relationships with supported country governments, suppliers, and logistics partners.

Over the life of the project, GHSC-PSM has delivered health commodities valued at $4.4 billion. The sheer volume of medicines and products moving through this system is astonishing, requiring stronger, more resilient health supply chains that ensure an uninterrupted stream of quality health products and services for millions of people worldwide. GHSC-PSM is also proud of its track record of meeting or exceeding on-time delivery (OTD) and on-time, in-full (OTIF) delivery targets for the 14th consecutive quarter.

The project explored new ways of quantifying cost savings and environmental impact to achieve best value for the U.S. taxpayer by implementing approaches that result in lower costs for commodities and freight. These efforts amounted to savings of more than $192 million in commodities and $73.4 million in logistics in this year alone (not including COVID-19 commodities). Savings were achieved by leveraging open competition in shipping lanes, working closely with suppliers, qualifying new products and vendors, offering alternative products to countries, and identifying manufacturing sources not subjected to export restrictions, among other creative solutions.

In FY 2022, GHSC-PSM leveraged the strength of its existing mechanism while introducing and expanding on approaches to logistics management. These initiatives included:

- Strengthening and redirecting the laboratory team with a focus on thinking differently about how the project leverages labs in response to HIV and beyond.
- Shifting the traditional business models with suppliers through vendor-managed solutions and vendor-managed inventory so that suppliers take on increased logistics responsibility for the delivery of goods.
- Introducing a new set of metrics for countries' consideration and inclusion in GHSC-PSM's contracts to measure warehousing and distribution technical assistance gains over time. Expanding the capabilities and reach of the Quantification Analytics Tool (QAT), a solution for country-led quantification. By the end of the fiscal year, QAT had replaced PipeLine in 29 countries and had more than 700 users worldwide.
- Promoting the adoption of GS1 global standards in 10 countries to reduce costs, enhance efficiency, and improve the availability of health commodities in public health supply chains.

- Designing and deploying analytics tools for timely decision making and enabling countries to reuse these tools in a way that encourages self-reliance. For example, the project adapted the Inventory Analysis Tool that was initially developed for Ghana, Guinea, and Nepal for use in Burma, Indonesia, and Namibia.
- Exploring ways to further increase the range of value-added activities undertaken in the Africa region, including greater use of African-based logistics providers, wholesalers, and manufacturers, to further the objective of local investment and innovation. For example, the project visited antiretroviral (ARV) manufacturers in India and malaria commodity manufacturers in Kenya, Tanzania, and Uganda to obtain industry feedback on the potential for increasing regional production in Africa.

Time and again, the project was called upon to assist in overcoming supply chain challenges. To do so, GHSC-PSM quickly engaged partners and stakeholders, gathered information, and identified solutions to get commodities to the right place at the right time. For example, the civil war in Ethiopia is affecting more than 740 health facilities. GHSC-PSM provided technical support to activate the Emergency Supply Chain System, restoring conventional supply chain activities. As a result, stakeholders supplied 461 accessible health facilities with stock. GHSC-PSM also identified an overstock of more than forty thousand bottles of dolutegravir (DTG) 10 mg dispersible tablets in Haiti that were needed for children living with HIV in Mozambique. Accurate supply forecasting and data sharing among country teams assisted in identifying this overstock and need and then negotiating the redistribution of stock from Haiti.

The project deployed the emergency loan fund to procure the Democratic Republic of Congo's FY 2022 malaria operational plan demand for artemether-lumefantrine, artesunate injectable, and sulfadoxine-pyrimethamine to mitigate the risk of stockout projected in Q1 FY 2023. The project also worked with USAID and 100% Life to deliver critical lifesaving ARVs and an emergency order of male condoms to Ukraine.

FY 2022 Milestone Highlights

- Made the project's last COVID-19–related commodity delivery to Italy.
- Delivered its first hormonal intrauterine device (IUD) order to Rwanda, expanding patient methods of choice and increasing access to hormonal IUDs in lower- and middle-income countries for the first time.
- Achieved 98 percent stock-keeping accuracy in all three regional distribution centers (RDCs), as reported by a third party that performed an independent audit of the annual stock count at the RDCs.
- Engaged with more than 60 suppliers to implement global standards requirements for identification, capture, and master data exchange.

Overall, the project aims to prevent stockouts from occurring in the first place. To that end, GHSC-PSM implements various targeted initiatives, such as the malaria Stockout Reduction Initiative. In FY 2022, the project expanded the Stockout Reduction Strategy Playbook to include community health workers and to reduce community-level stockout risk.

Learning was a key theme for FY 2022. GHSC-PSM worked to capture and share lessons gleaned over the life of the project. For example, in collaboration with USAID, GHSC-PSM produced a major cross-cutting technical document, "Driving Last-Mile Solutions to Ensure Access to Public Health Commodities," which includes insights from 18 countries' activities to reach the last mile. The project also completed a learning activity based on the technical independence indicator (also known as the "B8") to understand the underlying dynamics around their performance, uptake, use, and impact. The results spurred robust discussions on what the implications mean for the future of supply chain sustainability measurement. GHSC-PSM also conducted a landscape analysis of community health worker mobile applications for supply chain management at the last mile to help organizations identify appropriate mobile applications for capturing and sharing community health supply chain data.

Preparing for the transition to the NextGen suite of projects was also a focus area in FY 2022. GHSC-PSM stood up a Transition Team, a Technical Advisory Group, and a Country Transition Advisory Group focused on managing risk and promoting sustainability. The project created various transition management tools, including a country stakeholder analysis tool and procurement closeout timetables. In Q4, GHSC-PSM produced an inventory of more than 600 project headquarters information assets (data assets, knowledge products, standard operating procedures, etc.) and began developing a toolkit of resources for country office transition, including country transition plan templates and budget estimates.

The project also began working with Ethiopia and Nepal country offices, which anticipate early closeouts, to identify areas of risk and lessons learned for transition. In FY 2023, this work will not only continue, but also intensify, especially as NextGen projects are awarded.

Data and interoperability of data systems continue to underscore the project across all health areas and are essential for planning and optimization. The project aims for data visibility to grow stronger, particularly at the country level, so that key stakeholders can access timely and relevant information. GHSC-PSM will continue building on these initiatives in FY 2023, with a vision of increasing countries' stewardship of their own supply chains, more private sector involvement, and less centralized procurement, warehousing, and distribution at the country level.

Global Supply Chain Performance

Section C1 describes GHSC-PSM's global supply chain procurement and logistics activities and achievements. Highlights of our global supply chain performance in Q4 are below.

Procured over $95.65 million in drugs, diagnostics, and health commodities in Q4, and over $4.6 billion to date.

Delivered over $143 million in drugs, diagnostics, and health commodities in Q4, and over $4.4 billion to date.

Achieved OTD[1] **of 87 percent (81 percent COVID-impacted)**[2] **and OTIF of 90 percent (79 percent COVID-impacted)** (see Exhibits 1 and 2). The backlog of late orders was 3.7 percent.

OTD rates stayed consistently strong for all health areas in Q4. OTD was 87 percent (81 percent COVID-impacted) and OTIF was 90 percent (79 percent COVID-impacted) for the quarter, the 14th successive quarter that OTD has been above 85 percent. OTD was 88 percent (82 percent

[1] The project's delivery window is –14/+7 days. With this window, deliveries are considered on time if they are made within the period 14 days before or seven days after the agreed-to delivery date.

[2] During the COVID-19 pandemic, GHSC-PSM will present two versions of its usual OTD indicator. The first will be the "standard" version, calculated according to the indicator definition as laid out in the project's monitoring and evaluation plan and in accordance with all associated policies/standard operating procedures (SOPs). These policies and SOPs allow for USAID-approved adjustments to agreed-to delivery dates in the case of interruptions that are beyond the project's manageable control, including pandemic impacts. The "standard" version of OTD will therefore show the project's performance, controlling for impacts of COVID-19 and other external disruptions. The second calculation of OTD is the "COVID-19–impacted" version. This version follows the same rules and definitions as the standard indicator, but the "control" for pandemic impacts will not be used. All pandemic-impacted line items will be assessed as on-time or not, according to the agreed-to delivery date at the time the order was approved. This version of the indicator will show the full impact of supplier and logistics delays because of manufacturing shutdowns, port and border closures, and other pandemic control measures. The delays cannot be attributed to GHSC-PSM, but the project is committed to sharing these outcomes in the interest of full transparency and acknowledgement of the challenging and unprecedented circumstances presented by COVID-19.

COVID-impacted) for HIV; 87 percent (74 percent COVID-impacted) for malaria; 94 percent (94 percent COVID-impacted) for FP/RH, and 100 percent for MNCH medicines and commodities (for both standard and COVID-impacted OTD), each of which exceeded the contract's 80 percent quarterly target.

Additional delivery results, including OTIF, are discussed in each health area section. In Q2 FY 2020, the project began calculating COVID-impacted orders, which continued to adversely impact on-time delivery performance throughout FY 2022.

GHSC-PSM routinely conducts root-cause analyses of late deliveries to refine procurement and supply chain processes and to continuously improve performance. In Q4, GHSC-PSM made significant efforts to address the lingering impacts of COVID-19 on freight and logistics that were further exacerbated by the war in Ukraine. The project continues to show its adaptability and flexibility in handling unforeseen shifts in the marketplace.

Exhibit 1. OTD October 2021–September 2022

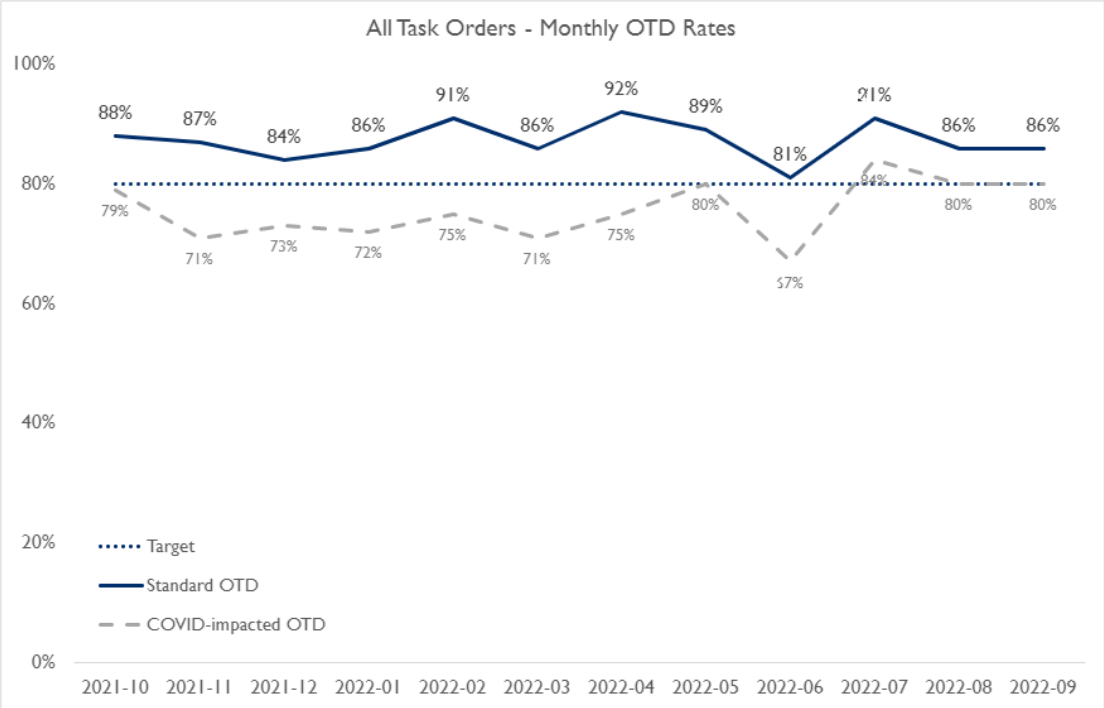
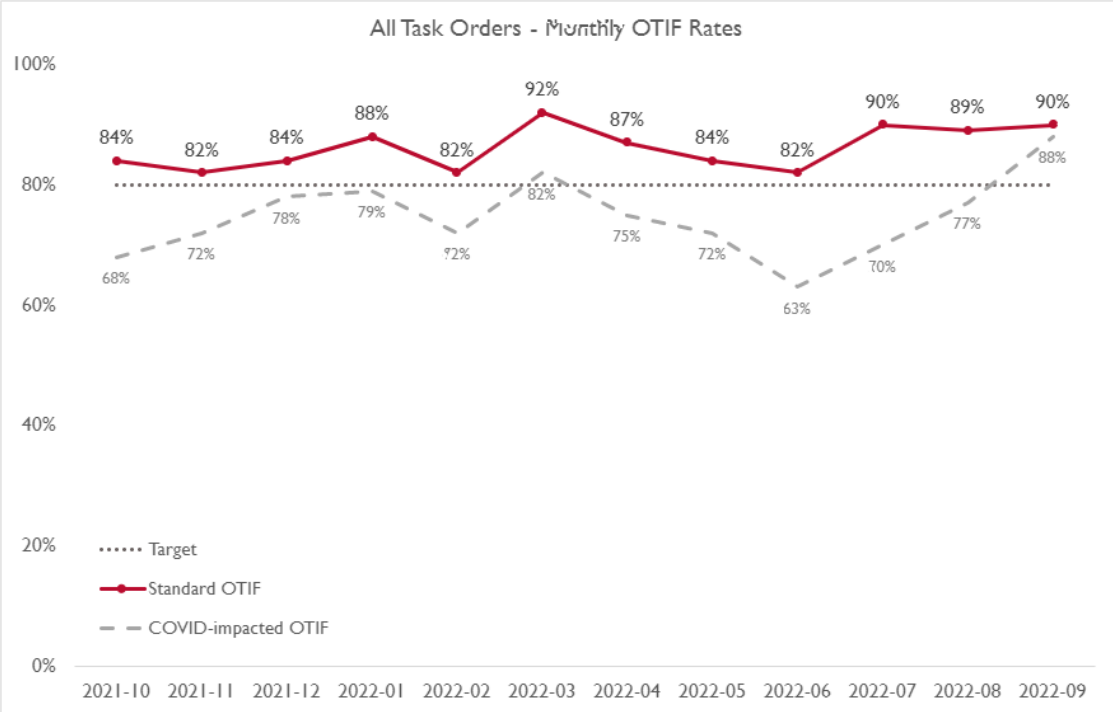


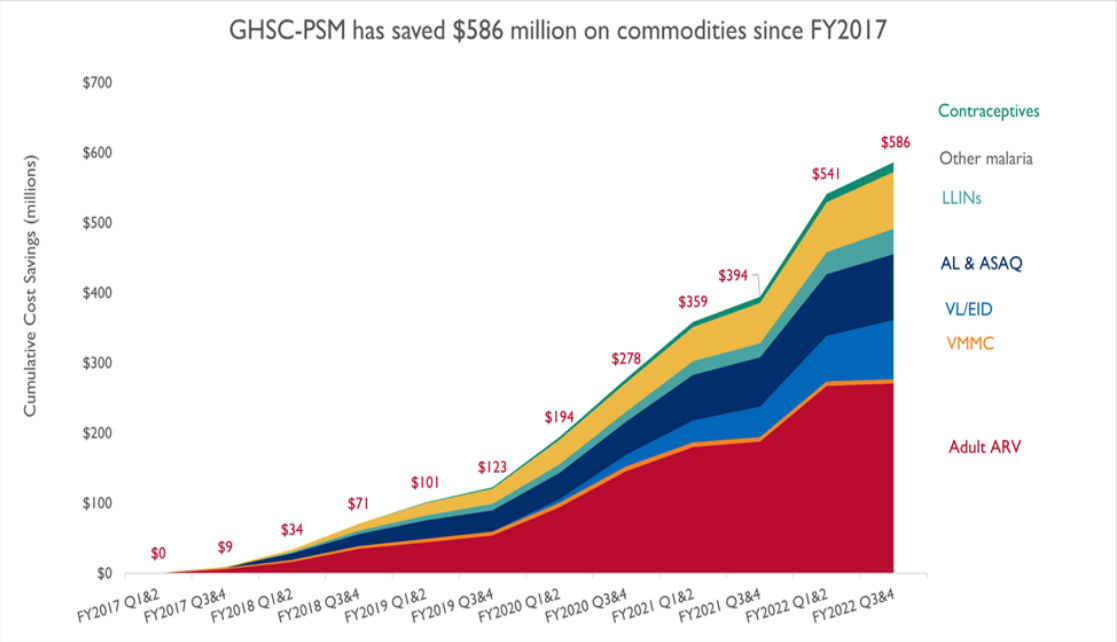
Exhibit 2. OTIF October 2021–September 2022



COST SAVINGS ON MEDICINES AND HEALTH COMMODITIES

GHSC-PSM conducts regular and detailed analysis to understand the markets for the medicines and health commodities it procures and to bring this knowledge to negotiations with suppliers. Through carefully negotiating long-term contracts with suppliers, for major product groups, including viral load testing, the project has saved $586 million on commodities over the life of the project, including $192 million in FY 2022, as shown in Exhibit 3.

Exhibit 3. Life-of-Project Savings on Medicines and Health Commodities



COST SAVINGS ON LOGISTICS

GHSC-PSM saved $6.9 million on logistics over Q3 through Q4 FY 2022 and $73.4 million over the life of the project. Cost savings are realized through:

- Open competition in freight lanes
- Optimization of the RDC network
- Strategic packing to reduce shipping costs

See section C1b. Global Supply Chain for details.

HEALTH AREAS

GHSC-PSM provides procurement services and technical assistance to strengthen supply chains and promote global collaboration for the U.S. government programs for HIV/AIDS, malaria, FP/RH, MNCH, and emerging health threats. Highlights of project achievements in FY 2022 are provided below.

HIV/AIDS

GHSC-PSM has delivered enough antiretroviral therapy to **provide over 20 million patient-years of HIV treatment to date.**

This includes **15.11 million patient-years of TLD treatment delivered to date.**

Impact indicators. Averted an estimated 350,000 deaths due to USAID support through the project, as well as more than 1.2 million infections, highlighting the direct impact of the project's commodity procurements.

Pre-exposure prophylaxis (PrEP). Delivered $23.2 million worth of PrEP to 27 countries, totaling more than six million PrEP bottles. In Q4, the project delivered $5.8 million worth of PrEP, the seventh consecutive quarter with deliveries of more than 900,000 packs.

Condoms. Procured 519 million male condoms, 4.2 million female condoms, and 22.6 million lubricants for 31 countries. More than 91 percent of the total volume of procured condoms and lubricants were for African countries.

Voluntary medical male circumcision (VMMC) kits. Procured enough VMMC kits and devices to allow for up to 860,000 male medical circumcision procedures across seven countries.

Transitioning to DTG 10 mg. Building on the transition to the optimal pediatric ARV, DTG 10 mg, delivered more than 1.4 million bottles valued at $5.75 million in FY 2022. These deliveries will ensure that each country can initiate its DTG 10 mg transition in line with approved transition plans.

Actualizing multi-month dispensing. Delivered nearly 15 million bottles of TLD 90 and 180 valued at $241 million to 25 countries.

Expanding the ARV Delivered at Place (DAP) program. Increased private sector engagement in the ARV supply chain by expanding GHSC-PSM's D-Term program in FY 2022, qualifying 10 countries as D-Term priority countries. The project delivered $53.6 million in orders under DAP or Delivered Duty Paid Incoterms in FY 2022.

Access to essential medicines. Collaborated with USAID/Washington and the USAID Global Health Supply Chain-Quality Assurance project in Q4 to finalize the essential medicines formulary, which

includes products to be procured under the new essential medicines sourcing strategy set to be implemented in Q1 FY 2023.

Implementing viral load/early infant diagnosis (VL/EID) awards. Delivered 13.2 million VL and EID tests, spending $150.8 million and saving $35.8 million of PEPFAR funds under the terms of global service-level agreements with the three VL/EID manufacturers.

For more information, see section B1: HIV/AIDS.

Malaria

To date, GHSC-PSM procured **over $1.1 billion in malaria medicines and commodities for 31 countries.**

This included treatment for **12.9 million malaria infections in Q4 and 468 million to date.**

In Q4, GHSC-PSM **delivered 8.67 million long-lasting insecticide-treated nets (LLINs) to 26 countries.**

Achieving on-time delivery. In Q4, *continued to achieve* OTD and OTIF above the target of 80 percent (87 percent OTD and 82 percent OTIF).

Sourcing, procurement strategies, and supplier engagement. In Q4, initiated vendor-stored inventory (VSI) contract negotiations with one of the two AL suppliers. VSI will launch in FY 2023 as a key proactive procurement strategy for this product.

Monitoring quality assurance (QA). Concluded out-of-specification (OOS) investigations into an LLIN and a malaria rapid diagnostic test (mRDT), which started in Q3.

Prioritizing and redirecting orders. Prioritized an order for 210,000 units of artesunate injectable in Tanzania, and moved the goods availability date forward by two weeks. The project flagged this order for expedited shipment to deliver as early as possible and prevent a stockout.

Implementing the Stockout Reduction Initiative. In Q3, introduced a Microsoft Excel-based template to 20 country offices to develop their investment planning budgets. In Q4, six countries used it to develop these draft budgets.

For more information, see section B2: Malaria.

FP/RH

GHSC-PSM has delivered enough contraceptives that, when combined with proper counseling and correct use, are estimated to **provide 86 million couple-years of protection to date.**[3]

This includes 3.9 **million couple-years of protection in Q4.**

On-time delivery. Delivered 94 percent (94 percent COVID-impacted) of FP/RH commodities on time in Q4. GHSC-PSM secured this continuous supply of FP/RH commodities despite the challenges linked to a supply-constrained environment for many products and underlying logistical challenges due to COVID-19.

Collaboration with global stakeholders. In Q4, focused on enabling the project to realize the benefits of the Global Family Planning Visibility and Analytics Network (VAN) by supporting and onboarding users; validating new features and processes, and integrating data with the VAN; and ensuring VAN engagement and VAN-specific tasks and work streams are included in country office work plans in FY 2023.

Through the Consensus Planning Group, the project collaborates with global procurers like the United Nations Population Fund and other stakeholders to track and fine-tune the flow of products into low- and middle-income countries. This results in significant reduction of stockouts and overstocks and generates savings by canceling or postponing orders.

The project works to raise awareness of the U.S. Government's FP/RH priorities and lessons learned in implementing programs in support of contraceptive security. In Q4, nine of the project's FP/RH-focused abstracts were accepted for presentation at conferences that will take place in Q1 FY 2023, including the International Conference on Family Planning.

Contraceptive security tracking. In Q4, formally began disseminating the 2021 Contraceptive Security Indicators survey results through an updated online dashboard, dataset, and report. The project

[3] In previous quarterly reports, the couple-years protection estimates included all condoms GHSC-PSM procured, regardless of funding source. Beginning with this report and moving forward, CYPs will include PRH-funded condoms only. HIV- and Zika-funded condoms will be excluded.

announced the launch on Twitter and LinkedIn and through email messaging to various audiences, including GHSC-PSM country offices, USAID Missions, Ministries of Health, and partner organizations.

For more information, see section B3: Family Planning and Reproductive Health.

MNCH

In Q4, the project used maternal and child health funds to **train 126 Ministry of Health (MOH) staff**, including 48 Essential Drug Officers, to manage and operate Drug Revolving Funds (DRFs) **in Nigeria**'s Bauchi and Sokoto States and **59 geographic information system data collectors in Mali** to map facilities and roads to improve last- mile delivery for MNCH commodities.

In FY 2022, the project focused on ensuring countries have the information and tools they need to avail and ensure the quality of commodities used to treat and prevent pregnancy-related disorders and address common child and newborn health issues. GHSC-PSM also worked to strengthen the domestic wholesaler operating environment for MNCH commodities and build data collection and logistics management information systems (LMISes) and analytics tools that inform decision making to improve child health and pregnancy outcomes.

Procuring and delivering commodities. Since its start, GHSC-PSM has delivered over $24.78 million in MNCH drugs and commodities. Over the course of FY 2022, GHSC-PSM supported four countries[4] in procuring MNCH products and completed its final shipment of Zika commodities. The project also coordinated bilingual training on these Zika commodities in three countries and for USAID staff.

Achieving on-time delivery. Delivered 100 percent of maternal and child health (MCH) commodities on time in Q4.

Providing international MNCH supply chain leadership and guidance. In FY 2022, hosted global technical discussions on availing commodities to treat childhood pneumonia and possible serious bacterial infection (PSBI) and began developing a call to action paper with key recommendations. T he project published two MNCH resources in Q4, the Postpartum Hemorrhage White Paper and an *updated version* of the MNCH Commodity Procurement Guide.

[4] GHSC-PSM procured MNCH commodities for four countries in Q3 FY 2022: Democratic Republic of the Congo (DRC), Nigeria, Rwanda, and Zambia.

Supporting systems for data-informed MNCH decision making. Refactored data analytics tools in Burkina Faso, Liberia, Nepal, and Zambia in FY 2022 so that they can be used more broadly and effectively to track and make decisions around MNCH commodities. GHSC-PSM also provided electronic LMIS support to Burkina Faso, Nepal, and Zambia and supported end-use verification data collection and reporting in 10 countries.

Working with countries to improve adherence to commodity quality standards and enhance in-country coordination and collaboration. Provided MNCH-supported technical assistance to 14 countries in FY 2022. This included supporting three assessments in Ghana: 1) assessing the supply system for antihypertensives to identify barriers and avail them to health providers and patients, 2) kicking off an assessment on availability, use and maintenance of medical devices and consumables for small and sick newborns, including oxygen, and(3) assessing how MNCH commodities are managed within the private sector (and disseminating results from the assessment). Drug Revolving Fund (DRF) activities also progressed with GHSC-PSM support in three Nigerian states.

For more information, see section B4: Maternal, Newborn and Child Health.

Strengthening Health Systems

GHSC-PSM's strategic goal is for every country to have a locally led health supply chain that is integrated, optimized, accountable, agile, lean, and able to sustainably supply quality products to all citizens. The project manages 33 country or regional offices, supplemented by headquarters-based experts; these offices provide wide-ranging technical assistance to strengthen national health supply chains.

Country highlights:

- Launched Digital Supply Chain Strategy and Architecture, in collaboration with the Malawi Ministry of Health. This was the culmination of more than two years of effort to create an integrated national digital health ecosystem that enables automated data exchange between supply chain management information systems at all levels.
- Continued to support countries' efforts to achieve supply chain resilience through activity-based costing implementation. In Kenya, successfully transitioned the Mission for Essential Drugs and Supplies operational team to a new profit and loss statement.
- Collaborated with People that Deliver, the Rwanda Ministry of Health, and IntraHealth to develop four case studies on USAID efforts to strengthen human resources for supply chain management in Rwanda.
- Collaborated with the Nursing and Midwifery Council in Zambia to facilitate an online learning experience for nursing students from Chipata and St Francis College of Nursing and Midwifery

on the health supply chain management. 147 students completed the course and were awarded certificates of completion.

For more information, see section C2: Systems Strengthening and Technical Assistance.

Introduction

A1. Background

The U.S. Agency for International Development (USAID) Global Health Supply Chain Program-Procurement and Supply Management (GHSC-PSM) project works to ensure uninterrupted supplies of quality medicines and commodities to save lives and to create a healthier future for all. The project directly supports the following global health areas of importance to the U.S. Government (USG):

- The U.S. President's Emergency Plan for AIDS Relief (PEPFAR) to help reach its HIV/AIDS global 95-95-95 testing, treatment, and viral-load suppression targets.
- The U.S. President's Malaria Initiative (PMI) to reduce malaria deaths and substantially decrease malaria morbidity toward the long-term goal of elimination.
- USAID's Family Planning and Reproductive Health (FP/RH) program to ensure that key reproductive-health commodities are available for safe and reliable voluntary family planning.
- USAID's maternal and child health (MCH[5]) program to prevent child and maternal deaths.
- Other public health threats as they emerge, with support for Zika and COVID-19 at this time.

The project procures and delivers medicines and commodities, offers comprehensive technical assistance (TA) to strengthen national supply chain systems, and provides global supply chain leadership to ensure that lifesaving health supplies reach those most in need. GHSC-PSM procured commodities or provided TA to 62 countries over the life of the project (see Exhibit 4 below).

[5] To clarify, the program externally is referred to as the "Maternal and Child Health Program," which was the impetus to name the task order the "Maternal and Child Health" task order. However, we often refer to maternal, newborn, and child health (MNCH) when discussing the technical content because we have a particular emphasis on supporting newborns.

A2. About This Report

We are pleased to present our performance report for FY 2022 (October 1, 2021, through September 30, 2022). GHSC-PSM is a matrixed project that integrates work across two axes: health areas and technical objectives. Accordingly, the report is organized as follows:

- Section B summarizes major activities in each of the **five health areas**, including HIV/AIDS; malaria; FP/RH; maternal, newborn and child health; and other public health threats.
- Section C describes activities under each of the **three main technical objectives** (global commodity procurement and logistics, systems strengthening, and global collaboration), including key indicator results for those objectives.
- Annex A describes the activities GHSC-PSM has undertaken with **COVID-19 funding** to respond to the pandemic.
- Annex B provides **performance indicators** for October 1, 2021, through September 30, 2022 (annual indicators).

Given the size and complexity of GHSC-PSM, this report summarizes its primary efforts and achievements and reflects only a fraction of the project's efforts each day to help people around the world live healthier lives.

Exhibit 4. Countries for Which GHSC-PSM Procured Commodities (proc.) or Provided TA Over the Life of the Project (does not include COVID-19 procurements)

	Proc.	TA		Proc.	TA
AFRICA:			ASIA:		
Republic of Angola	●	●	Islamic Republic of Afghanistan	●	
Republic of Benin	●		People's Republic of Bangladesh	●	
Republic of Botswana	●	●	Union of Burma	●	●
Burkina Faso	●	●	Kingdom of Cambodia	●	●
Republic of Burundi	●	●	Republic of Indonesia		●
Republic of Cameroon	●	●	Lao People's Democratic Republic	●	●
Democratic Republic of the Congo (DRC)	●		Nepal	●	●
Republic of Côte d'Ivoire	●		Islamic Republic of Pakistan	●	●
Kingdom of Eswatini	●	●	Independent State of Papua New Guinea	●	
Federal Democratic Republic of Ethiopia	●	●	Republic of the Philippines	●	
Republic of Ghana	●	●	Kingdom of Thailand	●	●
Republic of Guinea	●	●	Socialist Republic of Vietnam	●	●
Republic of Kenya	●	●	LATIN AMERICA & CARIBBEAN:		
Kingdom of Lesotho	●	●	Antigua and Barbuda	●	
Republic of Liberia	●	●	Commonwealth of the Bahamas	●	
Republic of Madagascar	●	●	Barbados	●	
Republic of Malawi	●	●	Federative Republic of Brazil	●	
Republic of Mali	●	●	Republic of Chile	●	
Islamic Republic of Mauritania	●		Republic of Colombia	●	
Republic of Mozambique	●	●	Dominican Republic	●	
Republic of Namibia	●	●	Republic of Ecuador	●	
Republic of Niger	●	●	Republic of El Salvador	●	●
Federal Republic of Nigeria	●	●	Republic of Guatemala	●	●
Republic of Rwanda	●	●	Co-operative Republic of Guyana	●	
Republic of Senegal	●	●	Republic of Haiti	●	●
Republic of Sierra Leone	●	●	Republic of Honduras	●	●
Republic of South Africa	●		Jamaica	●	●
Republic of South Sudan	●	●	Republic of Panama	●	●
United Republic of Tanzania	●	●	Republic of Paraguay	●	
Togolese Republic	●		Republic of Peru	●	
Republic of Uganda	●	●	Federation of Saint Kitts and Nevis	●	
Republic of Zambia	●	●	Saint Lucia	●	
Republic of Zimbabwe	●	●	Saint Vincent and the Grenadines	●	
EUROPE & EURASIA:			Republic of Suriname	●	
Republic of Kazakhstan	●		Republic of Trinidad and Tobago	●	
Kyrgyz Republic	●		MIDDLE EAST:		
Republic of Tajikistan	●		Republic of Yemen	●	
Ukraine	●				

PROGRESS BY HEALTH AREA

This section summarizes GHSC-PSM's support in FY 2022 for HIV/AIDS; malaria; FP/RH; maternal, newborn, and child health (MNCH); and other public health threats.

B1. HIV/AIDS

GHSC-PSM has delivered enough antiretrovirals (ARVs) to provide over **20 million patient-years of HIV treatment over the life of the project**, including nearly **329 thousand patient-years of treatment in Q4**.

To date, GHSC-PSM has delivered over **76.9 million bottles of tenofovir/lamivudine/dolutegravir (TLD)**[6] to 33 countries, which would provide over **15.1 million patient years of treatment**.

Multi-month dispensing (MMD) of packages of TLD first-line treatment accounted for **100 percent of all quantities delivered** in Q4. Patients likely saved **over 2.7 million trips** to the pharmacy in Q4 and **more than 104.4 million trips over the life of the project, saving patients time and money**.

In Q4, **a total of 31 countries procured HIV/AIDS medicines and commodities.**[7]

[6] This total figure includes 46.2 million bottles of TLD 90, 28.2 million bottles of TLD 30, and 2.4 million bottles of TLD 180. For more information, see Section B1. HIV/AIDS, TLD and multi-month dispensing.

[7] GHSC-PSM procured HIV/AIDS commodities for the following countries: AFRICA: Angola, Benin, Burkina Faso, Burundi, Cameroon, DRC, Côte d'Ivoire, Eswatini, Ethiopia, Kenya, Lesotho, Malawi, Mozambique, Namibia, Nigeria, Senegal, Tanzania, Uganda, Zambia, Zimbabwe; ASIA: Nepal, Vietnam; CARIBBEAN: Papua New Guinea, Haiti; CENTRAL/SOUTH AMERICA: El Salvador, Panama, Honduras, Guatemala; EUROPE & EURASIA: Ukraine, Kazakhstan, Tajikistan.

30 countries[8] received health supply chain systems strengthening with HIV/AIDS funding in FY 2022.

GHSC-PSM supports PEPFAR's goal of controlling the HIV/AIDS epidemic by procuring and delivering medicines and commodities to prevent infection and treat people living with HIV (PLHIV), including viral load testing commodities to monitor treatment efficacy. This requires global collaboration with suppliers, other donors (Global Fund), the USG, and supported country governments. GHSC-PSM implements data visibility initiatives to appropriately procure and distribute ARVs and diagnostics, linking patients with the health commodities they need. Project activities support USAID's efforts to achieve the 95-95-95 goals: 95 percent of HIV infected people know their status, 95 percent of these are on HIV treatment, and 95 percent of these have no detectable virus.

REFLECTIONS ON FY 2022

GHSC-PSM's day-to-day activities focus on procuring and delivering health commodities, but the project has not forgotten its overall goal of providing greater access to quality health commodities. To this end, the project developed and annually reports on HIV indicators intended to benchmark the impact of procurements on beneficiaries' lives. Using an internationally accepted methodology, GHSC-PSM estimates that 350,000 deaths were averted over the life of the project due to USAID support to countries for HIV care and prevention through GHSC-PSM, with more than 1.2 million HIV infections averted.[9] These indicators not only highlight the actual direct impact, as opposed to output and outcomes, but are also powerful messages that ensure key decision makers understand the positive impact of GHSC-PSM's commodity procurements.

GHSC-PSM played a key role in the delivery of several emergency orders of ARVs to Ukraine following the Russian invasion. A crucial element in the delivery of these lifesaving commodities was the project's successful collaboration with suppliers and partners on the ground, including USAID/Ukraine, Ukrainian NGO 100% Life, and multiple logistics partners. GHSC-PSM coordinated closely with 100% Life from the early days of the war, switching deliveries to Lviv in western Ukraine to keep shipments moving and treatment uninterrupted. In May, at the request of 100% Life, the project extended delivery of ARVs beyond Lviv, all the way to Kyiv, ensuring lifesaving medicines were safely distributed to adults and

[8] GHSC-PSM is provided HIV-funded technical assistance support to the following countries in FY 2022: AFRICA: Angola, Botswana, Burundi, Ghana, Cameroon, Eswatini, Ethiopia, Ghana, Kenya, Lesotho, Liberia, Mali, Malawi, Mozambique, Nigeria, Namibia, Rwanda, Tanzania, Uganda, Zambia, Zimbabwe; CARIBBEAN: Haiti, Jamaica; ASIA: Pakistan, Burma, Indonesia; CENTRAL/SOUTH AMERICA: El Salvador, Panama, Honduras, Guatemala.

[9] Methodology to support impact indicators

children living with HIV in the besieged capital city. GHSC-PSM will continue to partner with 100% Life in the procurement and secure delivery of these medications in FY 2023.

GHSC-PSM increased private sector engagement in the ARV supply chain by expanding its D-Term program in FY 2022, choosing 10 countries as D-Term priority countries.[10] The project laid the groundwork to involve the private sector in more aspects of the supply chain, releasing a two-year ARV allocation strategy for FY 2023 and FY 2024. Manufacturing ARVs in Africa is a long-term endeavor, and GHSC-PSM will continue to engage manufacturers to get their perspective in moving this agenda forward.

The global transition to TLD has been a great success. A total of 15 countries reported that at least 80 percent of the ARVs issued were TLD in FY 2022. The project expects the remaining seven countries will reach the same level of success in FY 2023. In FY 2022, countries such as Mozambique issued more bottles of TLD 90 (eight million) and fewer bottles of TLD 30 (two million), showing significant progress toward MMD. GHSC-PSM continued to support the transition to DTG 10 mg—the most effective ARV available for children living with HIV.

Along with improving access to adult and pediatric ARVs, expanding access to VL/EID testing is vital to improving treatment efficacy. Working with the private sector to reimagine the supply chain for reagents and testing instruments, the project has realized over $78.9 million in savings for PEPFAR since January 2020 while also building sustainable, long-term solutions.

As part of its effort to fortify country government ownership of resilient and robust diagnostic laboratory networks that can withstand country health emergencies and future pandemics, GHSC-PSM adopted a network approach to scale up and strengthen laboratory services in FY 2022, as published in Beyond Diagnostic Network Optimization: A Network Approach to Strengthening and Scaling Up Laboratory Services. The project's new laboratory strategy will improve the availability and visibility of laboratory services and commodities through an approach focused on strengthening and integrating data systems where possible, and collaboration with all stakeholders through technical support and project coordination.

Looking forward, GHSC-PSM will continue to support USAID in strengthening the supply chain system while advancing data visibility of HIV/AIDS commodities and services to improve forecasting and procurement decision making. The project will continue to strengthen relationships with suppliers and logistics partners and capitalize on its last-mile distribution network to ensure more equitable access to lifesaving HIV prevention and treatment medicines and services.

[10] DRC, Haiti, Kenya, Nigeria, Mozambique, Nigeria, Tanzania, Uganda, Zambia, and Zimbabwe.

IMPACT OF GHSC-PSM PROCUREMENTS

GHSC-PSM estimates that 350,000 deaths and more than 1.2 million HIV infections were averted by making ARVs available to adults and children who need them.[11] The project directly supported the delivery of antiretroviral therapy to provide more than 20 million patient-years of HIV treatment to date. When combined with proper counseling and correct use, these medicines save lives and prevent future infections, contributing to PEPFAR's goal of ending the HIV/AIDS pandemic as a public health threat by 2030. Calculating the estimated number of deaths averted due to USAID support through GHSC-PSM provides an important measurement. These indicators report actual direct impact, as opposed to output and outcomes, and are powerful messages highlighting the positive health impact of GHSC-PSM's commodity procurements.

HIV/AIDS SUPPLY CHAIN ON-TIME DELIVERY AND COST SAVINGS

Procurement

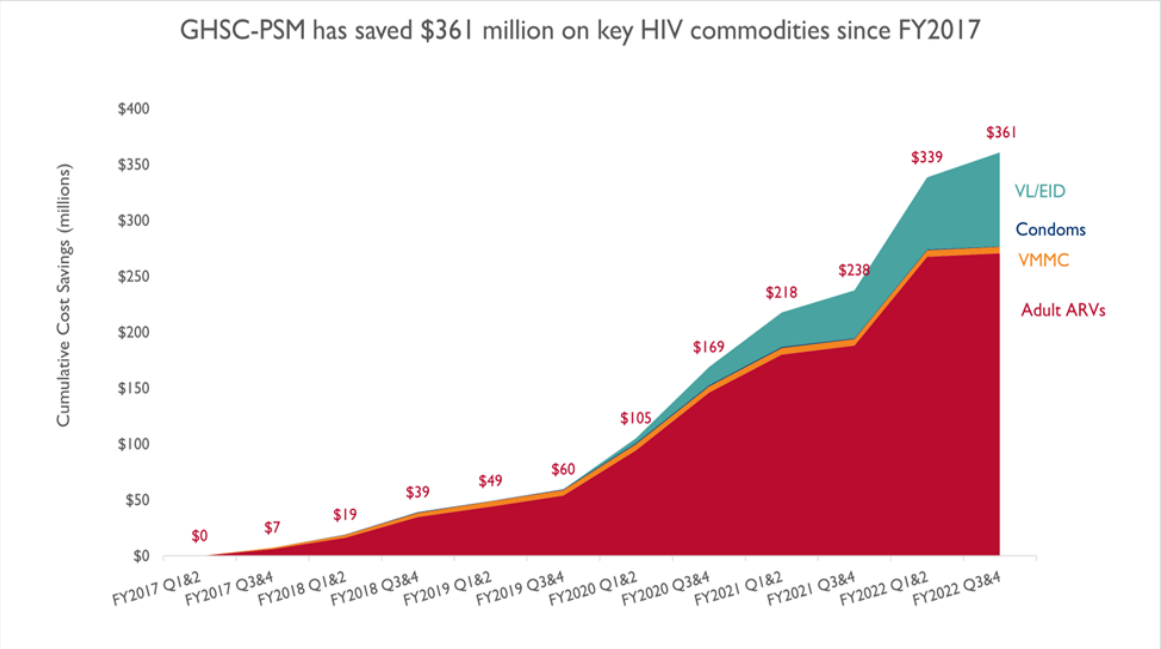
GHSC-PSM has procured more than $3.2 billion in HIV commodities over the life of the project, with $461.8 million worth of procurements in FY 2022 with adult ARVs making up 53 percent of all procurements by value.

Savings from strategic sourcing of HIV commodities

GHSC-PSM's strategic sourcing activities generated significant cost savings for PEPFAR and the countries and people served by its HIV programs. As shown in Exhibit 7, GHSC-PSM has saved $361 million on core HIV commodities over the life of the project compared to baseline prices, including $123 million in FY 2022. Savings include a total of $270.6 million on adult ARVs, driven almost entirely by the project's TLD strategy. The cost of TLD decreased slightly in the latter half of FY 2022, due to an increase in the use of a lower-cost vendor, producing the lowest price yet for TLD. The overall strategy of focusing on TLD 90- and 180-count bottle sizes also reduced costs and continued to yield savings as the project focuses on TLD procurement in support of MMD. Despite the lower prices, the second half of FY 2022 saw a slowing of centralized TLD procurements, primarily due to reduced stocking of the regional distribution centers (RDCs) and to clustering of most large country purchase orders in the first half of the year. Also, Rwanda and Uganda began procuring TLD themselves, whereas historically, they had largely contributed to centralized procurements. Lab cost savings also topped $84 million since the launch of the global request for proposal (RFP) in January 2020; the project hasn't seen any increases in pricing over the years, even in the face of inflation. This figure includes GHSC-PSM orders with estimated goods availability dates (GADs) through FY 2022.

[11] Methodology to support impact indicators.

Exhibit 5. Life-of-Project Savings on HIV Commodities



Deliveries

In Q4, GHSC-PSM delivered $89.28 million in HIV commodities to countries. Over the life of the project, GHSC-PSM has delivered nearly $2.97 billion in HIV commodities to countries. As previously mentioned, the timeliness of GHSC-PSM HIV deliveries remained consistently strong despite uncertainty and volatility in the global supply chain.

On-time delivery (OTD) and on-time, in-full (OTIF) delivery

Timeliness of GHSC-PSM deliveries remained consistently strong for standard OTD over the reporting period, as shown in Exhibit 6. In Q4, OTD was at 88 percent for HIV (82 percent for COVID-19 impacted). GHSC-PSM's OTIF rate measures the percentage of deliveries delivered on time and in full during a given period. Delivery of late orders in a subsequent month to the agreed-upon delivery date drives down the OTIF rate, as can delivery of split shipments, which helps explain the difference between OTD and OTIF rates. For OTIF, project performance continued to exceed the target of 80 percent, achieving 90 percent in Q4. See Annex A for further details.

