

# Promoting the Quality of Medicines (PQM) Program

**FY 2016 Third Quarter Report**

**April 1 – June 30, 2016**

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**About the Promoting the Quality of Medicines Program (PQM)**

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The Promoting the Quality of Medicines (PQM) program is a Cooperative Agreement between the United States Agency for International Development (USAID) and the United States Pharmacopeial Convention (USP). Since 1992, USP has worked cooperatively with USAID to help developing countries address critical pharmaceutical challenges. The earliest program, the Rational Pharmaceutical Management Project, implemented and evaluated country-specific drug information resource programs in selected developing countries. Subsequently, the Drug Quality and Information program focused on medicines quality control and quality assurance systems. The PQM program (2009–2019) provides technical assistance to strengthen medicines regulatory authorities and quality assurance systems and supports manufacturing of quality-assured priority essential medicines for malaria, HIV/AIDS, tuberculosis, neglected tropical diseases, and maternal and child health.

As of May 2016, USAID supports PQM’s work in 20 countries, 2 Regional Missions, and 4 core health programs.

*This document is made possible by the generous support of the American people through the United States Agency for International Development. The contents are the responsibility of the Promoting the Quality of Medicines program and do not necessarily reflect the views of USAID or the United States government.*

## Executive Summary

The PQM program provides technical assistance to strengthen medicines regulatory authorities (MRA) and quality assurance systems as well as to support the manufacture of quality-assured priority essential medicines for malaria, HIV/AIDS, tuberculosis, neglected tropical diseases, and maternal, newborn, and child health. USAID supports the PQM program's work in 20 countries and in two regional programs in Asia and Latin America. This report summarizes results achieved during the third quarter of FY16, from April 1<sup>st</sup> to June 30<sup>th</sup>, 2016.

The first result area of the PQM program aims to strengthen national regulatory systems. In pursuit of this goal, PQM provides technical assistance to strengthen pharmaceutical policies, legislations, and regulations to address critical quality assurance topics and enhance the ability of the MRA to execute policy. An integral component of the MRA is its national quality control laboratory; PQM strives to raise laboratory standards through physical and human resources. Highlights under the first result area during the quarter include the timely registration of 10 priority medicines by the Ethiopian Food, Medicine and HealthCare Administration and Control Authority (EFMHACA), including one antimalarial, five maternal, newborn, and child health (MNCH), and four HIV medicines. The PQM program supported EFMHACA to develop guidelines and risk-based approaches that made the timely registration possible. Significant progress was also achieved in the development of pharmaceutical law in Guinea and the Nigerian Ministry of Health implementation of the newly approved national Quality Assurance Policy. In Thailand, with funding from Regional Development Mission for Asia (RDMA), PQM worked closely with Thailand's Ministry of Public Health's Bureau of Vector-Borne Diseases Control at the policy level. Two key components of medicines quality (drug quality monitoring and the inspection of drug supply and distribution for control of artemisinin monotherapy) were included in the Operational Plan 2017-2021 of the National Malaria Elimination Strategy 2017-2026.

The availability of quality medicines, the second result area, encompasses PQM's broad technical assistance for the manufacturing of quality-assured priority essential medicines. PQM provides support to manufacturers to attain stringent international good manufacturing practices (GMP) standards necessary for the supply of quality medicines. Significant accomplishments from the quarter include the capacity-building workshop conducted for local manufacturers to help prepare for upcoming GMP audits and subsequent implementation of interventions. EFMHACA's target is to have five companies achieve GMP certification within the next five years. In Pakistan, PQM supported the Drug Regulatory Authority of Pakistan (DRAP) in the evaluation of a previously submitted dossier for local manufacture of chlorhexidine (CHX) gel for newborn umbilicus cord care. Also in Pakistan, full compendial analysis training on CHX was conducted for nine analysts from four manufacturers embarking in producing CHX gel products locally. Technical assistance to manufacturers in pursuit of WHO Prequalification or other stringent regulatory authorities was carried out for both the Core Tuberculosis (TB) program, which supported six priority multi-drug resistant tuberculosis (MDR-TB) products, and Core MNCH, which supported four priority products: two for maternal use, one for newborns, and one for children.

Improving the capacity to detect poor quality medical products is PQM's third result area. In collaboration with a country's MRA and national health program, medicine testing is conducted at a variety of sites in an effort to continuously monitor the quality of medicines present in the country. Field staff are trained in sampling and testing methods while national laboratories handle samples requiring advanced confirmatory testing. During the quarter, the Core MNCH program developed quality control screening procedures for three penicillin products. In Pakistan, an introduction of inter-laboratory testing training on chlorhexidine gel was conducted to 10 analysts from eight federal and provincial government laboratories.

The fourth result area is global advocacy and technical leadership to enable the use of product quality information for decision making. Results included under the result area highlight PQM's contribution to advocacy efforts to eradicate falsified and substandard products through transparent sharing of data on quality of medicines and collaboration with diverse partners at local, national, and international levels to advance pharmaceutical quality agenda. PQM introduced the Poor-Quality Medicines ALERT, accessible via the Medicines Quality Database (MQDB) home page, to provide rapid access to information on poor-quality medicines identified in post marketing surveillance activities in PQM supported countries.