Exhibit 6. HIV Commodities, OTD

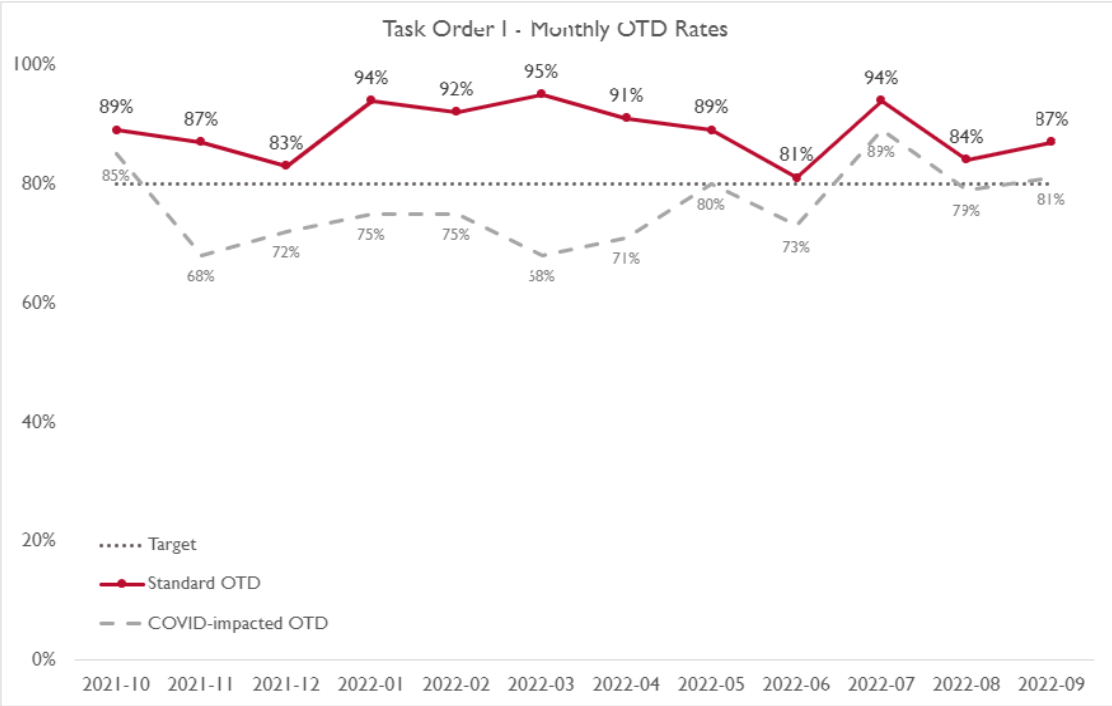
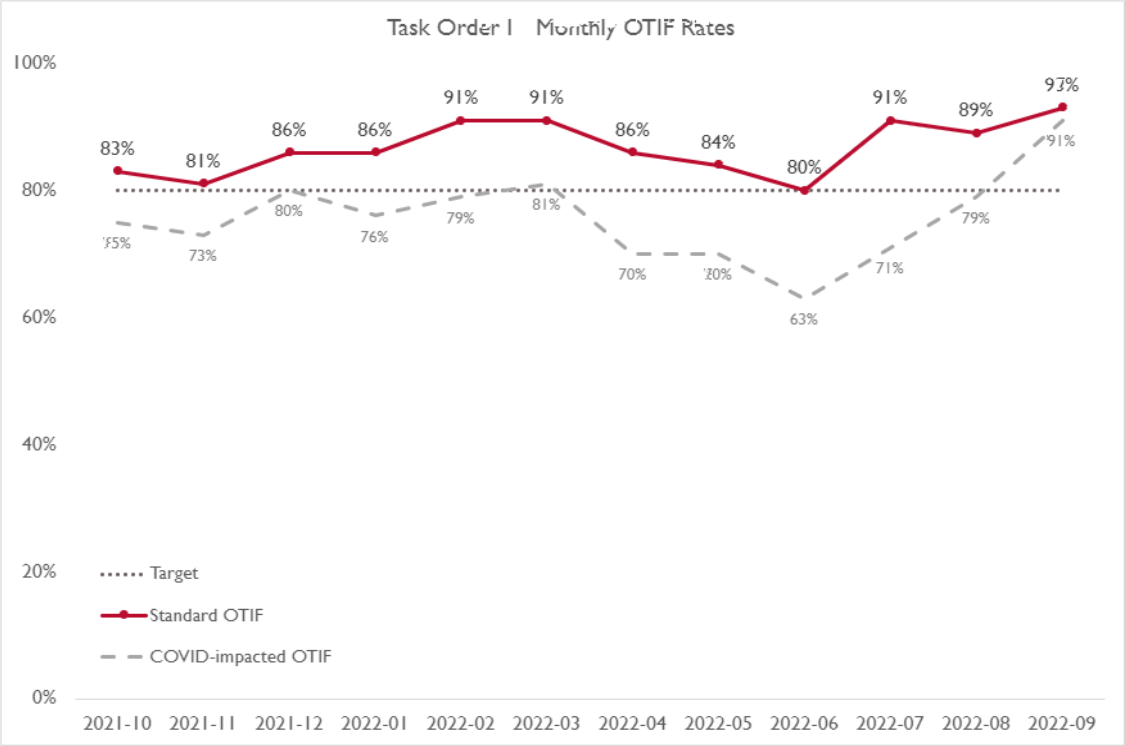


Exhibit 7. HIV Commodities, OTIF



Supporting PEPFAR's HIV Prevention Agenda

Pre-exposure prophylaxis (PrEP)

Daily oral PrEP using the antiretroviral medicines tenofovir/emtricitabine (TE) or tenofovir/lamivudine (TL) dramatically reduces the risk of HIV infection in people who use it as directed. In FY 2022, GHSC-PSM delivered $23.2 million worth of PrEP to 27 countries, totaling more than six million PrEP bottles. In Q4, the project delivered $5.8 million worth of product to Burundi, Democratic Republic of the Congo (DRC), Kenya, Malawi, Namibia, Nigeria, Philippines, Tanzania, Ukraine, Zambia, and Zimbabwe. This was the seventh consecutive quarter with deliveries of more than 900,000 packs, indicating progress in PrEP adoption in PEPFAR-supported countries. By regularly sharing demand forecasts with manufacturers, GHSC-PSM helps align manufacturing capacity to meet demand.

GHSC-PSM analyzes PrEP commodity deliveries and the impact of in-country scale-up on the PrEP program quarterly. The analysis is derived from qualitative and quantitative data from 24 countries to monitor stock levels and scale up progress. GHSC-PSM's communication with countries assists them in

adapting to the dynamics of their PrEP scale-up programs by advancing or delaying shipments when necessary.

Throughout FY 2022, the project mitigated a number of potential stockout risks and responded to calls to expedite PrEP program scale-up. For example, between Q3 and Q4, GHSC-PSM delivered 400,000 bottles of TL to Kenya to prevent a stockout. In response to the Ministry of Health (MOH) of Zimbabwe increasing its 2022 PrEP targets in Q3, GHSC-PSM advanced deliveries of TE by two months under DDP incoterms (by air) to ensure central stock stayed within min-max levels. In Q4 alone, the project fast tracked two orders of TE for Malawi to deliver a total of 70,250 bottles to avoid a stockout. GHSC-PSM delivered an additional 36,000 bottles of TE to the Philippines from the Dubai RDC to support the country's PrEP program.

Condoms

Correct and consistent use of condoms and lubricants significantly reduces the risk of transmission of HIV. USAID's support for the condoms program targets regions with high demand and supply gaps. In FY 2022, GHSC-PSM published the Annual Comprehensive Agency Report on Condoms and Lubricants for FY 2021.[12] The report shows consistent funding support through USAID for the condoms program over the last three years.

The project is continuing to see an increase in order volumes for specialty foil products in the male condom portfolio, which accounted for 63 percent of the FY 2022 order volume. In FY 2022, USAID approved the procurement of 519 million male condoms, 4.2 million female condoms, and 22.6 million lubricants for 31 countries in Africa (27), Asia (2), Europe (1), and LAC (1). More than 91 percent of the total volume of procured condoms and lubricants was for African countries.

A key challenge within the portfolio this year was pricing fluctuations caused by significant increases in the cost of key starting materials such as latex, silicon oil, aluminum, and packing. GHSC-PSM refreshed pricing both at the start and end of FY 2022. The newly established pricing secured the active participation of the supplier base, ensuring a continuous supply of products to PEPFAR countries, limiting security risk. GHSC-PSM saved on costs by fulfilling one third of the plain no-logo condom orders from stock held by suppliers through contractual agreements. In line with the project's goal to reduce dependence on RDCs, condom orders filled by the project's RDCs were reduced to five percent of FY 2022 orders.

GHSC-PSM renewed its long-term Basic Ordering Agreement (BOA) with The Female Health Company in FY 2022, sustaining 2021 prices despite growing pressures on the cost of raw materials due to

[12] The Annual Comprehensive Agency Report on Condoms and Lubricants for FY 2021

COVID-19 and inflation. The project also renewed long-term BOAs for male condom suppliers in FY 2022, adjusting prices to secure continuous delivery.

GHSC-PSM worked with several countries and social marketing organizations to develop or rebrand male condom and lubricant products. In Ghana, artwork for the new Ebony Plus brand was finalized by USAID/Ghana implementing partner Total Family Health Organisation. GHSC-PSM ensured samples were manufactured and shipped for registration. In Tanzania, the project collaborated with USAID partner T-MARC to revise branding for the Dume brand. Lastly, in Uganda, the project helped develop new artwork to allow Joint Medical Stores to transition from the Hot-Pink brand to Hot-Orange.

In Q4, the project delivered condoms and lubricants to Afghanistan, Benin, Burkina Faso, Burundi, Cameroon, Congo DRC, Ethiopia, Ghana, Haiti, Lesotho, Madagascar, Mali, Mozambique, Niger, Rwanda, Senegal, Sierra Leone, Eswatini, Uganda, Ukraine, Zambia, and Zimbabwe. During Q3 and Q4, GHSC-PSM delivered emergency orders of condoms to Ukraine. This included 2,372 cases of blue/gold-packaged male condoms plus 1,594 cases of lubricant.

Voluntary medical male circumcision (VMMC) kits

Male circumcision is cost-effective and reduces female-to-male sexual transmission of HIV by 60 percent.[13] The World Health Organization (WHO) continues to support VMMC as a critical HIV prevention intervention. In FY 2022, the total procured volumes of VMMC kits and devices approved by USAID allowed for up to 860,000 male medical circumcision procedures across seven countries (Eswatini, Malawi, Mozambique, Namibia, Tanzania, Uganda, and Zimbabwe).

GHSC-PSM delivered VMMC kits and other supplies to four PEPFAR-supported countries (Malawi, Mozambique, Uganda, and Zimbabwe) in FY 2022. Programs continue to shift to reusable instruments, as recommended by recent Country Operational Plan (COP) guidelines. As such, 67 percent of the total VMMC kits and devices procured in FY 2022 through GHSC-PSM were reusable instruments.

In Q4, GHSC-PSM continued coordinating with GHSC-QA and USAID to manage a VMMC kit supplier in Africa with recurring quality issues. GHSC-PSM, GHSC-QA, and USAID reviewed the corrective and preventive actions (CAPAs) put in place in Q3 to ensure the project's quality requirements are maintained.

GHSC-PSM continued to engage strategically with a Chinese-based VMMC device manufacturer and a local distributor of the Shang Ring device (used to carry out VMMC procedures) to determine if procurement efficiencies, especially in reduced lead time, can be achieved. GHSC-PSM also initiated

[13] USAID 2022 Voluntary Medical Male Circumcision Fact Sheet

discussions to reduce pricing given the volumes the project is procuring for PEPFAR. Negotiations will continue into Q1 of FY 2023.

Essential medicines

Among people living with advanced HIV, cryptococcal disease is one of the most opportunistic infections and is a major contributor to illness, disability, and mortality. Recent guidelines from the WHO recommend amphotericin B in combination with flucytosine for induction treatment of cryptococcal disease. Country adoption of these guidelines is critical to save lives, but access to these medications remains scarce, especially in low- and middle-income countries.

After successfully collaborating with GHSC-QA in Q3 to finalize QA reviews, GHSC-PSM completed an audit of local wholesalers in DRC, Malawi, and Mozambique in Q4. As an outcome, three suppliers became eligible as local wholesalers, two in DRC and one in Malawi. In Q1 FY 2023, GHSC-PSM will establish a contract and onboard the newly added local wholesalers to project systems and processes.

GHSC-PSM, in collaboration with USAID/Washington and GHSC-QA, finalized the essential medicines formulary in Q4, based on the Essential Medicines Product List review started in Q3. The formulary includes the products to be procured under the new essential medicines sourcing strategy, which was also concluded in Q4. In line with the strategy, GHSC-PSM hosted the GHSC Essential Medicines Supplier Conference in Q4 to update vendors on the new sourcing strategy. During this hybrid event, the project discussed the evolution of the strategy, along with the need to advance USAID's localization agenda and improve end-to-end visibility in supply chain processes. In Q4 the project released the essential medicines request for quotation (RFQ) to develop long-term, fixed-price contracts. These contracts will enable GHSC-PSM to execute the new sourcing strategy in Q1 FY 2023. Finally, the project continued contract negotiations with the manufacturer of Amphotericin B liposomal, a critical Advanced HIV Disease (AHD) commodity, which if successful, will enable GHSC-PSM to procure the commodity at market access pricing, ensuring product availability at a reduced price for PEPFAR countries.

Tuberculosis preventive treatment (TPT)

As the leading cause of morbidity among PLHIV, tuberculosis (TB) causes over a third of all AIDS-related deaths. The WHO recommends that PLHIV who are unlikely to have active TB should receive TPT as part of a comprehensive package of HIV care, including pregnant women and those who have previously been treated for TB, regardless of the degree of immunosuppression, even if latent TB infection testing is unavailable. Completion of TPT for all PLHIV (including eligible household contacts of PLHIV with TB disease) is a PEPFAR Minimum Program Requirement.

Previously, the preferred treatment regimen was six or nine months of isoniazid. Presently, three months of weekly high-dose isoniazid and rifapentine (3HP) is the preferred PEPFAR regimen for adult and adolescent TPT.

Three months of weekly high-dose isoniazid and 3HP

In Q4, 3HP products became more available in the market, which enabled the timely processing and delivery of orders. GHSC-PSM delivered rifapentine/isoniazid 300 mg/300 mg fixed-dose combination (FDC) tablets to eight countries: DRC, Eswatini, Lesotho, Namibia, Nigeria, Uganda, Zambia, and Zimbabwe. GHSC-PSM also delivered one order of rifapentine 150 mg to Haiti.

In Q4, with the anticipation of the eligibility of a second supplier of 3HP FDC, GHSC-PSM approved a new sourcing strategy for a two-supplier market to ensure continual supply from two suppliers, while limiting the quality risk to the project from the new supplier. Also in Q4, the project analyzed TPT shipments and country stock projections to improve visibility into the transition to, and scale-up of, 3HP for TPT-supported countries.

GHSC-PSM also actively participated in the global supply-demand discussion of 3HP with the ARV/3HP Procurement Working Group (APWG), by sharing 3HP demand status and experiences with suppliers. APWG members jointly agreed that 3HP procurement may continue within each procurement agency without a central allocation conducted by APWG.

Isoniazid preventive therapy (IPT)

Most GHSC-PSM countries transitioned to 3HP in FY 2022. However, the project is working with countries that need assistance in implementing IPT with the procurement of isoniazid, and in particular, isoniazid 100mg pediatric tablets. GHSC-PSM delivered orders of isoniazid tablets to DRC, Nigeria, and Uganda in Q4.

Supporting the First 95: Testing

To support rapid test kit (RTK) availability and reach the first 95 (HIV diagnosis), GHSC-PSM provides forecasting and supply planning as well as in-country logistics support to the USAID Global Health Supply Chain Program-Rapid Test Kit (GHSC-RTK) project (implemented by Remote Medical International), which undertakes the commodity procurement and international freight. GHSC-PSM promotes better management of HIV-RTK orders and deliveries through regional- and central-level stock data collection using the HIV/AIDS Data Visibility Dashboard. GHSC-PSM shares data monthly with GHSC-RTK to guide HIV-RTK procurement planning and data triangulation, and reviews HIV testing targets against HIV-RTK stock in countries with PEPFAR-supported HIV testing programs. Using this methodology, the project

identified six stockout risks this quarter and resolved them through emergency orders, expedited shipment requests, and stock transfers.

Supporting the Second 95: Treatment

Increased private sector involvement in ARV delivery

In FY 2022, GHSC-PSM increased private sector engagement in the ARV supply chain by expanding its D-Term program, supplier delivery of ARVs under Delivered at Place (DAP) and Delivered Duty Paid (DDP) Incoterms. The project qualified 10 high-volume ARV countries as D-Term priority countries: DRC, Haiti, Kenya, Nigeria, Mozambique, Nigeria, Tanzania, Uganda, Zambia, and Zimbabwe. In FY 2022, $69.2 million in ARV orders (83 order lines) were placed under DAP or DDP Incoterms. Five ARV suppliers delivered 31 order lines, with the balance pending delivery. GHSC-PSM coordinated with country teams and supplier representatives to clarify roles and responsibilities and establish import process maps. The result was OTD rates of 88 percent within the D-Term program. In Q4, the project placed 31 D-Term orders for nine countries and delivered six other orders.

GHSC-PSM laid the groundwork in FY 2022 to involve the private sector in more aspects of the supply chain. GHSC-PSM and USAID hosted a virtual ARV Supplier Conference to familiarize the supply base with USAID's private sector engagement objectives. The project then released a request for information (RFI) outlining a framework for ARV manufacturers to pre-position high-volume ARVs in regional warehouses on the African continent and expand the scope of the ARV D-term program. GHSC-PSM released a two-year ARV allocation strategy that will be implemented in FY 2023 and FY 2024.

In Q4, GHSC-PSM visited ARV manufacturers in India. A key focus was conducting site visits of ARV finished formulation and active pharmaceutical ingredient (API) manufacturing plants to understand the perspectives of investment, personnel/staffing, manufacturing quality assurance/quality control (QA/QC), the packaging process, and warehousing and logistics. The project held in-depth discussions with members of the ARV partner's senior leadership teams to discuss opportunities for manufacturing U.S. Food and Drug Administration (USFDA) tentatively approved ARVs in Africa in support of USAID's localization vision, and to understand the implications, feasibility, and investments/commitments required for such a shift. Joined by members of USAID and GHSC-QA, GHSC-PSM visited nine different ARV partners. Manufacturing in Africa is a long-term endeavor for which the manufacturers need to understand incentives, risks, and potential gains. Many have already started manufacturing ARVs in Africa, namely in Kenya, South Africa, and Uganda, and have insights to offer PEPFAR on what has worked and potential pitfalls.

Supplying TLD

Over the life of the project, GHSC-PSM has delivered **76.9 million bottles of TLD**[14] to **33 countries**.

This is enough to provide almost **15.1 million patient-years of TLD treatment**.

As of Q4, GHSC-PSM has delivered over **46.2 million bottles of TLD 90** to 30 countries.

TLD and multi-month dispensing

To achieve HIV treatment goals, GHSC-PSM supports PEPFAR countries' transition to TLD, the preferred first-line ARV. Over the life of the project, GHSC-PSM has delivered over 76.9 million bottles of TLD to 30 countries, including more than 46.2 million bottles of TLD 90, 28.3 million bottles of TLD 30 and 2.4 million bottles of TLD 180.

In FY 2022, GHSC-PSM delivered nearly 15 million bottles of TLD 90 and 180 to 25 countries. These deliveries were valued at $241 million, with $43 million delivered under D-terms. In Q4, the project delivered 1.2 million bottles of TLD 90 and 180 valued at $16 million to nine countries: Angola, Burkina Faso, Burundi, DRC, Mozambique, Nigeria, Tanzania, Uganda, and Zambia.

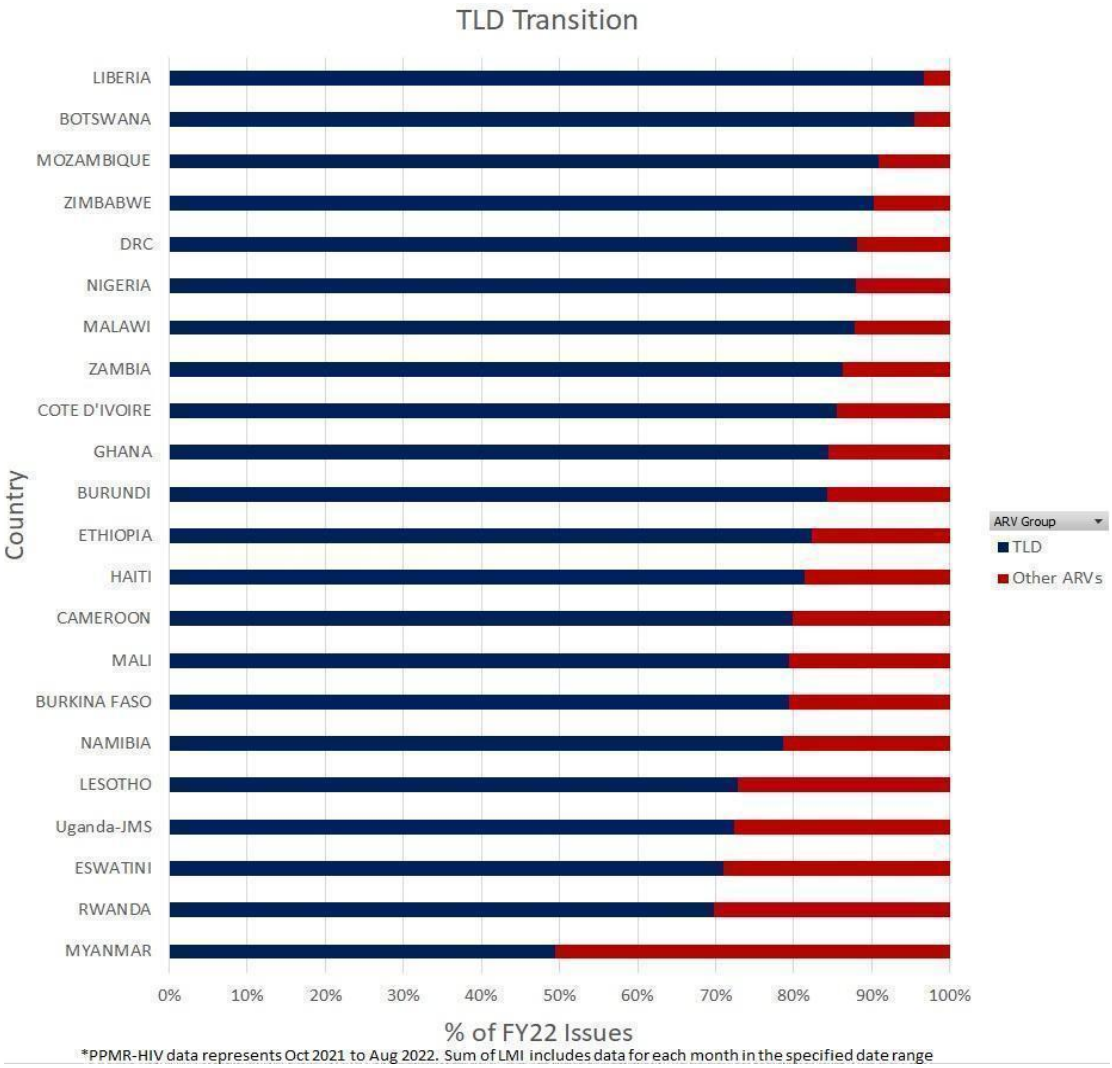
The project shares data and facilitates technical meetings to coordinate with key stakeholders on TLD uptake. GHSC-PSM aligned its product catalog ARVs with the PEPFAR formulary to promote optimal ARV regimen ordering. The project submits weekly reports to USAID outlining second-line or suboptimal products ordered by partner countries so that both parties can engage country counterparts to determine if a better product is available.

GHSC-PSM also reviews and compiles monthly ARV inventory data from 31 central and 80 regional warehouses in 22 countries through the First-Line ARV Reporting and Evaluation (FLARE) reports. These monthly reports monitor national (not PEPFAR-only) inventories of HIV commodities. The FLARE enables GHSC-PSM and USAID to minimize the remnants of the less-effective, older first-line ARV regimens (legacy ARVs). According to the FLARE data, global issues of lamivudine/zidovudine/ nevirapine, TLE600, and TLE400 decreased by 97 percent, 95 percent, and 60 percent, respectively, in FY 2022.

[14] This total figure includes 46.2 million bottles of TLD 90, 28.2 million bottles of TLD 30, and 2.4 million bottles of TLD 180. For more information, see Section B1. HIV/AIDS, TLD and multi-month dispensing.

The global transition to TLD has been a great success, with 15 countries reporting in FY 2022 that in excess of 80 percent of ARVs issued were TLD. The project expects the remaining seven countries will reach the same level of success in Q2 of FY 2023. Exhibit 6 presents the number of TLD bottles issued in proportion to other ARVs using national warehouse data shared with GHSC-PSM, where TLD 30 bottles and TLD 90 bottles are each counted as one unit or one issue.

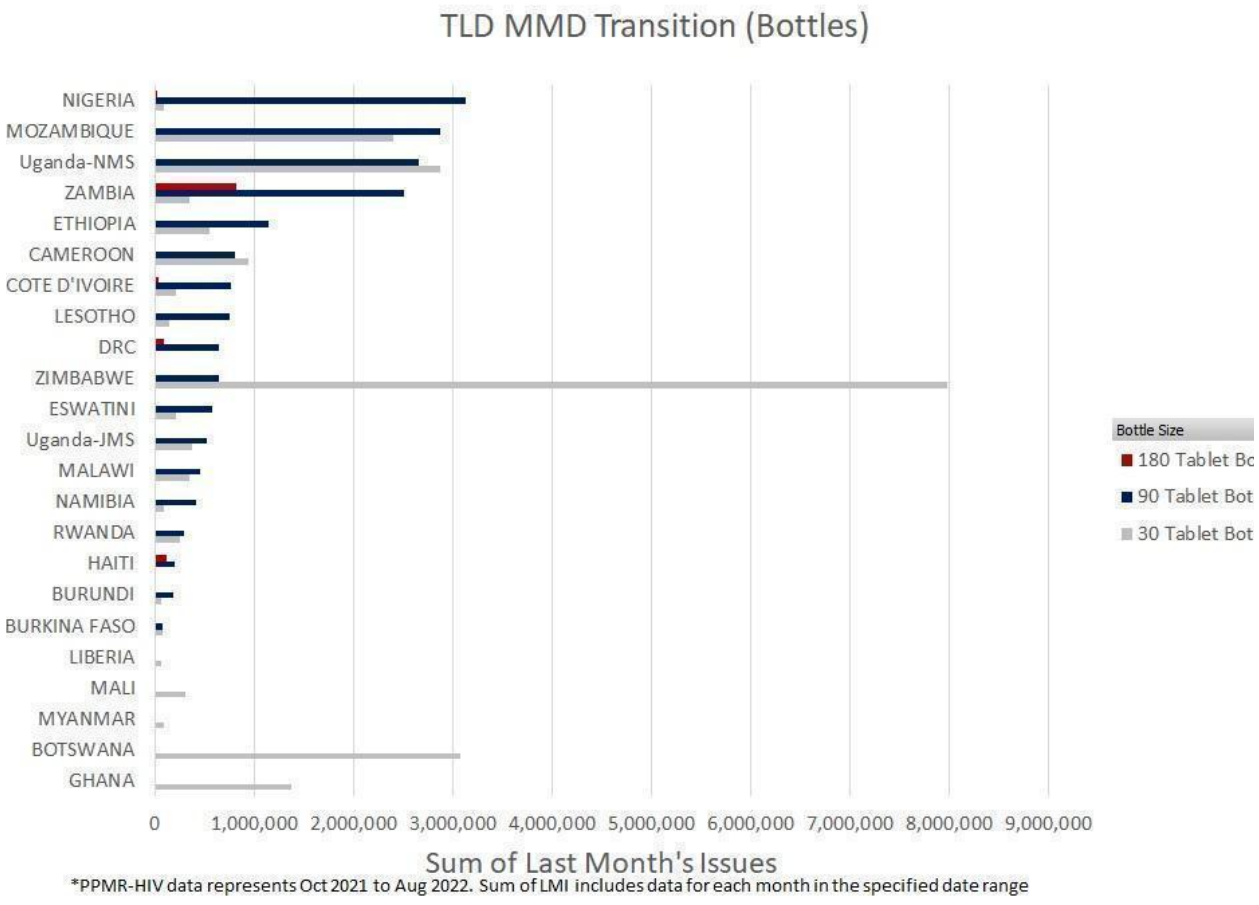
Exhibit 8. TLD Transition



MMD of TLD is also a high priority in the global fight against HIV. TLD is provided in bottles of 30, 90, and 180 tablets. The project used the monthly reports that monitor national warehouse (not PEPFAR-only) inventories of HIV commodities to present TLD by bottle size. In FY 2022, countries such

as Mozambique issued more bottles of TLD 90 (2.9 million) and fewer bottles of TLD 30 (2.4 million), which is great progress toward MMD. The Zambia national strategy is expected to shift as MMD becomes well established, moving away from TLD 90 toward a combination of TLD 180 and TLD 30 to provide the ideal combination of maximum MMD with flexibility based on dispensing needs. In Zimbabwe, the national MMD transition program gained momentum in Q2 with the arrival of Global Fund–supported TLD 90, in addition to GHSC-PSM-procured TLD 90. The total number of TLD 90 issued in Zimbabwe was 643,000 bottles and the total number of TLD 30 issued was eight million bottles. Exhibit 9 shows Botswana's reliance on TLD 30 for MMD. This highlights that TLD 30 and TLD 90 can be successfully dispensed to patients in support of MMD 90 or MMD 180.

Exhibit 9. TLD MMD Transition



*PPMR-HIV data represents Oct 2021 to Aug 2022. Sum of LMI includes data for each month in the specified date range

Supplying DTG 10 mg

Over the life of the project, GHSC-PSM has delivered 2.05 million bottles of DTG 10 mg to 22 countries.

In FY 2022, the project delivered 1.36 million bottles of DTG 10 mg valued at $5.7 million to 20 countries.

Pediatric ARVs

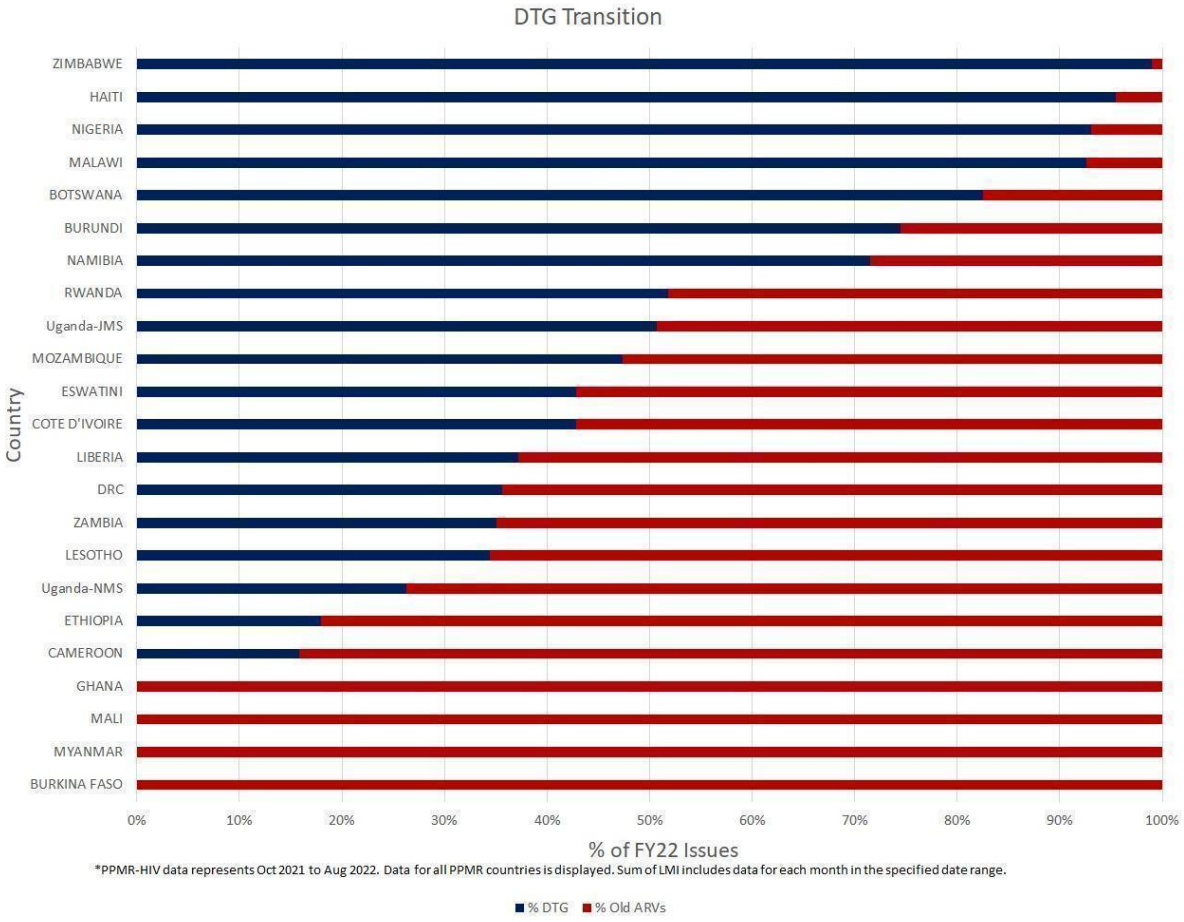
In FY 2022, GHSC-PSM supported PEPFAR countries to transition pediatric children living with HIV to DTG 10 mg—the preferred integrase strand transfer inhibitor (INSTI) pediatric ARV. GHSC-PSM analyzed orders and supply plan data monthly to increase USAID and stakeholder visibility into the pace and progress of country transitions. The project delivered more than 1.4 million bottles valued at $5.9 million to Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Congo DRC, Côte d'Ivoire, Ethiopia, Kenya, Mozambique, Namibia, Nigeria, Eswatini, Tanzania, Togo, Uganda, Ukraine, Zambia, and Zimbabwe. During Q4, GHSC-PSM delivered 446,000 bottles, valued at almost $1.8 million. These deliveries will assist countries in initiating or expanding DTG 10 mg transitions in line with their approved transition plans.

GHSC-PSM also tracks the overall demand for other first- and second-line pediatric ARVs. In FY 2022, the project delivered emergency orders of abacavir/lamivudine 120/60 to Côte d' Ivoire, darunavir 75mg to DRC, and 109,000 bottles of nevirapine 10mg/ml suspension to Kenya.

Despite the ongoing conflict between Ukraine and Russia, within a three-month period, GHSC-PSM procured and delivered five unique pediatric ARVs to Ukraine: abacavir/lamivudine 120/60, DTG 10 mg, lamivudine/zidovudine 30/60 mg, nevirapine 10 mg/mL suspension w/ syringe, 100 mL, zidovudine 10 mg/mL solution w/ syringe, 240 mL.

Progress on the global transition to DTG is reflected in Exhibit 8, comparing the distribution of DTG products to other pediatric ARVs. All DTG issues are assumed to be for patients in the 10 to 13.9 kg weight band. One third of the countries reported 50 percent of issues were DTG, while most reported that less than 50 percent of issues were DTG.

Exhibit 10. Transition From Old Pediatric ARVs to DTG



Supporting the Third 95: Viral Load Testing

GHSC-PSM expanded the laboratory team and portfolio in FY 2022, implementing a new laboratory strategy that will improve the availability and visibility of laboratory services and commodities, through an approach focused on strengthening and integrating data systems where possible, and collaboration with all stakeholders through technical support and project coordination. In FY 2023, GHSC-PSM will focus on improving data visibility to enhance the workflow efficiencies of lab activities.

As part of its effort to fortify country government ownership of resilient and robust diagnostic laboratory networks that can withstand country health emergencies and future pandemics, GHSC-PSM adopted a network approach to strengthen and scale up laboratory services as published in Beyond

Diagnostic Network Optimization: A Network Approach to Strengthening and Scaling Up Laboratory Services in Q1. The components of this multi-pronged approach include diagnostic network optimization (DNO), performance management, improvement of sample transport referral networks, and accurate forecasting and supply planning coupled with stable cost-effective procurement and service agreements inclusive of key performance indicator monitoring.

Implementing viral load awards

Preliminary data analysis shows that in Q4, GHSC-PSM delivered 2.3 million VL/EID tests, saving approximately $5.2 million compared to 2019 pre-global request for proposal (RFP) prices under the terms of the global service-level agreements. Total spend on these orders was approximately $24.2 million.

In FY 2022, GHSC-PSM delivered 13.2 million VL/EID tests, spending $150.8 million and saving $35.8 million of PEPFAR funds. When designated non-GHSC-PSM buyers who benefit from the negotiated prices of the global service-level agreements are taken into account (e.g., Global Fund, Ministries of Health, and national procurement agencies), 17.7 million tests were procured and delivered in FY 2022 at a cost of $195.3 million, with $43.4 million in savings under the terms of global service-level agreements with the three VL/EID manufacturers.

Throughout FY 2022, the project continued to build and expand the functionality of the Global VL Dashboard. The Dashboard now has five live modules with a plethora of VL data for the largest PEPFAR-supported countries, such as key performance indicators, test results, consumption forecasts, anomaly detection, and order management. GHSC-PSM undertook additional enhancements to provide visibility into requisition and purchase order details and to compare volume commitments with forecasts. The project also began developing a sustainable process to get the most accurate geographic information system (GIS) coordinates and the GIS capability drilldown to provide location-based information on a map for various countries related to VL/EID data.

Vendor-managed inventory (VMI) for VL commodities was another FY 2022 strategic initiative. This inventory model streamlines inventory management and order fulfillment by improving collaboration among the supplier, the buyer, and distributors. After several months of collaborative design and operationalization efforts among GHSC-PSM, USAID, and the supplier in Q4, the project launched a pilot VMI in one laboratory in Maputo (Mozambique). A similar pilot in Nigeria is scheduled to start in Q2 FY 2023.

An example of ongoing collaboration among the USG, GHSC-PSM, and VL manufacturers in FY 2022 was the transition of a supplier's Cobas AmpliPrep/Cobas TaqMan testing equipment to a new

generation of machines in the Africa region, which is expected to conclude at the end of Q1 FY 2023. Transition plans were collaboratively prepared with the supplier by GHSC-PSM and USAID for more than15 PEPFAR-supported countries and implementation is underway.

A key initiative that GHSC-PSM undertook over the course of FY 2022 was the Wave-2 RFP for VL/EID testing scale-up. This RFP builds on the successes of the first global RFP of 2019 that established competitive global prices for reagents and controls for all countries, and covered services for the six largest PEPFAR VL/EID countries. The new RFP focuses on services for around 40 additional PEPFAR-supported ('Wave-2') countries to establish all-inclusive pricing, create formal service-level agreements, and enable expanded instrument connectivity. The global request for proposals from the VL manufacturers was released in Q3 and the bids received in Q4.

Procurement of viral load and laboratory supplies

New standardized dried blood spot (DBS) kits replaced previous country-customized DBS kits in FY 2022. Countries now select from available kit variations, and orders are being fulfilled per request. In Q4, GHSC-PSM delivered the first shipments of these new standardized kits. GHSC-QA pulled the first samples of the kits to validate quality.

Lab consumables such as pipettes and pipette tips, and consumables used for VL and COVID-19 tests, remain in short supply globally due to the pandemic. Also, deliveries of VL/EID reagents and consumables were impacted by COVID-19 as vendors and third-party logistics (3PL) providers struggled to identify appropriate flight availability.

GHSC-PSM found that meeting country requirements for remaining shelf-life, especially for some VL/EID reagents and consumables, was a challenge for manufacturers. As the reagents and consumables are used together, they are shipped together, and therefore all bundled products must wait for every commodity on the requisition order to be available before shipment. This is especially challenging for countries requiring long waiver times, which negatively impacts shelf-life upon delivery. GHSC-PSM is pursuing initiatives to address these problems. For example, the requisition order now contains language to highlight the challenge of meeting the shelf-life requirements of countries, requesting Missions to discuss the risk of products not being accepted for importation with local partners. While GHSC-PSM will endeavor to meet country requirements, the USAID Mission accepts the risk and by approving the requisition order authorizes GHSC-PSM to make a financial commitment to the supplier. To minimize the potential risk of products not being consumed before expiry, some orders were split in two shipments, to provide fresher products for the second shipment.

In FY 2022, additional project countries received funding for testing (VL/EID, or CD4). In Q4, GHSC-PSM delivered GeneXpert assays for the first time to the Philippines. GHSC-PSM worked with the vendor and country on import requirements (inclusive of shelf-life expectations) to allow for smooth delivery.

Forecasting and supply planning

An accurate forecasting and supply planning process is key to a successful supply chain. GHSC-PSM supports product procurement through executing quantifications and training on the use of the Quantification Analytics Tool (QAT). Thirty countries that procure HIV/AIDS commodities (treatment, prevention, and/or diagnosis commodities) are trained and are using QAT to submit quarterly supply plans to GHSC-PSM. By Q4, GHSC-PSM had trained 17 countries (including one Ministry of Health) on the QAT forecasting module; and the project trained five countries (including two Ministries of Health) on the supply planning module: DRC, Liberia, Mozambique, Burma, and Tanzania. GHSC-PSM completed rollout of the forecasting module in 17 countries in FY 2022, as requested through the work plan. In FY 2022, the project continued working with USAID and PEPFAR to streamline the COP process, allowing countries to import required data directly from QAT into COP tools.

Data-driven lab network optimization using Opti-Dx

Through historical procurement data, forecast data, instrument coverage, utilization rates, and global positioning system data, the Opti-Dx web-based tool calculates and demonstrates potential changes to the lab network, which can inform instrument selection and placement based on data gathered during a DNO activity. GHSC-PSM began piloting lab optimization using Opti-Dx in Burundi and Uganda in Q1, and continued with the data collection and verification in Q2, Q3, and Q4. The project developed a baseline model in OptiDx for Uganda in Q4. Ghana kicked off a DNO activity in Q3 for which they will use Opti-Dx. For more information, see section C.2 Systems Strengthening Technical Assistance.

HIV/AIDS Supply Chain Data Visibility and Commodity Security

GHSC-PSM improves data visibility and analysis of HIV commodity inventories at all levels of the supply chain. The project reviews national inventory data each month for more than 108 HIV medicines and commodities at the central and regional warehouse levels in 22 PEPFAR countries to identify stock imbalances across the globe. Data generated assist in monitoring commodity stock risks and progress made toward specific initiatives, such as the success of the TLD and MMD transition along with the transition to DTG-based regimens for pediatric patients. These reports help mitigate imbalances and avoid rationing and waste by raising awareness, identifying opportunities to shift GHSC-PSM shipments, and supporting redistribution within a country.

In Q4, GHSC-PSM identified and reported monthly on 71 HIV commodity stockout risks across 13 countries. The most common causes of stockout risks were: late order placement (for orders funded by USAID and all other donors), late deliveries (for orders funded by Global Fund and host governments), supply constraints due to reduced manufacturing capacity, and donor funding gaps (including unfunded shipments and delays in the release of funding). Other causes included product expiries, higher than anticipated consumption due to commodity transitions and program rollouts, and in-country distribution issues. The products most commonly reported as stockout risks were HIV RTKs (27 risks), adult ARVs (15 risks), and VL/EID (13 risks).

Most stockout risks were mitigated through active donor and supplier coordination and bilateral data sharing. At times, GHSC-PSM supported stockout risk mitigations, including facilitating inter-warehouse or facility transfers. GHSC-PSM reported on nine commodity stockout risks resolved during the same period with the most common resolution noted as deliveries by USAID and other donors.

GHSC-PSM hosts monthly Proactive Stock Risk Management (ProStock) meetings. Building on the project's HIV/AIDS data analysis and reporting noted above, this meeting is a forum for GHSC-PSM and USAID to discuss actual and imminent gaps in HIV commodity access and implement action plans to address them. The project also presents potential HIV commodity stock risks in this forum, allowing for early action and mitigation on numerous longer-term stockout and expiry risks across all categories of HIV products, including adult and pediatric ARVs, PrEP, and VL/EID tests.

Country Support

The HIV/AIDS task order funded supply chain systems strengthening in 28 countries in FY 2022.

In **Burkina Faso**, following a fire in a central medical store (CMS) in Q1, a stockout of VL reagents led to a slowdown in testing. Despite the delivery of a large quantity of VL commodities in Q3, GHSC-PSM identified that the backlog of VL testing samples was not decreasing as expected. The project worked with the testing labs on data analysis to clear the backlog before the end of FY 2022, leading to an increase in samples tested and reducing the backlog of samples awaiting testing by 81 percent, from 6,148 to 1,191 in just three weeks.

In **El Salvador**, GHSC-PSM developed quality controls in the Single System for Monitoring and Evaluation of HIV Epidemiological Surveillance (SUMEVE) information system and conducted national quantification workshops for rapid HIV tests to cover 2022 to 2024. The project trained 117 attendees on morbidity quantifications through a new functionality in SUMEVE. This gives the national AIDS program and laboratory chiefs ownership of their annual forecasting exercises.

Ethiopia's conflict presents unique challenges that range from looting and damage to medicines, infrastructure, and warehouse and transport systems to the loss of workforce and interruption of health service delivery. The conflict is affecting more than 740 health facilities. GHSC-PSM provided technical support to Afar, Amhara, and Tigray regional health bureaus, Ethiopian Pharmaceutical Supply Services hubs, and health facilities to activate the Emergency Supply Chain System, restoring conventional supply chain activities and responding to the needs of the public. As a result of these concerted efforts, stakeholders were able to supply the remaining 461 accessible health facilities with stock, and deliver soft or hard copies of logistics management information system (LMIS) tools.

Also in **Ethiopia**, during Q4, GHSC-PSM supported regional DTG and 3HP pharmacovigilance orientation events. A total of 214 participants (114 male and 100 female) attended the orientations. This support is expected to improve spontaneous adverse drug event (ADE) reporting due to DTG and 3HP.

In **Eswatini**, GHSC-PSM continues to support efforts to empower the CMS toward financial autonomy. The project provided funding to support a study tour for key leadership from CMS and MOH to Lesotho's autonomous CMS in Q4. During the tour, participants learned about the operations, risks, opportunities, and benefits of activity-based management. Information collected was used to advocate to the government of Eswatini to allow CMS to generate income by charging a fee for service, funds that would assist CMS to eliminate many of the financial challenges that prevent optimal warehousing, inventory management, and distribution activities. The proposal was enthusiastically received and the team awaits the government's decision.

In **Guatemala**, GHSC-PSM, together with the National AIDS Program (NAP) and implementing partners, conducted a forecasting and supply planning exercise for condoms, lubricants and RTKs in Q4. One outcome was the procurement of 2,847 RTKs to have sufficient supply for Q2 FY 2023.

In **Indonesia**, in FY 2022, GHSC-PSM worked with NAP on the HIV forecast for 2022–2023. In Q1, the project helped develop the Antiretroviral Forecasting and Supply Planning Tool (ARVFAST), an application-based tool to simplify calculations and minimize human error when quantifying commodity needs. Calculations are based on the patient's history, the stock availability, the number of commodities received, and estimated stocks that will expire. In Q2, GHSC-PSM facilitated a quantification workshop where the project shared guidance with HIV program managers and pharmacists from 34 provinces on how to use the ARVFAST and Non-ARVFAST tools. As a result, each province submitted its 2022–2023 HIV commodity supply plans based on calculations using these tools. By facilitating this event, GHSC-PSM is helping to ensure proper HIV commodity forecasting for HIV treatment. The project also

facilitated an online meeting (Zoom and YouTube live streaming) in Q4 attended by 2,086 participants from 34 provinces to get feedback on targets and assumptions. The annual HIV forecasting for 2023–2024 was completed during a workshop in Q4 involving HIV and pharmacy program managers from 34 provinces, with GHSC-PSM guiding the provincial health offices and NAP team to use the ARVFAST and Non-ARVFAST applications. These tools and the subsequent coordination meetings are enabling successful and effective annual HIV logistics forecasting, which informs better supply planning for 2023–2024.

In **Lesotho**, GHSC-PSM provided technical support to the Supply Chain Management Department within the MOH to develop the country's first comprehensive National Stock Status tool. This tool provides the MOH with access to data from the CMS and service delivery points for all HIV and COVID-19 commodities nationwide, improving supply chain data, decision making, and planning.

At the request of **Lesotho's** MOH, GHSC-PSM assisted the MOH Supply Chain Unit in conducting a stock assessment of isoniazid (INH) 300 mg, used to treat TB. The assessment showed a high level of overstocking of INH 300 mg and, as a result, the project recommended that the MOH donate some of the medicine to countries with shortages. GHSC-PSM helped identify Haiti and Zambia, which were in need of the product, and the project successfully facilitated the donation of 7,941 blister packs (24x28) INH 300 mg tablets to Zambia and 1,000 blister packs (24x28) to Haiti in FY 2022. The donation helped Lesotho avoid expiries and wastage of product while assisting Haiti and Zambia in mitigating their shortages.

More recently, in Q4, GHSC-PSM identified 42,152 bottles of DTG 10 mg that were overstocked in **Haiti**, and needed for children living with HIV in **Mozambique**. This was a great example of global collaboration and highlights the impact of accurate supply forecasting and data sharing among country teams.

In **Zimbabwe**, GHSC-PSM together with the MOH and Childcare's Directorate of Laboratory Services conducted supportive supervision visits for the VL/EID testing laboratories outside the Greater Harare Province in Q3. The activity assessed the capacity of facilities to institute an electronic logistics management information system (eLMIS). GHSC-PSM also supported field visits to facilities in Manicaland and Matabeleland North provinces to mentor pharmacy staff on inventory management and storage, and on their current use of eLMIS.

GHSC-PSM collaborated with **USAID/Zambia's** electronics Supply Chain Management Information Systems (eSCMIS) project to develop analytics for supply chain decision making. This collaboration will increase reporting rates, data quality, and champion data use for decision making at all levels of the supply chain. GHSC-PSM has a broader supply chain technical assistance mandate, which includes supervisor capacity building to improve logistics system implementation and commodity availability across the country, whereas the eSCMIS project is focused on, among other things, eLMIS software development and countrywide implementation and support.

B2. Malaria

Delivered enough artemisinin-based combination therapies (ACTs) to treat more than **468.2 million malaria infections over the life of the project**, including **12.9 million** in Q4.

23 countries are receiving health supply chain systems strengthening support with malaria funding in FY 2022.

A total of **19 countries procured** malaria medicines and commodities in Q4; 31 over the life of the project**.**

Delivered enough long-lasting insecticide-treated nets (LLINs) to provide **protection from malaria for more than 17.3 million people in Q4 and 507.96 million people over the life of the project**.

REFLECTIONS ON FY 2022

In FY 2022, GHSC-PSM continued its focus on activities to reduce the burden of malaria in line with the five focus areas outlined in the PMI strategy 2021–2026. The project channeled its efforts toward reaching the unreached, strengthening community health systems, keeping malaria services resilient, promoting innovation, and supporting PMI stockout reduction initiatives in the malaria task order (TO2) countries.

Continuous reliable supply of malaria commodities is critical to malaria service delivery. In FY 2022 the project worked to overcome lingering logistics challenges posed by the pandemic, achieving OTD and OTIF delivery above the 80 percent target.

To innovate and lead, reach the unreached, and strengthen community health systems, the project is expanding the Stockout Reduction Strategy Playbook to include community health workers (by adding

specific guidance on stakeholders, root cause analysis, and prioritizing solutions) and reduce health facility and community-level stockout risks. The updated playbook will be finalized in early FY 2023. GHSC-PSM also conducted a community-level landscape analysis of the supply chain to understand and mitigate potential challenges at this level.

To keep malaria services resilient, GHSC-PSM worked in PMI countries on supply chain information systems and warehouse management. This is an effective way to improve data quality, secure stock availability, and ensure preparedness in the face of unforeseen situations such as pandemics, conflicts, and other natural disasters. GHSC-PSM staff in Cambodia, Burma, and Thailand were trained on the Quantification Analytics Tool (QAT) for supply planning. QAT helps program managers use supply data to improve forecasting and procurement needs up to 24 months in advance. By the end of Q4, 24 countries had used QAT to submit their malaria supply plans.

To further the objective of investing locally, innovating, and leading malaria elimination, the project-initiated efforts to increase procurement of malaria commodities on the continent of Africa. GHSC-PSM launched an RFI across various malaria commodities to better understand the opportunities and challenges suppliers face in setting up local manufacturing or further expanding manufacturing for those suppliers already manufacturing on the continent. The project also visited malaria commodity manufacturers in Kenya, Tanzania, and Uganda to support local production in Africa. These efforts assist the project in evaluating the malaria commodity market and countries can use the findings to source commodities locally and mitigate stockout risk. In FY 2022, GHSC-PSM also incorporated the information from the Procurement Planning and Monitoring Report for malaria (PPMRm) into the country stock risk dashboard to illustrate the timing and scope of upcoming stock risks, allowing donors and stakeholders to take actions to mitigate risks.

In addition to these activities, GHSC-PSM fosters quality assurance (QA) for LLINs, malaria rapid diagnostic tests (mRDTs), and pharmaceuticals. In FY 2022, the project added two pharma and one net testing lab. Another major achievement was GHSC-PSM's first successful LLIN delivery to Rwanda since 2019. The project worked with the Rwanda Biomedical Centre (RBC) and other key stakeholders to align post-inspection protocols, as misalignment had been a challenge in the past, prompting RBC to reject nets. As a result of this collaboration and execution of the post-inspection according to the agreement, RBC accepted the 2022 nets.

In FY 2023, the project will continue to undertake activities to support achievement of PMI's strategy 2021–2026. In light of this, GHSC-PSM is refining its localization and regionalization of procurement

strategy, developing a tool to optimize supply chain management through cost-benefit analysis in low malaria endemicity settings, and introducing an accountability tool to countries for malaria commodities. The highlights below shed more light on the milestones, achievements, and challenges of FY 2022.

COST SAVINGS ON MALARIA COMMODITIES

Commodity cost savings on core malaria products has reached $211.5 million over the life of the project, including $63.7 million in savings in FY 2022. This represents 21 percent of the total FY 2022 procurement value for these core commodities, and 19 percent of total procurement value for all malaria products. ACTs this year amassed $23.7 million in savings alone. Weighted average prices for ACTs continue to be lower than baselines, but AL 6x3 and AL 6x4 had some cost increases compared to earlier periods. Most vendors increased commodity pricing, driven by rising prices in the AL API market. Pricing for ASAQ products remained consistent throughout FY 2022, as the project procured from a single vendor this year. This vendor was awarded the allocations as it provided the best lead times. The project is planning to procure from additional suppliers in FY 2023.

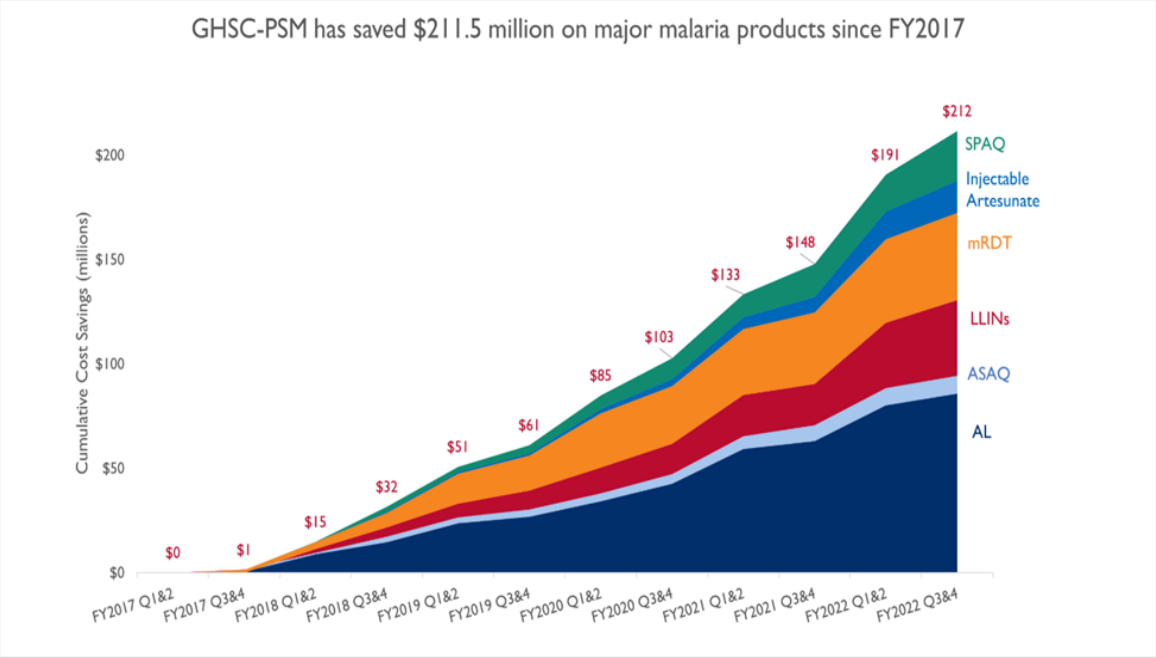
In FY 2022, GHSC-PSM almost doubled the life of project LLIN cost savings, amassing $16.4 million in FY 2022 alone, as compared to life of project savings as of FY 2021 that amounted to $19.8 million. Total life of project savings reached $36.3 million. These savings were primarily driven by overall price reductions in the net market, with prices for individual Piperonyl Butoxide (PBO) 150cm, PBO 170cm, and single-pyrethroid 170cm nets decreasing in FY 2022, while the cost of single-pyrethroid 150cm nets rose slightly. The project continues to use a mix of vendors, with seven different LLIN suppliers engaged in FY 2022. No procurements of PBO 150cm or single-pyrethroid 150cm nets were made in the second half of the year. The ongoing trend for LLINs is to shift to PBO nets.

For artesunate injectable 60 mg vials, cost savings rose dramatically in FY 2022, more than doubling the life of project's cost savings to a total of $15.4 million. These savings were due to supplier price reductions given the large volume of product the project procures and stable demand, and were also likely due to lower offered prices, presumably due to new entrants increasing competition for market share. In FY 2022 the project procured its largest volume of artesunate injectable 60 mg vials yet at the lowest prices seen since GHSC-PSM began tracking cost savings.

The project achieved $7.6 million in cost savings for mRDTs in FY 2022. FY 2022 market conditions allowed the project to procure from suppliers in closer alignment with the allocation strategy than in FY 2021, which generally offered lower prices on mRDT products. In FY 2021, the project had relied on higher-priced options due to delivery issues from lower-priced vendors, which were resolved in FY 2022. While the second half of FY 2022 saw a decrease in procurement volume, mRDT procurement is expected to rise in the beginning of FY 2023.

Sulfadoxine-pyrimethamine + amodiaquine (SPAQ) also saw an increase in cost savings this year, due to the project's allocation of a greater proportion of procurements to lower cost suppliers than in previous periods, as well as supplier price reductions.

Exhibit 11. Life-of-Project Savings on Malaria Commodities



Commodity Sourcing, Procurement, and Delivery

GHSC-PSM assesses the sources of critical commodities and market conditions—including key starting materials (KSMs) and APIs. The project uses these assessments to develop strategies that ensure that products are available and accessible, despite constrained supply and limited transit options due to COVID-19.

Commodity risk profiles

FY 2022 saw a temporary disruption in the supply of artesunate injectables resulting from an out-of-specification (OOS) investigation with one of the two prequalified manufacturers. By the end of Q4, the investigation had been closed and supply resumed. The project brought forward orders of artesunate injectables for Nigeria and Tanzania to avoid stockout.

Previously, GHSC-PSM procured rectal artesunate from two prequalified suppliers. Due to low demand leading into FY 2022 and subsequent volume awards, one of the two suppliers halted production. The low demand is potentially due to WHO's interpretation of the Community Access to Rectal Artesunate for Malaria (CARAMAL) study, which questions the product's appropriateness in all clinical settings. In Q4, GHSC-PSM sole-sourced from the remaining supplier who agreed to a production run in Q1 FY 2023 that met the demand for Benin, Cameroon, DRC, Liberia, and Zambia.

In Q4, GHSC-PSM placed ACT orders under the new strategy approved in Q3 by the Sourcing Governance Board. Two suppliers cited manufacturing challenges and delayed the goods availability dates for ACTs during this period, which resulted in a stockout in Burundi. ACT production for the Burundi order was completed in Q4 with delivery to Burundi in Q1 FY 2023.

In Q4, in the midst of a seasonal malaria chemoprevention (SMC) campaign, the Global Fund notified GHSC-QA of packaging discrepancies on tableting and age range for SPAQ products from Burkina Faso. GHSC-QA worked with the supplier on CAPAs and notified National Malaria Control Programs (NMCPs) in Ghana, Niger, and Nigeria, for whom this is a primary supplier, about the discrepancies. Once GHSC-QA is satisfied with the CAPAs, the project will resume orders with this supplier. GHSC-PSM secured GADs for all firm Q4 orders, using fresh production and the remainder of SPAQ stocked at the RDC in Belgium.

In Q4, the project placed and delivered its first order of sulfadoxine-pyrimethamine (SP) with a new European supplier for Malawi. The expanded supply base contributes to the SP strategy goals of sustaining market health through predictable lead times and geographic diversity of suppliers.

By Q4, LLIN and mRDT markets had largely stabilized from disruptions experienced in the first half of FY 2022 due to ongoing COVID-19 challenges, particularly delays in the shipment of active ingredients and key starting materials. Available manufacturing capacity enabled an LLIN dual active ingredient supplier to bring forward GADs for Côte d'Ivoire and Liberia.

Concerning mRDTs, GHSC-PSM received complaints from Kenya, Nigeria, and Senegal about the time required to read the mRDT test results from two suppliers' tests. These countries also raised concerns about the type of blood collection devices, the volume of buffer solutions, and mRDT instructions for use (IFU) provided by these suppliers, which prompted the project to work with PMI case management to ensure product appropriateness.

In Q4, lab orders for Nigeria were at different processing stages due to extensive pre-inspection and import requirements. Two wholesalers reported COVID-19–related delays that impacted orders in Angola, Ethiopia, and Nigeria.

Strategic sourcing

In Q4, GHSC-PSM strategic sourcing of malaria commodities focused on:

- **Conducting a strategic tender for long-lasting insecticide-treated nets (LLINs) in preparing for FY 2023 procurements**. The project re-solicits offers annually to ensure that prices and other aspects of supplier offers remain current, such as registration status, packaging configuration, and existing product portfolio. This permits the evaluation of best value in line with current market conditions. In Q4, GHSC-PSM closed a tender to mitigate rising global costs of finished goods and logistics—by incentivizing suppliers to manufacture finished goods closer to the end user, maintain high levels of on-time delivery, and incentivize manufacturer innovation to ensure product appropriateness.

- **Engaged with African manufacturers of malaria commodities to evaluate sourcing opportunities and challenges.** In Q4, the project traveled to East Africa and met with LLIN and malaria pharmaceutical suppliers. GHSC-PSM observed the manufacturing processes and learned about the commercial environment where these manufacturers operate.

Procurement and deliveries

In Q4, GHSC-PSM procured malaria commodities[15] for 19 countries with a total value of $31.3 million.

OTD and OTIF. Timeliness of GHSC-PSM deliveries remained consistent and strong for standard OTD and OTIF in Q4 for malaria commodities, with an OTD rate of 87 percent (74 percent for COVID-impacted) (see Exhibit 12). The OTIF rate in Q4 was 82 percent (63 percent for COVID-impacted). This was despite the high degree of uncertainty and the extreme volatility in global supply chains caused by the pandemic and other shocks.

Exhibit 12. Malaria Commodities, OTD

[15] GHSC-PSM procured malaria commodities for the following countries: AFRICA: Angola, Benin, Burkina Faso, Cameroon, DRC, Côte d'Ivoire, Ethiopia, Kenya, Liberia, Madagascar, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Senegal, Uganda, Zambia.

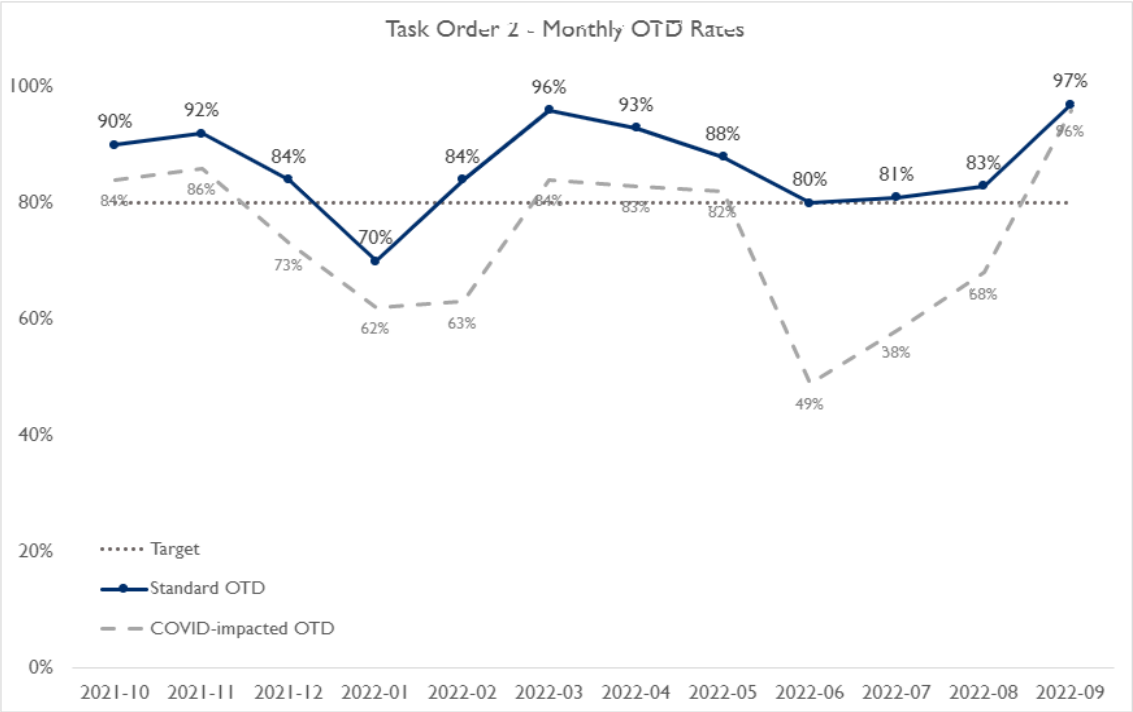
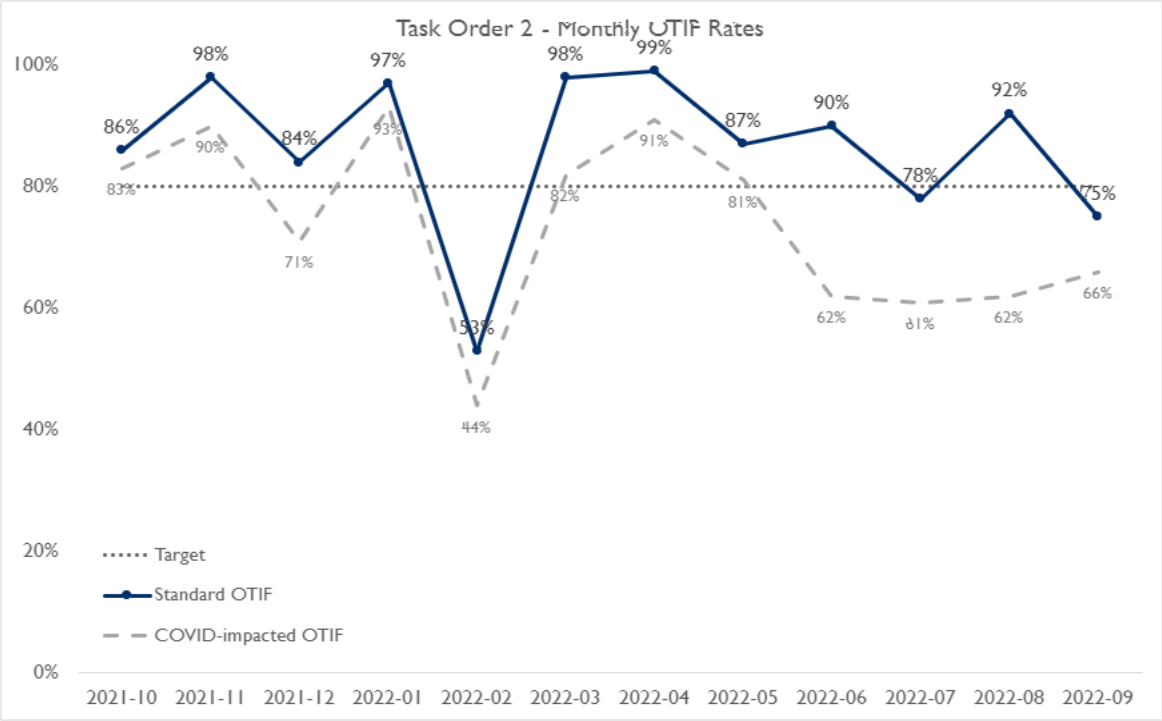

Task Order 2 - Monthly OTD Rates
100%
80%
60%
40%
20%
0%
90%
92%
84%
70%
84%
96%
93%
88%
80%
81%
83%
97%
84%
86%
73%
62%
63%
84%
83%
82%
49%
38%
68%
96%
Target
Standard OTD
COVID-impacted OTD
2021-10
2021-11
2021-12
2022-01
2022-02
2022-03
2022-04
2022-05
2022-06
2022-07
2022-08
2022-09

Exhibit 13. Malaria Commodities, OTIF



Global sourcing collaboration

GHSC-PSM participates in the Malaria Pharma Task Force,[16] mRDT Task Force,[17] and Indoor Residual Spraying/Insecticide-treated Nets (IRS/ITNs) Task Force.[18] These groups provide a valuable forum for exchanging information on market risks and promoting improved collaboration across the global malaria community. They are supplemented by one-off working sessions and communications to discuss acute risks, issues, and opportunities.

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[16] Pharma Task Force members include Clinton Health Access Initiative (CHAI), Bill & Melinda Gates Foundation (BMGF), GHSC-PSM, the Global Fund, Impact Malaria, the Malaria Consortium, Medicines for Malaria Venture (MMV), Médecins Sans Frontières (MSF), Pan-American Health Organization, PATH, PMI, UNICEF, and World Health Organization (WHO).

[17] mRDT Task Force members include CHAI, Foundation for Innovative New Diagnostics, BMGF, the Global Fund, the Malaria Consortium, MSF, PATH, PMI, GHSC-PSM, UNICEF, United Nations Development Program, Unitaid, and WHO.

[18] IRS/ITNs Task Force members include the Against Malaria Foundation (AMF), CHAI, BMGF, GHSC-PSM, the Global Fund, Innovative Vector Control Consortium, International Federation Red Cross, MMV, MSF, PMI, Population Services International, Results In Health, UNICEF, Unitaid, and WHO.

GHSC-PSM plays a continuing role in the Malaria Pharma Task Force and KSM/API working group, which increases visibility, and identifies and mitigates risks related to the upstream supply chains of finished malaria pharmaceutical products. In addition to participating in monthly KSM/API Working Group meetings, the project participated in multiple, out-of-cycle meetings in Q3 and Q4 of FY 2022, given evolving dynamics in the semi-synthetic and vegetal artemisinin markets. GHSC-PSM also regularly attends an Artemisinin Working Group meeting hosted by PATH, a GHSC-PSM peer in the malaria community, to contribute to and be made aware of engagement with KSM and API manufacturers, updates in artemisinin pricing, forecasting and progress towards investments in new artemisinin production methods.

Proactive Procurement Strategy

GHSC-PSM applies a proactive procurement strategy for key malaria commodities, such as artesunate injectables, and SPAQ. The project designs strategies to rapidly move commodities by leveraging a rotating emergency loan fund to secure large volumes of supplier production capacity in markets where the supply is particularly constrained. The project places orders based on data-driven demand signals, which secures production capacity earlier in the ordering process—often in advance of receiving orders.

Proactive procurement strategies ensure access to a supply of critical commodities when countries need them, reduce fulfillment lead times, and hedge against uncertainty and disruption in these markets. These strategies are partially informed by the use of demand data—derived from country supply plans, and the PPMRm—which the project translates into the country stock risk dashboards that illustrate the timing and scope of upcoming stock risks. These strategies are designed to mitigate future stockout risks, ensure timely delivery in constrained markets, and avail favorable market conditions (favorable pricing, etc.).

In Q4 GHSC-PSM did not undertake proactive procurements. The project began shipping orders to update the ACT stockpile in Q4, which is intended to meet emergency demands. GHSC-PSM began vendor stored inventory (VSI) contract negotiations with one of the two suppliers; VSI will launch in FY 2023.

Quality Assurance

Implementing strategies and innovations

In Q4, GHSC-PSM visited malaria commodity manufacturers in Kikuyu, Kenya; Arusha, Tanzania; and Kampala, Uganda to support local manufacturing in Africa and foster robust quality assurance in LLIN production. GHSC-PSM learned about the opportunities and challenges of local manufacturing in Africa

and the factors that may influence local manufacturers to expand. GHSC-PSM also learned more about LLIN manufacturing and its quality management systems (QMS).

Fostering quality in LLINs

In Q4, GHSC-PSM concluded an investigation into a batch of LLINs that was OOS for PBO active ingredient (AI) at the project's third-party laboratory. The acceptable specification for PBO content is 10 g/kg ± 25 percent; results for the batch in question were below the specification. GHSC-PSM reviewed the lab's procedures and conducted additional testing. The outcome was two OOS results, and one passing result. GHSC-PSM notified the supplier of the OOS and requested an internal investigation. The supplier performed additional testing and submitted a report to GHSC-PSM for review. The data showed that some nets met AI content specifications and others did not. Based on the review of all relevant documentation and test results, GHSC-PSM recommended rejection of the batch.

Fostering quality in mRDTs

In Q4, GHSC-PSM concluded an investigation into two batches of Pf mRDTs that a third-party testing lab reported as OOS for high false positive rates. The maximum threshold for false positives is less than10 percent, and the lab reported that a total of four batches had high false positive rates. To understand the OOS and the potential of a systemic issue, the project conducted additional tests at the WHO third-party laboratory. The samples tested passed and GHSC-PSM recommended release of the batches based on the additional tests performed with an increased sample size, thus a more accurate and reliable result.

Fostering quality in pharmaceuticals

In Q4 the project initiated a collaborative investigation into OOS SPAQ packaging that was procured by GHSC-PSM and the Global Fund. The project received complaints from the recipient country indicating that seven blisters from five batches of SPAQ were incorrectly packaged. The SPAQ blister packs were reported to contain four tablets of amodiaquine instead of three tablets of amodiaquine + 1 tablet of SP. The project halted future procurements, reported the incident to the supplier, and requested a CAPA. GHSC-PSM worked with the supplier to understand the root cause of the packaging OOS, which was attributed to the salvaging process of de-foiling blisters after they were rejected by the inspection camera. The project will review the effectiveness of the supplier's CAPA and make a recommendation to USAID on whether to resume procurement.

Promotion of Supply Chain Market Health

In Q4, GHSC-PSM completed a review of four pharmaceutical products, and one LLIN product (see table below), and added these products to the Restricted Commodity Waiver list governed by USAID

Automated Directives System 312. The list makes the products eligible for procurement, and updates the project records with new suppliers' manufacturing sites.

Product category	Product subcategory	Product detail
Pharmaceuticals	SMC	Sulfadoxine-pyrimethamine + amodiaquine (SPAQ) Dispersible Tablets (DT) 12.5+250+76.5mg
Pharmaceuticals	SMC	Sulfadoxine-pyrimethamine + amodiaquine (SPAQ) Dispersible Tablets (DT 25+500+153 mg
Pharmaceuticals	SP	Sulfadoxine-pyrimethamine (SP) 500/25mg Dispersible Tablets
Pharmaceuticals	SP	Sulfadoxine-pyrimethamine (SP) 250/21.5 mg Dispersible Tablets
LLINs	LLINs	Yorkool G3 LN

GHSC-PSM ensures quality control (QC) testing efficiency and testing capacity for key products by expanding the number of testing labs. In Q4, the project completed a method transfer for AL hard tablets and completed two method verifications: one for chloroquine and one for primaquine tablets.

Collaboration

As the chair of the LLINs Quality Assurance Group (LQAG), GHSC-PSM works with global procurers focused on LLIN QA and QC to foster discussions and activities related to LLIN quality and quality management systems. Meetings take place monthly. The participants included GHSC-PSM, PMI, the Global Fund, UNICEF, and WHO Pre-Qualification (PQ).

Key performance indicators

GHSC-PSM reported:

- A total of 88 percent of QA/QC processes were completed within the required lead times. This quarter had a slight decline in comparison with previous quarters, but achieving well above the target of 80 percent.
- Out-of-specification findings fell this quarter to 0.6 percent of batches tested, below the target of 1 percent, recovering from last quarter. Only one batch of products was rejected due to not-assured quality in only one category (LLINs).

Adoption of Standards-based Identification, Barcoding, and Data Sharing

In FY 2022, GHSC-PSM saw a positive trend in compliance of in-scope malaria suppliers with identification, barcoding, and data-sharing requirements of products procured. These requirements involve a phased implementation grounded in GS1 health care standards to create an enabling environment for data exchange and visibility. Highlights and milestones associated with these standards in FY 2022 are included in Section C.

Priority Setting and Redirection of Orders

To address country needs and market constraints, GHSC-PSM works with USAID to prioritize orders based on need, and conducts commodity order transfers to improve stock status. Below are Q4 examples of how these strategies ensure that countries avoid stockouts.

Due to stockout risk in Nigeria, GHSC-PSM prioritized an order for 48,333 units of artesunate injectable and moved the GAD up by two weeks. The project flagged this order for expedited shipment to ensure delivery as early as possible.

GHSC-PSM swapped production slots of 5,648 packs of AL 20/120 mg dispersible tablets, 30 x 6 x 1 blister pack tablets; prioritizing a shipment to Uganda due to a stockout and delaying delivery to the RDC stockpile.

GHSC-PSM postponed the production of 405,696 dual AI LLINs per Sierra Leone's request and brought forward orders for Côte d'Ivoire, Ghana, and Liberia.

The project deployed the emergency loan fund to procure DRC's FY 2022 malaria operational plan demand for AL, artesunate injectable, and SP to mitigate the risk of stockout projected in Q1 FY 2023.

In Q3 2022, GHSC-PSM received shipping documents for an mRDT order for Mozambique, with a planned delivery in Q1 FY 2023. In Q4, the project completed booking of the vessel, and scheduled delivery. GHSC-PSM requested the government of Mozambique to authorize early delivery for the order containing 306,497 packs of 25 tests. Due to overstock of consignments received from PMI and Global Fund, Mozambique accepted early delivery only for a partial quantity of 173,351 kits. Malawi had an urgent need for mRDTs and GHSC-PSM proposed the remaining 133,146 test kits be shipped there instead. The shipment is planned to arrive in Malawi in early Q2 FY 2023.

In Q4, 29 countries submitted data to the PPMRm. The PPMRm collects and reports information on stock status and on host governments' and other donors' shipments. Visibility into the stock status and shipment information enables PMI, the project, and countries to make decisions on prioritizing, expediting, or delaying procurements of shipments, and facilitates the review of forecasts and supply plans to optimize procurements. In Q4, based on PPMRm data, the project:

- Identified and mitigated stockout risks and took actions to expedite PMI and Global Fund shipments, including an:
    - Understock of artesunate injectable 60 mg in Zambia. GHSC-PSM responded by expediting the next two PMI shipments.
    - Understock of artesunate suppository 100 mg in DRC. To prevent a stockout, the country office expedited the next nine PMI shipments to arrive in Q2 FY 2023.
- Postponed shipments to prevent overstocking, including:
    - Overstock of artesunate injectable 60 mg in Madagascar. To prevent expiries, an upcoming Global Fund shipment was postponed to Q1 FY 2023.
- Redistributed stocks within the country, including:
    - Excess of AL 6x2 in Côte d'Ivoire. GHSC-PSM developed an allocation plan to redistribute the excess stock to health centers.
    - Excess of mRDTs in Rwanda. The NMCP and Rwanda Medical Supply Limited verified the stock at service delivery points to redistribute.

Stockout Reduction Initiative

The project implemented a stockout reduction initiative in 20 countries[19] starting in FY 2021 and throughout FY 2022, these countries began following a playbook through four stages:

1. Review baseline and targets based on available data
2. Review root causes using supporting evidence
3. Validate proposed solutions
4. Develop investment plans and incorporate prioritized investments into fiscal year work plans

In Q2, GHSC-PSM developed an Excel-based budget template for investment planning (stage 4) that was introduced to the 20 country offices to develop their investment plan budgets into the FY 2023 work plan. The template guides the budgeting process through four steps:

1. Review existing investment plan outputs
2. Define current state of each investment and expected impact
3. Provide costing details for each investment activity
4. Assess outputs to make decisions

In Q4, six countries used it to develop investment plan budgets.

In Q4, the project reviewed the stockout reduction initiative master playbook produced in 2020 to identify cross-cutting guidance for both health facilities and CHWs and added specific guidance for community health workers (CHWs) on stakeholders, root cause analysis, and prioritizing solutions. The amended playbook is expected to be finalized in early FY 2023.

LLIN Distribution Support

In Q4, GHSC-PSM delivered 8.67 million LLINs to countries for onward distribution as a malaria prevention measure (Exhibit 14). In Q4, nine[20] countries, prepared for, or launched large-scale LLIN mass distribution campaigns. This initiative made nets available to communities before the rainy season, particularly areas with high concentrations of malaria cases. In some countries, the project provided transportation support through local 3PL service providers to deliver LLINs from the central level to district or health facility levels for continuous distribution.

Exhibit 14. Quantity of LLINs Delivered to Countries in Q4 FY 2022

[19] Angola, Burkina Faso, Burundi, Cambodia, Cameroon, Ethiopia, Ghana, Guinea, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Sierra Leone, Thailand, Uganda, Zambia, Zimbabwe

[20] Angola, Burundi, Ethiopia, Liberia, Niger, Nigeria, Rwanda, Zambia, Zimbabwe

Country	Number of LLINs Delivered
Burundi	283,819
Cameroon	153,552
Congo DRC	452,700
Ethiopia	741,484
Ghana	156,960
Guinea	234,900
Kenya	615,502
Madagascar	650,000
Malawi	330,000
Mali	1,409,000
Niger	302,500
Nigeria	944,800
Rwanda	435,148
Tanzania	360,829
Uganda	1,600,527
Grand Total	**8,671,721**

In Q4, GHSC-PSM supported LLIN distribution activities:

- In **Burundi,** through its partner, Population Services International (PSI), the project and the NMCP distributed 124,550 nets to 57 percent (28 of the 49) of health districts. GHSC-PSM monitors district-level stock status and health center distributions monthly. Based on data collected from the districts, GHSC-PSM distributed 162,200 LLINs from districts to health centers in Q3 and Q4 FY 2022.
- In **Zambia**, the project collaborated with the National Malaria Elimination Centre (NMEC) and partners on the LLINs working group in preparing for 2023 continuous and mass distribution campaigns. GHSC-PSM updated LLIN guidelines, and NMEC launched a proposed schedule for a series of sub-national dissemination meetings in FY 2023. The project will support in-country distribution for the 2023 mass campaign following guidance from PMI. The AMF will procure the LLINs.

- In **Liberia**, GHSC-PSM supported distribution of 130,050 LLINs to nine counties (Bassa, Bong, Bomi, Cape Mount, Grand Gedeh, Lofa, Nimba, Montserrado, and Sinoe) through multiple channels, such as antenatal care (ANC) services. This included dispatch to nine county depots and last-mile distribution to 47 health facilities, such as clinics and county hospitals, in collaboration with health teams. GHSC-PSM received an additional shipment of 139,500 LLINs for routine ANC distribution. The project will use these LLINs for school-based distribution in Bong and Nimba counties in FY 2023.

Country Support

In FY 2022, GHSC-PSM provided supply chain systems strengthening support for malaria medicines and commodities in 23 countries.[21] Activities in Q4 included:

In **Rwanda**, GHSC-PSM trained 27 IntraHealth International (IHI) district malaria supervisors on e-LMIS functionality and usability. Participants were trained to place orders, upload consumption data, calculate average monthly consumption of malaria commodities, properly fill out stock cards, and triangulate data (comparison of cases vs. AL dispensed). The district supervisors will use these new skills to improve e-LMIS data accuracy at the service delivery points they oversee.

In **Nigeria**, GHSC-PSM is piloting an initiative to use manufacturer-applied identifiers and data carriers on LLIN packaging at specific distribution points to capture and verify net authenticity. In Q4, GHSC-PSM developed data models for pilot key performance indicators (KPIs) and business process requirements and configured the LLIN database to support the pilot.

In Q4, the project held a regional training for GHSC-PSM staff in **Cambodia**, participants from the project offices of Burma, and Thailand, as well as implementing partners (CHAI, CMEP2, and UNOPS), and government colleagues (CNM, DDF, and CMS) on the QAT for supply planning. Soon after the training, the Cambodia field office began to generate the supply

Participants at the regional QAT training in Cambodia. Photo credit: GHSC-PSM.

[21] GHSC-PSM provided technical assistance to countries with malaria funding: AFRICA: Angola, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Guinea, Kenya, Liberia, Malawi, Mali, Mozambique, Niger, Nigeria, Rwanda, Sierra Leone, Uganda, Zambia, and Zimbabwe; ASIA: Cambodia, Burma, Laos, Thailand.

plan through QAT in Q4. QAT enhances user interface and usability, better analytical capabilities, and automated data exchange. Adopting QAT can help program managers to use supply plan data to improve forecasting needs, determine procurement needs 18–24 months in advance, and optimize commodity procurements and delivery.

B3. Family Planning and Reproductive Health

To date, GHSC-PSM has delivered enough contraceptives to provide 86 **million couple-years of protection**, including 3.9 **million in Q4.**[22]

Procured FP/RH commodities[23] **for 15 countries**[24] in Q4 and provided **health supply chain systems-strengthening support** to **22**[25] **countries in FY 2022** with FP/RH funding.

Continued to successfully fulfill USAID-supported countries' orders in a timely manner, **achieving 94 percent (94 percent COVID-impacted) OTD** in Q4.

Disseminated the **results of the 2021 Contraceptive Security Indicators Survey** that included findings from **more than 40 countries**, along with a new section on the impact of COVID-19.

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[22] In previous quarterly reports, the couple-years protection estimates included all condoms GHSC-PSM procured, regardless of funding source. Beginning with this report and moving forward, CYPs will include PRH-funded condoms only. HIV- and Zika-funded condoms will be excluded.

[23] Per USAID guidance, all condom procurements are counted under the HIV/AIDS task order.

[24] GHSC-PSM procured FP/RH commodities for the following countries: Afghanistan, Benin, Burkina Faso, Congo DRC, Ghana, Kenya, Madagascar, Malawi, Mali, Mozambique, Nepal, Niger, Senegal, Uganda, Zambia

[25] GHSC-PSM provided technical assistance with FP/RH funding to the following countries in FY 2022: AFRICA: Angola, Burkina Faso, Burundi, Cameroon, Ethiopia, Ghana, Guinea, Liberia, Malawi, Mali, Mozambique, Nigeria, Rwanda, South Sudan, Sierra Leone, Uganda, Zambia, Zimbabwe; LAC: Haiti; ASIA/NEAR EAST: Nepal, Pakistan, Thailand.

The FP/RH task order serves as the primary vehicle through which USAID procures and provides FP/RH commodities for its voluntary FP programs; offers technical assistance to improve supply systems and contraceptive security in partner countries; and provides technical leadership to strengthen the global supply, increase financing, and introduce new FP/RH commodities.

REFLECTIONS ON FY 2022

In the past year, GHSC-PSM secured a continuous supply of FP/RH commodities, despite the challenges linked to a supply-constrained environment and underlying logistical challenges due to COVID-19. The project sought to maximize its strategic sourcing strategy to reduce FP/RH commodities supply risk, including leveraging stock at RDCs and regularly analyzing the allocation of available stock. As a result of these efforts, GHSC-PSM managed to achieve 95 percent (88 percent COVID-19 impacted) OTD.

The project delivered its first order of hormonal IUDs to Rwanda following its introduction to the USAID Catalog in 2021. This achievement expands method choice and increases access to hormonal IUD to lower- and middle-income countries (LMICs) for the first time.

GHSC-PSM strengthened business partnerships with FP/RH suppliers with the return of in-person supplier quarterly business reviews in Q3 and Q4 FY 2022. These strong partnerships enable robust information exchange that inform evidence-based decision making.

GHSC-PSM collaborated with FP/RH global stakeholders to ensure data visibility and promote a deeper culture of using data to inform decision-making across all technical areas that encompass the FP/RH portfolio core activities to achieve greater contraceptive security, as detailed below. A significant achievement in FY 2022 was the Automated Requisition Tracking Management Information System (ARTMIS)-Global Family Planning Visibility Analytics Network (VAN) data integration.

One focus area was diversifying supply risks. For example, GHSC-PSM worked with GHSC-QA to facilitate additional approvals of new syringe manufacturers that depot-medroxyprogesterone acetate (MPA-IM) suppliers can procure from to make the injectable more widely available. The project also worked with suppliers to diversify their sources of API for oral contraceptives and, along with GHSC-QA, updated the eligibility notification for products with these new API sources. As a result, GHSC-PSM now has the same products with more sources for API. GHSC-PSM also supported the successful phasing out of Combination 3 and introduction of combined oral contraceptives with non-ferrous fumarate placebo. In FY 2022, GHSC-PSM continued to pursue opportunities to expand access to a broad array of contraceptive methods for women to choose from. When combined with proper counseling and correct use, contraceptives can positively impact maternal and child health. By

using the Impact 2 modeling approach, the project can estimate expected benefits resulting from the millions of contraceptives GHSC-PSM delivered to USAID-supported health facilities and organizations.

In total over the life of the project, the contraceptives delivered globally equates to nearly 86 million (18 million in FY22) couple years protection (CYP). These are estimated to prevent approximately 890,000 deaths (165,000 FY22), including women (90,000 over life of project and 15,000 FY22) and children (800,000 over life of project and 150,000 FY22). The prevention of approximately 39,000,000 unintended pregnancies over the life of project (7,300,000 FY22) and 13,600,000 abortions (2,500,000 FY22) drives the reduced mortality. This represents a meaningful contribution to the overall goal of preventing suffering, saving lives, and creating a brighter future for families. As a downstream consequence of contraceptive availability, not only are lives saved but also a considerable amount of money in these resource-limited LMICs. A total of $2.75 billion in direct spending thus far is estimated to have been saved on health care, much-needed resources that can be reinvested in the overall health system. For more information on the methodology behind these calculations, and to find country-specific information, please visit the Country Procurement Impact Briefs here.