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## Acronyms

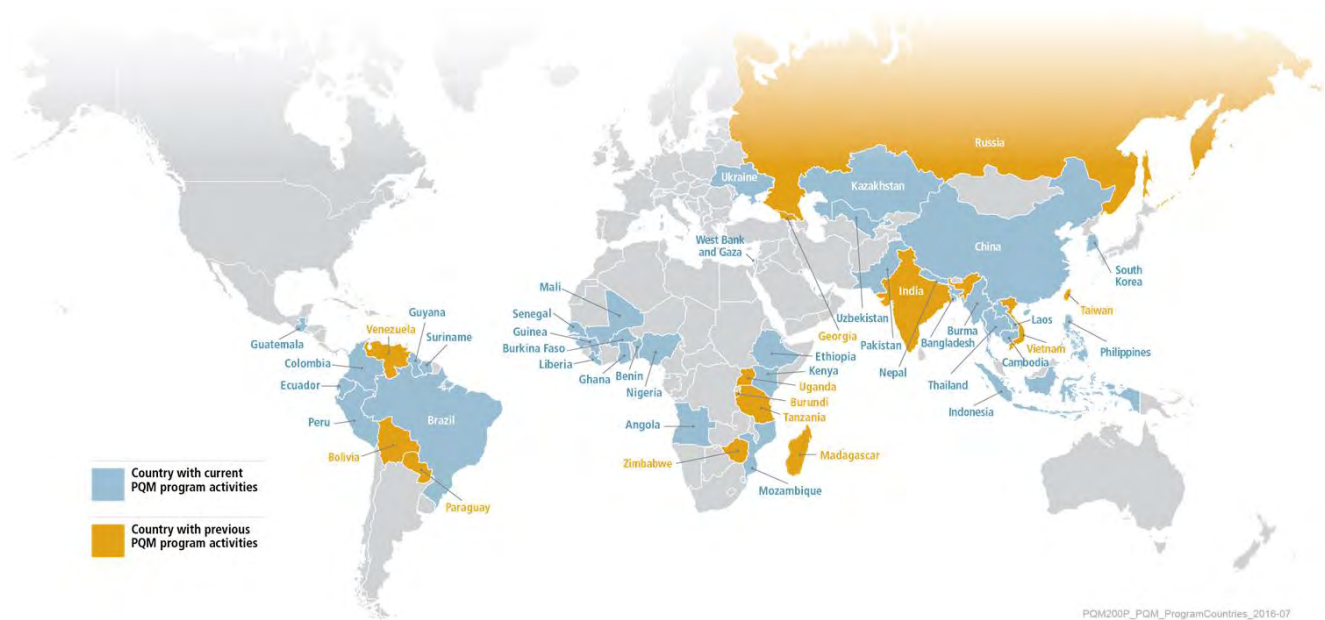
AMI	Amazon Malaria Initiative
AOR	USAID Agreement Officer's Representative
API	Active pharmaceutical ingredient
ARV	Antiretroviral
BPOM	Indonesian National Agency of Drug and Food Control
BMGF	Bill and Melinda Gates Foundation
BU	Boston University
CAPA	Corrective and preventive action
CDTL	Central drug testing laboratory (Pakistan)
CHX	Chlorhexidine
DFDA	Department of Food and Drug Administration (Burma)
DNPL	National Medicines Regulatory Authority (Guinea)
DPM	Directorate of Pharmacy and Medicine (Mali)
DRA	Mozambican Drug Regulatory Authority
DRAP	Drug Regulatory Authority (Pakistan)
EAC	East African Community
EFMHACA	Ethiopian Food, Medicine and HealthCare Administration and Control Authority
ERP	Expert review panel
FDA	Food and Drug Administration or Authority
FMOH	Federal Ministry of Health (Nigeria)
FPP	Finished pharmaceutical product
GDF	Global Drug Facility
GMP	Good Manufacturing Practices
HPLC	High-performance liquid chromatography
ISO/IEC	International Standardization Organization and the International Electrotechnical Commission
LMHRA	Liberian Medicines and Health Products Regulatory Authority
LNCM	Laboratoire National de Contrôle des Médicaments (Senegal)
LNCQM	National Quality Control Laboratory (Mozambique)
LNS	National Laboratory of Health (Mali)
MNCH	Maternal, newborn, and child health
MOH	Ministry of Health
MQAD	Ethiopian medical device laboratory
MQDB	Medicines Quality Database
MQM	Medicines quality monitoring
NHQC	National Health Products Quality Control Centre (Cambodia)
NQCL	National quality control laboratory

NTD	Neglected tropical disease
ORS	Oral Rehydration Solution
PMS	Post-marketing surveillance
PQM	Promoting the Quality of Medicines
PT	Proficiency test
PTSC	Pharmaceutical Technology Service Center (Thailand)
PZQ	Praziquantel
QAP	Quality Assurance Policy (Nigeria)
QA/QC	Quality assurance and quality control
QMS	Quality management system
SANAS	South African National Accreditation System
SOP	Standard operating procedures
TA	Technical assistance
TB	Tuberculosis
TOT	Training-of-trainers
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USP	United States Pharmacopeial Convention
WHO	World Health Organization
WHO PQ	World Health Organization Prequalification