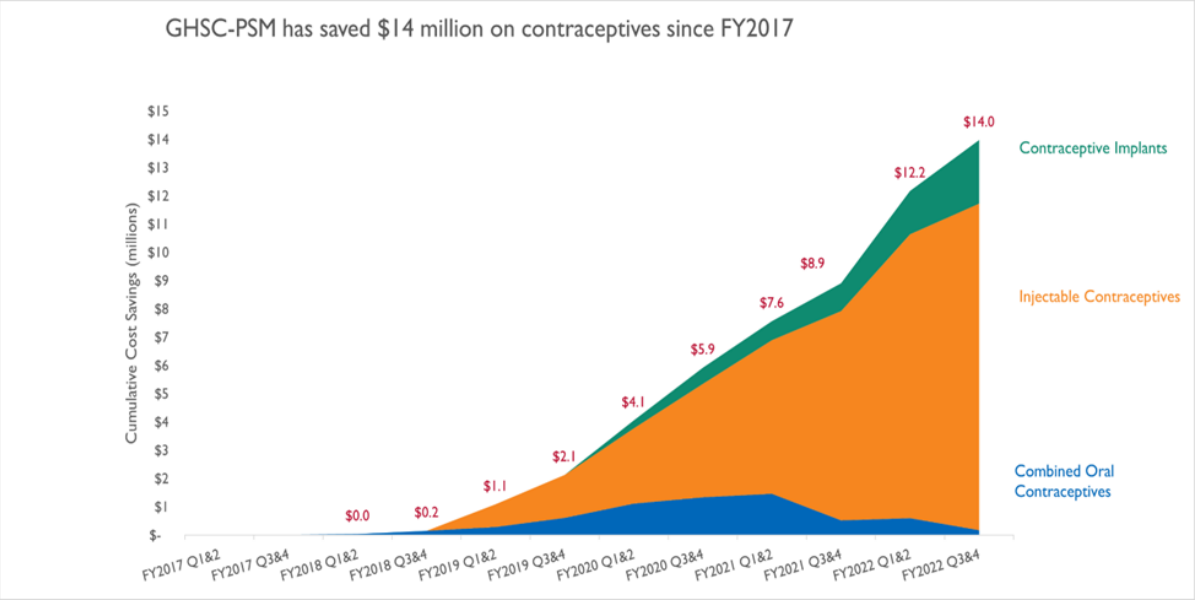
COST SAVINGS ON CONTRACEPTIVES

Commodity cost savings on core FP/RH products reached almost $14 million over the life of the project, including nearly $5 million in savings in FY 2022. This represents 8.8 percent of the total FY 2022 procurement value for these core commodities, and 5.7 percent of total procurement value for all family planning products over the life of the project. The greatest cost-saving drivers were injectable contraceptives, having accumulated $11.5 million in cost savings over the life of the project. Procurement of MPA-IM generics continues to yield savings over baseline prices.

Implantable contraceptives more than doubled their life of project cost savings in FY 2022, to a total of $2.2 million, from last year's $989,700. Two-rod implants reached their lowest average prices since the project began monitoring cost savings. Mozambique's procurement volumes for the generic two-rod product largely contributed to these savings, as well as a one-off discount from a supplier.

Despite the savings on these high-volume items, GHSC-PSM did see a steep price increase on combined oral contraceptives (COCs) with iron placebo, which reduced cost savings. The project began procuring non-iron placebo COCs in FY 2022 that has already generated about $294,000 in cost savings, primarily due to increased use of generic providers in the second half of the year. Both the iron and non-iron placebo combined oral contraceptives are tracked for project cost savings metrics.

Exhibit 15. Life-of-Project Savings on Contraceptives



Addressing FP/RH Priorities

In line with USAID's FP/RH priorities, GHSC-PSM continued to strengthen its global supply operations and to collaborate with countries in building self-reliant supply chains.

Securing reliable supply and maintaining high on-time performance

Despite ongoing global supply shortages of one-rod implants throughout FY 2022, GHSC-PSM continued to maximize its strategic sourcing strategy to reduce implantable supply risk and ensure access to a continuous and reliable supply of FP/RH commodities. The lingering effects of the pandemic and other global disruptions impacted logistics throughout FY 2022, including reduced global shipping capacity, difficulty in confirming bookings and moving cargo, a global container shortage, decreased availability of air freight capacity, and a shortage of drivers in specific geographic areas.

To mitigate these challenges, the project leveraged stock at the RDCs and regularly analyzed allocation of available stock to avoid stockouts.

Achieving OTD and OTIF

Timeliness of GHSC-PSM deliveries remained strong in Q4 for FP/RH commodities at 94 percent (94 percent COVID-impacted). OTIF numbers remained strong and consistent, at 98 percent for standard and 96 percent for COVID-impacted measures.

Exhibit 16. FP/RH Commodities, OTD

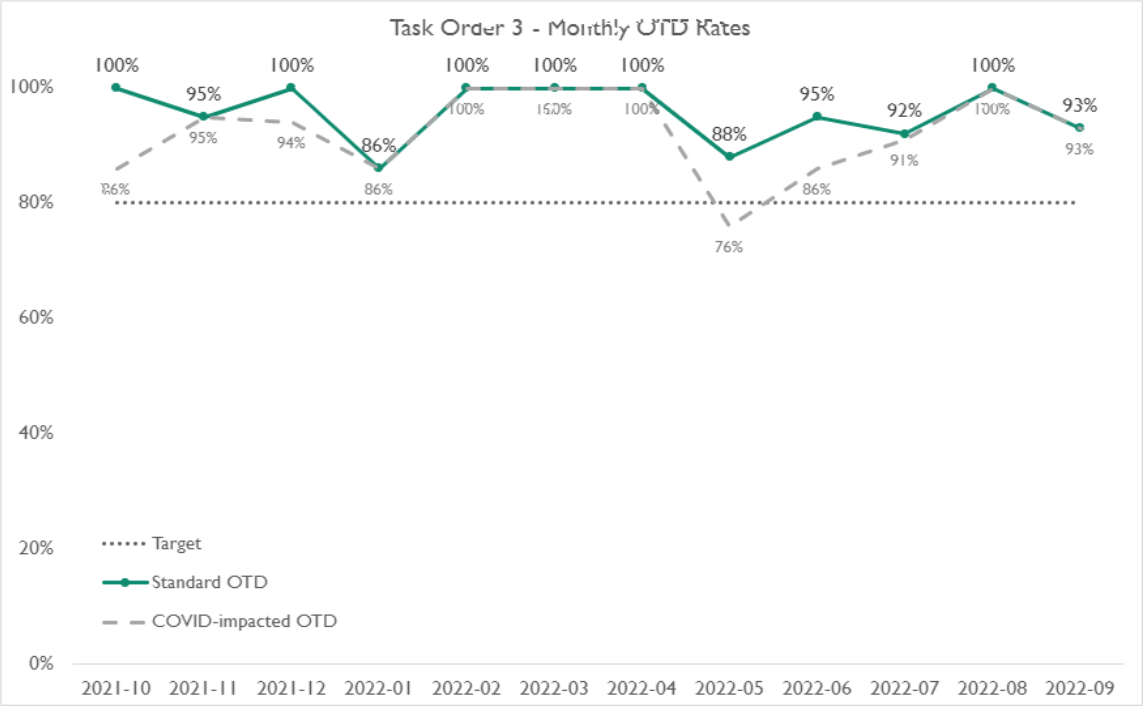
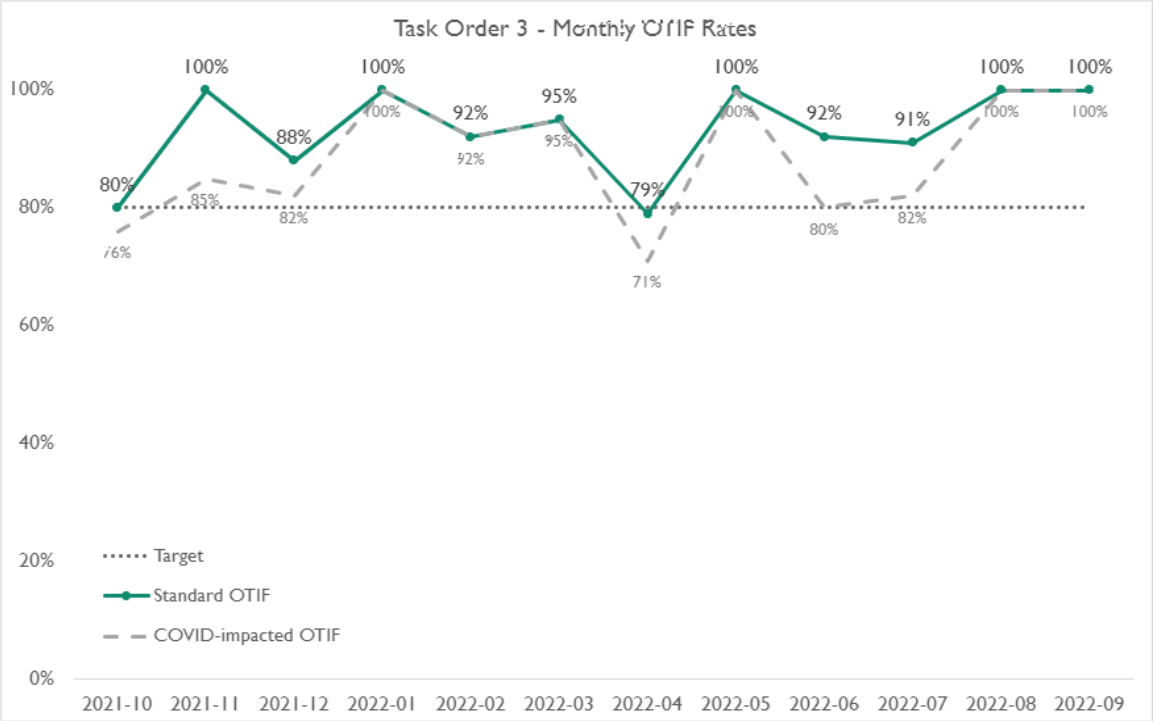


Exhibit 17. FP/RH Commodities, OTIF



Increasing accessibility of the hormonal IUD

In FY 2022, GHSC-PSM continued to actively participate in the Hormonal IUD Access Group and sub-working groups, including the Steering Committee, Partners Exchange, and Operations Group. In Q4, the project delivered its first hormonal IUD order to Rwanda.

Aligning injectable nomenclature

In FY 2022, GHSC-PSM coordinated with FP/RH stakeholders, including USAID, the VAN, and United Nations Population Fund (UNFPA), to align injectable product names/nomenclature with the following for consistency:

- Medroxyprogesterone Acetate 150 mg/mL, IM Injection (1 mL Vial) (MPA-IM)
- Medroxyprogesterone Acetate 104 mg/0.65 mL, SC Injection (Uniject Device) (MPA-SC)

This update more accurately describes the product and is expected to reduce confusion among stakeholders.

Reporting contraceptive and condom shipments

In Q3, GHSC-PSM published the FY 2021 Overview of Contraceptive and Condom Shipments that summarizes the FY 2021 delivered quantities and value of contraceptives and FP-funded condoms and compares these data with FY 2020 and FY 2019. It also presents 10-year trends from FY 2012 through FY 2021. For FY 2021, USAID provided 126 million contraceptive and FP-funded condoms worth $39 million to 21 countries in Africa, Asia, and Latin America and the Caribbean (LAC). Africa accounted for the largest share of delivered value at 83 percent. Injectable and implant contraceptives accounted for 71 percent of the total method choices with 99 percent of all implants shipped to Africa, continuing a recent trend of increasing shipments of implants to the region. Government programs received 67 percent of worldwide delivered value and social marketing organizations 33 percent.

Enabling use of standardized identifiers in USAID-supported catalog

In Q4, GHSC-PSM presented its evaluation of the as-is state for FP/RH product Global Trade Item Number (GTIN) allocation and recommendations to inform the future USAID-support catalog and tools. Recommendations included 1) decoupling concepts of planning, ordering, contracting, logistics, and reporting unit of measure; and 2) adding explicit guidance around unit-of-use GTIN allocation to the updated International Procurement Agency Technical Implementation Guide. The project recommended that implementation take place with NextGen implementer(s).

Updating the business case for local manufacturing in sub-Saharan Africa

In FY 2022, GHSC-PSM contracted with IQVIA to build on work conducted in FY 2021 and assess the demand for injectable contraceptives in FP2030 sub-Saharan Africa markets as well as South Africa. In Q4, IQVIA modified the model developed in FY 2021 to account for revised assumptions, including those related to demand, packaging costs, marketing and distribution costs, time for production and WHO prequalification, and construction and operating costs. In FY 2023, the updated model will be further enhanced and used to work towards the goal of realizing local manufacturing of hormonal contraceptives in sub-Saharan Africa.

Supporting social marketing engagement activities

In Q4, GHSC-PSM continued to monitor all aspects of social marketing activities related to demand, supply, product transitions, local and supplier regulatory requirements and branding, and oral contraceptive procurement and consumption trends. Supplier discussions remain critical for fostering social marketing activities and ensuring the acceptability of in-country overbranding as needed. Social marketing organization (SMO) engagement in Q4 also centered on communication and discussions with key SMOs on the oral contraceptive landscape around procurement, supply, and consumption trends. This involved data collection and analysis and ongoing key informant interviews for greater visibility.

To support the phasing out of ferrous fumarate-based placebo COCs from the USAID Catalog, GHSC-PSM has been working with SMOs to transition to non-ferrous fumarate-based placebo COCs. Project support to SMOs includes but is not limited to facilitating artwork updates and validation with various stakeholders, overseeing processes with suppliers to obtain marketing authorizations for overbranding approvals, and ensuring SMOs remain compliant with branding guidelines provided by USAID and suppliers. The successful introduction of the non- ferrous fumarate product among SMOs was a significant achievement in FY 2022, given that all supported SMOs approved of the change. GHSC-PSM maintained an adequate supply of the ferrous fumarate product to prevent stockouts during the transition. Also, despite stringent supplier regulations around overbranding, some suppliers were amenable to over branding their products by existing and new SMOs.

Leveraging global market intelligence to inform supply planning

In FY 2022, the project conducted outreach to country office forecasting and supply planning (FASP) teams to determine what market intelligence countries have access to, how they are using it, and what additional market intelligence data might be helpful to better inform supply planning processes. The project discovered that awareness of, and access to, market intelligence was not widespread.

Leveraging learnings from the outreach, GHSC-PSM updated the project's bi-monthly State of Supply messaging and coordinated with the VAN to share it with select VAN users. In Q4, the project conducted two webinars to increase awareness of and access to available reproductive health market intelligence tools among GHSC-PSM country office teams to inform country supply plans. In Q1 FY 2023, the project will host another webinar to raise further awareness of available reproductive health market intelligence tools among a broader audience.

Using progressive packaging

In FY 2022, GHSC-PSM analyzed potential cost, lead-time, environmental, and qualitative savings and benefits associated with implementing recommendations to optimize and "green" MPA-IM packaging. GHSC-PSM plans to implement these recommendations in Q1 FY 2023. Recommendations include: unbundling sharps container from MPA-IM bundle; eliminating logos, straps and plastic liners and Styrofoam from export cartons; and introducing a MPA-IM mini-bundle.,

Documenting FP/RH global supply chain best practices

In March 2022, GHSC-PSM facilitated a virtual brainstorming workshop with 23 stakeholders from USAID, GHSC-PSM, and GHSC-QA to inform a report documenting key FP/RH global supply chain best practices and associated successes, challenges, and lessons learned. GHSC-PSM initiated report writing in Q3 and plans to finalize the report in FY 2023.

Finalizing a new product catalog

USAID's FP/RH product portfolio has expanded in the last several years with the introduction of new products and generics. In FY 2022, GHSC-PSM finalized and disseminated a new product catalog to improve internal stakeholders' awareness of the USAID FP product portfolio with helpful information, including supplier profiles, volumetrics, logistics, and stock planning and warehousing information.

Safeguarding the quality of oral contraceptives

The Blue Lady logo is the single-most recognizable symbol of the oral contraceptive pills distributed by USAID. It is critical for the logo to be used appropriately to help maintain the integrity of the brand. In FY 2022, GHSC-PSM updated the Blue Lady logo guidelines for applying the logo to approved oral contraceptive supplier communications and product packaging.

Understanding the rationale for the declining demand in oral contraceptives

In FY 2022, GHSC-PSM coordinated with the SHOPS Plus project to understand the rationale for the declining demand for oral contraceptives among USAID supplied countries by conducting supply and demand analyses and deep-dive country analyses in Bangladesh, Ghana, Madagascar, Mali, Nigeria, Pakistan, and Zambia. GHSC-PSM will present the results of this analysis in FY 2023.

Analyzing supply chain mobile applications for community health workers (CHWs)

In Q4, GHSC-PSM concluded a landscape analysis of CHW mobile applications for supply chain management at the last mile. This analysis aims to support organizations that work with CHWs and their partners to identify appropriate mobile applications to capture and share community health supply chain data. The project will publish a technical brief and supporting analysis on the GHSC-PSM website in Q1 FY 2023.

Updating a landscape tracker for government and parastatal outsourcing

In Q4, GHSC-PSM built upon an existing logistics landscape tracker by aggregating information on where governments and parastatals are outsourcing supply chain services, either as the financier or contract holder. The tracker also details where the project is outsourcing warehousing and distribution services. As part of this activity, the project is collecting and validating data from 40 countries. Data collection and validation will conclude in Q2 FY 2023.

Collaboration with Global Stakeholders

GHSC-PSM builds global partners' awareness of and support for the USG's FP/RH priorities and programs and supports USAID's leadership in contraceptive security through the following activities.

Preparing for upcoming conferences

In Q4, GHSC-PSM prepared FP/RH presentations for three conferences that will take place in Q1 FY 2023:

- People that Deliver Global Indaba in Lusaka, Zambia: Two presentations on leadership change management and supply chain professionalization**.** This international forum has a dedicated focus on human resources for health supply chain management.
- The Global Health Supply Chain Summit in Dakar, Senegal: Presentation focused on the important role packaging can play in driving supply chain efficiencies, enhancing commodity security, and reducing environmental waste.
- International Conference on Family Planning in Pattaya City, Thailand: GHSC-PSM will make six presentations on topics such as Contraceptive Security Indicators, innovations in contraceptive packaging, digital health, the Drugs Out of Range stock alert tool, and local manufacturing in sub-Saharan Africa.

For more information, see section C3: Global Collaborations.

Leading the Reproductive Health Supplies Coalition (RHSC) Systems Strengthening Working Group (SSWG)

GHSC-PSM led the RHSC SSWG in FY 2022 following the Chair selection of the project's Senior Forecasting and Supply Planning Advisor in Q1. In Q4, GHSC-PSM led a webinar on "Recovery Strategies for Public Health Supply Chains Post-Black Swan Event" for the RHSC SSWG. The presentation focused on supply chain disruptions and the importance of using scenario mapping to make informed decisions as part of the recovery planning process.

Recognizing International Family Planning Days

GHSC-PSM recognized several key FP international days throughout FY 2022. In Q4, the project showcased World Contraception Day by publishing a video in coordination with the Haiti country office. Posted on LinkedIn and Twitter, the video highlighted the potential impact of contraceptives delivered by GHSC-PSM despite challenges such as poor infrastructure, social unrest, and natural disasters. Featured were the GHSC-PSM Haiti country director, a nurse, and a patient during an FP counseling session at a health facility.

Tracking contraceptive security

In Q4, GHSC-PSM formally launched its dissemination of the 2021 Contraceptive Security (CS) Indicators survey results through an updated online dashboard, dataset, and report. The project announced the launch on Twitter and LinkedIn and through email messaging to various audiences, including GHSC-PSM country offices, USAID Missions, Ministries of Health, and partner organizations. GHSC-PSM presented the results to the USAID Commodity Security and Logistics division through the Topical Tuesday forum and to the West African Health Organization at a workshop on contraceptive financing with support from the USAID Global Health Supply Chain-Technical Assistance Francophone Task Order (GHSC-TA FTO).

In FY 2022, GHSC-PSM conducted a research initiative to assess the policy drivers of modern contraceptive prevalence (mCPR) and private-sector method mix strategy (the number of FP methods offered in the private sector) using 12 years of data from the CS Indicators survey, covering 59 countries. The study identified 11 drivers from governance, financial, and supply chain policies, the most notable of which is an increasing share of spending on contraceptives by national governments. These drivers were further analyzed by segmenting countries into Gross National Income categories, highlighting differences in the policies found to predict increasing mCPR and method mix strategy by income group. GHSC-PSM will submit this research for publication in a peer-reviewed journal in FY 2023.

Enhancing visibility of FP supply data

GHSC-PSM serves as a key contributor in supporting the strategic development and scale-up of the VAN platform and processes. The VAN is the RH community's pioneering initiative to increase supply chain visibility and improve stakeholder collaboration. In Q4, GHSC-PSM focused on enabling the project to realize the benefits of the tool by supporting and onboarding users; validating new features, processes, and integrating data with the VAN; and ensuring VAN engagement and VAN-specific tasks and work streams in country office FY 2023 work plans. Project activities included:

- Managed the ARTMIS-VAN data integration, focusing on maintaining data quality and adding new product stock-keeping units and hierarchies. Conducted regular integration reviews and data quality process checks to ensure timely updates to the VAN while GHSC-PSM performed root-cause analysis and implemented change requests.

- Worked with Burundi, Liberia, and Rwanda in-country stakeholders to convey the benefits of upgrading their VAN membership from a basic to premium subscription. The latter provides greater visibility into inbound shipment data, supply planning and forecasting features, data quality and action ticketing, and country-specific support from VAN Control Tower analysts.

GHSC-PSM included funding for country upgrades to premium membership in these countries' FY 2023 work plans. GHSC-PSM country offices will work with in-country stakeholders over the course of FY 2023 to determine if there is a domestic sustainable funding source for continuing their premium membership beyond the first trial year.

- Worked with Ghana and Nigeria, existing VAN premium members, to include country-funding for their memberships in their FY 2023 work plans.

- Worked with the 16 GHSC-PSM countries that hold basic VAN memberships to institutionalize and codify the use of the platform into their FY 2023 work plans. This included hosting a joint GHSC-PSM-RHSC advocacy session with project country directors to familiarize them with the platform and ensure the inclusion of a VAN-specific end-to-end visibility activity into their work plans. Countries with representatives in attendance include Niger, Zambia, Nepal, Kenya, Haiti, Angola, DRC, Mozambique, and Zimbabwe.

- In collaboration with RHSC, GHSC-PSM developed current-state process maps, hosted cross-organizational brainstorming sessions, and identified recommendations for long-term process improvements to harmonize the country supply planning process between QAT and VAN.

- Participated in the VAN Steering Committee (GHSC-PSM is a non-voting member) and provided input on GHSC-PSM use cases for large VAN planned features, including shipment notice visibility through iNTTRA, and a demand sensing module.

- Participated in regular VAN working groups, including the following task forces: Data Management, Technical Management, Data Sharing, Systems Strengthening, and Super User and Analytics.

Country Support

Last-mile Digitization: Electronic Client Record in Sindh

GHSC-PSM provided technical assistance to **Pakistan**'s Population Welfare Department (PWD) in introducing an electronic client record (ECR), a web and android-based application, to improve last-mile client-level FP data visibility.

The digitization of FP client registers in the form of ECR, as part of the computerized logistics management information system (cLMIS), resulted from consultations between the PWD and GHSC-PSM technical teams. For effective implementation of ECR, GHSC-PSM trained 39 PWD staff

(eight men and 31 women) in Q4 at PWD, Sindh. The ECR module covers indicators of FP (method used, counseling, follow-up, and referrals), general health services, and long-acting reversible contraceptives (LARC) removal. The service data is automatically aggregated in cLMIS reports and analytics. This is the first initiative in the domain of FP services across Pakistan after the COVID-19 management information system.

ECR will help track FP compliance, determine contraceptives' continuation and discontinuation rates and reasons, and monitor FP services and commodity security. This will lead to high-level transparency and validity for improved commodity availability for married women of reproductive age, which will contribute to achieving FP 2030 goals.

Reproductive Health Commodity Distribution

GHSC-PSM works with the **Malawi** Ministry of Health (MOH) in coordinating the FP quantification review, commodity procurement, distribution planning, monthly stock status preparation, and development of supply plans for all FP commodities. In Q4, GHSC-PSM delivered more than $750,000 worth of FP commodities to health facilities across the country, including 346,766 COC, 600,660 vials of MPA-SC, 41,654 emergency contraceptives, 77,431 female condoms, and 3,568 IUDs. This support is expected to improve FP commodity availability in health facilities.

FP Commodity Tracking Exercise

Through the MOH, the government of **Malawi** reported persistent stockouts of FP commodities despite full fiscal year funding commitments for all 11 FP commodities in the country since 2018. Poor data quality, underreporting, and missing data from health facilities exacerbated these stockouts.

On behalf of USAID, GHSC-PSM provided technical and financial assistance to the MOH to roll out an FP tracking tool and conducted FP commodity tracking exercises targeting 200 under-performing facilities in 28 districts in Malawi. The tool captured data and tracked commodity movements at all levels to identify the areas contributing to stockouts. Analysis of this data aims to trigger immediate and long-term commodity security interventions as part of ongoing efforts to improve FP commodity data visibility and availability at each level of health care in Malawi.

GHSC-PSM and USAID implementing partners collaborate to avail FP products to the community

USAID, through its implementing partners, works directly with community health associations (ASACOs) to make FP products available in remote regions of **Mali**, including Bamako, Kayes, Koulikoro, Mopti, Ségou, and Sikasso. As part of this effort, GHSC-PSM estimated six-month needs for each community health center (CSCOM) and developed distribution plans for FP commodities to the targeted regions.

For Mopti, Ségou, and Sikasso regions, GHSC-PSM subcontracted a 3PL transport company to carry contraceptives from the central warehouse to the designated warehouse in each district, where the USAID-funded Health System Strengthening (HSS) project is operational. GHSC-PSM and the HSS project coordinated with the ASACOs to conduct last-mile delivery to 573 CSCOMs.

For the Kayes region, GHSC-PSM delivered the commodities to the USAID-funded Momentum Private Healthcare Delivery project, which distributed them to 10 CSCOMs.

For Bamako and Koulikoro regions, GHSC-PSM subcontracted with a local nongovernmental organization, JIGI, to distribute contraceptives to the districts in Koulikoro and the community health centers in Bamako. In the Koulikoro region, GHSC-PSM and JIGI coordinated with the ASACOs to conduct last-mile delivery to the CSCOMs.

GHSC-PSM implemented the Distribution Transportation Tool, which enables supply chain managers to monitor transportation and delivery through various routes. Overall, in Q4 the project, through the 3PLs, distributed 1,285 boxes of contraceptives to 850 CSCOMs in six regions of the country.

B4. Maternal, Newborn, and Child Health

14 countries received MNCH health supply chain strengthening support in FY 2022.

Four countries procured MNCH medicines and commodities in FY 2022. Since its beginning, the project has procured a total of **$24.92 million in MNCH commodities, including $146 thousand in Q4.**

Refactored five data tools in four countries (Burkina Faso, Liberia, Nepal and Zambia) in FY 2022, increasing the tools' usability across country contexts, and improving the countries' ability to plan for and track MNCH supply chain issues.

Coordinated a series of **technical working group sessions with global partners**–including WHO, United Nations Children's Fund (UNICEF), USAID, CHAI, Promoting the Quality of Medicines Plus (PQM+), and Medicines, Technologies and Pharmaceutical Services (MTaPS)–to improve standards of care for small and sick newborns.

GHSC-PSM supports USAID's efforts to prevent child and maternal deaths by increasing access to quality-assured medicines and supplies under the MCH task order. The project provides global technical leadership on MNCH commodities and ensures that supply chain management considerations are included in global dialogue and initiatives.

This section of the GHSC-PSM report summarizes achievements under the MCH task order objectives in FY 2022, including those of the core work contributing to the global dialogue on priority MNCH issues, and the performance of the project's global supply chain and country offices. The MCH task order objectives are as follows:

- **Objective 1. Provide international MNCH supply chain leadership and guidance**: GHSC-PSM contributes to the global MNCH commodity and supply chain knowledge base,

engages with technical coordination bodies, and promotes international MNCH and supply chain best practices.

- **Objective 2. Support data-informed health supply chain decision making for MNCH commodities**: The project implements and trains staff to use MNCH data collection and analysis tools; advocates for data system investments; and works with countries to demonstrate the value of timely and accurate data for commodity management.

- **Objective 3. Improve adherence to globally recognized best practices in MNCH commodity management**: The project develops procurement, storage, and distribution resources and partners with national governments to implement MNCH commodity management best practices.

- **Objective 4. Enhance in-country MNCH supply chain coordination and collaboration**: GHSC-PSM guides national governments as they lead and institutionalize coordination among sub-national partners, programs, and donors involved in MNCH service delivery and commodity selection and management.

- **Objective 5. Conduct ad hoc strategic procurement and delivery to increase availability of quality-assured MNCH commodities** in project-supported countries.

REFLECTIONS ON FY 2022

One major goal for GHSC-PSM's MCH task order in FY 2022 was to increase availability and appropriate use of MNCH commodities by sharing information and tools for countries and their partners. This included a focus on quality amoxicillin and gentamicin—common, affordable, antibiotics that should be available at all levels of a health supply chain. On behalf of USAID and UNICEF, GHSC-PSM established a working group with sister supply chain projects, MTaPS and PQM+, to discuss barriers to making these commodities available and generate a call to action. In FY 2023, the working group will publish a call-to-action paper with priority recommendations.

Also, the project updated one of its most widely downloaded resources, the MNCH Procurement Manual. The manual provides useful technical information on priority MNCH products. The updated version now includes specifications on antihypertensives for pregnant women and tranexamic acid for management of postpartum hemorrhage (PPH).

Also in FY 2022, GHSC-PSM documented its most important resources and lessons learned from its work on increasing availability, and addressing barriers to access, of quality PPH commodities. PPH is the

leading cause of maternal mortality. This PPH white paper shares global learnings from years of work across many country contexts and dives into case studies that demonstrate how specific countries have managed enabling environments and different supply chain structures to improve availability of PPH commodities and save mothers' lives.

Another focus for the MCH task order this year was pharmaceutical wholesalers—they are central in health supply chains, and are particularly crucial for MNCH commodities, often relied upon to supply countries' essential medicines. In many countries, commercial pharmaceutical associations exist to address challenges and partner with governments to operate as proactive, solution-oriented, standard-setting organizations. In FY 2022, GHSC-PSM partnered with the International Federation of Pharmaceutical Wholesalers to provide technical assistance to the national wholesaler association in Zambia. The project worked to improve its organizational capacity, enhance leadership skills, and provide planning tools, helping to strengthen the association and further its goal of improving commodity availability.

The MCH task order also continued its work from FY 2021 to catalog over 35 data analytics tools used by country offices to analyze a range of supply chain data and solve complex challenges. These tools are developed to complement existing systems (i.e., LMIS, DHIS) and by putting them all in one place, countries can easily reference what might work well for their needs. The catalog describes each tool, the platform it uses, the data it requires to function, and a point of contact for the tool. This year the MCH task order worked with the project's data analytics experts to share and adapt these tools for other countries. For example, the project refactored the Consumption Anomalies tool, used in Zambia to identify inaccurate and incomplete logistics data. Refactoring aims to generalize the software code associated with the tool, making it more robust, enabling it to function beyond the original scope, and allowing it to be shared, reused, and integrated with different data systems. With MCH and systems strengthening support, the tool is now being introduced in Guinea and Liberia.

Another resource the MCH task order supported this year is the revised guidance for reproductive, maternal, newborn, and child health (RMNCH) commodity forecasting. In FY 2022, the project validated the guidance by putting it to use in several of its country offices. Once the resource was validated and published, GHSC-PSM teams (including GHSC-PSM in Nigeria and Pakistan) presented on the guidance in global fora—such as the Child Health Task Force and Maternal Health Supplies Caucus. These presentations are disseminating the guidance and reinforcing the real-world uses for it, as evidenced by project country teams.

The MCH task order had a renewed focus on supporting newborn health this year, and began coordinating and providing logistical support to the newborn technical working group (TWG) to review

and determine key deliverables to improve care for small and sick newborns. Among other stakeholders, the TWG brings together WHO, UNICEF, and USAID to work in this space. In FY 2022, GHSC-PSM helped review the TWG's guiding framework and enlist over 40 global experts in neonatology from all continents to advise on essential and desirable medicines and devices/consumables for the care of sick and small newborns.

Finally, while the GHSC-PSM TO4 team does not procure significant quantities of commodities, the task order did support select procurements. In FY 2022, GHSC-PSM procured and delivered essential medicines to DRC and equipment for newborns in Rwanda. The project also completed Zika commodity procurements.

GHSC-PSM will continue toward its objectives to improve MNCH outcomes through innovative supply chain solutions in FY 2023. **More details on the project's MNCH achievements from FY 2022 are provided below.**

International MNCH Supply Chain Leadership and Guidance

Developing new commodity chapters for the MNCH procurement and supply manual

In 2019, GHSC-PSM published the Manual for Procurement and Supply of Quality Assured Maternal, Newborn and Child Health Commodities for procurement agencies and specialists as they establish quality assurance systems for procuring MNCH products. The manual included useful technical information on a subset of priority MNCH products, such as key considerations for procurement and product specifications. In FY 2022, GHSC-PSM reviewed and updated existing commodity chapters and developed new commodity chapters for products that were not included in the original guidance, including select antihypertensives and tranexamic acid (TXA). The updated manual is now available on the project website and will be disseminated throughout FY 2023.

Developing the MNCH Commodity Tool for accelerating new and underutilized commodities

In FY 2022, GHSC-PSM began developing the MNCH Commodity Tool, a resource that will help countries establish systems and processes for accelerating use of new and underutilized MNCH commodities and commodity formulations. The tool will capture the expertise acquired by GHSC-PSM's MCH task order while working with governments to update and tailor their national MNCH management strategies and corresponding supply chain operations. The tool will assist national stakeholders with decision making and process improvements for MNCH commodity management to increase availability of affordable, quality-assured MNCH commodities at service delivery points. In Q4, GHSC-PSM completed a literature review to identify and incorporate existing, evidence-based guidance on accelerating availability of MNCH commodities and developed an outline for the tool. The project

will complete tool development and validate the resource in two project-supported countries in Q1 FY 2023.

Developing the Postpartum Hemorrhage White Paper

In FY 2022, GHSC-PSM completed a white paper documenting its collective resources and lessons learned from its work as a technical leader in addressing barriers to accessing quality PPH commodities. The paper shares global learnings, resources, and updates on recommended commodities for managing PPH. It also dives into specific country approaches that demonstrate solutions and cite potential roadblocks as governments and partners navigate enabling environments and different supply chain structures to improve availability of PPH commodities. For example, Liberia has had success with integrating oxytocin into the Expanded Program on Immunization (EPI) cold chain to capitalize on existing cold chain logistics and keep this PPH drug sufficiently cold so it is safe to use. The paper explains the advocacy and policy work needed to reach this stage and reflects on how EPI integration in Liberia can be improved upon and sustained. The white paper also provides easy access to all of the resources GHSC-PSM has developed in its years of working to improve PPH commodity quality, availability, and management. To learn more and to read the paper, visit the GHSC-PSM website. The paper will be disseminated widely throughout FY 2023.

Co-hosting global technical discussions with MTaPS and PQM+ to improve the availability of commodities to treat childhood pneumonia and possible serious bacterial infection (PSBI)

Of the infectious diseases that contribute to child mortality, pneumonia and PSBI rank among the highest. Amoxicillin became the recommended treatment for pneumonia in children under 5 years in 2014. In 2015, gentamicin injection, together with amoxicillin, was recommended by WHO to treat newborns with PSBI. This combination is recommended for lower-level facilities when newborns cannot readily go to a higher-level facility such as a hospital (where other antibiotics would be more readily available). Despite progress since these announcements, access to and appropriate use of pediatric amoxicillin (dispersible tablets and suspension) and gentamicin injection remain a challenge.

In FY 2022, GHSC-PSM, MTaPS, PQM+, and other collaborators conducted research on select barriers and interventions for availing these commodities, specifically in the areas of quantification, finance, appropriate use, and quality. GHSC-PSM presented the information during three sessions hosted by the Child Health Task Force (CHTF). Each session was attended by 60–80 individuals from a range of countries, all with high rates of pneumonia. Participants were engaged in breakout sessions to validate and prioritize proposed interventions. Following the sessions, GHSC-PSM and other USAID supply chain projects began developing a call to action paper to summarize recommendations to overcome barriers, and to communicate solutions tailored to certain audiences—especially governments, multilateral

organizations, and donors—to encourage specific actions for availing these commodities. The paper will be completed and disseminated in FY 2023, and GHSC-PSM will partner with MTaPS and PQM+ to implement select recommendations in priority countries.

Supporting the Every Newborn Action Plan (ENAP) Technical Working Groups

In Q4 FY 2022, GHSC-PSM coordinated the efforts of WHO, UNICEF, and USAID and over 30 experts from all continents to improve the quality of care for newborns. The group set out to 1) develop global guidance around selection, classification, and prioritization of newborn priority medicines; 2) develop a list of essential versus desirable medicines for newborn care; and 3) assess availability and quality of, and identify gaps in, global guidance (i.e., technical briefs, best practices, country lessons learned) to improve newborn care. GHSC-PSM will continue to coordinate logistics, including for two upcoming TWG subgroups meetings focused on medicines, medical devices, and consumables, and is supporting the ENAP through discrete activities in the countries it supports.

Assessing medical devices and consumables for small and sick newborns in Ghana. In Q4, GHSC-PSM designed a comprehensive assessment of newborn medical devices, commodities, and providers' capacity to use these supplies in Ghana. The assessment includes a sub-focus: a situational analysis of 1) the prevalence of improvised bubble continuous positive airway pressure (CPAP), 2) 100 percent oxygen use, and 3) pulse oximetry monitoring use in district health centers. The analysis is designed to:

- Determine data gaps regarding the availability of resuscitation devices for the care of small and sick newborns (SSNs)
- Investigate health staff capacity to manage and maintain devices critical to ensuring adequate care for SSNs
- Evaluate maintenance protocols for medical devices used for newborn care
- Assess the oxygen ecosystem for SSNs at health facilities

The preliminary report for the assessment is expected in early Q3 FY 2023, and results are expected to be presented at the International Maternal Newborn Health Conference in South Africa.

Support for Data-informed Health Supply Chain Decision Making for MNCH commodities

Rolling out the forecasting module of the QAT

GHSC-PSM's QAT leverages new technologies—building on and replacing the previous FASP tools PipeLine and Quantimed—to support countries as they forecast and supply plan for their health programs. In FY 2020–2021, GHSC-PSM developed the QAT supply planning module and rolled it out to

28 countries. In FY 2022, the project completed and launched the QAT forecasting module. This module uses commonly collected health supply chain data such as morbidity, demographics, services, and historical consumption. Critically, the project worked this year to integrate the recently updated RMNCH Quantification Supplement (which GHSC-PSM consulted on and validated in several countries) into QAT so that users can use the latest guidelines for forecasting and supply planning for RMNCH commodities.

Conducting end-use verification surveys in project-supported countries

MNCH data and analytics within national LMISs are not always adequate to identify and resolve supply chain issues. GHSC-PSM uses the end-use verification (EUV) survey to increase the availability of MNCH commodity data. The survey helps supply chain staff collect data on commodity availability, storage conditions, and factors that affect commodity availability at service delivery points. EUV data collection is also an opportunity for GHSC-PSM country teams to provide on-site capacity building for service delivery point staff and MOHs, gather supplemental qualitative data on reasons for stockouts, and cross-check LMIS data accuracy on stock availability trends.

The table below depicts countries that collected EUV data and submitted EUV reports to USAID/Washington and in-country stakeholders in Q4 and throughout FY 2022.

Countries that collected EUV data in FY 2022	Benin[+], Burkina Faso, DRC [+], Ethiopia, Ghana**, Guinea**, Liberia, Mali, Nigeria**, and Zambia**
Countries that submitted EUV reports in FY 2022*	Benin[+], Burkina Faso**, Ethiopia, Ghana, Guinea**, Liberia**, Mali, Nigeria, and Zambia

[+]EUV survey support in Benin and DRC is facilitated by GHSC-PSM's partner project, GHSC-Technical Assistance Francophone Task Order
**Not all reports have been formally approved by USAID/Washington*
***Conducted in Q4*

Results from recent EUV in Guinea. As noted above, GHSC-PSM worked with the Guinea MOH to conduct EUV data collection in Q4. The survey found that, while stockouts were persistent for several key commodities, the stockout rates for both iron and folic acid tablets and magnesium sulfate ampoules decreased by 5 percent (from 23 percent to 18 percent) and by 29 percent (94 percent to 65 percent), respectively, after GHSC-PSM provided targeted support to health facilities following the previous EUV report. A spike in oxytocin stockouts was also reported in this report, which the project determined

was related to low availability at regional depots and the expiration of large quantities of oxytocin. In FY 2023, the project in Guinea will help the MOH's MNCH program to develop and analyze stock orders to reduce stockout rates. GHSC-PSM will also support the MOH and its partners in increasing adherence to proper oxytocin storage.

Results from recent EUV in Mali. Mali's most recent EUV revealed that health facilities do not have a dedicated cold chain for the conservation of oxytocin, a critical PPH commodity that must be kept cold. Most facilities surveyed stored oxytocin in the EPI cold chain (reserved for vaccines). Through the EUV, GHSC-PSM tracked to what extent oxytocin was integrated into the EPI cold chain, provided feedback on oxytocin storage conditions, and evaluated functionality and continuous maintenance of cold chain equipment at all levels of Mali's supply chain. The EUV also allowed data collectors to take inventory of small cold chain equipment (e.g., thermometers and refrigerators) at the regional, district, and health facility levels. Key findings include the following:

- The majority (87 percent) of health facilities with a cold chain monitor temperature daily. This rate has increased by 17 percent compared to the past EUV (70 percent).
- Cold chain temperature monitoring is slightly more common in district warehouses than in regional Pharmacies Populaire du Mali (61 percent compared to 60 percent).
- At some centers, small temperature measuring equipment (e.g., thermometers) is often in poor condition or unavailable.

With EUV data at hand, GHSC-PSM has recommended corrective measures to address Mali's cold chain challenges and will work with the MOH to address them.

Improving data analytics and information systems for MNCH commodity decision making
eLMIS platforms aggregate and help stakeholders analyze an array of national supply chain information. In FY 2020, GHSC-PSM conducted a data use survey in 15 countries, which indicated that countries often face the time-consuming challenge of manually entering, consolidating, and analyzing logistics data. In response to these countries' needs and desire to scale up use of data for MNCH commodity management, GHSC-PSM developed a catalog of robust analytics tools in FY 2021 that project-supported countries use to inform MNCH commodity management decisions. The catalog describes each tool, the platform it uses, the data it requires to function, and a point of contact for the tool. The catalog is meant to be particularly helpful to countries with nascent eLMISs, providing a blueprint of analytics tools that already exist to support key supply chain decisions.

Refactoring (making the code more easily applicable to multiple countries) analytics tools.
In FY 2022, GHSC-PSM assessed the countries it supports to determine which could benefit most from tested analytics tools that increase visibility throughout the supply chain. The project implemented two

MNCH Data Catalog tools, the **QA tool** and **consumption data anomalies tool,** in Zambia and were either being considered for scale-up or in the process of implementation in Liberia and Zimbabwe by the end of Q4.

In Q4, GHSC-PSM refactored tools for use in **Burkina Faso**, where the team is facing challenges collecting and analyzing supply chain data from the facility, district, and regional levels. The project refactored a **data capture tool** incorporating all health facilities in the country, classified by regions and districts. The Excel-based tool easily generates analyses and dashboards for visualization and identification of potential data issues or stockouts. A user guide was developed and translated into French with input from MOH partners, and the project is recording training videos for implementing the tool. This tool could significantly reduce the level of effort for manual input of stock data in Burkina Faso; it supports data-driven decision making for improved supply chain performance and stockout reduction.

GHSC-PSM also refactored two tools for use in **Liberia**; the first tool allows supply chain actors to efficiently obtain data extracts with minimal manual effort and time. It is a Python-based solution that allows users to specify criteria for data extracts from eLMIS, such as timeframe, products, health area, and geographic area.

The second is the aforementioned **consumption data anomalies tool,** which provides analyses to inform data-driven decisions regarding leakages throughout the supply chain as well as identify health facilities in need of urgent supplies. In the second phase of the activity to take place over the course of FY 2023, GHSC-PSM aims to include all health facilities in the tool to enable greater visibility into the management of commodities from service delivery points to the central level of the country.

Enhanced In-country MNCH Supply Chain Coordination and Collaboration

Supporting the management of antihypertensives in Ghana

In Q4, GHSC-PSM worked closely with the Ghana Health Service (GHS) to assess the availability of anti-hypertension commodities in Ghana's public sector. A previous study had revealed challenges around hypertensive disorders of pregnancy (HDP), a condition that includes pre-eclampsia, eclampsia, gestational hypertension, and chronic hypertension. Surveyors collected data in 85 health facilities at all three levels of the health system in five regions. Data analysis had begun, with extensive input and guidance from GHSC-PSM, by the end of Q4. The final report is expected by mid-November 2022. Findings and recommendations will be shared with stakeholders to improve availability and management of antihypertensives and ensure that they are properly incorporated into national policies. Results from the study will help inform other countries' work, especially by establishing a methodology to assess

antihypertensives and provide solutions for improving maternal health through effective supply chains for HDP commodities.

Improved Adherence to Globally Recognized Best Practices in MNCH Commodity Management

Providing systems strengthening technical assistance

GHSC-PSM is providing MNCH systems strengthening support to increase access to quality-assured MNCH commodities to 14 countries[26] in FY 2022. Specific country achievements are described below.

Improving access to essential medicines at Nigeria's last mile. Access to quality-assured medicines in primary healthcare settings is critical in Nigeria. In Bauchi and Sokoto State governments, GHSC-PSM builds the capacity of the In-State Team (IST) which runs the Drug Revolving Fund (DRF) Committee and helps ensure this access. In Q4, the project trained 78 IST members (40 in Bauchi, 38 in Sokoto) and 48 (24 in Bauchi, 24 in Sokoto) Essential Drug Officers (EDO) for the first time to manage and operate the DRF scheme. As a result, Bauchi's IST and EDOs retrieved logistics and financial data (March - June 2022) from 291 (83 percent) of the 346 target health facilities. Additionally, NGN 2,232,039 ($5,221) was collected from these facilities as the 2 percent markup for monitoring and evaluation and deposited in the state DRF account, while approximately NGN 2 million ($4,678) was received as program sustenance from July - September 2022.

Similarly, the IST and EDOs reached 107 (90 percent) health facilities in Sokoto, retrieving logistics and financial data collected between March and July 2022. The total procurement and sales for July was NGN 20,497,915 ($47,948), portions of which will go to monitoring and evaluation and program sustenance.

With the IST in place and EDOs fully operational in the states and local government agencies, there will be continuous monitoring, mentoring, coaching and evaluation of the DRF across all levels. This will promote transparency, accountability of the DRF medicines and financial system, local ownership, and the scheme's long-term viability.

Disseminating MNCH private sector assessment findings in Ghana. In FY 2022, GHSC-PSM and GHS conducted an assessment to determine how MNCH commodities are managed within the private sector given that a significant proportion of users seek care in pharmacies and private health facilities. Following the study, the findings were disseminated to key stakeholders to inform advocacy and

[26] GHSC-PSM provided MNCH technical assistance to 14 countries in FY 2022: AFRICA: Burkina Faso, Ethiopia, Ghana, Guinea, Liberia, Malawi, Mali, Mozambique, Nepal, Nigeria, Pakistan, Rwanda, and Zambia; CARIBBEAN: Haiti

action for improved management and access to MNCH commodities in Ghana's private sector. GHSC-PSM disseminated the findings to pharmacists in the private and public sectors during the 2022 Annual General Meeting of the Pharmaceutical Society of Ghana.

Key recommendations included:

- Create a cost incentive to encourage the private sector to offer critical MNCH commodities including amoxicillin dispersible tablets, oral rehydration salts+Zinc co-pack, chlorhexidine gel and injectable products.
- Review and update policies (national essential medicines list, standard treatment guidelines, and National Health Insurance Scheme (NHIS) Price List) that guide stocking decisions and health product administration to include all United Nations Commission on Life-Saving Commodities for Women and Children commodities deemed critical for effective MNCH management. Extensively disseminate these policies to public and private sectors.
- Incrementally introduce pooled procurement mechanisms based on centralized forecasting to improve demand planning and supply of MNCH commodities in the private sector.

GHSC-PSM is working with GHS, the Community Practice Pharmacist Association, NHIS, and other stakeholders to implement these recommendations. This initiative will ensure improved availability of high-quality and affordable MNCH commodities in the private sector.

Providing GIS mapping training for investigators and their supervisors to improve data quality in Mali. GHSC-PSM has been working with Mali's Directorate of Pharmacy and Medicine (DPM) to implement the country's Master Plan for the Supply and Distribution of Essential Drugs and Other Health Products (SDADME-PS). As part of the Master Plan, geographic information system (GIS) data are collected in the Kayes and Koulikoro regions to map pharmaceutical locations, road networks, and other accessibility parameters (ponds, bridges, rivers, security situation, etc.), all of which affect the supply chain's ability to deliver pharmaceutical products—including MNCH supplies. GIS data collectors and survey supervisors require specialized training to collect quality data for this mapping. With MNCH funds, GHSC-PSM and DPM conducted a two-day data collection training in Bamako in Q4. Of the 20 total district medical officers (MCDs, 19 were trained (one MCD sent a delegate) on survey supervision and 40 investigators were trained on data collection. During the training, participants selected the sites to visit and defined the axes of travel for the collection. DPM and GHSC-PSM trainers strengthened the skills of investigators and supervisors in using 1) the KoBo data collection tool and questionnaire, 2) trackers for collecting GPS data and tracing routes, and 3) the distance-measuring device for calculating the area and volume of the drug stores and other facilities. Trainees began data collectio n in September 2022.

Ad Hoc Strategic Procurement to Increase Availability of Quality-assured MNCH Commodities

Over the course of FY 2022, GHSC-PSM supported four countries[27] in procuring priority MNCH products. GHSC-PSM supported the procurement of equipment for small and sick newborns, including neonatal incubators and CPAP machines in Rwanda and consumables to support the DRF in Nigeria. Also, GHSC-PSM delivered a large procurement of essential medicines in DRC and began a new order for more lifesaving essential medicines, including magnesium sulfate, oxytocin, and amoxicillin.

Zika. GHSC-PSM delivered 41,256 canisters of VectoBac WG Biological Larvicide-Water Dispersible Granules to four countries: Dominican Republic, Haiti, Honduras, and Jamaica in FY 2022. Bef ore delivery to the respective countries, the project coordinated supplier-led training, held in English and Spanish, for staff at these countries' Ministries of Health and their USAID counterparts.

[27] GHSC-PSM procured MNCH commodities for four countries in FY 2022: DRC, Nigeria, Rwanda, and Zambia.

SECTION C

PROGRESS BY OBJECTIVE

C1. Global Commodity Procurement and Logistics

Procured $95.65 million in health commodities in Q4 and **$715.78 million** in FY 2022. Total values for the life of the project are over **$4.64 billion**.

Delivered 1,373 line-item orders in Q4, with a value of **$143 million**.

Delivered 87 percent (81 percent COVID-impacted) of line items on time, based on the defined on-time window (within the period 14 days before or seven days after the agreed delivery date). **Delivered 90 percent (79 percent COVID-impacted) on-time and in-full.**

REFLECTIONS ON FY 2022

Many of the overall characteristics that defined FY 2022 for GHSC-PSM were pandemic driven, similar to the previous year. Although many countries began to slowly recover from the impacts of COVID-19, just how enduring effects of the pandemic were on global supply chains became increasingly apparent, with persistent lockdowns in China, port congestions, and constantly shifting shipping schedules. To mitigate these effects, the project continued to work collaboratively with USAID and its supply chain partners to understand and proactively respond to the wide-ranging and longer-term supply chain challenges that GHSC-PSM expects to extend out over the next two or more years. Despite these continuing challenges, delivery performance remained high in FY 2022, with on-time delivery at 88 percent, while 86 percent of all commodities were delivered on time and in full.

FY 2022 was also notable for renewed emphasis on more strategic initiatives. For example, this year, GHSC-PSM significantly increased private sector engagement for the delivery of ARVs and asked suppliers and manufacturers to take on shipment of these orders rather than running them through the project's 3PL/fourth-party logistics (4PL) channels. In FY 2022, GHSC-PSM also executed vendor-stored inventory (VSI) strategies for condoms and personal protection equipment (PPE) and advanced VSI strategies for ARVs and artemether-lumefantrine dispersible tablets (AL-DT) that will be executed in FY 2023.

In FY 2022 the project launched the Wave-2 RFP for VL/EID testing, which seeks to add 42 additional PEPFAR-supported countries to the six already included in Wave 1. The goal of the global RFPs (Waves 1 and 2) is to establish fair pricing for VL testing commodities, create formal service-level agreements, and enable expanded instrument connectivity. This initiative, started four years ago, has yielded tremendous cost savings, with a net savings of over $30 million a year. Also, in response to PEPFAR's evolving policy toward regional manufacturing, GHSC-PSM continues to coordinate with USAID and provide technical expertise toward advancing this agenda. In Q4, the project, along with USAID and GHSC-QA, visited ARV manufacturers in India to assess key manufacturing requirements for ARVs and how these can be adapted for ARV manufacturing in Africa. For more information, see section B1. HIV/AIDS.

One of the valuable lessons learned from COVID-19 is the importance of maintaining strong relationships with suppliers. In Q4, GHSC-PSM visited suppliers and manufacturers in the Netherlands and India. Suppliers expressed appreciation for the value the project places on its relationship with them, citing GHSC-PSM's responsiveness to suppliers' concerns—which is evidenced in the project's constantly evolving sourcing strategies.

Looking forward, in FY 2023, GHSC-PSM will continue to advance its strategy to increase operational effectiveness within the supply chain by working closely with suppliers, logistics providers, and in-country teams to identify risks and develop mitigation plans as needed. The project will also continue to collaborate with USAID toward actualizing PEPFAR's objective for regional manufacturing of ARVs and other select commodity categories.

C1a. GLOBAL SUPPLY CHAIN: FOCUSED ON SAFE, RELIABLE, CONTINUOUS SUPPLY

GHSC-PSM's procurement strategy focused on three primary objectives in Q4:

1. Maintain on-time deliveries, despite the impact of COVID-19 and the war in Ukraine.
2. Balance price, delivery, and quality to achieve the best value.
3. Reduce response/cycle times, lead times, and transaction costs.

In Q4, the project achieved strong OTD and OTIF while operating the global supply chain within the context of the continuing impact of the COVID-19 pandemic, and in the face of unforeseen challenges, by focusing on performance and managing overall commodity and supply chain costs through the following initiatives:

MORE HEALTH COMMODITIES THROUGH MARKET DYNAMICS, STRATEGIC SOURCING, AND SUPPLIER MANAGEMENT

GHSC-PSM works across project teams and external stakeholders to understand markets for the medicines and health commodities it procures. The project develops sourcing strategies, builds strategic relationships with suppliers that shape markets, enhances project performance, and achieves greater value for USAID within each product category. GHSC-PSM conducts market analyses, leads strategy development, employs sourcing best practices, contributes to process improvements, and negotiates and proactively manages contracts with suppliers and 3PLs. The project executes sourcing activities for products under each health area in line with the strategic sourcing calendar and undertakes additional sourcing for products to support USAID's COVID-19 response. See sections B1, B2, B3, B4, and Annex A for details.

Supplier relationship management

GHSC-PSM prioritizes building strong relationships with suppliers by encouraging honest dialogue on procurement and logistical challenges suppliers face, such as the impacts of scarcity of raw materials on production. As mentioned earlier, in Q4, GHSC-PSM conducted its first visit since the onset of COVID-19 to suppliers and manufacturers in the Netherlands and India. The project continues to proactively manage operations affected by global market, supply chain, and logistics factors, including the lingering effects of COVID-19 and the impact of the war in Ukraine. Routine supplier meetings keep the project up to date on products, production capacities, delivery schedules, and quality matters, while commodity and supplier risk profiles inform performance assessments and order allocation strategies.

Operational excellence

In Q4, GHSC-PSM developed an automated essential medicines allocation tool to reduce requisition order (RO) to purchase order (PO) cycle time and operational costs. The tool auto-generates notifications of intent and allocates order lines to suppliers all while improving data accuracy, decision compliance, and quality. Also in Q4, other RO automation tools (ARV/DCP/Labs) produced a 61 percent reduction in the order clarification compared to initial GHSC-PSM sourcing approval cycle time while

automatically processing order lines for DCP and lab, from order clarification to fulfillment plan creation. These initiatives and other efforts contributed to a PO release average cycle time reduction of 43 percent from Q3 to Q4 for ARV orders.

GHSC-PSM completed the Rapid Response Intake Form, which allows the project to react efficiently to requests and consistently gather more information on the front end, track progress, and provide end-to-end visibility of requests in flight. The project also upgraded the RDC database to a web service platform that allows information to be available in near real time, enhances automation for orders using the RDC inventory, and enables the project to be proactive in managing inventory status and metric reporting.

Regional Distribution Center Operations

In FY 2022, GHSC-PSM leveraged the three RDCs to deliver more than $210 million worth of commodities to 34 destination countries with 91 percent OTD for RDC orders. In Q4, the project delivered more than $28 million worth of commodities to 21 destination countries with an average OTD of 86 percent. As COVID-19 disrupted the global supply chain, the project's strategy to use RDCs and pre-position key commodities across task orders ensured access to commodities with minimal or no disruption. The project used RDCs in FY 2022 to deliver more than 54 percent of TLD while enabling HIV MMD rollout. In Q4, the project used RDCs to deliver more than 72 percent of TLD.

In FY 2022, GHSC-PSM contracted external auditors to perform annual stock counts at all three RDCs (Belgium, United Arab Emirates (UAE), and South Africa). These inventory audits reported an accuracy rate of over 98 percent in all three RDCs. A team from the Office of the Inspector General also performed an in-person audit of the RDC in the UAE while collecting data on all three RDCs in Q4. Auditors expressed that they were impressed with the way that the UAE RDC operated.

DECENTRALIZED PROCUREMENT (DCP)

In Q4, GHSC-PSM achieved 87 percent OTD for orders managed through the DCP channel. To mitigate the impact of COVID-related logistics constraints on global supply of VL/EID reagents and consumables, the project holds bi-weekly order management meetings with manufacturers and is distributing VL/EID on demand across all available platforms until this constraint is relieved.

In line with the project's strategy to maintain decentralized procurement capability in Africa, GHSC-PSM transitioned responsibility for laboratory procurements for Kenya and Tanzania from the U.S. to the DCP Kenya local procurement team. This enables more orders to be managed in a similar time zone as the destination countries and further reduces transactional costs. In Q4, the project conducted a DCP

training in Lusaka for the Zambia local procurement team. The training covered how to source and procure lab supplies under the centrally established long-term agreements and provided an opportunity to update existing and new standard operating procedures (SOPs).

GLOBAL STANDARDS

GHSC-PSM operationalizes its procurement requirements for pharmaceutical, medical device, sterile kit, laboratory reagent, and LLIN suppliers to adopt standardized product identification and labeling and exchange product master data leveraging GS1 standards. These supplier requirements include:

- *Identification:* Assigning GTINs that identify trade items and Global Location Numbers that identify business entities and locations.
- *Capture:* Labeling specified packaging levels with barcodes encoded with GTIN, batch/lot, expiration date, serial shipping container code, and (for pharmaceuticals and LLINs) serial number.
- *Share:* Exchanging product master data through the Global Data Synchronization Network (GDSN).

FY 2022 saw remarkable progress in suppliers implementing these requirements, thus laying the groundwork to use these data in global and national supply chain processes and systems. Advancing compliance requires regular engagement with suppliers for existing and new items. In FY 2022, through this ongoing engagement, the project:

- Collected, validated, and added GTINs for 300 items to the GHSC-PSM catalog.
- Collected master data for 342 new items through the GDSN, and maintained data on existing items. In Q4 alone, the project sent and received more than 500 messages in the GDSN.
- Communicated, collected, and validated information regarding serialized packaging as a part of the final phased deadline in GHSC-PSM's supplier requirements.
- Provided technical assistance to Botswana, Burundi, Ghana, Malawi, Namibia, Nigeria, Rwanda, Uganda, Zambia, and Zimbabwe to advance traceability standards.
- Advanced ability to maintain more timely and accurate product master data within national systems through access to product data that has been published to GDSN by the project.

Quality assurance

GHSC-PSM streamlines and optimizes QA and quality control (QC) business processes and procedures to rapidly address any incidents and product failures as they occur, ensuring quality products reach the end consumer. Highlights in Q4 include:

- Managed seven recall incidents by facilitating collaboration across internal and external teams to expedite activities, including product quarantines, to ensure patient safety and product replacement to avoid stockouts.
- Worked with GHSC-QA to optimize the product recall and market withdrawal SOPs to expedite recall activities.
- Managed quality incidents (i.e., received 30 new incidents and completed 25, including four recall incidents) and continuously enforced and promoted prompt reporting of quality incidents and adherence to SOPs to ensure timely quality product distribution to the end-user.
- Worked with USAID contracting officer's representatives and GHSC-QA to obtain USAID's approval of a process that allows the project to internally manage quality incidents with a commodity value of less than or equal to $1,000.

QA for malaria commodities

For QA for malaria commodities, see section B2. Malaria.

IMPACTS OF SECURITY AND COVID-19 ON FREIGHT AND LOGISTICS

Origin challenges

The COVID-19 pandemic continued to pose challenges to the supply chain industry in FY 2022. While its impact waned somewhat in Q3, the lockdowns in China affected origin and shipping operations. The constraints on shipping capacity remain in effect, specifically around port infrastructure and processes at high-volume origin points. Trucking availability remains severely constrained in Europe, and air-carriers are seeing a huge impact on their ground handling and shipping services because of labor strikes.

Airfreight

The war in Ukraine continued to impact flight capacity in Q4. While heavy sanctions on cargo operators forced the airfreight market to rely on belly space in passenger flights, high fuel prices are affecting carrier rates as airlines respond by focusing their routes on popular destinations, using various aircraft types to adjust to demand. Although overall airline scheduling showed a rebound in Q4, an ongoing area of concern is limited capacity for already underserved locations, which could worsen as fuel rates soar and fewer freighter aircraft serve these routes.

Ocean freight

Weather effects, global ocean shipping schedules, and port congestion continue to hinder ocean freight. In Q4, space on ocean vessels remained tight due to frequently canceled sailings and last-minute omissions of some ports from the schedule. Weather effects, such as the early onset of typhoon season, and regulations imposed by the International Maritime Organization on emission standards, are disrupting port operations and carrier schedules. Carriers remain overcommitted and are limiting booking acceptances and rolling shipments. A significant impact of these challenges in Q4 was vessel delays, which created unreliable schedules. Ocean freight pricing also remains volatile as carriers increase oil prices and fuel surcharges in response to the global market.

Destination challenges

Weather, security, and port infrastructure continue to affect deliveries to destination countries. Earlier in the year, port congestion was most severe in Tanzania due to renovations, while cyclones and tropical storms damaged road infrastructure in Madagascar, Malawi, Mozambique, and Zambia, negatively impacting delivery activities in those countries. In Q4, adverse weather continued to impact deliveries to destination countries, with flooding in Pakistan and Sierra Leone as examples.

Globally, security remains a concern. In Haiti, for example, an ocean container was hijacked. Instability and security issues were also keenly felt in West Africa and in Kenya (due to the 2022 Kenyan general elections).

EMERGENCY PROCUREMENT HIGHLIGHT

Securing ARVs for Ukraine

As mentioned in Section B1. HIV/AIDS, GHSC-PSM secured $5.6 million worth of ARVs (a one-year supply) for Ukraine. The activity consisted of two primary phases: sourcing and delivery.

> **Sourcing:** GHSC-PSM leveraged relationships with its ARV supply partners to address this crisis. In March 2022, nearly 210,000, 90-tablet bottles of dolutegravir/lamivudine/tenofovir DF 50/300/300 mg were delivered from the manufacturer in India to Ukraine, just 27 days from order placement (historically, the waiver process averaged three months). Concurrently, a second order for 10 unique ARV products was issued. Eleven different ARV suppliers responded within 48-hours with stock options and lead times. GHSC-PSM averaged eight working days to source and obtain USAID approval for these orders. Shortly after, the project placed a third order for 21 additional ARVs. This included a number of low-demand, hard to source pediatric ARVs. Again, ARV supply partners responded immediately. Multiple partners offered to divert

existing orders to meet the demand, and one supply partner consolidated stock from three different manufacturing locations. Between March and August 2022 GHSC-PSM delivered 36 orders of ARVs to Ukraine.

Delivery: The war in Ukraine resulted in flight capacity constraints, airspace restrictions, waiver and clearance process changes, communication challenges, and a lack of transporters. Leveraging the project's established emergency response processes, GHSC-PSM immediately set up a Ukraine logistics response listserv and closely engaged its 3PL network to identify logistical options. The project's Security and Deliver-Return teams monitored the situation on the ground and maintained operational transparency among a local NGO, U.S. Embassy staff, and 3PL partners through WhatsApp, emails, and twice-daily calls. GHSC-PSM also worked in tandem with its partners to consolidate ARV orders at ports of departure and secure belly-space to fly the goods to Poland. The volatile security situation and import requirements routinely resulted in suppliers changing shipping documents, a need with which they were happy to comply. Close collaboration across the supply chain resulted in the successful delivery of 17 consolidated ARV shipments. GHSC-PSM leveraged its 3PL's expertise to deliver cargo by air, ocean, and land, while maintaining on-time delivery standards.

C1B. PROJECT PERFORMANCE

In this section, we summarize findings on key indicators of global supply chain performance. More detail on these and other indicators is provided in Annex B.

DELIVERY TIMELINESS

GHSC-PSM measures OTD in two ways:

- OTD, the number of on-time deliveries as a percentage of expected deliveries in the period
- OTIF, the number of on-time deliveries as a percentage of all actual deliveries in the period

OTD is a more accurate reflection of recent performance, while OTIF is a lagging indicator as late orders due in prior periods get delivered.

In Q4, GHSC-PSM OTD was 87 percent (81 percent COVID-impacted) and OTIF 90 percent (79 percent COVID-impacted), the 14th successive quarter that OTD has been above 85 percent (see Exhibits 18 and 19).

During the COVID-19 pandemic, GHSC-PSM presents two versions of OTD indicators:

1. According to the indicator definition, the "standard" version is calculated as laid out in the project's monitoring and evaluation plan and following all associated policies.

2. The "COVID-19–impacted" version follows the same rules and definitions as the standard indicator but removed the "control" for pandemic impacts to demonstrate the adverse effect of COVID-19 on OTD from Q3 FY 2020 to date on GHSC-PSM shipments.

Exhibit 18. October 2021 through September 2022 Monthly Indefinite Delivery, Indefinite Quantity (IDIQ) OTD

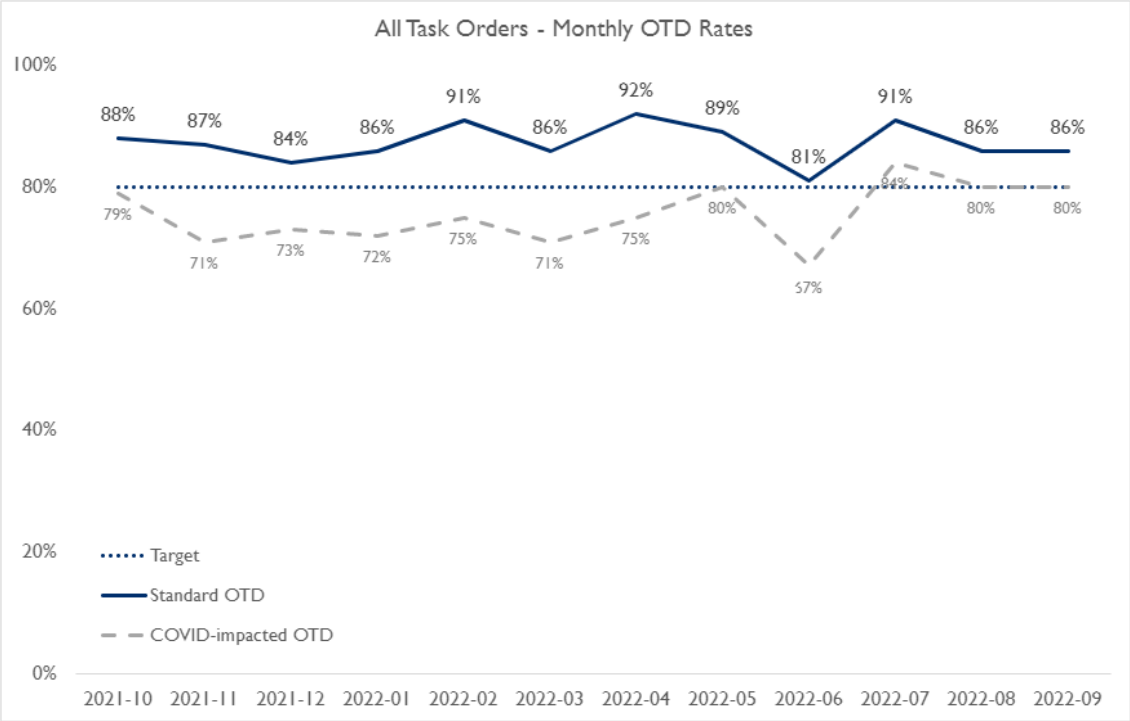
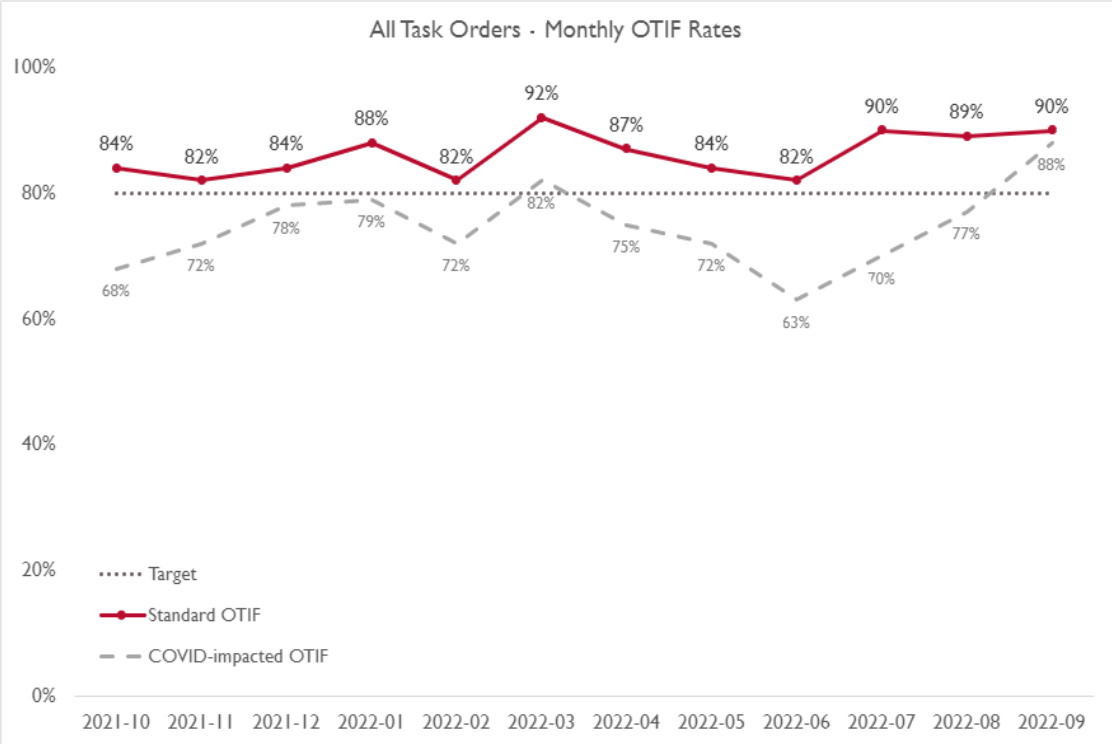


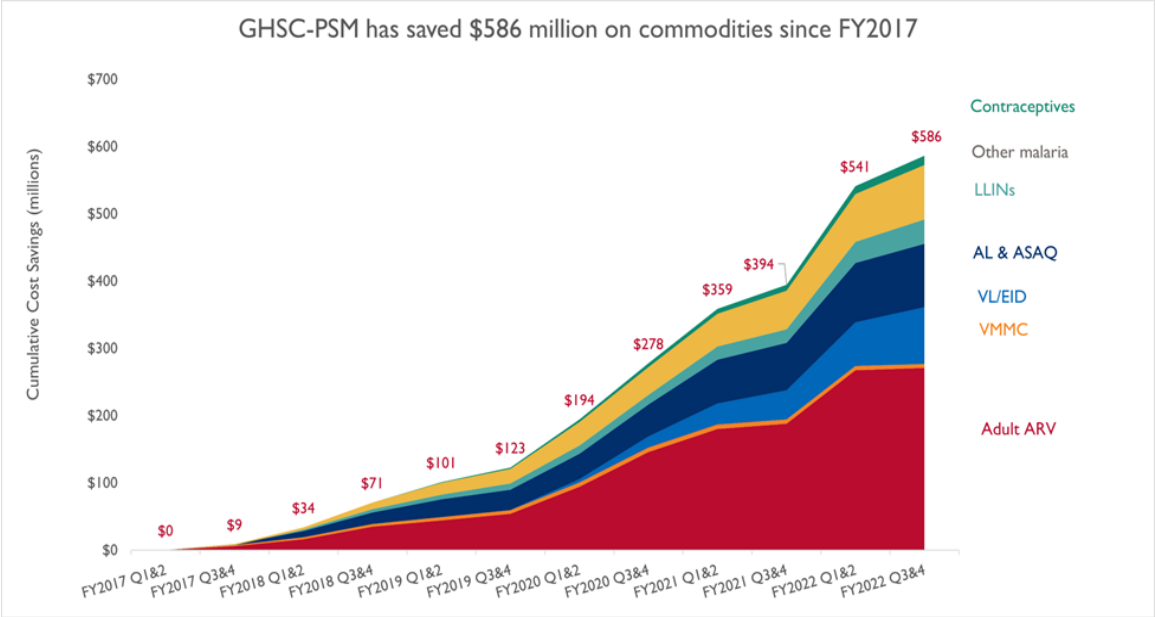
Exhibit 19. October 2021 through September 2022 Monthly IDIQ OTIF



COST SAVING ON MEDICINES AND HEALTH COMMODITIES

GHSC-PSM conducts regular and detailed analysis to understand the markets for the medicines and health commodities it procures and to bring this knowledge to negotiations with suppliers. Through careful negotiation of long-term contracts with suppliers for major product groups, including viral load testing this year, the project saved $586 million on commodities over the life of the project, as shown in Exhibit 20.

Exhibit 20. Life-of-Project Savings on Medicines and Health Commodities



To produce long-term value and sustainability, GHSC-PSM achieved these cost savings while working to ensure suppliers maintain their interest in the market and expanding the number of suppliers in many commodity categories, such as condoms and mRDTs, so the USG can benefit from a competitive supplier base. Additional savings have also accrued as prices for these commodities have risen slower than the general rate of inflation.

COST SAVINGS ON LOGISTICS

Open competition in freight lanes. GHSC-PSM saves money on logistics by managing through a 4PL model that competes lanes between 3PL shipping companies to improve service and reduce costs. This leads to cost savings on shipping rates versus an alternative approach with limited or no competition for shipping lanes (a simple 3PL approach) through scale and competition.

Exhibit 21. Cost Savings Through Open Competition in Freight Lanes

Task Order	Benefits of Competing Freight Lanes
Task Order 1	$35,737,249
Task Order 2	$8,812,473
Task Order 3	$711,289
Task Order 4	$36,527
Grand Total	**$45,297,538**

As of Q3 2019, logistics savings were calculated as the difference between the rates awarded to the selected 3PL and the average of the two most expensive 3PLs. This method provides a comparison for all shipping lanes and simulates the rates that would likely be obtained under a non-competitive, 3PL model. The project uses shipping data and annual 3PL rates for the specific timeframe of the shipment being measured to calculate these cost savings. There have been times where annual 3PL rates were not

available due to market conditions. When annual 3PL rates were not available adjustments [28] were made to past rates to most accurately track these savings with the available information.

The project conducted a freight rate card refresh starting April 2022. The April 2022 rates were used to calculate the cost savings for Q3 to Q4 FY 2022. When a 2022 shipment did not have a rate on file, the project used past rates adjusted by market inflation. Cost savings due to open competition in freight lanes declined from prior years. While using the FY 2019 rates or an adjustment of the FY 2019 rates from Q3 FY 2019 to Q2 FY2022, cost savings were calculated on average $9.9 million (this does not include savings from Q3 FY 2020 to Q2 FY 2021, since these savings included only sea shipments). Cost savings due to open competition in freight lanes for Q3–Q4 FY2022 were $2.9 million. This can be explained by how the project conducted the bids for the April 2022 rates. GHSC-PSM sent targeted lanes to the 3PLs that would be most competitive in particular lanes. This reduces the variance that was seen among the bids and thus reduces the gap between the selected and the average between the two most expensive bids.

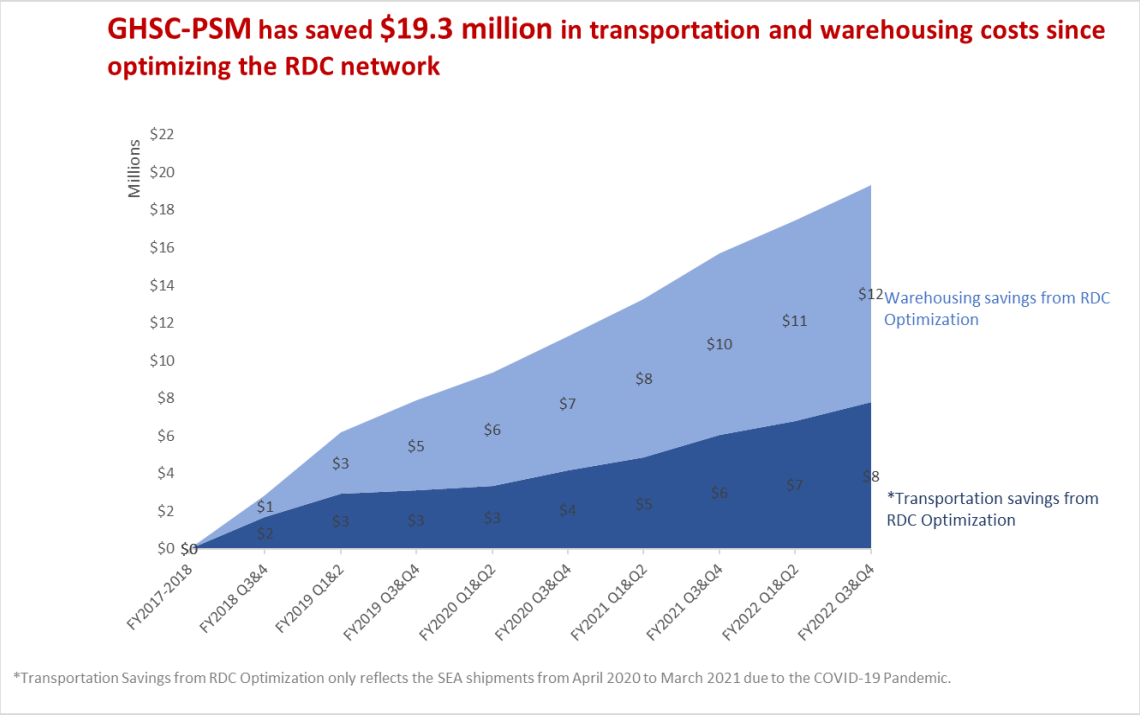
Optimizing the RDC network. GHSC-PSM saves money on logistics by optimizing the project's network of RDCs. Savings are generated through:

- Warehousing savings from lower costs at the project's three RDCs (Dubai, Belgium, and South Africa)
- Transportation savings from shipping costs on actual commodities that moved through the three RDCs, compared to what shipping would have been for those commodities under the previous, five-warehouse model (Ghana, Kenya, Netherlands, Singapore, and South Africa). These savings are in addition to cost savings generated from negotiating lower shipping rates.

[28] In early Q3 2020, GHSC-PSM recognized that air freight market rates were rising rapidly because of the COVID-19 pandemic. During this time, the project placed a hold on the Annual 3PL Rate Refresh for air shipments and extended ocean rates until the end of November 2020. As a result, the project, in consultation with USAID, decided to manage air shipment pricing under a spot bid model and review ocean shipments case by case with the expectation that there would be nominal impact on that pricing would be nominal. In December 2020 the project refreshed ocean freight rates and used them to calculate ocean cost savings from December 2020 to the end of Q2 2021. In the Q2 FY 2022 GHSC-PSM IDIQ Report, the project, in consultation with USAID, adjusted the FY 2019 rate cards to account for the shift in the market, determined by taking the average of all spot bids acquired per shipment to arrive at a market increase rate per shipment. This rate was then applied to the FY 2019 rates per shipment to adjust the quotes to market values at the time of booking the shipment. Using these adjusted rates, the final cost savings figures were calculated as the difference between the rates awarded to the selected 3PL and the average of the two most expensive 3PLs, similar to previous years.

GHSC-PSM saved $17.4 million in transportation and warehousing costs since optimizing the RDC network. Exhibit 22 shows cost savings from RDC optimization; the light blue indicates warehouse savings and the dark blue, transportation savings.

Exhibit 22. RDC Optimization Cost Savings

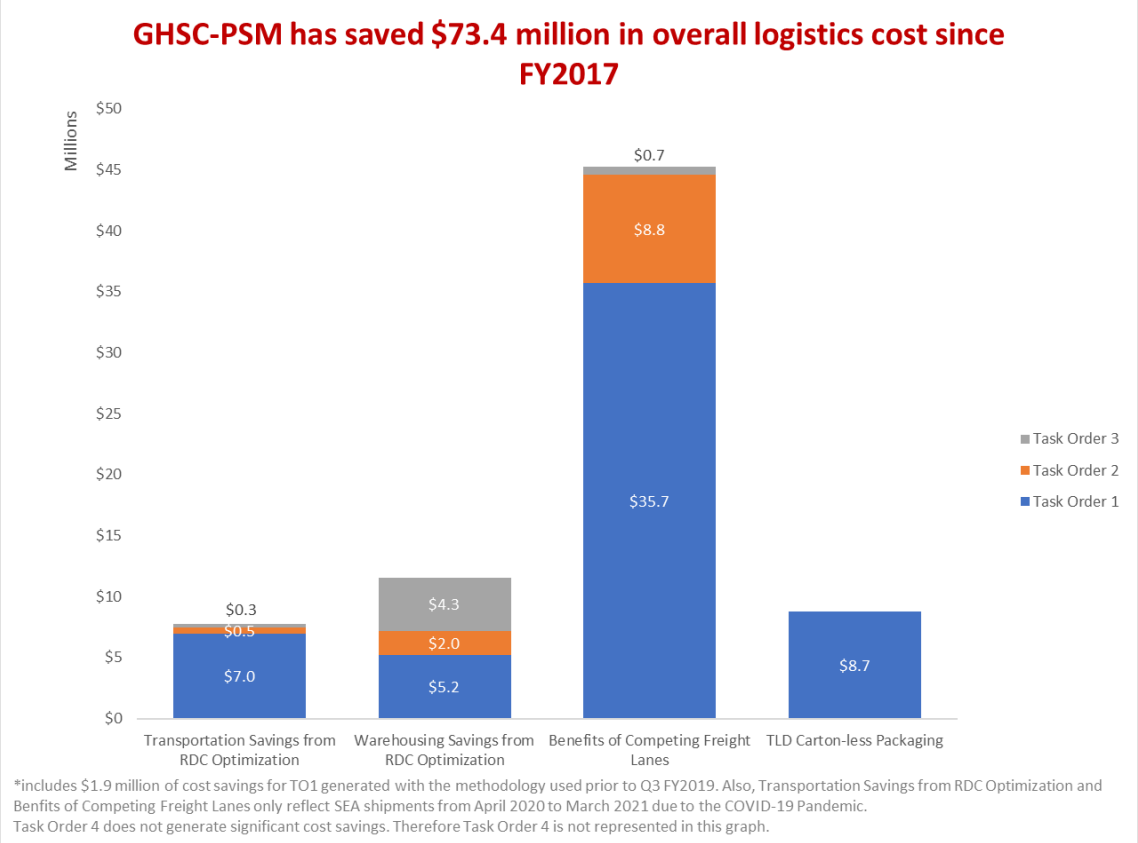


Strategic packing to reduce shipping costs. GHSC-PSM saves money on logistics by reducing the weight and shipping containers needed to transport TLD products. In FY 2019 the project began procuring TLD in carton-less packaging and introduced larger pill counts in TLD bottles. Carton-less is a term global health procurement agents currently use to refer to ordering and handling pharmaceutical products by the bottle and without the external boxes around each individual bottle. Before FY 2019, GHSC-PSM standardized the TLD pack size to 30 tablet bottles.

Beginning in FY 2019, GHSC-PSM shifted to procuring 90- and 180-tablet bottles. These changes allow suppliers to fit more total tablets in shipping containers, thus reducing the total number of shipping containers needed and saving $3.5 million in logistics cost by sea. This also reduces total weight of shipments, saving $5.2 million to date in logistics costs by air.

Total cost savings on logistics to date were $73.4 million, which includes $19.3 million in transportation and warehousing costs from optimizing the RDC network, $8.7 million from strategic packaging of TLD, and $45.3 million from competing freight lanes. (See Exhibit 23.)

Exhibit 23. Logistics Cost Savings Breakdown



REDUCTION IN CARBON EMISSIONS

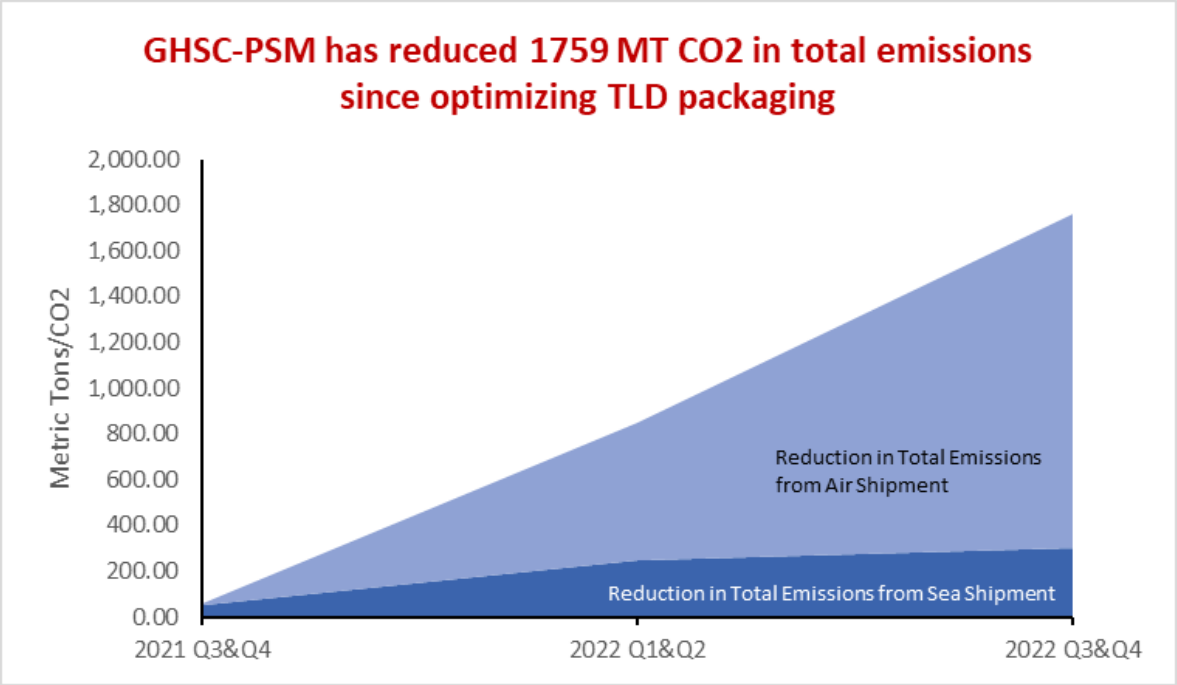
Beginning in August 2021, GHSC-PSM focused on reducing carbon emissions on TLD order shipments as part of the green initiative effort. The carbon emission reduction in sea shipments is calculated by comparing the estimated actual containers shipped when using carton-less TLD packaging versus how many containers would have been needed using 30 pill pack cartons. Since August 2021, total emissions produced would have been 603.0 metric tons/carbon dioxide (CO_2) had the project continued shipping TLD in packs of 30 pills in cartons. Since the project changed from carton to carton-less packaging and increased pack size to 90 or 180 pills per bottle, the actual emission was 352.3 metric tons/CO_2.

Therefore, total emission reductions due to this change was 301.1 metric tons/CO2. This was an emission reduction of 49.9 percent between August 2021 and September 2022.

The carbon emission reduction in air shipments is calculated by comparing the estimated actual weight shipped when using carton-less TLD packaging versus the weight to ship 30 pill pack cartons. Since August 2021, total emissions produced would have been 5,983.1 metric tons/carbon dioxide (CO2) had the project continued shipping TLD in packs of 30 pills in cartons. Since the project changed from carton to carton-less packaging and increased pack size to 90 or 180 pills per bottle, the actual emission was 4,525.5 metric tons/CO2. Therefore, total emission reductions due to this change was 1,457.6 metric tons/CO2. This was a emission reduction of 23.4 percent between August 2021 and September 2022.

Total emission reductions from air and sea shipments was 1,758.8 metric tons/CO2 between August 2021 and September 2022.

Exhibit 24. Cumulative total emission reductions



C2. SYSTEMS STRENGTHENING TECHNICAL ASSISTANCE

Assisted 50 countries with health supply chain systems strengthening over the life of the project.