## Program Background and Framework

Since 1992, the U.S. Pharmacopeial Convention (USP) has worked cooperatively with the United States Agency for International Development (USAID) to help developing countries address critical issues related to pharmaceuticals. PQM's mission is to help ensure the quality, safety, and efficacy of medicines essential to USAID priority diseases—particularly malaria, HIV/AIDS, and tuberculosis—and maternal and child health. The PQM program is USAID's response to the growing development challenge posed worldwide by falsified and substandard medicines. There is increasing recognition of the burden of these poor-quality medicines and their threat to public health, especially in low- and middle-income countries. Falsified and substandard medicines can cause treatment failure and adverse reactions, increasing morbidity and mortality, and they may contribute to antimicrobial resistance. They represent not only a waste of scarce resources but also a substantial risk to public health. They further risk undermining decades of health investments, including those made by USAID.

**Figure 1: PQM Program Reach Worldwide**



The PQM program has presence in four countries (Ethiopia, Indonesia, Nigeria, and Philippines) and programs in 34 non-presence countries. Using a systems-based approach, PQM offers technical assistance in several areas to achieve the aforementioned strategic objectives. Many of these approaches are replicated globally but tailored to fit the needs of individual countries or regions. These approaches include building the capacity of medicines regulatory authorities to review and approve quality essential medicines and strengthen their ability to protect their own population from poor-quality medicines. PQM works with national and regional regulatory authorities to build sustained capacity for medicines evaluation, manufacturing inspection, and surveillance. PQM supports national quality control laboratories (NQCLs) through hands-on training and technical assistance to improve laboratory standards, with one goal being to assist those labs with attaining internationally recognized certifications, such as International Standardization Organization (ISO) accreditation and/or World Health Organization Prequalification (WHO PQ).

PQM also helps NQCLs implement or improve post-marketing surveillance (PMS) programs. One aspect of PMS is field-based medicines quality monitoring (MQM), which involves laboratory staff collecting medicine samples at sentinel sites. These samples are screened in the field using a GPHF-Minilab™ and subsequently undergo confirmatory testing in the laboratory.

PQM's systems-based approach also extends to medicines manufacturers. PQM experts in good manufacturing practices (GMP) travel to manufacturing sites to help companies improve their GMP compliance and develop dossiers to submit to the WHO PQ program.

PQM's work is based on four **strategic objectives**:



The program's four result areas are as follows:

- IR 1: National Regulatory Systems Strengthened
- IR 2: Availability of Quality Medicines Increased
- IR 3: Capacity to Detect Poor-Quality Medical Products Increased
- IR 4: Use of Information for Decision-Making Increased

This report presents highlights of PQM activities organized by intermediate result area—representing multiple countries where the program works—as well as by global, regional, and country portfolios for the April–June 2016 period.



## Quarterly Progress by Result Area

### IR 1: National Regulatory Systems Strengthened

PQM strengthens the capacity of MRAs to review and approve quality essential medicines so that these MRAs can strengthen their ability to protect their populations from poor-quality medicines. PQM works with national and regional regulatory authorities to build sustained capacity for medicines evaluation, manufacturing inspection, and surveillance.

#### **Policies, Legislation, Quality Assurance, and Regulatory Guidelines and Standard Operating Procedures (SOPs) Improved**

Improving policy is fundamental to ensuring the quality of medicines and improving health systems; without effective policies, the illegal trade of poor-quality medicines would become rampant. PQM offers technical assistance to develop adequate quality assurance measures against falsified and substandard medicines and to establish accepted international standards of good regulatory practice, from comprehensive national pharmaceutical legislation to MRA- and laboratory-specific medicines regulation.

*Guinea, Mozambique, and Nigeria, with support from PQM, developed more effective policies and legislations that incorporated critical quality assurance elements.*