Provided **technical feedback on 165 supply plans in Q4 FY 2022 and 660 throughout FY 2022** to strengthen national supply planning capabilities.

Since Q1 FY 2021, **assisted 29 countries** (10 of those in FY22) to transition from PipeLine to QAT, a modernized solution for country-led forecasting and supply planning.

GHSC-PSM's strategic goal is for every country to have a locally led health supply chain that is integrated, optimized, accountable, agile and lean, and can sustainably supply quality products to all citizens. To support this goal, headquarters and field-based technical specialists work with country teams to define systems strengthening strategies that are appropriate to the local context and can be realistically achieved. The project places emphasis on automated data capture and real-time end-to-end data visibility (most notably through advanced analytics, global standards and traceability, forecasting and supply planning, and management information systems), private-sector engagement, pharmaceutical-grade infrastructure, and efficient distribution across countries (through laboratory networks, warehousing, and distribution systems strengthening). Through workforce development, leadership, and governance activities, the project works with country stakeholders to ensure their supply chains are managed by supply chain professionals dedicated to quality improvement. Where possible, it collaborates on strategies to outsource functions to accountable private sector providers.

REFLECTIONS ON FY 2022

Throughout the fiscal year, GHSC-PSM's health systems strengthening programs focused on supporting each country to effectively manage its public health supply chain and outsource key functions to the private sector whenever possible. Across all health areas, the project encouraged country governments to take the lead on all activity areas, from advanced analytics to workforce development.

Through advanced analytics, GHSC-PSM introduced an Anomaly Detection Tool that reviews more than 200,000 orders in just minutes to detect anomalies and provide supply chain actors with actionable information. This tool prevents inappropriate purchase/requisition order amounts from being fulfilled and distributed and can potentially avert over- or under-stock of health commodities.

GHSC-PSM's Quantification Analytics Tool (QAT) is enabling efficient supply planning and tracking of inventory turnover in countries, providing key information for decision making. Since its rollout, the project has trained 700 QAT users across the world and continues to engage health supply chain partners to expand its user base.

The project is moving countries toward self-reliance by prioritizing activity-based costing/activity-based management (ABC/ABM) for warehousing and distribution. This approach helps country governments determine the real costs of warehousing and distribution activities and teaches warehouse/regional distribution center operators how to "act" like the private sector. ABC/ABM provides tools to capture cost information (daily, monthly, and annually), new management processes, and organizational learning about how these tools and processes help improve cost management. A key example of how ABC/ABM can drive supply chain resilience can be seen in Lesotho, where, in FY 2022, the National Drug Service Organization celebrated more than five years of improved financial performance and reduced order cycle times.

Throughout FY 2022, GHSC-PSM supported countries to increase efficiencies in warehousing and distribution operations. In Haiti, for example, the project introduced a perpetual inventory control approach to stock taking that complements the geographic cycle count methodology and enables warehouse operators to detect and fix inventory variances quickly. The project continues to advocate for end-to-end data visibility and use among country stakeholders to promote transparency, maximize performance, and increase efficiencies across public health supply chains.

Looking forward, GHSC-PSM will continue prioritizing technical assistance activities that enable countries to lead their supply chain systems sustainably. In FY 2023, the project will work with governments and stakeholders to use data to maximize supply chain performance and leverage existing tools to measure progress and results.

ADVANCED ANALYTICS

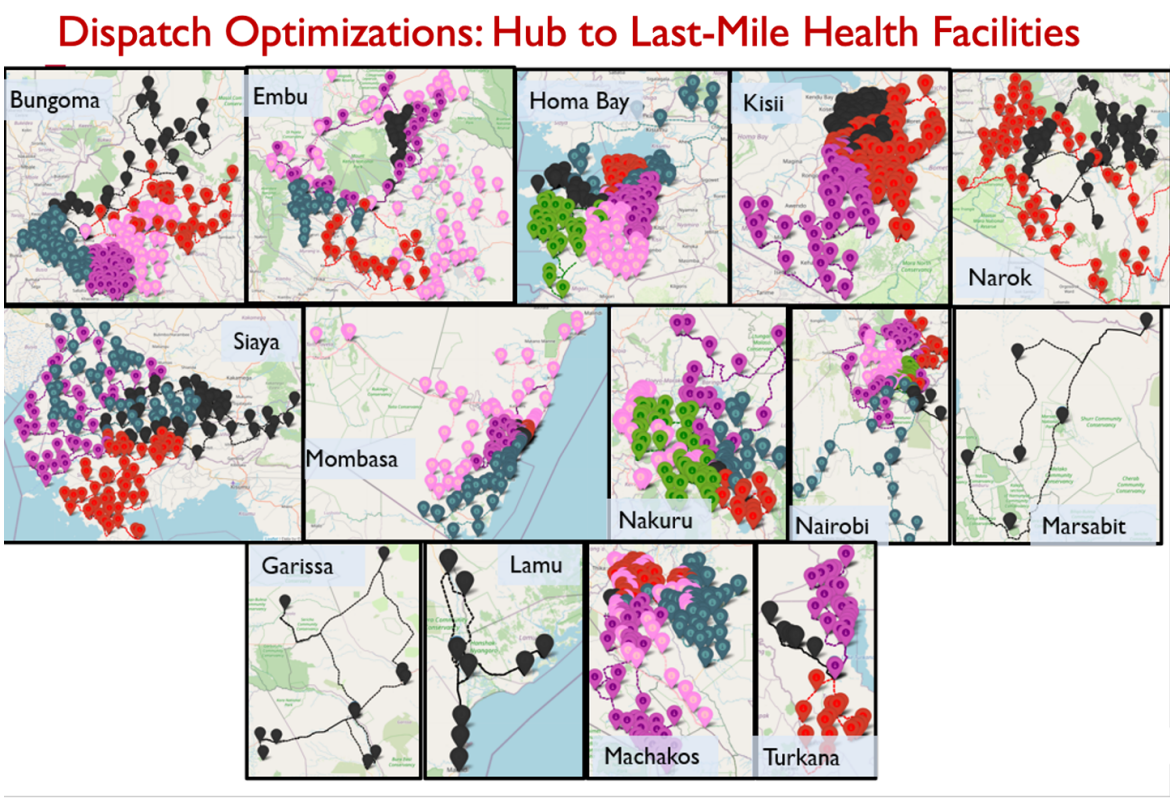
Advanced analytics enables countries to expand the use of existing data to facilitate decision making across the supply chain, from day-to-day operations to high-level strategy. GHSC-PSM facilitates this process by designing analytic tools that leverage existing investments in management information systems to make data available in real time and meet individual country needs.

By designing analytic tools that are repeatable, reusable, and adaptable in various contexts, GHSC-PSM's advanced analytics program is improving timely decision making in day-to-day operations across several countries and enabling countries to reuse these tools in a way that encourages and enhances self-reliance. Below are examples of how the project has refactored[29] various tools to meet country needs.

- Earlier in the year, refactored the Inventory Analysis Tool for use in Burma, Indonesia, and Namibia. The tool— developed initially for Ghana, Guinea, and Nepal—identifies facilities and products at risk of stockout or overstocking and allows countries to take proactive actions to reduce these risks. The project reconfigured the tool to use logistics data independent of the LMIS system, an approach more suitable to these countries' contexts.
- In Q4, adjusted the Dynamic Routing Tool (Dispatch Optimizer) for use in Kenya to assess historical distributions of HIV/AIDS and malaria commodities against optimized routing scenarios and to identify efficiencies for future distribution routing. Taking historical data and generating optimized routes provided significant insights into the last-mile distribution, such as the need to increase transparency and visibility of the hub distribution strategy, which was shown to be more efficient. The Dynamic Routing Tool can be adapted for use in other countries seeking to assess their last-mile distribution strategies.

For more information about refactoring analytics tools, see Section B4. Maternal Newborn and Child Health.

[29] Adapting tools for multiple countries requires a process known as "refactoring" the code—removing all of the original country-specific aspects, and redesigning the data from another country to support the same analysis. As such, adapting a tool to a new country becomes a matter of rapid configuration instead of time-intensive customization.



Screenshots of the optimized last-mile routes in Kenya based on historical orders.

Through its advanced analytics program, GHSC-PSM consistently strives to strengthen data reliability, consistency, and accuracy with information that ensures data quality improvement and supports the end user. In Q4, the project developed a configurable quality assurance tool that identifies data that do not meet required standards, provides actionable feedback, and enables users to monitor and track resolutions. This tool is a valuable step toward enabling countries to use reliable data for decision making and will be deployed in FY 2023.

GLOBAL STANDARDS AND TRACEABILITY

GHSC-PSM's support for implementing GS1 standards aims to enable trading partners—including manufacturers and suppliers, logistics providers, regulatory agencies, medical stores, and health facilities—to operate from the same high-quality master data.

GHSC-PSM worked with 10 countries in FY 2022—Botswana, Burundi, Ghana, Malawi, Namibia, Nigeria, Rwanda, Uganda, Zambia, and Zimbabwe—to support their adoption of GS1 standards for product

identification, location identification, and data exchange. Adoption of global standards can reduce costs, enhance efficiency, and improve the availability of health commodities in public health supply chains.

In Q4, the project supported the following countries to adopt global standards:

- In **Malawi**, delivered targeted trainings to key stakeholders, including government, donors, implementing partners, and USAID, on key concepts related to GS1 standards, product master data management, traceability governance, and traceability regulation and policies.
- In **Rwanda,** finalized the compliance monitoring framework for the approved Rwanda Regulations Governing the Implementation of Identification, Data Capture, and Data Sharing for Traceability of Pharmaceutical Products for commodities distributed on the market. This framework would allow the Rwanda FDA to monitor supplier compliance with these regulations and ensure a common approach to verifying labels and barcodes on pharmaceutical products distributed on the Rwandan market.
- **In Uganda,** implemented an automatic information and data capture solution to support barcode scanning for warehouse operations of all pharmaceutical products at the Joint Medical Store (JMS). This includes using GTIN as a secondary product identifier, and, for non-GTIN products, supporting barcode label printing upon receipt to enable barcode data collection for subsequent operations. The initial deployment is planned to go live in early FY 2023 and will include transactions covering purchase orders, receiving, warehouse transfer receipts, inventory inquiries, and barcode label printing. Data compliance with GS1 standards is facilitated by a "bolt-on" Master Data Management solution.
- In **Zambia**, worked with the MOH to bolster national traceability objectives by implementing a National Product Catalog (NPC). Earlier in FY 2022, the project initiated the operation and maintenance phase of the NPC tool, which includes continuous monitoring and maintenance of the technology. Furthermore, GHSC-PSM worked with the Zambia Medicines Regulatory Agency to incorporate industry feedback on draft identification and labeling guidelines, thus making progress on policy and regulations to support traceability efforts.
- In **South Africa,** initiated integration of the GDSN tool with the Product Catalog Management Tool (PCMT). This activity involves a phased approach that includes manual integration between GDSN and PCMT in phase 1, and between PCMT with Warehouse Management System Expert in phase 2. Both phases will be completed in FY 2023.

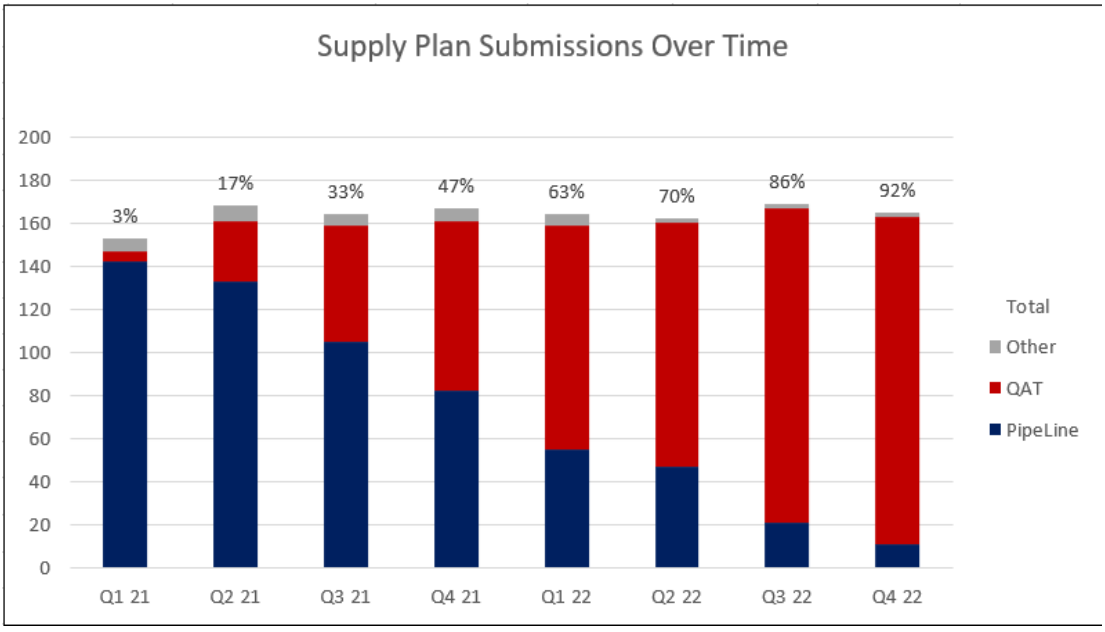
More information on standards implementation can be found in the Management Information Systems section below.

FORECASTING AND SUPPLY PLANNING

GHSC-PSM supported 36 countries with FASP assistance to help institutionalize processes so countries can move from relying on external technical support to developing their own fully integrated FASP capabilities. This included in-person quantification assistance, training, and supply plan monitoring support. In Q4, GHSC-PSM reviewed 165 supply plans and, in all of FY 2022, GHSC-PSM reviewed 660 supply plans. This included 153 USAID high-priority supply plans from 33 countries in the fourth quarter alone. These reviews aim to ensure that plans comply with data quality, supply planning, and procurement scheduling standards, thereby enhancing program managers' ability to maintain adequate inventory to meet disease prevention and treatment targets and respond to demand.

GHSC-PSM continued rolling out the QAT supply planning module throughout FY 2022. The QAT is a modernized solution for country-led quantification that leverages new technologies and has enhanced features over the existing supply planning tool, PipeLine, and will eventually replace it. So far, QAT has replaced PipeLine in 29 countries and is used to manage more than 170 supply plans. For more information about supply planning submissions, see section C2a. Project Performance. GHSC-PSM's QAT users continue to roll out the tool to local stakeholders. At the end of FY 2022, QAT users numbered over 700 worldwide.

Exhibit 24. QAT Supply Chain Submissions Over Time



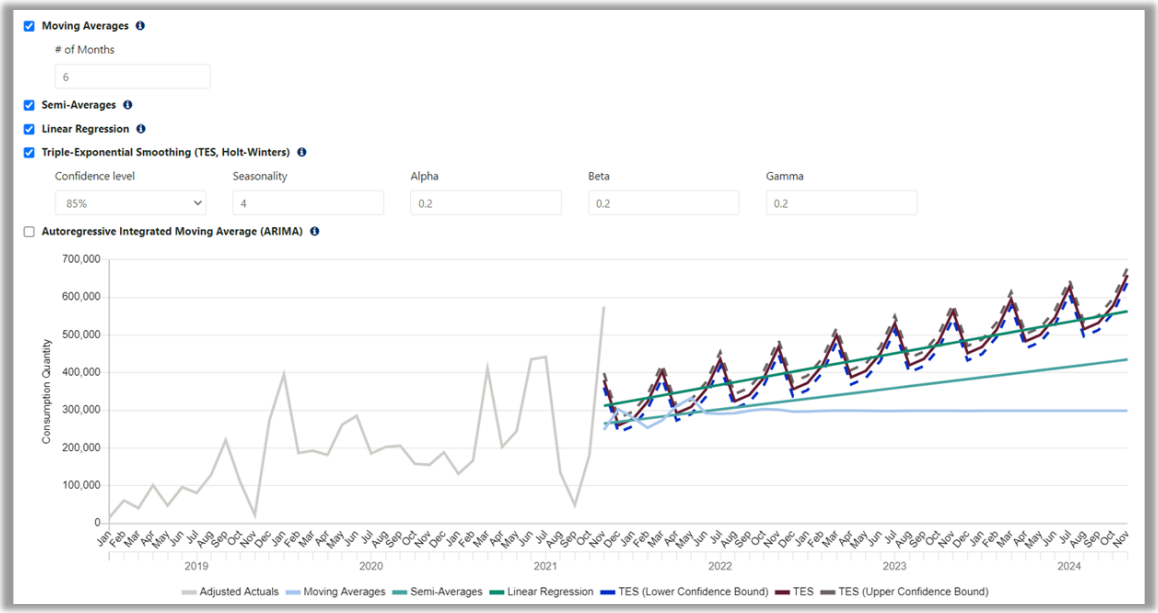
In Q4, GHSC-PSM conducted four regional training exercises on the forecasting module of QAT. The project held regional trainings in Burundi, Cameroon, and Zambia for 80 staff from 17 countries representing GHSC-PSM and government stakeholders. The project also conducted a regional training in Cambodia for four Asian countries.

A key component of ensuring the sustainability of QAT is the wide user adoption of the tool. To this end, GHSC-PSM engages health supply chain partners and stakeholders to build a broader user base for QAT. In Q4, the project received funding from USAID's Bureau of Humanitarian Assistance (BHA) to work with UNICEF in co-designing and executing a pilot to use QAT for supply planning of nutrition products in three to five countries. UNICEF has reached out to its country offices to confirm the pilot countries, while GHSC-PSM is moving forward to train nutrition program personnel in Mozambique in Q1 FY 2023.

Furthermore, in Q4, GHSC-PSM:

- Completed initial development phases of the QAT supply planning and forecasting modules. In FY 2023, the project will move into a maintenance and periodic upgrade mode of operations with its subcontractor.
- Finalized upgrades to the Enterprise Resource Planning platform in QAT, which allows users to link their supply plan shipment data to a regular data feed from GHSC-PSM's order management system and ARTMIS. This reduces data entry time and errors.
- Expanded the supply planning logic to include planning by months of stock and minimum stock quantity.

Exhibit 25. Sample Consumption-based Forecast Extrapolation from QAT's Forecasting Module



MANAGEMENT INFORMATION SYSTEMS (MIS)

GHSC-PSM focuses on improving data accuracy and quality for MIS implementation, including implementation of GS1-compliant standardized product data to build master datasets toward achieving end-to-end data visibility. The project works with countries to evaluate the data captured in information systems (e.g., eLMISs and warehouse management systems) for standardization, and to establish methods and plans for managing master data sets across information systems to avoid redundant data entry and ensure data accuracy and quality.

In FY 2022, GHSC-PSM recommended a new approach and plan to USAID for publishing information technology solutions (including systems, applications, and tools) developed under the GHSC-PSM contract as open-source software for public use in the future. The proposed mechanism approved by USAID will use GitHub as an open-source tool that is simple to operate and provides an easy method for managing software for public and private use. GHSC-PSM will begin publishing in FY 2023, using a free software license from the Massachusetts Institute of Technology—one of the least-restrictive open-source licenses that do not require the release of modifications to the original code under the same license.

In Q4, GHSC-PSM worked with the following countries to strengthen supply chain management information systems:

- In **Guinea,** continued to build information management capacity by providing operational support to data centers toward DHIS2, deployment of e-SIGL Urgence, and the ongoing procurement of server components (RAM memories, CPU). In Q4, the project collaborated with the German development agency, *Deutsche Gesellschaft für Internationale Zusammenarbeit*, or GIZ, to organize a15-day training on DHIS2 for SMSI on three key modules: data analysis, configuration, and administration.
- In **Mozambique,** upgraded the current SIGLUS (Sistema de Informação e Gestão de Logistica para Unidades Sanitarias) mobile application to align its architecture with the new Medicines and Medical Articles Information System (SIMAM) structure (based on OpenLMIS v3). The project outsourced management of the MACS warehouse management software to a local entity and provided remote technical support for Ferramenta Central (Central Tool), MACS, SIMAM, and Information and Logistics Management System for Health Units (SIGLUS) users to monitor and improve data quality.
- In **Malawi**, supported the MOH, through the Health Technical Support Services department, to develop and launch a Digital Supply Chain Strategy and Architecture (DSC-S&A). The launch of the DSC-S&A was the culmination of more than two years of consistent effort in which the project worked with the MOH to create an integrated national digital health ecosystem that enables automated data exchange among supply chain management information systems at all levels.

LABORATORY NETWORKS

GHSC-PSM continues to promote the development of efficient and well-planned laboratory networks and support high-quality service delivery through data-driven optimization and GIS–based visualization applications as well as quantification to ensure appropriate and timely supply planning.

In the past, GHSC-PSM worked with PEPFAR-supported countries to use ForLab and ForLab+ desktop and web-based tools for laboratory forecasting. However, as these tools became less efficient for laboratory forecasting and countries reverted to Microsoft Excel-based forecasting tools, GHSC-PSM, in FY 2022, improved and launched the forecasting module of QAT to be suitable for laboratory use.

The use of modern software applications like OptiDx—developed by GHSC-PSM, Coupa, and FIND [30] in collaboration with USAID—can increase coverage and reduce costs by generating models and potential scenarios that improve visibility into network performance, and create opportunities to optimize laboratory equipment placement through a DNO activity.

[30] See https://www.finddx.org/about/

GHSC-PSM leads DNO activities with multiple stakeholders—including MOH, GHSC-PSM, USAID, other implementing partners, and donors using OptiDx. Stakeholders review the scenarios generated and develop an operational plan that takes into account how the proposed changes to the lab network affect the program's budget, operations, human resources, and logistics.

In FY 2022, GHSC-PSM supported **Burundi**, **Ghana,** and **Uganda** to improve their understanding of diagnostic networks through detailed analysis using Opti-Dx.

- In **Burundi,** worked with relevant stakeholders in Q3 to review diagnostic network data, identify gaps, and transfer paper-based records to a digital database. In Q4, the project presented the data to stakeholders and began discussions about DNO objectives in preparing for the DNO workshop in early FY 2023. Through these discussions, GHSC-PSM identified additional data quality gaps and completed a further review to resolve concerns identified by stakeholders.
- **In Ghana**, held a stakeholder engagement meeting in Q3 to discuss the purpose of DNO and the goals of each stakeholder. In Q4, the project gathered, cleaned, and collated the data needed for the DNO workshop, which will take place in FY 2023.
- In **Uganda,** after conducting a series of reviews of potential scenarios with stakeholders, facilitated a DNO workshop in Q4. Following the workshop, the project worked with regional stakeholders to review the outcomes of the activity and began developing an operational plan, which will be completed and implemented in FY 2023.

In Q4, GHSC-PSM further revised the Instrument Procurement Questionnaire, which contains 12 questions that countries must answer in preparation for procuring laboratory equipment. USAID requires these questions to ensure countries address appropriate plans and preparations before procuring certain laboratory equipment/instrumentation/analyzers that come with a warranty, are connected to electricity, and require additional maintenance. So far, **Burundi, Haiti, Kenya, Mozambique, Namibia, Uganda**, **Zambia,** and **Zimbabwe** have completed the questionnaire.

WAREHOUSING AND DISTRIBUTION

GHSC-PSM improves warehousing and distribution systems in more than 25 countries. As part of this work, the project aims to move countries' warehousing from being a mid-/long-term storage facility to a distribution center model that promotes more frequent stock turnover (inventory turns). This requires changes in infrastructure and processes to keep up with improved warehouse speed and shorter order cycle times. Interventions include improving data-driven decision making across the supply chain, optimizing distribution networks, and increasing efficiencies in warehousing and distribution operations.

Throughout FY 2022, the project continued to roll out the cycle count and inventory variance policy to establish an acceptable level of warehouse inventory variance and cycle count methodology for all GHSC-PSM stakeholders. The policy applies to all operations where the project directly oversees warehouse operations, has contractual agreements with a 3PL provider for warehousing services, or supports warehouse operations with other implementing partners or their counterparts within various Ministries of Health (e.g., through a central medical store or a parastatal).

3PL Subcontracting

Earlier in the year, the project produced a generic storage and distribution contract template for potential use in any USAID-supported country, with an emphasis on transitioning from transaction-based to performance-based logistics contracting. The draft contract template includes commercial supply chain KPIs to measure and monitor 3PL performance.

In Q4, GHSC-PSM reviewed and updated the template's contractual language to ensure the project is measuring appropriate activities to minimize risk when contracting with 3PL providers. Countries that included KPIs in their request for proposals for upcoming contract modifications or renewals are Botswana, Ghana, Kenya, Mali, Niger, and Uganda. GHSC-PSM is also developing a KPI tool and dashboard for each country, aiming to establish a robust mechanism and record of 3PL performance that will allow for comparison of KPI results across countries. Angola and DRC began a pilot of the KPI dashboard in Q4 and will complete user acceptance testing and feedback in FY 2023.

Activity-Based Costing/Activity Based Management

GHSC-PSM is implementing private sector approaches, such as ABC/ABM, which recognizes that warehousing and distribution are part of a larger strategy, one that requires integrating procurement, transportation, storage, picking and packing, delivery, and other activities in such a way that increases velocity, improves orchestration and high performance, lowers the risk of expiry, and lowers warehouse operational costs.

In Q4, GHSC-PSM provided technical assistance to Eswatini, Ghana, and Kenya in various stages of ABC/ABM implementation:

- In **Kenya**, successfully transitioned the Mission for Essential Drugs and Supplies (MEDS) operational team to a new profit and loss (P&L) statement. The project worked closely with MEDS and USAID to develop the P&L statement, which gives USAID insight into the actual cost MEDS is incurring on the project and is providing MEDS with significant and detailed visibility into its own expenses to improve planning. On the warehouse floor, the team is transitioning its

U-flow picking pattern to a Z-pick format, an approach that reduces selection travel time by 50 percent or more. These opportunities for efficiencies were identified through the use of ABC/ABM tools.

- In **Ghana**, provided in-country technical assistance for ABC/ABM implementation at the Ashanti and Eastern Regional Medical Stores (RMS). Before the in-country visit, both RMSs shared their financial data to facilitate development of a P&L statement. The project initiated an in-person inception meeting with the RMS finance team and will continue to hold weekly virtual meetings in FY 2023 to discuss customization and use of the P&L statements. GHSC-PSM also worked with RMS staff to implement a daily planner and recommended techniques—such as dejunking and using racks and pallets, trollies, pallet jacks, and forklifts—for more efficient picking and packing, and use of warehouse space.
- In **Eswatini,** worked with the MOH and CMS to carry out an ABC exercise and compile a P&L statement for the CMS. Following the exercise, the project and CMS agreed on a reasonable fee-for-service charge (based on the P&L). The project will present results of the ABC exercise to stakeholders in FY 2023 before deciding on next steps.

WORKFORCE DEVELOPMENT

GHSC-PSM strengthens public health supply chain workforces through the project's country offices. These interventions build sustainable workforces through professionalization and systematic assessment and approaches to workforce development. Throughout FY 2023, GHSC-PSM provided remote support to Angola, Botswana, Burkina Faso, Ethiopia, Liberia, Rwanda, Sierra Leone, Zambia, and Zimbabwe.

Country-specific workforce development activities in Q4 include the following:

- In **Rwanda,** GHSC-PSM collaborated with the MOH to continue implementing the professionalization framework that is taking place in five phases and will be completed in FY 2023. In Q4, the project began the third phase—customization and application of the framework to the Rwandan context at all levels—and supported the creation of a computerized tool to assist with developing process maps for job competencies.
- Also in **Rwanda,** collaborated with People that Deliver, Rwanda Ministry of Health, and Intra Health to develop four case studies on USAID efforts to strengthen human resources for supply chain management in Rwanda. These include 1) Applying a theory of change for human resource development in public health supply chains in Rwanda; 2) Labor markets for health supply chain management in Rwanda: a qualitative study of stakeholder perspectives; 3) Developing a framework to professionalize health supply chain management; and 4) a holistic approach to comprehensive workforce development in Rwanda.

GHSC-PSM will pursue the submission, acceptance, and publication of these case studies in selected journals.

- In **Zambia**, collaborated with the Nursing and Midwifery Council to facilitate an online learning experience for nursing students from Chipata and St. Francis College of Nursing and Midwifery on health supply chain management. The objective of the course is to complement the school's logistics management curriculum and expose students to processes, forms, and tools they would use in health facilities. Facilitators and students used WhatsApp and Google Meet to communicate during the course. A total 147 students completed the course and were awarded certificates of completion.
- In **Sierra Leone**, collaborated with the Directorate of Pharmaceutical Services (DPS) and the National Medical Supplies Agency (NMSA) to update the integrated health commodities logistics system's SOPs. In Q4, the project facilitated the finalization and launch of the SOPs, which will guide system operators on how to ensure an uninterrupted flow of commodities through multiple levels of the supply chain, from the central and district levels to the peripheral health units and community health workers (CHWs). In FY 2023, GHSC-PSM will collaborate with DPS and NMSA to develop a training curriculum for the SOPs.

LEADERSHIP AND GOVERNANCE

In FY 2022, GHSC-PSM continued to support strategy, planning, and standards-setting activities.

In Q4, the project focused on approaches that measure project success and can serve as indicators for future technical assistance directions. To this end, GHSC-PSM proposed an alternative measure for assessing capability and performance at all levels of the supply chain, tagged the "Big 5 Focus Area Indicators." The indicators are:

1. Stockouts/In-stock/Stock Available
2. Inventory Turns
3. Geographic Cycle Counting /inventory Accuracy
4. Warehouse Throughput (per hour)
5. Cost Per Unit

These indicators are drawn mainly from the ABC/ABM model and have been proposed for use in FY 2023. Understanding the results of these indicators can help to indicate status, diagnose system-level problems, or identify weaknesses to be addressed. By developing the same baseline measures for each country, the project can demonstrate technical assistance gains in each country over time.

GHSC-PSM introduced The Big 5 Indicators to country teams in Q4 for inclusion in FY 2023 work plans and drafted performance indicator reference sheets, in the same format as other project-wide indicators, to make data collection clear. In FY 2023, the project will hold several internal webinars to facilitate country adoption of these indicators.

ENVIRONMENTAL COMPLIANCE

In accordance with USAID's Environmental Procedures (22 CFR 216), the project supports implementation of the GHSC-PSM Initial Environmental Examination and the Environmental Mitigation and Monitoring Plan. Implementation includes multi-faceted services to all global staff, such as a review of technical documents pertaining to 22 CFR 216, technical guidance and advisory support, training and capacity building, and direct technical assistance.

In Q4, GHSC-PSM addressed USAID's comments on the FY 2021 Environmental Mitigation and Monitoring Report (EMMR) and resubmitted the final document to the USAID Global Health Bureau Environmental Officer. Based on USAID's feedback, the project will add a new annex to the FY 2022 EMMR, which is due by December 1, 2022. The new annex will provide a high-level overview of all activities, organized by intervention category, that took place during the reporting period.

GHSC-PSM also finalized one sub–task order to dispose of expired and damaged products at the Dubai RDC. Implementation is expected to begin in Q1 FY 2023.

END-USE VERIFICATION

GHSC-PSM uses the EUV survey to assess the availability of malaria, FP/RH, and MNCH commodities and collect data on attributes that contribute to commodity availability, including storage conditions, staff capacity, and data management. The project presents findings to Missions and MOHs and helps facilitate conversations and activities to improve commodity availability. The survey also gathers qualitative data, which provide insights into the reasons for stockouts. This source of data can be used to triangulate LMIS results and determine stock availability trends. EUV data collection also serves as an important opportunity for GHSC-PSM country teams to provide on-site capacity building for health facility staff without increasing the burden on staff.

In FY 2022, GHSC-PSM supported countries as they implemented changes to EUV reporting. These changes expanded the scope of select indicators to capture additional areas of supply chain performance and aimed to improve useability of the data. To consolidate and standardize EUV information, GHSC-PSM created an automated process for all TO2 survey data for PMI and GHSC-PSM analysis. This included 66 linkable EUV surveys conducted after Q2 FY 2020 when the project implemented the

standardized survey. GHSC-PSM also began analyzing EUV reports to identify common trends across countries (such as rate of MNCH commodity stockouts); collection of additional indicator data has enabled a more thorough assessment of commodity availability and trends in supply chain performance. This analysis is ongoing, and GHSC-PSM aims to provide a review of all EUV reports submitted in FY 2022 in early FY 2023.

In Q4, the project made significant changes to ensure that the EUV tools, processes, and indicators are standardized across countries for uniform data quality and to strengthen the tool's precision and reliability. Nine countries (Angola, Burundi, DRC, Ethiopia, Ghana, Guinea, Niger, Nigeria, and Zambia) successfully implemented the revised survey, while five countries (Ethiopia, Guinea, Mali, Nigeria, and Zimbabwe) submitted the COVID-19 continuity of care module.

NATIONAL SUPPLY CHAIN ASSESSMENT

The National Supply Chain Assessment (NSCA) is a comprehensive review that assesses capability and performance at all levels of a health supply chain. Results of the assessment help supply chain stakeholders develop their strategic, operational, and/or investment plans and monitor whether activities are achieving their desired outcomes.

In Q4, GHSC-PSM supported implementation of the NSCA in four countries (Burundi, DRC, Madagascar, and Rwanda):

- In the **DRC**, worked with GHSC-TA FTO to complete the NSCA report and share it with in-country stakeholders for review and feedback.
- In **Burundi**, began implementing its country stakeholder engagement strategy and confirmed a scoping trip for January 2023 and fieldwork for April and May 2023.
- In **Madagascar**, GHSC-PSM conducted data analysis and began drafting sections of the report, which is due in Q1 FY 2023. IMPACT will manage the process of collecting and incorporating stakeholder feedback following the submission of the draft report.
- In **Rwanda**, in conjunction with the MOH, held a dissemination event to release the NSCA findings; bringing together key representatives from the government, donors, and implementing partners to discuss results and create an action plan based on the recommendations in the report.

In addition to FY 2022 NSCA implementation activities, the project is actively engaged in discussions with countries to scope potential FY 2023 NSCAs with initial plans for field assessments in Burundi, Guatemala, and Lesotho. (Burundi's NSCA activity is spread across two project years).

LEARNING AGENDA: SUPPLY CHAIN TECHNICAL INDEPENDENCE INDICATOR

During Q4, GHSC-PSM finalized a year-long learning activity investigating the supply chain technical independence indicator, also known by its informal moniker "B8." The purpose of the activity was to understand the dynamics around performance, uptake, use, and impact of the indicator. The activity used a sequential mixed-methods explanatory design and four key learning questions that were co-created with the activity's USAID backstops. Also, the activity investigated the effectiveness or validity of this measurement approach and the implications for USAID and the health supply chain community writ large as the project continues to refine and enhance the measurement of sustainability. GHSC-PSM presented its findings to USAID and the results were well received with strong interest in what the implications mean for the future of supply chain sustainability measurement.

C2A. 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 the project operates and to help calibrate our work. These indicators also help establish priorities for the project's health systems strengthening support and, over time, will allow the project to assess the outcomes of technical assistance. Dashboards with these country-specific indicators are made available for GHSC-PSM country offices to explore with in-country stakeholders.

CAPACITY BUILDING

The number of people trained is an indicator that the project focuses its capacity-building resources on and identifies areas to improve related supply chain outcomes. GHSC-PSM trained 6,515 individuals in Q4 (3,046 women and 3,469 men) and 25,654 individuals over the course of FY2022.

Most training was cross-cutting and addressed topics relevant to multiple health areas. In Q4, by funding source, 26 percent were trained with HIV/AIDS funding; 60 percent with malaria funding; 8 percent with FP/RH funding; and 7 percent with MCH funding. Trainings focused on warehousing and inventory management, LMIS, governance and finance, transportation and distribution, and human resources capacity development.

C3. Global Collaboration

Presented two posters at the **AIDS 2022** conference on work in Ethiopia and Ghana.

Prepared **several presentations: six** for **International Conference on Family Planning (ICFP) 2022, 14** for the **People that Deliver Global Indaba, six** for **American Society of Tropical Medicine & Hygiene 2022**, and **10** for the **Global Health Supply Chain Summit.**

Published **Driving Last-Mile Solutions to Ensure Access to Public Health Commodities.** This groundbreaking report focuses on activities that directly support actors and systems at the last mile of the supply chain.

The scale, scope, and complexity of managing a global supply chain require collaboration with international and local partners to ensure the availability of medicines and health commodities. By integrating work across health sectors and sharing information, resources, activities, and capabilities, the project can achieve what it could never accomplish alone. GHSC-PSM's global collaboration efforts focus on coordinating with global donors and stakeholders to develop innovative means for responding to supply chain interruptions.

Strategic Engagement

As described throughout this report, GHSC-PSM engages actively with other global players to promote the availability of medicines and commodities. The project does this by providing supply chain expertise and working with global partners to allocate scarce supply, promote harmonization of standards and practices, and manage commodity stock information as a global good. Highlights of groups the project participates in are recapped below.

- Host monthly **Proactive Stock Risk Management (ProStock)** meetings with USAID as a forum for building on the project's HIV/AIDS data collection and analysis, discussing gaps in HIV commodity access, and implementing action plans to address them. (For more details, see section B1.)

- Participate in the **APWG**, sharing 3HP demand status and experiences with global suppliers. (For more details, see section B1.)

- Engaged with African manufacturers of malaria commodities to evaluate sourcing opportunities and challenges. In Q4, the project traveled to East Africa and met with LLIN and malaria pharmaceutical suppliers. GHSC-PSM observed the manufacturing processes of these products and gained knowledge of the commercial environment where these manufacturers operate. (For more details, see section B2.)

- Play a key role in the Malaria Pharma Task Force and KSM/API working group. In Q4, suppliers communicated higher costs and challenges in sourcing vegetal artemisinin. The working group explored ways to incentivize the use of SSA to combat the rising price of vegetal artemisinin. (For more details, see section B2.)

- In Q4, collaborated with the chair of the LQAG and global procurers of LLIN QA and QC to foster discussions and activities related to LLIN quality and quality management system. (For details, see section B2.)

- Following the completion of all FY 2022 SMC orders, GHSC-PSM met with the Global Fund, UNICEF, and Malaria Consortium in Q3 to discuss FY 2023 campaigns and ensure coverage and order placement timing. Multiple countries have already placed orders for the coming FY 2023 malaria ordering season. (For more details, see section B2.)

- Chair the LQAG, a global working group of procurers focused on LLIN QA and QC. In Q3, following the 2nd Convening of Raising the floor on ITNs Quality, the LQAG discussed its willingness to collaborate with WHO prequalified vector control in generating a glossary. (For more details, see section B2.)

- Serve as a member of the Global Donor Technical Working Group and participate in bi-weekly meetings to coordinate actions and resolve problems with malaria commodity suppliers who cannot fulfill demands because of capacity constraints due to COVID-19.

- Participated in the VAN Steering Committee (GHSC-PSM is a non-voting member) and provided input on the VAN capabilities matrix. Also participated in regular VAN working groups, including the Data Management, Technical Management, Data Sharing, and Super User and Analytics task forces. (For more details, see section B3.)

- Through the Consensus Planning Group, work with global procurers like UNFPA and other stakeholders to track and fine-tune the flow of product LMICs. (For more details, see section B3.)
- Participated in FP/RH working groups, including the Hormonal IUD Access Group, the Healthy Markets Community of Practice (formerly the Total Market Approach Working Group), and the Market Development Approaches Working Group. (For more details, see section B3.)
- Participate in the Newborn Technical Working Group. In FY 2022, led a redesign of the working group's ENAP results framework. (For more details, see section B4.)
- Participate in the Maternal Health Supplies Caucus (MHSC). In FY 2022, several GHSC-PSM teams presented to MHSC and to a separate global audience during an MTaPS-hosted webinar, on their efforts to validate and implement new RMNCH forecasting guidance. (For more details, see section B4.)
- Participate in USAID and BMGF-funded CHTF meetings and contribute to ad hoc CHTF activities. In FY 2022, the project and CHTF partners hosted a series of technical meetings to discuss barriers to availing key commodities for treating childhood pneumonia and PSBI and to validate and prioritize actions for national governments to take to ensure these commodities are accessible to families. (For more details, see section B4.)
- Following the 2019 adoption of GS1 Joint Technical Implementation Guide by donors and procurement agents, in FY 2022, GHSC-PSM convened a virtual forum among donors, procurement agents, and other strategic partners to share updates on and lessons from global standards adoption across the International Procurement Agent community. The community agreed to update the joint guidance, and GHSC-PSM volunteered to facilitate the update to be completed in early FY 2023.
- In FY 2022, GHSC-PSM was a key contributor to the solutioning of the Traceability and Verification System for Health Products (TRvST) initiative. TRvST is a multi-donor collaboration including UNICEF, Global Fund, and USAID to establish a global repository of trusted health product information with functionality enabling verification and traceability for these products. Technical support to the TRvST initiative centered on data modeling, supplier engagement, and country technical implementation support, specifically in Nigeria, Rwanda, and Malawi. In Q4, USAID provided funding to TRvST for verifying ARV products. GHSC-PSM developed an engagement strategy for ARV suppliers to provide serialized products to TRvST. Verification of ARVs is expected to begin in Q2 FY 2023.

Knowledge Sharing

To ensure that the critical lessons learned, adaptations, and best practices can be repurposed by Ministries of Health, supply chain managers, donors, and other supply chain stakeholders, GHSC-PSM

documented and shared project activities, technical research, and success stories. Details can be found in sections throughout the report, but below are some highlights from FY 2022:

- Prepared 14 presentations that were accepted to the People that Deliver Global Indaba and 10 presentations that were accepted to the Global Health Supply Chain Summit, taking place in Q1 FY 2023.
- Prepared six presentations that were accepted to ICFP2022, taking place in Q1 FY 2023. The presentations focus on work conducted in Rwanda, Angola, and several global FP initiatives.
- Made two poster presentations in July 2022 at the International AIDS Society conference (AIDS 2022) from project offices in Ethiopia and Ghana.
- Prepared six presentations that were accepted at the American Society of Tropical Medicine and Hygiene 2022 conference, focused on project work in Ethiopia and Cameroon. These will be presented in Q1 FY 2023.
- In Ghana, presented the project's work to operationalize the Supply Chain Master Plan at the 2022 Center for Applied Research and Innovation in Supply Chain–Africa Supply Chain Research Conference, June 28–30, 2022.
- Expanded the GHSC-PSM Traceability Toolkit to includ e the quick guide, "**Key Considerations for Centralized National Pharmaceutical Traceability Approaches**," which provides a summary of information in existing resources to highlight key considerations for countries contemplating implementation of centralized traceability approaches.
- Published a new technical report titled, "**Using a Data Science Approach to Build Timely, Sustainable, Repeatable and User-centered Analysis to Drive Actions**."This technical brief explores how to strengthen monitoring and evaluation processes through a data science approach to analytics that enables supply chain decision makers to act based on timely, transparent, and repeatable analysis.
- In Q4 FY 2022, published two MNCH resources, the "**Postpartum Hemorrhage White Paper**" and an updated version of the "**MNCH Commodity Procurement Guide**."
- Published the **Annual Comprehensive Agency Report on Condoms and Lubricants for FY 2021**. The report shows consistent funding support through USAID for the condoms program over the last three years.
- Published **Beyond Diagnostic Network Optimization: A Network Approach to Strengthening and Scaling Up Laboratory Services** to serve as a guide for implementing a network approach to strengthening and scaling up laboratory services.

- Held a satellite session with USAID at the African Society for Laboratory Medicine 2021 Conference in Q1 FY 2022: **Beyond DNO: The Changing Landscape of Laboratory Medicines.**
- Published **Driving Last-Mile Solutions to Ensure Access to Public Health Commodities.** This groundbreaking report focuses on activities that directly support actors and systems at the last mile of the supply chain. Dissemination will take place in FY 2023.
- Published **Developing Robust Sustainable O2 Supply for Patients in Tajikistan** that documents the project's work with the Tajikistan MOH to procure and deliver pressure swing adsorption (PSA) systems in hospitals, oxygen cylinders, and many more commodities to create a sustainable supply of oxygen and to address systemic gaps in oxygen management.
- Presented three posters at the International Conference on AIDS and STIs in Africa: 1) Strengthening HIV Viral Load Laboratory Supply Chains and Network Performance through a Sustainable, Replicable, Data-driven Approach , 2) Quality Management Improvement Approach in Rwanda, and 3) Approaches applied to ensure essential HIV services during COVID-19 in Ethiopia.
- Hosted a digital webinar on DRFs in Nigeria and the role of sustainable financing in building resilient supply chains. The Drug Revolving Fund Playbook, containing lessons learned from implementing DRFs across Nigeria, was launched at this webinar. The webinar was broadcast on LinkedIn Live and has been viewed over 1,000 times, generating 190 engagements and 1,855 impressions.

Other Global Collaboration

Building on the extensive adoption of the QAT within USAID, PEPFAR, and PMI programs, GHSC-PSM engages multiple other health supply chain partners and stakeholders to build an even broader user base for QAT. In FY 2022, the project continued discussions with UNICEF and USAID's BHA and secured additional funding from BHA to co-design and execute a pilot in three to five countries. (For more details, see section C2.)

Country collaboration

GHSC-PSM collaborated with Against Malaria Foundation (AMF) in **Guinea, Nigeria, and Zambia,** to deliver or distribute AMF-procured LLINs to the designated locations. The project managed quality assurance/quality control for the AMF-procured LLINs in Guinea and Nigeria.