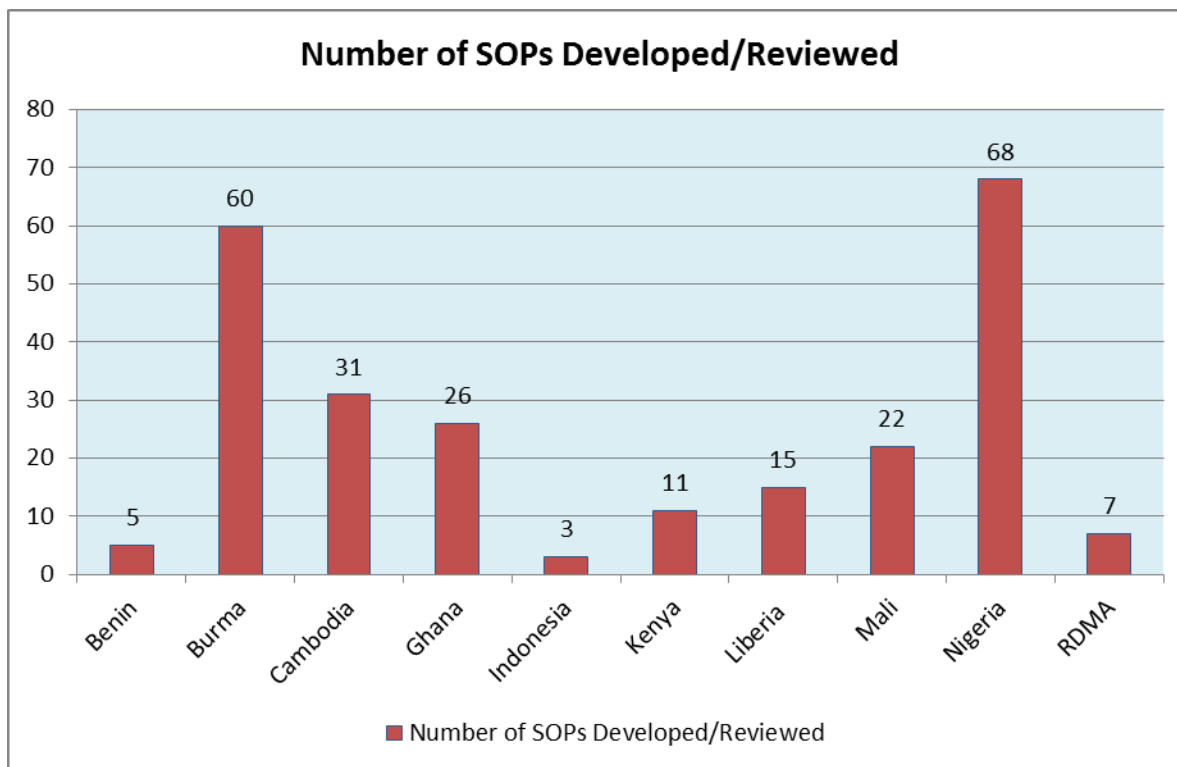
**Guinea** The current pharmaceutical legislation in Guinea did not clearly address certain key regulatory functions, such as PMS and inspection of pharmaceutical premises within the mandate of the regulatory agency, DNPL. To improve this legal framework, PQM consultants worked in past quarters with the national committee in charge of revising the pharmaceutical law (henceforth, the Committee) to revise the first draft. In this quarter, PQM conducted a second workshop during which PQM consultants delivered technical guidance to the committee on draft revision, making recommendations on how to proceed with completing the missing elements and drafting key articles of the law. The Committee determined the scope of the new law, including the products to be regulated, the establishments to be regulated, and their related practices and involved professionals. Additionally, the Committee agreed on the inclusion of essential quality functions, such as PMS and inspection, as part of the DNPL mandate. Next, PQM plans to hold additional workshops to continue the momentum on finalizing the review prior to its submission to relevant legislative authorities in Guinea for passage.

**Mozambique** Following discussions between PQM, USAID, and the Mozambican Drug Regulatory Authority (DRA), plans were initiated to assist the DRA in revising the pharmaceutical law. USAID and the DRA have agreed that PQM will lead a committee of Ministry of Health representatives and stakeholders, who will help draft an improved pharmaceutical law. The first meeting will take place in the fourth quarter.

**Nigeria** In previous quarters, PQM worked closely with the Federal Ministry of Health (FMOH) and other partners at the federal and state levels to conduct high-level advocacy to the relevant stakeholders and used various sensitization meetings to talk about the potential benefit of the new Quality Assurance Policy (QAP) on processes and procedures of drug manufacturing, administration, and regulation. The QAP was adopted by the National Council of Health as a binding document for implementation by all relevant agencies. This quarter, discussions were completed with the Food and Drugs Unit of the FMOH; it is the body responsible for overseeing policy implementation of the roadmap and monitoring implementation of the QAP. A resolution was reached to target improvement of monitoring and evaluation of the QAP by relevant agencies, such as the National Agency for Food and Drug Administration and Control (NAFDAC), Pharmacists'

Council of Nigeria, and National Institute for Pharmaceutical Research and Development. Plans are in the final stage for strengthening the monitoring and evaluation capacity of the FMOH Food and Drugs Unit in this thematic area.

The graph below provides a count of the SOPs that were developed by the national regulatory authority with PQM's technical support or reviewed by PQM experts at the request of the national regulatory authority during the third quarter.



*MRA-specific technical assistance was provided to develop strategic plans, PMS, and GMP guidelines in the Philippines, Mali, Senegal, Nigeria, and Thailand.*

**Philippines** PQM assisted the Food and Drug Administration (FDA) to establish, define and redefine, and execute its regulatory mandate in order to address the identified need of regulating the pharmaceutical products from pre-marking authorization to PMS. In order to execute its mandate, PQM assisted the FDA in developing its five-year strategic plan (2017–2021). PQM reviewed the current FDA action plan (2013–2017) to determine which sections needed to be improved and enhanced for inclusion in the new strategic plan. Technical assistance to improve PMS guidelines included conducting a nationwide survey led by the Product Research and Standards Development Division to capture baseline data on the number of licensed establishments that will serve as baseline for improving the PMS system. PQM is also currently developing a concept note to facilitate a seminar on licensing through the FDA (Administrative Order A.O. 2014-0034 for local Government Unit/ Rural Health Unit/ City Health Offices involved in pharmaceutical management to support the Department of Health A.O. 2016-0003 “Guidelines on the Unified Licensing Requirements and Procedures of FDA”). To improve the capacity of GMP regulatory inspectors, PQM held a consultation meeting with FDA inspectors to determine training needs and objectives as well as provided guidance on advanced regulatory science and approaches and quality assurance/quality control (QA/QC) systems. PQM then began initial stages of drafting a concept note to facilitate and conduct a training workshop on GMP (local/foreign) inspection.

**Mali** PQM organized a roundtable to engage key local QA partners, namely the Directorate of Pharmacy and Medicine (DPM), the Central Medical Store (PPM), National Malaria Control Program, and the Health Inspectorate in the efforts of the National Laboratory of Health (LNS). The partners identified the priorities and areas of focus for the roadmap for developing the strategic plan. Three focus groups were formed to reflect on thematic areas, which include: 1) the legal framework and

collaboration between LNS, DPM, PPM, and the Ministry of Health and Public Hygiene; 2) expectations and needs of LNS clients; and 3) support of LNS capacity strengthening by its clients and partners. PQM developed the roadmap and shared it with the partners. Implementation of the strategic plan will help LNS prioritize its actions to strengthen its leadership, governance, and technical and financial capacity, leading to improvement of its overall performance. Building upon second quarter progress, PQM completed the review of two of 22 SOPs submitted by LNS for review. The remaining will be completed and reported in the fourth quarter.

**Senegal** A recent visit revealed that the Directorate of Pharmacy and Drugs (DPM) faces several challenges in maintaining its personnel, as it lacks a dedicated department for inspection activities and dossier evaluation, a robust quality management system, and well-defined final five-year strategic plan. To foster the development of the DPM, PQM delivered technical guidance to include critical elements in the DPM five-year strategic plan, which include 1) the creation of an inspection department; 2) recruitment of qualified personnel; 3) a list of training needs (GMP, dossier evaluation); and 4) registration. In addition, the DPM organogram requires revision with definitions of the roles and responsibilities of each staff member.

**Thailand** PQM worked closely with the Ministry of Public Health's Bureau of Vector-Borne Diseases Control Malaria Cluster on development of National Malaria Elimination Strategy (2017-2026) and its Operational Plan (2017-2026). As a result, two key components of medicines quality (drug quality monitoring and inspection of drug supply and distribution for control of artemisinin monotherapy) were included in the Operational Plan of the National Malaria Elimination Strategy.

**Nigeria** PQM provided assistance to NAFDAC to strengthen the capacity of its PMS unit to monitor the quality of medicines in the supply chain in Nigeria. A PMS workshop was held this quarter in conjunction with NAFDAC and other key stakeholders. An implementation framework with guidelines was developed to channel the course of action for the PMS directorate to include medicines quality surveillance. Prior to this workshop the emphasis had been on pharmacovigilance; however, with the PMS guidelines, the agency will also proactively monitor medicines quality within the supply chain and will trigger regulatory actions as needed. The PMS guideline is at the final stage of review for adoption as a binding implementation framework for the PMS unit.

*PQM provided technical assistance to NQCLs for the development of manuals and SOPs in Nigeria and Liberia.*

**Nigeria** PQM support toward ISO accreditation for three labs continued to improve the technical capacity of two regional NAFDAC quality control laboratories in Agulu and Kaduna, and at the National Institute for Pharmaceutical Research and Development lab in Abuja. Trainings were provided to 130 laboratory staff (74 men, 56 women) by PQM on Good Documentation Practices, Good Laboratory Practices, and Good Pharmaceutical Practices for Quality Control Laboratory to build QMS capacity toward ISO accreditation, three quality manuals and 68 SOPs on a variety of related QMS topics were developed, reviewed, or updated by the laboratory staff, thus strengthening the QA/QC systems within the respective laboratories. PQM provided technical guidance during the reviews and monitored the development of the SOPs.

**Liberia** PQM provided technical assistance to the Liberia Quality Control Laboratory in the review of two new SOPs for operation of the oven and water bath. The SOPs are part of the technical requirements for ISO accreditation, which requires a written procedure for the equipment used in the laboratory. The next steps in the next quarter will be for laboratory management to ensure that staff are trained on the SOPs and procedures used in daily operation. PQM will continue to provide technical assistance on the implementation of QMS requirements toward ISO 17025, including training on procedures, as needed.

### **Key Regulatory Functions of National Regulatory Agencies Improved**

After assessing existing quality assurance systems, PQM builds the capacity of the MRAs to strengthen regulations, registration, and inspections processes through hands-on training and technical assistance.