In **Zambia,** GHSC-PSM collaborated with USAID's eSCMIS project to develop analytics for supply chain decision making. This collaboration will increase reporting rates, data quality, and champion data use for decision making at all levels of the supply chain. For more information, see section B1 HIV/AIDS.

Collaboration With Other USAID GHSC Projects

GHSC-PSM is a member of the GHSC program family and interacts regularly with the other GHSC projects.

In particular, GHSC-PSM collaborates with GHSC-QA to share information, identify mutual challenges and solutions, and ensure QA requirements are incorporated into GHSC-PSM systems. Furthermore, GHSC-PSM collaborates with GHSC-QA to streamline and optimize QA and QC business processes and procedures to rapidly address any incidents and product failures as they occur, ensuring quality products reach the end consumer.

- Identified areas for process and communication improvements among the project, suppliers, and GHSC-QA in reporting quality incidents, more specifically, related to transport of temperature-controlled products and reporting of incidents related to temperature excursions.
- Worked with GHSC-QA to streamline and optimize lab commodity procurement from local eligible suppliers.
- Worked with GHSC-QA to provide input and support toward COVID-19–related commodity procurement.
- Worked with GHSC-QA in FY 2020 to create standardized DBS kits. In Q4, GHSC-PSM delivered the first shipments of these new standardized kits following GHSC-QA quality validation.
- Coordinated with GHSC-QA and USAID to manage a VMMC kit supplier in Africa with recurring quality issues, and implemented CAPAs to ensure quality requirements are maintained.
- After successful collaboration with GHSC-QA in Q3 on finalizing QA reviews, completed an audit of local wholesalers in DRC, Malawi, and Mozambique in Q4.
- In collaboration with USAID/Washington and GHSC-QA, finalized the essential medicines formulary in Q4, based on the Essential Medicines Product List review in Q3.
- Visited nine ARV manufacturers in India in Q4, joined by members of USAID and GHSC-QA.

Annex A. COVID-19 Response

In Q4, the project delivered more than **28 million** COVID-19 commodities to **seven countries** approved for American Rescue Plan Act (ARPA) funding, including COVID-19 **RTKs, N95 face masks, and disposable syringes.** The project placed orders for COVID-19 commodities for **nine countries**, including more than **4.1 million line items of oxygen equipment, vaccine administration supplies, and PPE to be delivered in FY 2023**.

In Q4, the project placed orders for **26 lines of oxygen consumables and durables** (including feeding tubes, pulse oximeters, and automatic voltage regulators) for Kenya. By the end of Q4, the project had **delivered three order lines of oxygen consumables and durables** to Mozambique and Tajikistan.

In FY 2022, the project delivered more than **35 million** COVID-19 commodities to **ten countries** approved for ARPA funding. The project also delivered **125 lines oxygen of consumables and durables, 4 pressure swing adsorption systems (PSA), and 609,756 cubic feet of oxygen** to **six countries**. The project's work on ventilator support continued as **6,813 ventilator support commodities** (including non-invasive ventilation helmets and cardiovascular ultrasound systems) were delivered to Italy.

Global Procurement and Logistics

COVID-19 Test-to-Treat Program

In FY 2022, GHSC-PSM received funding to support the COVID-19 Test-to-Treat Program for 10 countries: Bangladesh, Botswana, Côte d'Ivoire, El Salvador, Ghana, Lesotho, Malawi, Mozambique, Rwanda, and Senegal. In Q4, GHSC-PSM worked with implementing partners in El Salvador to place an order for COVID-19 RTKs under this program.

In collaboration with the GHSC-QA, GHSC-PSM initiated negotiations with two suppliers to begin procurement of WHO-prequalified COVID-19 therapeutics.

COVID-19 and the Global Supply Chain

In Q4, GHSC-PSM worked on the following **global supply chain** activities to manage and respond to COVID-19.

Procurements Under COVID-19 ARPA

Under ARPA funding, GHSC-PSM is procuring cold chain supplies, cold chain equipment, bulk liquid oxygen, diagnostic tests, general patient care commodities, laboratory consumables, essential medicines, and PPE, along with a limited range of critical COVID-19 commodities for countries requiring emergency supplies, establishing a virtual stockpile of COVID-19 commodities, and providing related technical assistance.

COVID-19 stockpile. In Q4, the project fulfilled seven country orders from the RTK and PPE stockpiles. By the end of Q4, GHSC-PSM had allocated 882,575 COVID-19 RTKs from the RTK stockpile to four countries: Haiti, Honduras, Tunisia, and Ukraine. The project earmarked approximately 3,228,792 products for delivery from the PPE stockpile to four countries: Afghanistan, Haiti, Honduras, and Panama. Products available in the PPE stockpile include surgical gowns, barrier gowns, coveralls, examination gloves, face shields, and face masks. These products are held at the supplier warehouses at no risk to the project and made available within seven calendar days of PO issuance.

In Q4, the project placed orders for nine countries for delivery in FY 2023 following a comprehensive analysis and quantification process conducted by the respective GHSC-PSM country teams, to meet in-country needs within country-specific funding envelopes:

- **El Salvador:** 17,000 COVID-19 RTKs
- **Panama:** 1,200,000 examination gloves, and 100,000 N95 face masks
- **Pakistan:** 480 COVID-19 detection tests, 400 Mycobacterium tuberculosis detection tests
- **Honduras:** 111,624 surgical gowns, 12,120 plastic face shields, 333,750 surgical face masks, 148,900 examination gloves, 338,000 surgical gloves, 51,200 bouffant caps, 34,000 N95 face masks, 8,612 protective goggles, 12,000 shoe covers, 2,000 liters of antibacterial hand soap, 7,600 liters of hand sanitizer
- **Mozambique:** 290 water purifier and distiller units, 491 oxygen hose sets, 300 pentaflow splitters, 300 10-liter oxygen concentrators and spare parts kits, 300 oxygen hoses, and 1,100 medical oxygen cylinders
- **Namibia:** 300,000 surgical gloves

- **Haiti:** 100,000 COVID-19 RTKs, 400,000 examination gloves, 300,000 surgical face masks, 50,000 plastic face shields, 100,080 N95 face masks
- **Tunisia:** 150,000 COVID-19 RTKs
- **Ukraine**: 402,200 COVID-19 RTKs

In Q4, GHSC-PSM supported bulk liquid oxygen (LOX) projects in Botswana and Namibia. The project executed a contract with one GHSC-QA qualified and eligible South African supplier of LOX to facilitate the supply of bulk LOX to eight hospitals in Namibia. GHSC-PSM is establishing a project charter with the Mission and MOH in Botswana for three hospitals located in Francistown and Masunga. GHSC-PSM is establishing a project charter with the Mission and MOH in Botswana for three hospitals located in Francistown and Masunga. The scope of work will include installing vacuum insulated evaporators with tank telemetry systems for level and pressure monitoring and cylinder manifold systems to ensure the supply of oxygen is met during normal and peak consumption at each hospital. GHSC-QA is finalizing supplier eligibility and quality assurance review while GHSC-PSM evaluates the proposal for the equipment and supply of bulk LOX.

In Q4, GHSC-PSM delivered critical medical supplies and equipment to seven countries across South East Asia and Africa:

- **Botswana:** 24,125 coveralls
- **Lesotho:** 4,1000 pediatric bag valve masks, 70 oxygen analyzers, 100 neonatal laryngoscopes, 2,050 neonatal pulse oximeters, 20,000 pediatric nasal cannulas, 2,000 flowmeters, 40,000 adult nasal catheters, 200 nebulizers, 3,000 nasogastric tube holders, 45 intravenous infusion pumps, 50 air-oxygen blenders, 900 infant resuscitation masks, and 900 infrared thermometers
- **Madagascar:** 150,000 examination gloves, 10,000 face shields, 424,000 face masks, 50,000 bouffant caps, 30,000 barrier gowns, and 2,000 protective goggles
- **Malawi:** 14,000,000 surgical face masks, 200,000 shoe covers, 510,000 bouffant caps, 12,000 barrier gowns, 330,000 biohazard bags, 5,662,500 examination gloves, 730,000 surgical gloves, 60,000 plastic face shields, 43,200 protective goggles, 40,000 N95 face masks
- **Namibia:** 250,000 surgical face masks, 620,000 surgical gloves, 2,500 sealable bags
- **Pakistan:** 160 pentaflow splitters, 362 10-liter oxygen concentrators and spare parts kits, 159 30-liter oxygen concentrators and spare parts kits, 600 oxygen analyzers, 600 infrared thermometers, 1,600 intravenous infusion pumps, 7,000 oxygen masks, 17,000 oxygen tube connectors, 150 cardiac monitors, 1,200 nebulizers, 3,000 endotracheal tubes, 400,000 nasal catheters, 6,000 endotracheal tube introducers, 2,000 suction tubes, and 600 pulse oximeters

- **Zimbabwe:** 4,000,000 surgical face masks, 660,000 N95 face masks

Procuring consumables and durables for ventilator support. In Q4, GHSC-PSM continued work on the ventilator program, delivering one order line of replacement ventilator filters to Nepal. GHSC-PSM also placed orders for 14 line items of ventilator consumables and preventative maintenance training for biomedical engineers identified by the MOH in Mongolia.

Procuring oxygen-related commodities and providing technical assistance for their management. Supplemental oxygen is an essential, lifesaving treatment for people infected with COVID-19. As part of its global response to the pandemic, USAID tasked the project with procuring and delivering oxygen commodities, including pressure swing adsorption plants, vacuum swing adsorption plants, oxygen concentrators and cylinders, oxygen disaster manifolds, as well as consumable and durable items.

In Q4, GHSC-PSM placed orders for 26 oxygen order lines of consumable and durable items for Kenya. Items include feeding tubes, pulse oximeters, and automatic voltage regulators. By the end of the quarter, GHSC-PSM delivered the following procurements:

- **Tajikistan:** 235 flowmeter adapters
- **Mozambique:** 100 oxygen regulators, 75 flowmeter adapters

Moreover, during the reporting period, fabrication was completed for the five PSA plants for Kenya. The first unit is scheduled to ship in Q1 FY 2023. Also, the VSAs for Haiti that GHSC-PSM delivered in Q3 were successfully installed and commissioned in Q4.

Procuring, transporting, and commissioning four mobile BSL-2 laboratories and staff training. To strengthen the Pakistan public sector's diagnostic capacity for COVID-19 cases, especially in remote and hard-to-reach areas, GHSC-PSM procured four mobile BSL-2 laboratories that were delivered in Q3. The project worked in coordination with Air Filter Maintenance Service (AFMS), the lab vendor, to ensure successful handover of the mobile laboratories to the Government of Pakistan. In preparing for deployment, GHSC-PSM coordinated with the National Institute of Health (NIH), AFMS, and lab experts to draft modalities for handover, operations, safety and security, staff training, a lab manual, guidelines, SOPs, and an Enterprise Lab Solution. The project engaged consultants to develop biosafety and biosecurity guidelines and SOPs. During Q4, formal handover ceremonies organized by GHSC-PSM in conjunction with USAID were held to transition the lab to the NIH located in Islamabad and to the Sindh government. By the end of FY 2022, four BSL-2 labs were delivered to proposed sites to benefit all provinces and regions in Pakistan.

One lab is stationed at the NIH Islamabad to cover the Northern region, i.e., Islamabad Capital Territory, Gilgit Baltistan, and Azad Jammu and Kashmir, while the second lab is stationed at Karachi to

cover Sindh and Balochistan Provinces. A third lab is stationed at Peshawar to cover Khyber Pakhtunkhwa, and the fourth lab is stationed at Lahore to cover Punjab.

These mobile labs will fill Pakistan's diagnostic capacity gap by enabling real-time testing at the epicenter of outbreaks and epidemics to generate a timely response. Specifically, these labs will strengthen border surveillance against potential pandemics and endemics. Each lab has the capacity to run more than 1,000 real-time tests through polymerase chain reaction and GeneXpert machines in 24 hours.

COVID-19 In-Country Technical Assistance

Vaccine distribution and management. In Q4, GHSC-PSM worked to plan for and implement **COVID-19 case management and vaccination-related technical assistance in 23 countries** that received COVID-related funding in FY 2021 and FY 2022. Technical support varies from country to country and includes providing cold chain and ultra-cold chain storage and distribution, developing waste management plans to manage vaccine-related waste, and coordinating vaccine rollout activities by participating in various technical working groups. Efforts are underway to ensure supply chains can support large-scale vaccine distribution, and the project has specifically ramped up its work in assessing cold chain capacity in the countries it supports and identifying opportunities to strengthen the global supply chain.

In **Lesotho**, GHSC-PSM conducted data verification in the Leribe District with the MOH and Supply Chain Management Directorate on products including COVID-19–related supplies and supported forecasting and quantification of all commodities including for HIV, TB, nutrition, FP, lab, essential medicines, COVID-19 PPE, and COVID–19 vaccines. GHSC-PSM also provided support for a stock status review of COVID-19 commodities at the CMS.

In **Mozambique**, GHSC-PSM conducted supervisory visits to several provinces to brief health facility staff on COVID-19 management procedures and provide technical support in data analysis and the use of electronic management information systems (SIGLUS/SIMAM). The project conducted training and presentations on the electronic management standards and the correct storage procedures for COVID-19 vaccines. In Q4, GHSC-PSM began distributing COVID-19 vaccines throughout the country.

In **Ethiopia**, the USG, through GHSC-PSM, supported the MOH and Ethiopian Pharmaceuticals Supply Service (EPSS) in developing a distribution plan and deployment plan for more than 23.9 million doses of COVID-19 vaccines in support of the third round immunization campaign. Also, the project conducted supportive supervision in more than 600 vaccination centers to promote good safety storage, stock management, and adverse events following immunization management during the campaign. GHSC-PSM supported the EPSS in monitoring COVID-19 vaccine stock, shelf life, and temperature control. This analysis helped to facilitate the redeployment of 1.4 million doses of short-shelf-life Pfizer vaccines so that they could be used before expiration.

In **Nigeria**, GHSC-PSM continued to provide technical support to the States to facilitate the development and joint review of the COVID-19 vaccine distribution and transportation route plans. The project also provided technical assistance on vaccine handling, transport, and documentation to state and 3PL staff across 36 states and the Federal Capital Territory of Abuja.

In **Colombia**, the project provided support to 38 fixed vaccination sites in 30 municipalities in seven departments to strengthen their cold chain and supply logistics. This support included procuring and distributing over 700 units of cold chain equipment, including thermal boxes, freezers, and temperature data loggers. GHSC-PSM continued to support the MOH in revamping the national vaccines information system, PAIWEB. In FY22, the local team of technical experts working on PAIWEB resolved 49 issues flagged by the MOH in priority functional areas. In Q4, the project developed a user survey to measure the improvements brought on by PAIWEB's system upgrade (code cleaning and refinement). This survey will be administered in FY 2023.

In a concurrent activity, GHSC-PSM deployed and trained staff on a central-level warehouse management system to establish new stock-keeping information systems and synchronize them with existing systems, including PAIWEB. In Q4, the project rolled out two pilots at the sub-national level to explore the possibility of harmonizing Colombia's pharmaceutical supply chain information systems.

COVID-19 Emergency Preparedness and Response

In addition to vaccine support, country teams engaged with national government stakeholders in Q4 to assist them in responding to the COVID-19 pandemic.

- In **Burkina Faso**, GHSC-PSM provided support to the MOH with logistics to supply national laboratories with COVID-19 diagnostic commodities. The project supports the MOH in regularly dispatching COVID-19 diagnostic commodities to the seven national laboratories in Ouagadougou: National Influenza Reference Laboratory, Institute for Research in Health Sciences, Pietro Annigoni Biomolecular Research Center, National Public Health Laboratory, the Yalgado Ouedraogo University Hospital Center, the University Hospital Center of Tengandogo, and the University Hospital Center of Bogodogo.

Current Reporting Period

2022-Q4

GLOBAL HEALTH SUPPLY CHAIN PROGRAM

Procurement and Supply Management

Delivery Impact to Date

Number of ACT treatments delivered

468,256,834

Number of Couple Years Protection delivered

85,982,029

Person-years of ARV treatment delivered

20,005,785

Global Supply Chain M&E Indicator Performance

FY2022 Quarter 4, July - September 2022

Delivery (OTIF, OTD and Backlog)	Cycle Time	Quality Assurance (TO2 only)	Procurement	Registration
Supply Plan Error	Forecast Error	Supply Plan Submissions	Warehousing	Vendor Performance

HIV Complete Quarterly Results (TO1)

Malaria Complete Quarterly Results (TO2)

FP/RH Complete Quarterly Results (TO3)

MNCH & Zika Complete Quarterly Results (TO4)

USAID FROM THE AMERICAN PEOPLE

PEPFAR U.S. President's Emergency Plan for AIDS Relief

PMI U.S. PRESIDENT'S MALARIA INITIATIVE LED BY USAID FROM THE AMERICAN PEOPLE CDC

Delivery Performance

Current Reporting Period

2022-Q4

TO	Analysis
Crosscutting	Overall delivery performance has remained strong and generally consistent with the previous quarter. OTIF results increased to 90 percent, and OTD remained the same at 87 precent. The backlog has increased compared to the last quarter, from 1.2 percent to 3.7 percent of line items. Overall delivery volume has decreased slightly from last quarter. The OTD and OTIF results shown here include all applicable reason codes and illustrate performance within GHSC-PSM's manageable control. "COVID-impacted" versions of these metrics are available in the main narrative of the report, showing how pandemic factors outside of project influence continue to impact supply chain outcomes. COVID-impacted OTD for the quarter was 81 percent, and COVID-impacted OTIF was 79 percent. In both cases of OTD and OTIF, the gap between the standard result and the COVID-impacted result has narrowed, which is a positive sign. This is suggestive of a reduction in COVID-related delays for line items and orders. For further discussion of global supply chain dynamics during the pandemic, please see the main narrative of this report.
TO1 - HIV	Overall delivery performance for HIV has remained strong. OTIF results increased from previous quarter, from 83 percent to 90 percent, and OTD from 87 to 88 percent. The increase in performance is significant because the delivery volume has increased this quarter. The backlog has increased to 3.9 percent this quarter, below the target of 5 percent. The OTD and OTIF results shown here include all applicable reason codes and illustrate performance within GHSC-PSM's manageable control. "COVID-impacted" versions of these metrics are available in the main narrative of the report, showing how pandemic factors outside of project influence continue to impact supply chain outcomes. COVID-impacted OTIF for the quarter was 81 percent, while OTD was 82 percent. In the case of OTIF, the gap between the standard result and the COVID-impacted result has remained the same. At the same time, for OTD, there is a difference of 6 percentage points, suggesting that COVID-related problems continue to impact the delivery times of products which were initially planned in the current quarter. For further discussion of global supply chain dynamics during the pandemic, please see the main narrative of this report.
TO2 - Malaria	Overall delivery performance for malaria commodities continued to exceed the project's target. OTIF results decreased from 92 percent to 82 percent, while OTD results stayed at the same level as last quarter's, i.e. 87 percent. The backlog was at 1.8 percent, well below the 5 percent target. Overall, the delivery volume dropped following a peak in Q3, with 180 items delivered in this period. The OTD and OTIF results shown here include all applicable reason codes and illustrate performance within GHSC-PSM's manageable control. "COVID-impacted" versions of these metrics are available in the main narrative of the report, showing how pandemic factors outside of project influence continue to impact supply chain outcomes. COVID-impacted OTD for the quarter was 74 percent, and COVID-impacted OTIF was 63 percent. For OTD results, the gap between the standard and COVID-impact result widened by 1 percent while for OTIF results the gap decreases indicating a lower impact of COVID-related delays in this quarter. For further discussion of global supply chain dynamics during the pandemic, please see the main narrative of this report.
TO3 - FP/RH	Keeping in with the trend of last quarter, the delivery performance for family planning commodities is robust, with OTIF increasing from 90 percent to 98 percent and OTD decreasing by 1 percent point to 94 percent. The backlog increased to 2.4 percent but well below the 5 percent target. Delivery volume included 47 items delivered to the countries, in line with previous periods this year. The OTD and OTIF results shown here include all applicable reason codes and illustrate performance within GHSC-PSM's manageable control. "COVID-impacted" versions of these metrics are available in the main narrative of the report, showing how pandemic factors outside of project influence continue to impact supply chain outcomes. For OTD, there was no difference between figures impacted by COVID reason codes and standard indicators. There was a slight difference of 2 percentage points between COVID-impacted OTIF and standard OTIF. For OTD and OTIF, the gap between COVID-impacted and standard figured remained at the same level and narrowed in this quarter, respectively. For further discussion of global supply chain dynamics during the pandemic please see the main narrative of this report
TO4 - MNCH	Delivery performance for maternal and child health products was very strong for the period, at 89 percent OTIF and 100 percent OTD. Overall delivery volume was the same as the previous quarter, with only 9 items delivered. Backlogged items stood at 1.1 percent this quarter. The OTD and OTIF results shown here include all applicable reason codes and illustrate performance within GHSC-PSM's manageable control. "COVID-impacted" versions of these metrics are available in the main narrative of the report, showing how pandemic factors outside of project influence continue to impact supply chain outcomes. COVID-impacted OTIF for the quarter was 44 percent, indicating that several lines delivered in this period originally had agreed delivery dates in earlier periods, but were delayed due to COVID. Please note, there are very few line items for TO4 this quarter, which helps create this massive variation in results. For further discussion of global supply chain dynamics during the pandemic, please see the main narrative of this report.

A1a. On-time, In-Full Delivery

Task Order	Total # of Line Items Delivered	OTIF	OTIF Target
TO1 - COVID19	71	93%	80%
TO1 - HIV	1,062	90%	80%
TO2 - Malaria	180	82%	80%
TO3 - FP/RH	47	98%	80%
TO4 - MNCH	9	89%	80%
Total	**1,369**	**90%**	**80%**

A1b. On-time Delivery

Task Order	Total # of Line Items with ADDs in the quarter	OTD	OTD Target
TO1 - COVID19	92	73%	80%
TO1 - HIV	1,118	88%	80%
TO2 - Malaria	174	87%	80%
TO3 - FP/RH	51	94%	80%
TO4 - MNCH	4	100%	80%
Total	**1,439**	**87%**	**80%**

A16. Backlog Percentage

Task Order	Total # of line items with ADDs in the last 12 months	Backlog	Backlog target
TO1 - COVID19	303	7.6%	5%
TO1 - HIV	4,256	3.9%	5%
TO2 - Malaria	840	1.8%	5%
TO3 - FP/RH	208	2.4%	5%
TO4 - MNCH	92	1.1%	5%
Total	**5,699**	**3.7%**	**5%**

Delivery Performance

Current Reporting Period

2022-Q4

Task Order	A1a. OTIF rate		A1b. OTD rate		A16. Backlog percentage	
	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months
TO1 - COVID19	**93%**	**71**	**73%**	**92**	**7.6%**	**303**
COVID19	93%	71	73%	92	7.6%	303
TO1 - HIV	**90%**	**1,062**	**88%**	**1,118**	**3.9%**	**4,256**
Adult ARV	90%	62	83%	70	1.5%	333
Condoms	89%	53	86%	49	1.2%	161
Laboratory	90%	769	88%	809	4.8%	3,002
Other Non-Pharma	92%	53	91%	57	3.3%	211
Other Pharma	92%	36	93%	40	1.8%	171
Other RTK	83%	6	100%	6	0.0%	24
Pediatric ARV	88%	33	94%	33	2.8%	141
TB HIV	100%	23	100%	25	0.0%	107
Vehicles and Other Equipment					0.0%	9
VMMC	100%	27	100%	29	0.0%	97
TO2 - Malaria	**82%**	**180**	**87%**	**174**	**1.8%**	**840**
ACTs	95%	41	95%	42	0.3%	292
Laboratory	73%	33	83%	29	4.2%	118
LLINs	90%	31	94%	34	1.3%	157
mRDTs	94%	16	100%	16	2.7%	73
Other Non-Pharma	92%	13	92%	13	3.0%	33
Other Pharma					0.0%	3
Severe Malaria Meds	57%	23	52%	23	4.1%	74
SMC	100%	7	100%	7	0.0%	36
SP	56%	16	80%	10	1.9%	54

Task Order	A1a. OTIF rate		A1b. OTD rate		A16. Backlog percentage	
	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months
TO3 - FP/RH	**98%**	**47**	**94%**	**51**	**2.4%**	**208**
Combined Oral Contraceptives	80%	5	67%	6	3.8%	26
Copper-Bearing Intrauterine Devices	100%	1	100%	1	0.0%	14
Emergency Oral Contraceptives			0%	1	20.0%	15
Implantable Contraceptives	100%	17	100%	17	2.2%	45
Injectable Contraceptives	100%	13	100%	15	0.0%	63
Levonorgestrel-Releasing Intrauterine Devices	100%	1	100%	1	0.0%	1
Other Non-Pharma			100%	1	0.0%	9
Progestin Only Pills	100%	8	100%	7	0.0%	23
Standard Days Method	100%	2	100%	2	0.0%	12
TO4 - MNCH	**89%**	**9**	**100%**	**4**	**1.1%**	**92**
Other Non-Pharma	100%	4	100%	4	7.7%	13
Other Pharma	80%	5			0.0%	79

Data notes

See "Indicator Details" pages in this report for more information.

Quarterly indicator targets are effective beginning FY2018 Q4.

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.

Cycle Time Performance

Current Reporting Period

2022-Q4

A3. Average overall cycle time

Task Order	# of line items delivered	Average Cycle Time	Cycle time target	Average dwell-adjusted cycle time
TO1 - COVID19	72	221	250	221
TO1 - HIV	994	250	250	245
TO2 - Malaria	179	340	340	307
TO3 - FP/RH	46	319		315
TO4 - MNCH	9	249	350	249
Total	**1300**	**263**		**254**

A3. Average overall cycle time (with TO3 Targets)

Task Order	# of line items delivered	Average Cycle Time	Cycle time target	Average dwell-adjusted cycle time
TO3 - FP/RH	**46**	**319**		**315**
Direct drop fulfillment	21	392	300	383
Warehouse fulfillment	25	258	250	258

See next page for break downs by process segment, product category, fulfillment channel, and transportation mode

TO	Analysis
TO1 - HIV	End-to-end cycle time for HIV/AIDS commodities decreased this quarter, to 250 days, at exactly the target. Dwell-adjusted cycle time was 245 days. This quarter saw a decrease in the Clarify and Pick Up and Deliver segments' cycle time, but an increase in the cycle time for Manufacture and Sourcing and Planning. Distribution orders had a longer cycle time of 268 days (266 dwell-adjusted), but only accounted for 3 percent of orders this quarter, while the other 97 percent were purchase orders, which had an average cycle time of 249 days (244 dwell-adjusted). The average dwell duration this quarter was 83 days, and 63 line items had holds applied, 26 of which were routed to the DRC.
TO2 - Malaria	End-to-end cycle time for malaria commodities increased from last quarter to 340 days, exactly at the target. Dwell-adjusted cycle times also increased this quarter, for a cycle time of 307 days. There were significant increases in the cycle time for both the Manufacture and the Sourcing and Planning segments, but decreases in both the Pick Up and Clarify segments. Distribution orders had a shorter cycle time this quarter, 168 days for both standard and dwell-adjusted, but only accounted for 6 percent of orders, while the other 94 percent were purchase orders, which had an average cycle time of 352 days (316 dwell-adjusted). 87 line items had holds applied this quarter, with an average dwell duration of 71 days. The most common holds this quarter were: RO held at the supply planning stage, RO held at the tech package stage, and RO held at the Pre-RFx/Pre-allocation stage. Across all malaria countries, ACTs accounted for almost a fourth of all products ordered, and had a cycle time of 285 days (262 dwell-adjusted).
TO3 - FP/RH	End-to-end cycle times for family planning products remained relatively consistent this quarter. For warehouse fulfillments, the cycle time remained consistent at 258 days, for both standard and dwell-adjusted times. Cycle times for direct drop fulfillments increased to an average of 392 days, with the dwell-adjusted cycle time also increasing to 383 days. Two of the purchase order line items had holds applied this quarter, for an average dwell duration of 94 days. DRC had the longest cycle time of any country for direct drop fulfillments, of 715 days. The DRC orders with these long cycle times were for implantable contraceptives, with some orders placed two years ago and filled this quarter. The procurement process for implantable contraceptives requires that countries place orders as early as possible so they can be in the queue for receipt of the product, hence the longer cycle times. Countries are placed in a queue order determined by a consensus planning group. Kenya, Ghana, and Rwanda all had dwell adjusted cycle times of over 400 days this quarter, as well. Kenya and Rwanda also had longer cycle times due to the procurement process for implantable contraceptives. Rwanda had another order for hormonal IUDs, which had a long cycle time; however, the country requested delivery date was met. Ghana and Senegal's orders with long cycle times were for social marketing combined oral contraceptives (SM COCs). These orders for SM COCs with the iron placebo were the last call for orders. Ghana and Senegal placed orders for the COCs far in advance and Senegal's requested delivery date was met. Implantable contraceptives accounted for the largest portion of line items across all country direct drop fulfilments this quarter, and averaged a cycle time of 570 days (557 dwell-adjusted).
TO4 - MNCH	Cycle times for maternal and child health decreased to an average of 249 days this quarter, both standard and dwell-adjusted. Because of how few maternal and child health products are delivered each quarter, the cycle time is incredibly variable, greatly impacted by individual line items. This quarter saw a decrease in almost every cycle time segment except for Clarify and Source, which had an increase. No line items had holds applied this quarter. Other pharma accounts for over half of line items for MNCH products and had an average cycle time of 166 days this quarter, both standard and dwell-adjusted.

Data notes

Data on overall cycle start and end dates are complete for all line items delivered this quarter. However, internal milestone data may not be complete for some line items. 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, especially in earlier reporting periods.

Overall cycle time is defined as the number of days between when a customer order is submitted to when the shipment is actually delivered to the customer, inclusive of the start/end days and all holds or other dwell times. Dwell-adjusted cycle time is defined as the overall cycle time with all days of measurable dwell time deducted. Dwell is measured using system timestamps for the start and end for a set of acceptable holds, as defined by the GHSC-PSM hold status policy.

Quarterly indicator targets are set for end-to-end cycle times. Targets are not set for individual segments or dwell-adjusted cycle time.

Cycle Time Performance

Current Reporting Period

2022-Q4

A3. Average overall cycle time by product group, fulfillment channel, and transportation mode (TO1, TO2, and TO3)

Fulfillment Channel	Direct Drop Fulfillment			Warehouse Fulfillment			Total
Task Order	Air	Land	Sea	Air	Land	Sea	
TO1 - COVID19	**218**	**173**	**230**				**221**
COVID19	218	173	230				**221**
TO1 - HIV	**237**	**253**	**305**	**248**	**248**	**302**	**250**
Adult ARV	218		271	130	248	235	**231**
Condoms			308	303		471	**320**
Laboratory	233	255	353				**242**
Other Non-Pharma	289	231	273				**254**
Other Pharma	326	266	234				**289**
Other RTK	334						**334**
Pediatric ARV	190		229	250			**209**
TB HIV	296		397	310			**328**
VMMC	126		320				**275**
TO2 - Malaria	**320**	**290**	**365**	**43**		**180**	**340**
ACTs	190		304			196	**285**
Laboratory	341		437				**364**
LLINs		290	352				**338**
mRDTs			336				**336**
Other Non-Pharma	342		434				**380**
Severe Malaria Meds			430				**430**
SMC				43		170	**152**
SP	169		393				**365**
TO3 - FP/RH	**443**		**346**	**224**		**271**	**319**
Combined Oral Contraceptives			397			305	**360**
Copper-Bearing Intrauterine Devices						292	**292**
Implantable Contraceptives	577		549	239		217	**399**
Injectable Contraceptives	165		252			310	**272**
Levonorgestrel-Releasing Intrauterine Devices	293						**293**
Progestin Only Pills				203		251	**233**
Standard Days Method	253						**253**

A3. Average overall cycle time by product group, fulfillment channel, and transportation mode (TO4)

Fulfillment Channel	Direct Drop Fulfillment			Total
Product Category	Air	Land	Multiple	
Other Non-Pharma	353			**353**
Other Pharma		65	569	**166**
Total	**353**	**65**	**569**	**249**

Data notes

Data on overall cycle start and end dates are complete for all line items delivered this quarter. However, internal milestone data may not be complete for some line items. 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, especially in earlier reporting periods.

Overall cycle time is defined as the number of days between when a customer order is submitted to when the shipment is actually delivered to the customer, inclusive of the start/end days and all holds or other dwell times. Dwell-adjusted cycle time is defined as the overall cycle time with all days of measurable dwell time deducted. Dwell is measured using system timestamps for the start and end for a set of acceptable holds, as defined by the GHSC-PSM hold status policy

Quarterly indicator targets are set for overall end-to-end cycle times. Targets are not set for individual segments or dwell-adjusted cycle time.

Average cycle times by process segment

Fulfillment channel	Clarify and Source	USAID Approval	Process PO/DO	Manufacture/Prepare and Pick Up Order	Manufacture	Pick Up	Deliver
Direct drop fulfillment	**65**	**4**	**48**		**97**	**38**	**38**
TO1 - COVID19	38	1	49		7	53	59
TO1 - HIV	54	4	50		109	32	27
TO2 - Malaria		3	36		82	42	61
TO3 - FP/RH		15	31		131	46	45
TO4 - MNCH	81	4	51		28	149	62
Warehouse fulfillment	**52**	**4**	**86**	**49**	**6**	**32**	**56**
TO1 - HIV	44	3	129	51	4	40	40
TO2 - Malaria		2	8	38	14	8	86
TO3 - FP/RH		7	54	51	0	42	67
Total	**64**	**4**	**50**	**109**			**40**

Quality Assurance Performance (TO2 only)

Current Reporting Period

2022-Q4

A2. QA processes completed within required lead times

Task Order	Total # of QA processes completed	% QA Processes On Time	A2 Target
TO2 - Malaria	**57**	**88%**	**80%**
ACTs	17	82%	80%
LLINs	8	100%	80%
mRDTs	10	100%	80%
Other Pharma	3	67%	80%
Severe Malaria Meds	14	93%	80%
SMC	0		80%
SP	5	60%	80%

A13. Out-of-specification percentage

Task Order	Total # of batches tested	Out-of-specification percentage	A13 Target
TO2 - Malaria	**167**	**0.6%**	**1%**
ACTs	37	0.0%	1%
LLINs	23	4.3%	1%
mRDTs	37	0.0%	1%
Other Pharma	2	0.0%	1%
Severe Malaria Meds	61	0.0%	1%
SMC	0		1%
SP	7	0.0%	1%

Data notes

All QA activities for TO2 are conducted by GHSC-PSM. All QA activities for TO1, TO3, and TO4 are managed by the USAID GHSC-QA contract. GHSC-QA may be contacted for data related to these TOs.

Exceptional procedures outside of routine QA testing and clearance are excluded from indicator A2. This includes consignments requiring QA investigations, method transfers, non-PMI procurements, post-shipment quality control, and LLIN shipments requiring witnessing of loading and/or sealing of goods.

Quarterly indicator targets are effective beginning FY2018 Q4.

A15. QA investigation report submission (Q2 & Q4 only)

Task Order	# of reports due	Report submissions	A15 Target
TO2 - Malaria	**1**	**100%**	**90%**
ACTs	0		90%
LLINs	1	100%	90%
mRDTs	0		90%
Other Non-Pharma			
Other Pharma	0		90%
Severe Malaria Meds	0		90%
SMC	0		90%
SP	0		90%

Ref	Analysis
A02	A total of 88 percent of QA/QC processes were completed within the required lead times. This quarter had a slight decline in comparison with previous quarters, but achieving well above the target of 80 percent. There was a decrease in both severe malaria medicines and SP. SP was the only product group with QA processed outside of the estimated QA lead times scoring below the target, which performed at 60 percent, due largely to the small number of shipments in total requiring QA processes this quarter (five). With COVID-19 transactions included, the result remains the same, having no impacted transactions this quarter.
A13	Out of specification findings fell this quarter to 0.6 percent of batches tested, below the target of 1 percent, recovering from last quarter. Only one batch of product was rejected due to not-assured quality in only one category (LLINs).
A14b	The vendor scorecard rating for lab service providers this quarter was 94 percent, remaining relatively consistent with the previous quarter. Scores were high across the board, as well, with responsiveness and invoice accuracy scoring 100 percent, completeness and reliability scoring 95 percent and 92 percent respectively, and service scoring 88 percent. Reliability and completeness had the only decreases in score this quarter, while invoice accuracy remained the same, and responsiveness and service saw increases in scoring.
A15	Only one report was due for issuance this quarter. The target of 90 percent was met by submitting the investigation report on time.

Warehouse Performance and Product Losses

Current Reporting Period

2022-Q4

C7a and C7b. Product loss due to expiry, theft, damage and other causes while in GHSC-PSM control

Task Order	Country	Type of Loss	Product Group	Loss Value	Loss Denominator	% Loss
TO1 - HIV	Malawi	Damage	ARVs	$557	$1,258,720	0.04%
TO1 - HIV	Nigeria	Damage	ARVs	$550	$15,884,398	0.00%
TO1 - HIV	Kenya	Damage	Laboratory	$618	$6,103,292	0.01%
TO1 - HIV	RDC	Expiry	Adult ARVs	$19,794	$16,976,214	0.12%
TO3 - FP/RH	RDC	Expiry	NA	$0	$7,634,929	0.00%
TO1 - HIV	DRC	Other	Lab	$73,308	$13,300,355	0.55%

A8. Shelf life remaining

Task Order	Inventory Balance	% Shelf Life Remaining	Shelf life target
TO1 - HIV	$7,199,409	81%	80%
TO2 - Malaria	$0		70%
TO3 - FP/RH	$5,170,083	85%	80%
Total	**$12,369,492**	**83%**	

Ref	Task Order	Analysis
A08	TO1 - HIV	At the close of the quarter, the weighted average shelf life remaining for HIV/AIDS commodities at the RDC fell to 81 percent, which was a drop of approximately 6 percentage points from last quarter. The ARV product category exceeded 80 percent. The predominant product in the RDC has been TLD90 and Tenofovir/Emtricitabine, both of which have robust shelf lives. These products move quickly, and most of the other products under TO1 have already been allocated to destination countries.
A08	TO2 - Malaria	There was zero usable malaria stock on hand at the end of this quarter. Therefore, no shelf life figure is reported.
A08	TO3 - FP/RH	Weighted average shelf life remaining for family planning products has increased to 85 percent in FY22 Q4, with all product categories exceeding the 80 percent target. The main products stored in RDCs are 2-rod implants and the microlut tablets. These products normally have high demand but limited supply, so procurements are made in anticipation of the demand to prevent any gaps in fulfillment of orders.
C07a	TO1 - HIV	The RDCs experienced expiries of adult ARVs this quarter. The total value of expired ARVs amounted to $19,794. The expired amount was a significant reduction from last quarter's figure of $42,731. The expired ARV product is Darunavir 75 mg, which was procured based on a technical direction memo; however, there was no follow-up demand, which resulted in expiry of the product. The expiries represented less than 1 percent of the overall HIV inventory.
C07a	TO3 - FP/RH	There were no expiries of family planning products in GHSC-PSM's RDC inventory this quarter.
C07a	TO2 - Malaria	There were no expiries of malaria products in GHSC-PSM's RDC inventory this quarter.
C07b	Crosscutting	The project reported four instances of product loss. One of them was a loss in Democratic Republic of Congo pertaining to a shipment of HIV/AIDS laboratory items. The product was not approved by the local authorities due to low shelf life. This loss represented less than one percent of the value of the HIV products delivered in DRC during the period. The project reported a few other instances of damage occurring during transit through the global supply chain, which affected relatively small proportions of GHSC-PSM's order volume. These types of losses are typical for large supply chain operations. No losses this quarter exceeded 1 percent of the value of commodities shipped for the task order in the quarter of the loss.

Data notes

Average inventory balance (A4 and C7a denominator) is calculated using the ending balance at the close of each month.

Expired inventory is excluded from shelf life calculations (A8). It is reported under product loss.

Quarterly indicator targets are effective beginning FY2018 Q4. Per the project M&E plan, no targets are required for product loss indicators (C7a and C7b).

Task Order 1 inventory includes all condoms. GHSC-PSM does not hold any inventory for Task Order 4.

Procurement Performance

Current Reporting Period

2022-Q4

A10. Framework contract percentage

Task Order	Procurement total	Framework contract percentage	Framework contract target
TO1 - COVID19	$4,212,791	50%	
TO1 - HIV	$52,050,819	88%	90%
TO2 - Malaria	$31,308,128	100%	90%
TO3 - FP/RH	$7,978,192	100%	95%
TO4 - MNCH	$146,092	100%	85%
Total	**$95,696,023**	**91%**	**NA**

A10. Product-level detail

Task Order	Framework contract percentage	Procurement total
TO1 - COVID19	**50%**	**$4,212,791**
COVID19	50%	$4,212,791
TO1 - HIV	**88%**	**$52,050,819**
Adult ARV	100%	$16,230,092
Condoms	100%	$3,932,454
Laboratory	72%	$20,666,487
Other Non-Pharma	13%	$566,035
Other Pharma	100%	$2,098,949
Other RTK	0%	$183,433
Pediatric ARV	100%	$5,780,843
TB HIV	100%	$425,054
VMMC	100%	$2,167,473
TO2 - Malaria	**100%**	**$31,308,128**
ACTs	100%	$9,492,300
Laboratory	87%	$146,046
LLINs	100%	$8,954,797
mRDTs	100%	$1,922,200
Other Pharma	100%	$30,970
Severe Malaria Meds	100%	$622,860
SMC	100%	$9,701,315
SP	100%	$437,640

A10. Product-level detail

Task Order	Framework contract percentage	Procurement total
TO3 - FP/RH	**100%**	**$7,978,192**
Combined Oral Contraceptives	100%	$1,333,498
Implantable Contraceptives	100%	$1,592,812
Injectable Contraceptives	100%	$4,862,882
Progestin Only Pills	100%	$189,000
TO4 - MNCH	**100%**	**$146,092**
Other Pharma	100%	$146,092

Task Order	Analysis
TO1 - HIV	Use of framework agreements for HIV/AIDS products fell slightly to 88 percent in FY22 Q4, just below the framework contract target. This decrease was due to a decrease of framework contract use in laboratory products and other non-pharma products. All other products maintained Q3's framework contract percentage. Laboratory products remained the largest category (in terms of number of products) using non-framework contracts, for consumables, equipment, reagents, and other lab products. Condoms, adult ARVs, other pharma, pediatric ARVs, TB HIV, and VMMC products each had framework contract percentages of 100 percent.
TO2 - Malaria	Malaria procurements remained above the target, at 100 percent utilization of framework contracts this quarter. This slight increase is primarily due to LLINs which had an increase in framework contract usage, from 95 to 100 percent. Laboratory products did have a slight increase in the use of non-framework contracts this quarter, but it accounts for less than 1/1,000 of the total amount of TO2 products, so it is not impactful in the total utilization score for malaria framework contract usage. Additionally, ACTs, mRDTs, other pharma, severe malaria medicines, SMC, and SP all have made full use of framework agreements this quarter.
TO3 - FP/RH	Family planning continues to procure all items under framework contracts, per the sourcing strategy for these commodities.
TO4 - MNCH	There were only two orders for maternal, child, and newborn health commodities released this quarter, both other pharma: one for Amoxicillin in Zambia and one for Gentamicin for the DRC. All orders were framework contract orders, accounting for around $146,000 combined.

Data notes

Procurement totals are equal to the total value of all line items procured from vendors each period. This includes Purchase Orders and warehouse Replenishment Orders. Distribution Orders released from the RDCs to countries are not counted, as these quantities are already included when the items are first purchased as Replenishment Orders.

Framework contracts include indefinite 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 orders.

Commodities are considered "purchased" if the "PO Released for Fulfillment Date" in ARTMIS falls within the reporting period.

Registration Waivers

A7. Temporary registration waiver percentage

Task Order	Temporary registration waiver percentage	Total # of line items delivered
TO2 - Malaria	**12.7%**	**181**
ACTs	9.8%	41
Laboratory	0.0%	33
LLINs	16.1%	31
Severe Malaria Meds	8.3%	24
mRDTs	37.5%	16
SP	37.5%	16
Other Non-Pharma	0.0%	13
SMC	0.0%	7
TO3 - FP/RH	**10.6%**	**47**
Implantable Contraceptives	17.6%	17
Injectable Contraceptives	7.7%	13
Progestin Only Pills	12.5%	8
Combined Oral Contraceptives	0.0%	5
Standard Days Method	0.0%	2
Copper-Bearing Intrauterine Devices	0.0%	1
Levonorgestrel-Releasing Intrauterine Devices	0.0%	1
Total	**12.3%**	**228**

Task Order	Analysis
TO2 - Malaria	The project required registration waivers for about 13 percent of line items delivered in FY2022 Q3. Waivers were spread across product categories (RDTs, LLINs, and all pharmaceutical categories) and eight countries. In all instances where waivers were required for LLINs or ACTs, the necessary registrations for the destination countries are currently in progress.
TO3 - FP/RH	The project used registration waivers for 11 percent of family planning deliveries this quarter, consistent with the previous quarter. This represented five line items. One item was for Angola, which does not have a registration authority at present. One was progestin-only pills for Mozambique, which is typically imported under a waiver due to lack of Portuguese-language labeling for the product. Two items (MPA-IM and two-rod implants) required waivers for Haiti, and one (one-rod implants) was required for Rwanda.