**Ethiopia** With technical assistance from PQM, the Ethiopian Food, Medicine, and Healthcare Administration and Control

Authority (EFMHACA) was able to register the following 10 USAID priority medicines during the third quarter: one antimalarial (Arthemeter injection), five MNCH (Amoxicilline dispersible tablet, Sulfamethoxazole+Trimetoprim and Metronidazole injection), and four ARV medicines (Efaverenze). All of the registered priority medicines were processed through the fast-track registration system. Overall, the authority has registered 129 medicines, including 75 generics, of which 54 went through an abridged review process that bypassed some assessment procedures, as the products had already been registered by other stringent regulatory authorities or the WHO PQ system. The registration of priority medicines, such as ARV, antimalarial, and MNCH medicines, was expedited. For example, for Amoxicilline dispersible tablets, 19 months were needed for registration before the implementation of fast-track; now, through the fast-track registration system, initiated through PQM support, the number of months taken to register the same product has been reduced to four. PQM has also added MNCH medicines, ARV, and antimalarial medicines to the fast-track registration system. PQM supported the development of the Medicines Registration Guideline, which identifies products to be assessed through the fast-track system.

**Ethiopia** Additionally, PQM provided training to 17 staff of EFMHACA on dossier assessment of in vitro diagnostic kits for HIV/AIDS and malaria. External assessors also received training in dossier assessment from PQM, in collaboration with EFMHACA and Jimma University. Twenty-two EFMHACA staff and regional/city administration regulatory bodies were trained on the inspection of distribution channels and good distribution practice. The training goes hand in hand with the GDP and good storage practice guidelines developed with PQM's support. In addition to the short-term trainings, PQM is making strategic long-term contributions toward creating a pool of trainers to sustain staff capacity and build medicines regulatory systems by providing support to the Addis Ababa University School of Pharmacy in curriculum development for a new master's degree program in regulatory affairs. After undergoing several revisions with input from PQM, the curriculum has been approved by the university's senate, and the Regulatory Affairs Master of Science program is expected to be launched in August 2016.

**Burma** In May 2016, PQM helped the Burma Department of Food and Drug to organize a national training workshop for 24 inspectorators from 14 states and divisions across the country. This was a follow up from the November 2015 regional training course conducted in Laos in which seven countries in South-East Asia were represented, including Burma. 11 topics/modules were covered starting from understanding the QA/QC of medicines to maintaining the quality of medicines throughout the supply and distribution chains; good inspection practices to sampling strategies. A post training knowledge assessment showed that 83% of the participants increased their knowledge on the subject matter.

### **Standards of Practice at National Quality Control Laboratories (NQCL) Improved**

PQM builds the capacity of the NQCLs through hands-on training and technical assistance to improve laboratory standards, with one goal being to assist those labs in attaining internationally recognized certifications, such as ISO accreditation and/or WHO PQ.

*During the third quarter, PQM assisted laboratories to prepare for both ISO 17025 as well as WHO PQ certifications. In pursuit of ISO 17025, PQM engaged in QMS strengthening in Burma, Cambodia, Indonesia, and Kenya, and developed an accreditation action plan in Senegal. In Thailand, PQM worked to strengthen PMS in preparation for WHO PQ. In Kazakhstan, an initial assessment of three NQCLs was conducted in pursuit of achieving compliance with both WHO PQ and ISO 17025.*

**Burma** Preparation of ISO/IEC 17025 Accreditation for the Burmese Department of Food and Drug Administration (DFDA)'s QC laboratory in the Nay Pyi Taw laboratory is ongoing. PQM provided technical guidance and the network resource in identifying a proper and qualified agency to conduct calibration of laboratory equipment and proficiency testing (PT), which were the key steps for establishing Nay Pyi Taw QC lab's QMS. The network resource activity is a new initiative for identifying and compiling a pool of qualified service providers in calibration and PT in the region (and potentially beyond) to provide assistance to PQM's work in supporting the QC labs in the region toward ISO 17025 and/or WHO PQ, as laboratory equipment calibration and PT are the two major parts of the process. Two of the critical challenges in progressing toward achieving ISO/IEC 17025 targeted for Q2 FY17 have been the appropriate number of human resource with proper trained

skills in quality systems management and technical areas and the limited lab equipment required. In the effort towards addressing these challenges, the Director General of DFDA has been very supportive in facilitating PQM's work. The Director played a key role to influence government decisions to purchase essential lab equipment e.g., three HPLC systems, one UPLC, and one dissolution tester. Additionally, the Director issued a departmental order to ensure that the staff/analysts trained by PQM are dedicating their time and effort as top priority to implement every CAPA PQM recommended in a timely manner. Furthermore he committed that no staff transfer would be allowed until the lab achieves ISO/IEC 17025 certification.

**Cambodia** PQM had provided technical support to the National Health Products Quality Control Centre (NHQC) to develop documents toward meeting the QMS and technical requirements of ISO/IEC 17025 in order to attain accreditation by December 2017 or early 2018. As of June 2016, NHQC had finalized and approved their Quality Manual and 31 SOPs with associated documents such as master lists, forms, instructions, and worksheets. Between April and June 2016, there are 10 new SOPs drafted and under review. Meanwhile, NHQC conducted an internal training on the Quality Manual, and 12 SOPs were developed.

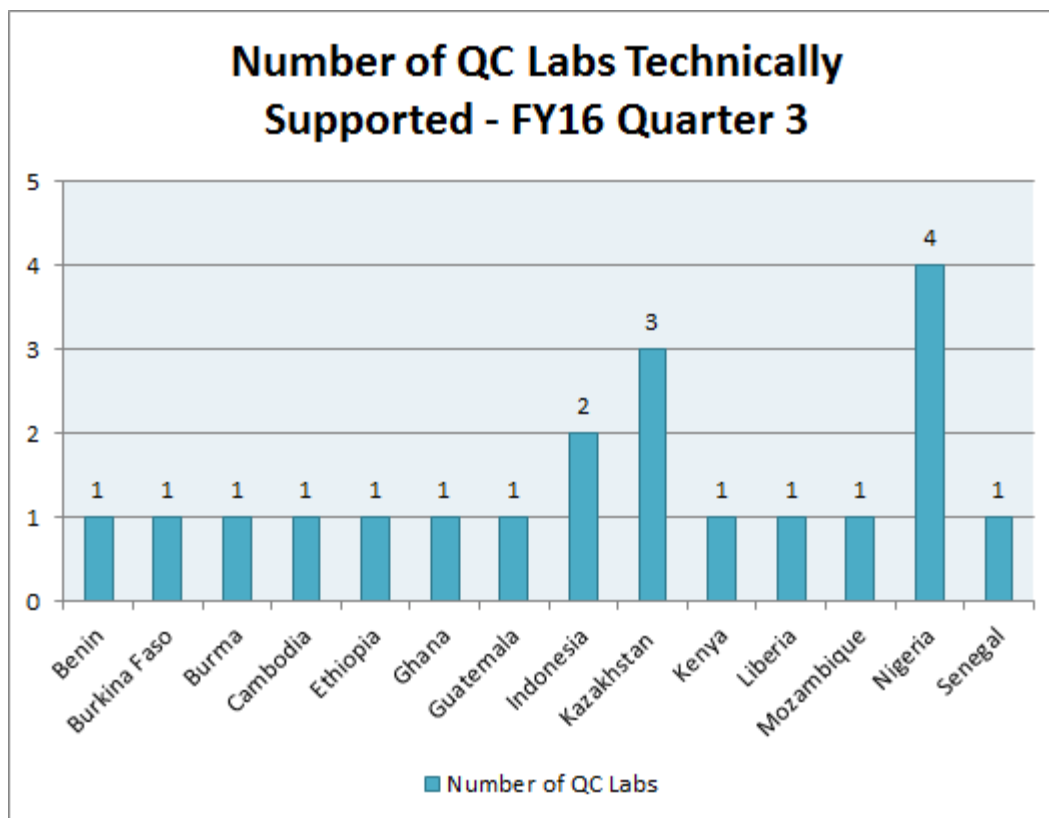
**Indonesia** PQM conducted an assessment of the Therapeutic Laboratory within the Teranokoko Division of BPOM in Jakarta, with PEPFAR funding in support of testing ARVs and related medicines in the greater Jakarta catchment area. Based on the assessment findings, the lab has the minimum quality and technical documents to meet the requirements of ISO/IEC 17025. However, the laboratory does not have sufficient objective evidence to indicate compliance with the standard. For this reason, PQM will offer technical assistance in the next quarter in the areas of QMS, document and record control, general good laboratory practices, proper use of international compendial methods, and equipment standardization.

**Kenya** A visit to the Kenya NQCL in March by PQM and the South African National Accreditation System (SANAS) revealed 29 non-conformances against ISO 17025 performance: 26 major non-conformances and three minor non-conformances. During this quarter, PQM provided technical assistance to the National Quality Control program primarily to address SANAS audit findings. Addressing these non-conformances will ultimately lead to maintaining NQCL ISO 17025 accreditation. Once the Corrective and Preventive Actions (CAPAs) are accepted by SANAS, a formal announcement indicating that the accreditation is maintained will follow.

**Senegal** To continue supporting the ISO 17025 accreditation effort, PQM met with the director and staff of the Laboratoire National de Contrôle des Médicaments (LNCM) to review and update the accreditation action plan. The next steps were outlined with the lab's QA team. Going forward, PQM will work remotely with LNCM to complete the review of the internal audit and management reports, toward meeting ISO 17025 requirements. As part of the ISO 17025 accreditation action plan, PQM 1) conducted an assessment of the lab's equipment, including high-performance liquid chromatography (HPLC), UV-visible spectrophotometry, gas chromatography, desiccator, balance, and Karl-Fisher; 2) repaired non-operational equipment; 3) provided a list of spare parts, accessories, and other supplies needed for LNCM to maintain its equipment in good operational status; and 4) verified equipment identity, affiliated documentation, job/position descriptions, and authorization and competency of the laboratory staff. Guidance was also provided to the LNCM director and staff regarding the installation of the new HPLC and proper utilization of the equipment's software. The HPLC assay technique will be included under the LNCM's scope of ISO accreditation. Additionally, PQM reviewed the WHO audit of LNCM and the lab's CAPA reports. Based on the actions taken, PQM will assist the lab in addressing other major and minor findings. This will be done as a mock audit during PQM's next in-country visit.