Supply Plan Submissions

Current Reporting Period

2022-Q4

B6. Quarterly supply plan submission rate to GHSC-PSM HQ

Product Group	# of supply plans required	Supply plan submission rate	Submission target
	1	100%	
ARVs	21	100%	95%
Condoms	21	90%	90%
FP commodities	24	92%	95%
Lab (HIV diagnostics)	15	100%	90%
Malaria commodities	27	100%	90%
RTKs	19	100%	90%
TPT	14	100%	85%
VMMC	5	80%	80%
Total	**147**		

Task Order	Analysis
TO1 - HIV	Submission rates for HIV supply plans have remained strong across product groups, with 100 percent submissions on ARVs, Lab and TPTs and RTKs.
TO2 - Malaria	Malaria supply plans submissions increased to 100 percent this quarter.
TO3 - FP/RH	Supply plan submissions for family planning commodities and condoms remained strong this quarter, with 92 percent of supply plans submitted for family planning commodities, missing two supply plans under family planning and one under condoms.

Supply Plan and Forecast Performance

Current Reporting Period

2022-Q4

A6a. Supply plan error - HIV Products

Product Category	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	Annual APE Target	4-quarter bias
Adult ARV	26%	-26%	16%	22%	-16%
Condoms	5%	-5%	30%	25%	30%
Laboratory	12%	12%	19%	25%	19%
Pediatric ARV	45%	45%	3%	30%	3%

A6a. Supply plan error - Malaria products

Product Category	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	Annual APE Target	4-quarter bias
ACTs	32%	32%	45%	35%	45%
mRDTs	249%	-249%	9%	25%	9%

A6b. Forecast error - Family Planning products

Product Category	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	Annual APE Target	4-quarter bias
Combined Oral Contraceptives	20%	20%	11%	35%	11%
Copper-bearing Intrauterine Devices	7%	7%	48%	35%	-48%
Implantable Contraceptives	15%	15%	13%	25%	-13%
Injectable Contraceptives	10%	10%	0%	25%	-0%
Progestin Only Pills	0%	0%	12%	25%	12%

Task Order	Analysis
TO1 - HIV	Forecast error for condoms decreased to 5 percent for the quarter from last quarter's 45 percent, due to a slight overplanning, recovering from the previous three quarters' issues with underplanning. Burkina Faso placed a short order of condoms this quarter, and there was one reduction in the quantity of condoms ordered for Ghana due to funding constraints. The rolling four quarters supply plan error also decreased to 30 percent this quarter, nearing the 25 percent target.
TO1 - HIV	Supply plan error for adult ARVs has widened this quarter, to 26 percent, from Q3's 13 percent, due to overplanning. In Q4, variance can be accounted for by one large order of over 700,000 units that was not placed. The four quarter metric remained consistent at 16 percent. For pediatric ARVs, supply plan error increased greatly to 45 percent for the quarter, from last quarter's 9 percent, due to underplanning. This error can be accounted for by three large orders from Nigeria, Uganda, and Zambia that were unplanned, accounting for 337,000 units. The pediatric ARV four quarter metric remained low at 3 percent this quarter.
TO1 - HIV	Supply plan error for lab commodities narrowed this quarter, as compared to Q3, from 46 percent to 12 percent. CD4, VL, molecular products, and other products were generally underplanned this quarter, recovering from last quarter's overplanning trend. EID, however was overplanned, due mostly to Zambia ordering about half of what the country had planned, having planned for 12,700 and ordering 6,500. The rolling four quarters metric increased slightly to 19 percent, still falling within the goal of 25 percent.
TO2 - Malaria	Supply plan error for ALs decreased this quarter to 37 percent, a recovery from the last three quarters, while still having some significant underplanning. For Q4, countries struggled with planning according to their need. Many countries planned to procure mRDTs for Q4, but had to scale down or delay their procurements based on consumption, and therefore overforecasted their RDT needs by 249 percent, a reduction from last quarter's 283 percent. Many of the intended orders were shifted to the quarter and to the beginning of FY23. The rolling four quarters metric for mRDTs decreased to 8 percent this quarter. For ASAQ, on the other hand, the forecasted quantity was exactly what was delivered this quarter, having a forecast error of 0 percent. Among ACT products, ASAQ had previously been a challenging commodity as countries adjusted to changing consumption trends, but it seems countries have made the necessary adjustments to their expected ACT consumption, stabilizing both the ASAQ forecast error and reducing the AL forecast error this quarter. The rolling four quarters metric for ASAQs decreased to 22 percent this quarter in reflection of this recovery, but the AL metric rose slightly to 56 percent this quarter, due to the exclusion of FY21 Q4 from the metric, which had an error of only 1 percent that quarter. TO2 will reiterate to countries to do routine evaluations of consumption and make adjustments to their supply plans as more comsumption data becomes available.
TO3 - FP/RH	Forecast errors for implants decreased from the previous quarter's 27 percent to 15 percent in Q4, which also slightly decreased the rolling four quarters metric to 13 percent. Benin, Burkina Faso, and Cote d'Ivoire each placed an order with short lead times, impacting the forecast error. The forecast error for injectable contraceptives also decreased this quarter to 10 percent, and the four quarter rolling metric decreased to 0 percent. Combined oral contraceptives had an increase in forecast error, to 20 percent this quarter, due mostly to two orders placed by Burkina Faso with short lead times. The rolling four quarters supply plan error has recovered from past quarters and remains relatively consistent at 11 percent. Progestin-only pills saw an extremely low error this quarter, at less than 1 percent for the second quarter in a row, which also slightly lowered the four quarters metric to 12 percent. Lastly, copper-bearing IUDs had a strong performance this quarter with an error of 7 percent, and saw an increase in the rolling four quarters metric to 48 percent due to the small number of orders having a large impact on the rolling metric.

Total Landed Cost

Current Reporting Period

2022-Q4

A5. Total Landed Costs

Task Order	Total Landed Cost (Freight and Logistics)	TLC Target	Delivery Total	Total Landed Cost (Freight, Logistics, and HQ Operations)
TO1 - HIV	7.7%	10%	$575,822,887	12.6%
TO2 - Malaria	22.4%	18%	$193,478,852	26.0%
TO3 - FP/RH	10.1%	22%	$45,213,169	19.7%
TO4 - MNCH	10.6%	14%	$7,080,203	20.5%
Total	**11.3%**	**12%**	**$821,595,111**	**16.2%**

A5. Cost Breakdown

Cost Type	TO1 - HIV	TO2 - Malaria	TO3 - FP/RH	TO4 - MNCH	**Total**
Freight and Logistics	**$44,232,027**	**$43,374,323**	**$4,564,042**	**$751,149**	**$92,921,541**
Country-specific Logistics	$1,612,131	$440,167	($116,558)	$7,075	**$1,942,815**
Demurrage	$487,490	$562,639	$162,020	$6,367	**$1,218,516**
Drop Ship Freight	$30,441,421	$41,257,917	$2,506,937	$723,036	**$74,929,311**
Inbound Freight	$1,787,126	$105,871	$268,157	$0	**$2,161,154**
Insurance	$2,130,341	$362,647	$6,876	$14,614	**$2,514,478**
Loss	$17,218	$0	$0	$0	**$17,218**
Outbound Freight	$6,163,632	$409,430	$1,332,929	$0	**$7,905,991**
Security	$223,718	$119,929	$0	$57	**$343,704**
Warehousing	$1,368,950	$115,723	$403,681	$0	**$1,888,354**
HQ Operations	**$28,415,249**	**$6,868,145**	**$4,347,436**	**$700,805**	**$40,331,635**
Forecasting and Supply Planning	$1,645,415	$791,897	$621,355	$12,484	**$3,071,151**
GS1	$1,163,439	$393,950	$22,817	$38,739	**$1,618,945**
MIS	$3,478,208	$643,692	$638,877	$85,608	**$4,846,385**
Monitoring and Evaluation	$5,070,909	$1,242,968	$739,159	$142,915	**$7,195,951**
Procurement	$15,585,740	$3,548,009	$2,246,767	$388,713	**$21,769,229**
Warehousing and Distribution	$1,471,538	$247,629	$78,461	$32,346	**$1,829,974**
Total	**$72,647,276**	**$50,242,468**	**$8,911,478**	**$1,451,954**	**$133,253,176**

Analysis

HIV: This period, freight and logistics costs as a percentage of dollar value delivered for HIV and COVID-19 commodities remained consistent, at 7.7 percent. The value of commodities delivered was similar to the previous period, with a slight increase in expenditures in the freight category of drop ship, and slight declines in almost all other categories. When headquarters supply chain operations cost are factored in, the total landed cost result has increased slightly, to above 12 percent. Headquarters expenditures have increased this period, most notably in procurement, but decreased in almost all other categories.

Malaria: Data for the current period shows total landed costs rising, to over 22 percent. Expenditures in drop ship freight increased from the previous period. Total landed cost including headquarters operations expenditures also showed an increase, rising to 26 percent. Decreased spending on Procurement was offset by increases in spending on Monitoring and Evaluation, Warehousing and Distribution, and GS1. Per agreement with USAID, quality assurance costs are not included in this indicator, since GHSC-PSM does not manage QA across all TOs. For TO2, where QA is managed by the project, the total landed cost (freight and logistics) with QA included increases to 23.9 percent. Total landed cost including HQ operations is 28 percent with QA included.

FP/RH: This period, freight and logistics costs as a percentage of family planning commodities delivered declined to 10.1 percent. This was primarily driven by a reduction in drop ship freight expenditures. When headquarters supply chain operations cost are factored in, the total landed cost result is 19.7 percent, a significant decrease from last period's 29.5 percent. There were no significant increases in expenditures of headquarters operations this period, but there was a significant decrease in MIS expenditures.

MNCH: Data for the current period shows that freight and logistics costs as a percentage of MNCH commodities delivered increased slightly to 10.6 percent, below the target of 14 percent. Expenditures in freight and logistics categories have increased, specifically in the drop ship freight category. A delivery surge in the first half of FY22 of high-value deliveries to DRC had a few pending deliveries during last period's reporting that are presented in this period, meaning that some of the costs associated with the higher volumes are represented in this period's data. Total landed cost with headquarters operations expenses included also increased this period, to 20.5 percent. Headquarters expenditure decreased this period, most notably in the Procurement category.

Data notes

GHSC-PSM's total landed cost indicator is equal to the sum of all costs associated with commodity delivery, divided by the total value of commodities delivered. It is reported semiannually, for a rolling 12-month period. It provides a high-level sense of the project's relative operations and direct logistics costs, but it may lack precision for several reasons: 1) Commodity cost savings may cause the denominator to decrease, even if volume stays the same. This may have the effect of increasing total landed cost as percentage, even if costs in the numerator remain the same. 2) Logistics costs for items shipped under C and D Incoterms are built into the commodity cost charged by the supplier. They cannot be separated out and assigned to the numerator. 3) Costs in the numerator represent invoices paid, per the project monthly financial statement, while commodity costs are based on items delivered Numerator costs may therefore be delayed compared to delivery activity represented by the denominator.

Vendor Performance

Current Reporting Period

2022-Q4

A14a-c. Average vendor rating score

Vendor Type	Average vendor rating
Commodity Supplier	62%
Freight Forwarder	82%
QA Lab	94%

14b. QA Lab Vendor Scorecard Components, Weighting, and Scores

Component Name	Indicator Name	Indicator Score	Indicator Weight (Overall)	Overall Weighted Score
1 - Reliability (Timeliness of Service)	Does the lab provide on-time provision of completed test reports?	92%	48%	44%
2 - Responsiveness	Does the lab provide prompt response after receipt of GHSC-PSM request for testing	100%	15%	15%
3 - Completeness of Documentation	Frequency of modification to Certificates of Analysis (CoA)	95%	18%	17%
4 - Invoice Accuracy	Submitted invoices for routing testing adhere to set IDIQ pricing	100%	10%	10%
5 - Service	Adherence to other terms and conditions, not related to reliability, responsiveness, completeness, and cost (Qualitative)	88%	10%	9%
Total			**100%**	**94%**

Analysis

This quarter's average freight forwarder vendor rating shows a result of 83 percent for average 3PL performance. Performance within the EDI status performance, reliability, and responsiveness categories increased this quarter, while there were slight decreases in all the other categories, including on-time performance, which is the most heavily weighted and scored about 90 percent this quarter. These decreases can be attributed to a shift in vendors this quarter, with one vendor having fully ended their time with the project, and a different vendor saw FY22 Q4 as their first full quarter. As such, the quarter includes no data for the old vendor, and has data on the new vendor for all three months. However, the new vendor is still working their way up to the share of shipments that the other 3PLs currently have, and as such their numbers are quite low. Additionally, this vendor was still very new to the project when the project solicited responses for the survey for customer service covered in this period, and they were therefore not considered. Finally, during this quarter, the metrics by which invoicing is measured have changed: the completeness metric is no longer used, and the timeliness metric now only evaluates the timeliness of invoices that have been received, rather than all invoices.

The vendor scorecard rating for lab service providers this quarter was 94 percent, remaining relatively consistent with the previous quarter. Scores were high across the board, as well, with responsiveness and invoice accuracy scoring 100 percent, completeness and reliability scoring 95 percent and 92 percent respectively, and service scoring 88 percent. Reliability and completeness had the only decreases in score this quarter, while invoice accuracy remained the same, and responsiveness and service saw increases in scoring.

On-time performance (OTP) for high-risk, high-value suppliers was 62 percent this quarter, a decrease from the last quarter. This decrease in performance was consistent across all task orders and nearly all commodity groups, with the COVID-19 commodity group being a notable exception, which saw improved on-time performance and higher volumes than earlier in the calendar year. The lab commodity group continues to experience difficulties noted in previous quarters, which, given the large number of order lines in the previous period (696 out of 1,149 total), has a notable effect on the overall score. In many cases, the delays recorded for lab suppliers stem from one delayed line causing an entire shipment to count as late, as all items in that order must be shipped together because the products need to be used together.

Data notes

Per the GHSC-PSM M&E plan, targets are not required for vendor performance indicators.

Global Advocacy Engagements

Current Reporting Period

2022-Q4

HIV/AIDS

3

Name of Engagement	Description
ARV Supplier Conference	The second annual ARV Supplier Conference was virtually held on July 20. The 2.5 hour virtual conference provided an overview of the ARV landscape and shifts to the ARV sourcing strategy, namely continued scale up for the D-term program and launching of the Vendor Managed Services initiative in FY2023. The conference included presentations from GHSC-PSM and GHSC-QA as well as participation from 14 supplier organizations as well as USAID.
Essential Medicines Suppliers Conference	The GHSC-PSM Essential Medicines team held an in-person and online wholesaler conference on August 9, 2022. The hybrid event included presentations from GHSC-PSM, GHSC-QA, and USAID and highlighted key changes to the Essential Medicines sourcing and QA strategies. Approximately eight wholesaler organizations as well as members of USAID's Bureau for Global Health and Bureau for Humanitarian Assistance participated in the hybrid event.
International AIDS Conference	GHSC-PSM and USAID co-hosted a closed satellite session with ARV suppliers during AIDS 2022 to discuss USAID/PEPFAR's localization vision and obtain manufacturer feedback. In addition, the gathering offered an opportunity for informal networking as the first in-person event held since the onset of COVID-19. Five Chemonics members participated in the conference and two GHSC-PSM teams, Ethiopia and Ghana, presented posters.

Global Advocacy Engagements

Current Reporting Period

2022-Q4

Malaria

7

Name of Engagement	Description
LLINs Quality Assurance Group (LQAG)	A collaborative global (Global Fund, UNICEF, PMI, GHSC-PSM, WHO, VCT, PQ) quality assurance working group for LLINs that meets monthly, and collaboration with a general objective of providing a forum for monitoring and communicating LLINs' quality-related concerns and trends to facilitate and/or implement activities to mitigate identified quality issues and potential risks.
RDT Task Force Meeting	GHSC-PSM participates in the quarterly RDT Task Force meetings, in which the task force explores the state of the RDT market, shares intelligence regarding market conditions and in-country challenges, provides supplier/logistic updates as necessary, and shares findings from studies. In Q3, the task force discussed HRP2/3 deletions and their implications for diagnostics. There was no meeting in Q4.
KSM/API Working Group	KSM/API Working Group meetings have formally transitioned to be monthly, but GHSC-PSM participated in multiple, out-of-cycle meetings in Q3 and Q4 of FY2022, given evolving dynamics in the semi-synthetic and vegetal artemisinin markets. GHSC-PSM also regularly attends an Artemisinin Working Group meeting hosted by PATH, a GHSC-PSM peer in the malaria community, to contribute to and learn of engagement with KSM and API manufacturers, updates in artemisinin pricing, forecasting, and progress toward investments in new artemisinin production methods.
PMI/TGF/PSM QA Meetings	Monthly collaboration meetings with PMI, the Global Fund, and GHSC-PSM QA team members to discuss QA/QC activities, including but not limited to OOS investigations and methodologies and QA/QC best practices, as these organizations engage the same manufacturers, use the same WHO guidance, and often experience similar quality-related challenges.
Pharma Task Force Meetings	Pharma Task Force meetings are monthly meetings, which GHSC-PSM participates in, to discuss market conditions, supplier updates, and in-country updates/challenges. In Q3 discussions focused on updates to an OOS investigation for an artesunate injectable supplier, which has since been closed; and updates on the status of WHO PQ site inspections, previously delayed due to COVID-19. Discussions continued regarding price volatility in the vegetal artemisinin market, and high-level sourcing strategies were shared for meeting demand for the upcoming fiscal year.
Vector Control Task Force Meeting	The VCTF is a coordination call between key procurers of ITNs and IRS for sharing of intelligence regarding market conditions and logistics challenges, as well as a forum for alignment on key strategic initiatives. As operations somewhat normalized after the pandemic, a TOR was finalized in Q1 as a longer-term structure for the taskforce, which covered the objectives, membership, call structure, and modus operandi of the Vector Control Supply Access Task Force. Updates were provided on monthly calls regarding the status of PBO and dual AI LLINs supply, along with monitoring of container availability out of China and India.
GF, AMF, PSM, PMI ITN Coordination Call	There was a coordination call between key procurers of ITNs that involved collaboration around upcoming NextGen ITN orders, and sharing of intelligence regarding market conditions, logistics challenges, and forecasted demand. The call also served as a forum for alignment on key strategic initiatives.

Global Advocacy Engagements

Current Reporting Period

2022-Q4

Family Planning and Reproductive Health

7

Name of Engagement	Description
Consumer Packaged Goods (CPG) Markets Group	GHSC-PSM participates in the CPG Global Market group to prioritize constrained products within available supply. GHSC-PSM provides input on market analysis and coordinates with consortium partners on new FP product introductions. In addition to reviewing specific orders, GHSC-PSM works with CPG to review market-level forecasts and funding gap reports to align on outputs and methodology.
Contraceptive Security (CS) Indicators Survey dissemination	The 2021 CS Indicators survey report highlighted data from 45 countries across eight topics including a new section on the impact of COVID-19 on contraceptive security. The results were shared through several forums, including a workshop on contraceptive financing led by the West African Health Organization.
Global Family Planning Visibility and Analytics Network (GFPVAN)	GHSC-PSM participated in the Global Family Planning Visibility and Analytics Network (VAN) Steering Committee and provided input on the VAN capabilities matrix. GHSC-PSM also participated in the VAN analytics workstream and business process improvement workstream to improve the quality of reports, provide input into the use data for procurement decision making, and participate in discussions around country participation in the VAN.
Hormonal Intrauterine Device (IUD) Steering Committee and Hormonal IUD Intrauterine Device (IUD) Access Group	GHSC-PSM actively participates in the Hormonal IUD Access Group and sub-working groups, including the Steering Committee, Partners Exchange, and Operations Group. In Q3, GHSC-PSM placed its first hormonal IUD order to be delivered to Rwanda in 2022.
IAWG Supplies Sub-Working Group	GHSC-PSM participates in the monthly meetings of the Inter-Agency Working Group on Reproductive Health in Crises (IAWG) Supplies Sub-Working Group (SWG). The goal of the working group is to strengthen access to SRH supplies in crisis-affected settings from pre-crisis preparedness, to acute humanitarian response, to protracted response and recovery. During the reporting period, GHSC-PSM participated in discussions on plans for the International Conference on Family Planning and updates to the IAWG-RHSC community of practice.
Sayana Press Access Collaborative: Operations Group	The Operations Group which is a workstream of the Sayana Press Access Collaborative discussed issues related to production, policy and program implementation. The discussion provided GHSC-PSM with insight into the technical assistance and supply efforts which are ongoing across consortium partners.
Systems Strengthening Working Group	GHSC-PSM regularly participates in SSWG meetings held by the Reproductive Health Supplies Coalition (RHSC). The working group provides a forum for those working in systems strengthening to convene and discuss common issues and challenges. In FY22 Q4, GHSC-PSM led a webinar entitled “Recovery Strategies for Public Health Supply Chains Post-Black Swan Event” for the RHSC SSWG. The presentation focused on supply chain disruptions and the importance of using scenario mapping—predicting what might happen in the future and how a program/supply chain might operate to help decision makers plan for recovery, weigh the information and advice they have received, and make informed decisions as part of the recovery planning process.

Global Advocacy Engagements

Current Reporting Period

2022-Q4

Maternal, Newborn, and Child Health

3

Name of Engagement	Description
Child Health Task Force	GHSC-PSM, Medicine Technologies and Pharmaceutical Services Program (MTaPS), Promoting the Quality of Medicinees Plus (PQM+) Program and other collaborators conducted research on select barriers and interventions for availing amoxicillin and gentamicin, specifically in the areas of quantification, finance, use, and quality. GHSC-PSM presented the information during three sessions hosted by the Child Health Task Force (CHTF) in May 2022. GHSC-PSM and other USAID supply chain projects began developing a call to action paper to summarize the recommendations to overcome barriers, and to communicate solutions tailored to certain audiences—especially governments, multilateral organizations, and donors—to encourage specific actions for ensuring availability of these commodities. Also in this reporting period, GHSC-PSM presented with MTaPS on the updated Reproductive, Maternal, Newborn, and Child Health (RMNCH) Quantification Supplement (which GHSC-PSM consulted on and validated in several countries). Many GHSC-PSM teams presented at the Child Health Task Force, as well as the Maternal Health Supplies Caucus, on the supplement, including the project's Nigeria and Pakistan teams who spoke about their positive experiences using these resources.
Every Newborn Action Plan (ENAP)	GHSC-PSM provided technical and logistic support to finalize deliverables for the global ENAP Technical Working. Organizations driving the ENAP agenda include USAID, WHO, UNICEF, NEST 360, and more. With inputs from MTaPS and PQM+, deliverables 1 and 2 were finalized and approved by leading conveners (USAID, WHO, and UNICEF). The overall objective of this global effort is to promote policies leading to improved care for small and sick newborns globally. Two technical working subgroups were created, one focused on medicines for newborn facilitated by PQM+ and the other, led by GHSC-PSM, which covers medical devices and consumables. The two deliverables are as follows: 1) Develop global guidance around selection, classification, and prioritization of medical devices and consumables for newborn care, and 2) Develop a list of essential vs. desirable medical devices and consumables for newborn care. GHSC-PSM helped coordinate the selection process of expert neonatologists, pediatricians, pediatric nurses, biotechnicians, and policy makers from all continents to collaborate on the implementation of the two identified deliverables. Next steps include determining Deliverable 3, developing a timeline for assessing feedback from identified global experts, and finalizing deliverables for dissemination.
Maternal Health Supplies Caucus	GHSC-PSM participates in routine meetings for the MHSC, a subgroup of the reproductive health supplies coalition, which provides a forum for the maternal health and family planning communities to come together, forge a common language for understanding maternal health supply-related challenges, and draw on existing approaches to address the bottlenecks undermining commodity security across health systems.

Global Advocacy Engagements

Current Reporting Period

2022-Q4

Crosscutting

2

Name of Engagement	Description
Arizona State University Women in Supply Chain Symposium in Tempe, AZ	GHSC-PSM's Procurement & Deliver Return Director gave a keynote speech at this annual conference, held at one of the leading universities for supply chain management education and training. This year's theme was "Workplace of the Future: Flexibility, Wellness, Diversity, Equity, and Inclusion."
Association for Supply Chain Management (ASCM) Connect Conference in Chicago, IL	Three GHSC-PSM staff members (Zambia Strategic Program Director, Haiti Deputy Country Director, and the Director of Program Management) participated on a panel entitled "Managing Supply Chain Risk Through Strategic Outsourcing" during this international conference covering key topics in supply chain management.

Complete Quarterly Results (TO1)

Reporting Period

2022-Q4

A1a. OTIF rate / A1b. OTD rate / A16. Backlog percentage / A10. Framework contracting

Task Order	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months	Framework contract percentage	Procurement total
TO1 - COVID19	**93%**	**71**	**73%**	**92**	**7.6%**	**303**	**50%**	**$4,212,791**
COVID19	93%	71	73%	92	7.6%	303	50%	$4,212,791
TO1 - HIV	**90%**	**1,062**	**88%**	**1,118**	**3.9%**	**4,256**	**88%**	**$52,050,819**
Adult ARV	90%	62	83%	70	1.5%	333	100%	$16,230,092
Condoms	89%	53	86%	49	1.2%	161	100%	$3,932,454
Laboratory	90%	769	88%	809	4.8%	3,002	72%	$20,666,487
Other Non-Pharma	92%	53	91%	57	3.3%	211	13%	$566,035
Other Pharma	92%	36	93%	40	1.8%	171	100%	$2,098,949
Other RTK	83%	6	100%	6	0.0%	24	0%	$183,433
Pediatric ARV	88%	33	94%	33	2.8%	141	100%	$5,780,843
TB HIV	100%	23	100%	25	0.0%	107	100%	$425,054
Vehicles and Other Equipment					0.0%	9		
VMMC	100%	27	100%	29	0.0%	97	100%	$2,167,473
Total	**91%**	**1,133**	**87%**	**1,210**	**4.1%**	**4,559**	**85%**	**$56,263,610**

A6a and A6b. Absolute percent supply plan or forecast ...

A6 Indicator	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	4-quarter bias
A6a - Supply plan error				
Adult ARV	26%	-26%	16%	-16%
Laboratory	12%	12%	19%	19%
Pediatric ARV	45%	45%	3%	3%
A6b - Forecast Error				
Condoms	5%	-5%	30%	30%

C7a and C7b. Product loss due to expiry, theft, damage, and other causes

Country	Type of Loss	Product Group	Loss Value	Loss Denominator	% Loss
Malawi	Damage	ARVs	$557	$1,258,720	0.04%
Nigeria	Damage	ARVs	$550	$15,884,398	0.00%
Kenya	Damage	Laboratory	$618	$6,103,292	0.01%
RDC	Expiry	Adult ARVs	$19,794	$16,976,214	0.12%
DRC	Other	Lab	$73,308	$13,300,355	0.55%

A3. Cycle time (average)

Fulfillment Channel	Direct Drop Fulfillment			Warehouse Fulfillment			**Total**
Task Order	Air	Land	Sea	Air	Land	Sea	
TO1 - COVID19	**218**	**173**	**230**				**221**
COVID19	218	173	230				**221**
TO1 - HIV	**237**	**253**	**305**	**248**	**248**	**302**	**250**
Adult ARV	218		271	130	248	235	**231**
Condoms			308	303		471	**320**
Laboratory	233	255	353				**242**
Other Non-Pharma	289	231	273				**254**
Other Pharma	326	266	234				**289**
Other RTK	334						**334**
Pediatric ARV	190		229	250			**209**
TB HIV	296		397	310			**328**
VMMC	126		320				**275**
Total	**236**	**251**	**283**	**248**	**248**	**302**	**248**

A8. Shelf life remaining

% Shelf Life Remaining	Inventory Balance
81%	$7,199,409

B6. Quarterly supply plan submissions

Product Group	Supply plan submission rate	# of supply plans required
ARVs	100%	21
Condoms	90%	21
Lab (HIV diagnostics)	100%	15
RTKs	100%	19
VMMC	80%	5

Crosscutting indicators

A14. Average vendor ratings

Vendor Type	Average vendor rating
Commodity Supplier	62%
Freight Forwarder	82%

Complete Quarterly Results (TO2)

Reporting Period

2022-Q4

	A1a. OTIF rate		A1b. OTD rate		A16. Backlog		A7. Waiver percentage		A10. Framework contracting		A2. QA processes on time		A13 Out-of-spec		A15. QA reports	
Task Order	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months	Temporary registration waiver percentage	Total # of line items delivered	Framework contract percentage	Procurement total	% QA Processes On Time	Total # of QA processes completed	Out-of-specification percentage	Total # of batches tested	Report submissions	# of reports due
TO2 - Malaria	**82%**	**180**	**87%**	**174**	**1.8%**	**840**	**12.7%**	**181**	**100%**	**$31,308,128**	**88%**	**57**	**0.6%**	**167**	**100%**	**1**
ACTs	95%	41	95%	42	0.3%	292	9.8%	41	100%	$9,492,300	82%	17	0.0%	37		0
Laboratory	73%	33	83%	29	4.2%	118	0.0%	33	87%	$146,046						
LLINs	90%	31	94%	34	1.3%	157	16.1%	31	100%	$8,954,797	100%	8	4.3%	23	100%	1
mRDTs	94%	16	100%	16	2.7%	73	37.5%	16	100%	$1,922,200	100%	10	0.0%	37		0
Other Non-Pharma	92%	13	92%	13	3.0%	33	0.0%	13								
Other Pharma					0.0%	3			100%	$30,970	67%	3	0.0%	2		0
Severe Malaria Meds	57%	23	52%	23	4.1%	74	8.3%	24	100%	$622,860	93%	14	0.0%	61		0
SMC	100%	7	100%	7	0.0%	36	0.0%	7	100%	$9,701,315		0		0		0
SP	56%	16	80%	10	1.9%	54	37.5%	16	100%	$437,640	60%	5	0.0%	7		0
Total	**82%**	**180**	**87%**	**174**	**1.8%**	**840**	**12.7%**	**181**	**100%**	**$31,308,128**	**88%**	**57**	**0.6%**	**167**	**100%**	**1**

A3. Cycle time (average)

Fulfillment Channel	Direct Drop Fulfillment			Warehouse Fulfillment		**Total**
Task Order	Air	Land	Sea	Air	Sea	
TO2 - Malaria	**320**	**290**	**365**	**43**	**180**	**340**
ACTs	190		304		196	**285**
Laboratory	341		437			**364**
LLINs		290	352			**338**
mRDTs			336			**336**
Other Non-Pharma	342		434			**380**
Severe Malaria Meds			430			**430**
SMC				43	170	**152**
SP	169		393			**365**
Total	**320**	**290**	**365**	**43**	**180**	**340**

C7a and C7b. Product loss due to expiry, theft, damage, and other causes

Country	Type of Loss	Product Group	Loss Value	Loss Denominator	% Loss

B6. Quarterly supply plan submissions

Product Group	Supply plan submission rate	# of supply plans required
Malaria commodities	100%	27

A8. Shelf life remaining

% Shelf Life Remaining	Inventory Balance
	$0

A6a. Absolute percent supply plan error

A6 Indicator	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	4-quarter bias
A6a - Supply plan error				
ACTs	32%	32%	45%	45%
mRDTs	249%	-249%	9%	9%

A14. Average vendor rating - QA labs

Average vendor rating
94%

Crosscutting indicators

A14. Average vendor ratings

Vendor Type	Average vendor rating
Commodity Supplier	62%
Freight Forwarder	82%

Complete Quarterly Results (TO3)

Reporting Period

2022-Q4

A1a. OTIF rate / A1b. OTD rate / A16. Backlog percentage / A10. Framework contracting

Task Order	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months	Framework contract percentage	Procurement total
TO3 - FP/RH	**98%**	**47**	**94%**	**51**	**2.4%**	**208**	**100%**	**$7,978,192**
Combined Oral Contraceptives	80%	5	67%	6	3.8%	26	100%	$1,333,498
Copper-Bearing Intrauterine Devices	100%	1	100%	1	0.0%	14		
Emergency Oral Contraceptives			0%	1	20.0%	15		
Implantable Contraceptives	100%	17	100%	17	2.2%	45	100%	$1,592,812
Injectable Contraceptives	100%	13	100%	15	0.0%	63	100%	$4,862,882
Levonorgestrel-Releasing Intrauterine Devices	100%	1	100%	1	0.0%	1		
Other Non-Pharma			100%	1	0.0%	9		
Progestin Only Pills	100%	8	100%	7	0.0%	23	100%	$189,000
Standard Days Method	100%	2	100%	2	0.0%	12		
Total	**98%**	**47**	**94%**	**51**	**2.4%**	**208**	**100%**	**$7,978,192**

A7. Temporary Waiver Percentage

Task Order	Temporary registration waiver percentage	Total # of line items delivered
TO3 - FP/RH	**10.6%**	**47**
Implantable Contraceptives	17.6%	17
Progestin Only Pills	12.5%	8
Injectable Contraceptives	7.7%	13
Combined Oral Contraceptives	0.0%	5
Copper-Bearing Intrauterine Devices	0.0%	1
Levonorgestrel-Releasing Intrauterine Devices	0.0%	1
Standard Days Method	0.0%	2
Total	**10.6%**	**47**

A3. Cycle time (average)

Fulfillment Channel / Task Order	Direct Drop Fulfillment Air	Direct Drop Fulfillment Sea	Warehouse Fulfillment Air	Warehouse Fulfillment Sea	**Total**
TO3 - FP/RH	**443**	**346**	**224**	**271**	**319**
Combined Oral Contraceptives		397		305	**360**
Copper-Bearing Intrauterine Devices				292	**292**
Implantable Contraceptives	577	549	239	217	**399**
Injectable Contraceptives	165	252		310	**272**
Levonorgestrel-Releasing Intrauterine Devices	293				**293**
Progestin Only Pills			203	251	**233**
Standard Days Method	253				**253**
Total	**443**	**346**	**224**	**271**	**319**

C7a and C7b. Product loss due to expiry, theft, damage, and other causes

Country	Type of Loss	Product Group	Loss Value	Loss Denominator	% Loss
RDC	Expiry	NA	$0	$7,634,929	0.00%

B6. Quarterly supply plan submissions

Product Group	Supply plan submission rate	# of supply plans required
Condoms	90%	21
FP commodities	92%	24

A6b. Absolute percent forecast error

A6 Indicator	Supply plan/ forecast error	Supply plan/ forecast bias	4-quarter error	4-quarter bias
A6b - Forecast Error				
Combined Oral Contraceptives	20%	20%	11%	11%
Condoms	5%	-5%	30%	30%
Copper-bearing Intrauterine Devices	7%	7%	48%	-48%
Implantable Contraceptives	15%	15%	13%	-13%
Injectable Contraceptives	10%	10%	0%	-0%
Progestin Only Pills	0%	0%	12%	12%

A8. Shelf life remaining

% Shelf Life Remaining	Inventory Balance
85%	$5,170,083

Crosscutting indicators

A14. Average vendor ratings

Vendor Type	Average vendor rating
Commodity Supplier	62%
Freight Forwarder	82%

Complete Quarterly Results (TO4)

Reporting Period

2022-Q4

	A1a. OTIF rate		A1b. OTD rate		A16. Backlog perentage		A10. Framework contracting
Task Order	OTIF	Total # of Line Items Delivered	OTD	Total # of Line Items with ADDs in the quarter	Backlog	Total # of line items with ADDs in the last 12 months	Framework contract percentage	Procurement total
TO4 - MNCH	**89%**	**9**	**100%**	**4**	**1.1%**	**92**	**100%**	**$146,092**
Other Non-Pharma	100%	4	100%	4	7.7%	13		
Other Pharma	80%	5			0.0%	79	100%	$146,092
Total	**89%**	**9**	**100%**	**4**	**1.1%**	**92**	**100%**	**$146,092**

Crosscutting indicators

A14. Average vendor ratings

Vendor Type	Average vendor rating
Commodity Supplier	62%
Freight Forwarder	82%

A3. Cycle time (average)

Task Order	Direct Drop Fulfillment	Total
TO4 - MNCH	**249**	**249**
Other Non-Pharma	353	**353**
Other Pharma	166	**166**
Total	**249**	**249**

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

Delivery Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A01a	On Time, In Full Delivery (OTIF) - Percentage of line items delivered on time and in full, within the minimum delivery window (within -14/+7 calendar days of the agreed delivery date (ADD))	Number of line items delivered to the recipient on time and in full during the quarter	Total number of line items delivered to the recipient during the quarter	ARTMIS	Quarterly	Lines items are considered on-time and in-full if the full ordered quantity of the line item is delivered to the recipient within the -14/+7 day delivery window. If the line item is partially delivered within the window, it may be considered on-time but not in-full.
A01b	On Time Delivery (OTD) — Percentage of line items delivered on time, within the minimum delivery window (within -14/+7 calendar days of the agreed delivery date (ADD))	Number of line items with an ADD during the quarter that were delivered to the recipient on time	Total number of line items with an ADD during the quarter	ARTMIS	Quarterly	
A16	Percentage of backlogged line items	Number of line items with an ADD on or before the reporting period end date, within a rolling 12-month period, that have not been cancelled or put on hold and that are currently undelivered and late	Total number of line items with an ADD on or before the reporting period end date, within a rolling 12-month period, that have not been cancelled or put on hold	ARTMIS	Quarterly	

Cycle time Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A03	Cycle time (average)	Sum of cycle time for all line items delivered during the quarter	Count of all line items delivered during the quarter	ARTMIS	Quarterly	Overall cycle time is defined as the number of days between when a customer order is submitted to when the shipment is actually delivered to the customer, inclusive of the start/end days and all holds or other dwell times. The project is implementing new dwell tracking procedures, with the intent of reporting dwell-adjusted cycle time by FY2021.

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

Quality Assurance Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A02	Percentage of QA processes completed within the total estimated QA lead times (on-time completion rate for QA processes)	Number of consignments complying with the pre-established QA lead times during the quarter	Total number of consignments requiring QA processes that were cleared for shipment during the quarter	QA Database	Quarterly	Consignment is defined as a shipment of commodities, including one or more line items. QA process transactions are managed at the consignment level, regardless of the number of line items in the consignment.
A13	Percentage of batches of product for which the final result is showing nonconformity (out of specification percentage)	Total number of batches of product showing nonconformity during the quarter	Total number of batches tested during the quarter	QA Database	Quarterly	
A14b	Average vendor rating score - QA lab services	Sum of all key vendor ratings.	Number of key vendors from whom GHSC-PSM procured lab testing services during the quarter	QA scorecard	Quarterly	All vendors are equally weighted in the overall score, regardless of procurement volume from each vendor.
A15	Percentage of quality assurance Investigation reports submitted within 30 calendar days of outcome determination (QA investigation report submission)	Number of QA investigation reports submitted to PMI within 30 days of outcome determination	Total number of QA investigation reports due during the reporting period	QA Database, email submissions	Semiannual	

Procurement Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A07	Percentage of line items imported using a temporary registration waiver (temporary waiver percentage)	Number of line items that were imported using a temporary registration waiver	Total number of line items delivered to the recipient during the quarter	Supplier registration bidding documentation	Quarterly	
A10	Percentage of product procured using a framework contract (framework contract percentage)	Value of product purchased through framework contracts during the quarter	Total value of commodities purchased during the quarter	ARTMIS	Quarterly	

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

Forecast and Supply Planning Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A06a	Absolute percent supply plan error, with variants annual absolute percent error and supply plan bias	Absolute value of the differences between the actual quantities with requested delivery dates during the quarter minus the quantities planned for delivery according to country supply plans	Sum of the actual quantities with requested delivery dates during the quarter	ARTMIS, Country Supply Plans	Quarterly	Supply plan error is currently calculated for adult and pediatric ARVs, HIV lab products, ACTs, and malaria rapid diagnostic tests. Planned quantities are drawn from an aggregation of country supply plans submitted in the prior quarter, including only the quantities that are forecasted to be procured through GHSC-PSM. Actual quantities are derived based on the requested delivery dates for products included in customer ROs submitted to ARTMIS.
A06b	Absolute percent forecast error, with variants annual absolute percent error and forecast bias	Absolute value of the differences between the actual quantities with requested delivery dates during the quarter minus the quantities planned for delivery according to the global demand forecast	Sum of the actual quantities with requested delivery dates during the quarter	ARTMIS, Country Supply Plans, PPMR, other sources	Quarterly	Forecast error is currently calculated for condoms and contraceptives. Forecasted or planned 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 and additional inputs, such as country order history, data from coordinated planning groups, and global market dynamics indicators. Actual quantities are derived based on the requested delivery dates for products included in customer ROs submitted to ARTMIS.

Warehouse Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A04	Inventory turns (average number of times inventory cycles through GHSC-PSM controlled global facilities)	Total ex-works cost of goods distributed from GHSC-PSM-controlled global inventory stocks (in USD) within the fiscal year	Average monthly inventory balance (in USD)	Inventory extract	Annual	
A08	Average percentage of shelf life remaining for warehoused commodities, weighted by the value of each commodity's stock (product at risk percentage)	Percentage of shelf life remaining at the end of the quarter, weighted by value of commodities, summed across all products	Total value of commodities, summed across all products, at the end of the quarter	Inventory extract	Quarterly	Shelf life requirements vary by country and by product.

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

3PL and Commodity Vendor Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A14a	Average vendor rating score - Commodity suppliers	Sum of all key vendor ratings	Number of key vendors from whom GHSC-PSM procured products/commodities during the quarter	ARTMIS	Quarterly	Scorecards are compiled on one-month lag, i.e. Q1 data represents vendor performance from Sept-Nov. Supplier OTIF is currently reported for high value and/or high risk suppliers. Only suppliers for which one or more order line items were fulfilled in this reporting period were included. All vendors are equally weighted in the overall score, regardless of procurement volume from each vendor.
A14c	Average vendor rating score - Freight forwarders	Sum of all key vendor ratings	Number of key vendors from whom GHSC-PSM procured freight forwarding services during the quarter	3PL scorecard	Quarterly	To allow complete data collection, freight forwarder scorecards are conducted on a one-month lag (i.e. Q1 data represents performance from Sept-Nov, rather than Oct-Dec). Overall score is weighted by delivery volume, such that vendors who deliver a greater number of shipments will have a relatively greater impact on the result.

Product Loss Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
C07a	Percentage of product lost due to expiry while under GHSC-PSM control (product loss percentage)	Total value of product lost due to expiry during the quarter	Average inventory balance (in USD) during the quarter	Inventory reports	Quarterly	Expiries from the Regional Distribution Centers (RDCS) are presented in the GSC section of this report. Expiries that occur in warehouses that GHSC-PSM manages in countries are reported in the country-specific sections of this report.
C07b	Percentage of product lost due to theft, damage, or other causes, while under GHSC-PSM control (product loss percentage)	Total value of product lost due to theft, damage, or other causes during the quarter	For losses in transit: Total value (in USD) of product delivered during the quarter For losses in storage: Average inventory balance (in USD) during the quarter	GHSC-PSM Continual Improvement system reports	Quarterly	Product losses due to incidents are reported only after the actual value of the loss has been determined, which may be later than the quarter in which the incident took place or was first reported to GHSC-PSM Continual Improvement.

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

Total Landed Cost

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
A05	Total Landed Cost (as a percentage of total value of commodities delivered to recipients)	Sum of all freight and logistics costs (in USD) paid by GHSC-PSM during the reporting period	Sum of the value of all commodities delivered to recipients during the reporting period	ARTMIS, Monthly Financial Statement	Semiannual	The project will also report a variant of this indicator that includes all HQ supply chain operations costs in the numerator. Quality assurance costs will be excluded from all task orders, as QA costs are not paid by GHSC-PSM for all task orders. A version of the indicator including QA costs will be reported for Task Order 2 only.

Global Advocacy Engagments

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
C08	Number of global advocacy engagements in support of improved availability of essential health commodities	Number of global advocacy engagements in support of improved availability of essential health commodities	NA	Project work plans, narrative reports	Semiannual	

Indicator Details

Check out the GHSC-PSM IDIQ M&E Plan for complete details on all our indicators.

Delivery Impact Indicators

Indicator Code	Name	Numerator	Denominator	Data Source(s)	Reporting frequency	Other Info
NA	Number of ACT treatments delivered	Sum of ACT treatments delivered to countries, where a treatment is equal to one blister strip		ARTMIS	Quarterly	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 Artemether/Lumefantrine, Artesunate/Amodiaquine, and Artenimol/Piperaquine formulas.
NA	Number of Couple Years Protection delivered	Total of contraceptive method units delivered to countries, multiplied by the couple-years protection conversion factors per method, summed across all contraceptive methods delivered.		ARTMIS and USAID/MEASURE CYP conversion factors	Quarterly	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 intrauterine devices (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).
NA	Person-years of ARV treatment delivered	Sum of the monthly treatment units of adult first-line ARV treatments delivered to countries , divided by 12		ARTMIS	Quarterly	This report only includes Adult Efavirenz/Lamivudine/Tenofovir (TLE, Nevirapine/Lamivudine/Zidovudine (NLZ), and Dolutegravir/Lamivudine/Tenofovir (TLD). Doses for calculating treatments are based on World Health Organization (WHO)-recommended guidelines. The calculation of patient-years allows GHSC-PSM to monitor effectiveness and efficiency by a standard unit.