**Thailand** PQM continued to support Chulalongkorn University Faculty of Pharmaceutical Sciences' Pharmaceutical Technology Service Center (PTSC) to attain WHO PQ by providing compendial assays to support the region's PMS on sampling and testing. Other technical leadership support, such as the training on analytical methods and monographs development, was delivered to the Greater Mekong Subregion countries. PTSC will help fill the gap for timely test results that the existing regulatory WHO PQ Accredited QC labs (BDN of Thailand and NIDQC of Vietnam) cannot resolve. A follow-up assessment of PTSC was done by PQM to determine the laboratory's progress toward WHO PQ. The five-day assessment verified implementation of actions to correct 60 percent (18/30) of the observations from the December 2014 assessment.

The graph below provides a count of the QC laboratories that received technical support from PQM during the third quarter.



**Kazakhstan** PQM performed initial assessments of three NQCLs within the National Center for Expertise of Medicines, Medical Devices and Medical Equipment (Kazakhstan FDA) in Karaganda, Pavlodar, and Kostanay to gauge their compliance with WHO PQ and ISO 17025 requirements and their capability to participate in the WHO PQ program. In addition to these labs, PQM visited Astana NQCL. Although the PQM team found certain areas of non-compliance with the standards, the labs can improve their QMS, as they have qualified and dedicated staff. Karaganda, Kostanay, and Astana labs have good physico-chemical laboratories, compliant with WHO requirements, and they may be prepared for WHO PQ. However, Pavlodar lab is located on the ground floor of a residential house and cannot apply for WHO PQ until the lab is transferred into an isolated building. Per results of the initial assessment, PQM will provide to the three labs confidential reports with detailed descriptions of findings, recommendations on improvements, and tentative timelines for implementation of CAPAs. In eight to 10 months, based on effectiveness of CAPA implementation, PQM will collaborate with Kazakhstan FDA to select labs for follow-up visits, with subsequent application for participation in the WHO PQ program. According to the latest preliminary results of the assessment, at least three laboratories have potential for WHO PQ.

*PQM provided technical assistance to three laboratories to maintain ISO 17025 accreditation during the quarter. In Ethiopia, accreditation was successfully maintained, while in Ghana and Indonesia, PQM supported quality measures in preparation for upcoming maintenance audits.*

**Ethiopia** PQM provided support to the medical device laboratory (MQAD) to maintain its expansion of scope to include ISO 17025 accreditation for physico-chemical test methods and condom test methods. The lab's ISO accreditation was successfully maintained. With PQM's support in the past quarter, samples for proficiency tests (PT) were procured, and the MQAD lab has participated in the PTs. Results of the PTs showed a 100 percent pass rate. In the next quarter, PQM will support the MQAD lab in its efforts to participate in condom PTs, as they are a requirement to maintain ISO accreditation of the condom lab.

**Ghana** During the quarter, PQM continued supporting capacity improvement of Ghana's NQCL in preparation for an ISO 17025 accreditation audit. The staff were trained on quality management topics, including root cause analysis, how to write effective CAPAs, how to properly respond to an audit, as well as hands-on demonstration/training on Karl Fischer, pH, and specific rotation. Building on the 42 QMS documents and SOPs reviewed during the past quarter, PQM assisted the lab in revising an additional 12 SOPs within the medical device unit and the pharmaceutical microbiology unit. Following the ISO 17025 surveillance visit by ANSI-ASQ National Accreditation Board (ANAB), the lab successfully maintained its ISO 17025 Accreditation.

**Indonesia** An initial QMS audit of the Jakarta provincial BPOM laboratory was conducted during the quarter at the request of BPOM in preparation for a re-accreditation audit by the national accreditation body KAN for ISO 17025 certification. PQM conducted extensive evaluation of their current compliance with ISO 17025, the results of which were submitted in a confidential audit report to the provincial laboratory and will be followed up by PQM to implement CAPA during the next few months.

*PQM provided technical assistance to two laboratories in Ghana and Nigeria in order to expand the scope of ISO 17025 accreditation during the quarter.*

**Ghana** The capacity of the NQCL to assess medicines quality was expanded as the lab added 15 more tests, including a major test in pharmaceutical microbiology and medical devices, to its scope of accreditation. Successful expansion of the accreditation scope demonstrates that the lab can produce reliable and internationally acceptable data in these test areas to support regulatory actions, thus strengthening medicines quality in Ghana.

**Nigeria** As a follow-up to the successful American National Standards Institute-American Society of Quality National Accreditation Board surveillance visit that indicated that the ISO17025 accreditation of the NAFDAC QCL Yaba laboratory was sustained, PQM, in collaboration with the head of the Collective Dynamics and Control Laboratory (CDCL) department, drafted strategies for sustaining and widening the accreditation scope, recalibrating equipment, updating quality management systems, and continuing measures for ownership.

### **Capacity of Lab Staff to Conduct QA/QC Increased**

PQM collaborates with the WHO, its regional and country offices, and national health authorities to conduct training courses on a broad spectrum of quality control test procedures and good manufacturing practices. The courses—held onsite at national drug quality laboratories or at sentinel sites and local labs—focus on a wide range of topics related to various facets of medicines quality at the regional, national, and local levels.

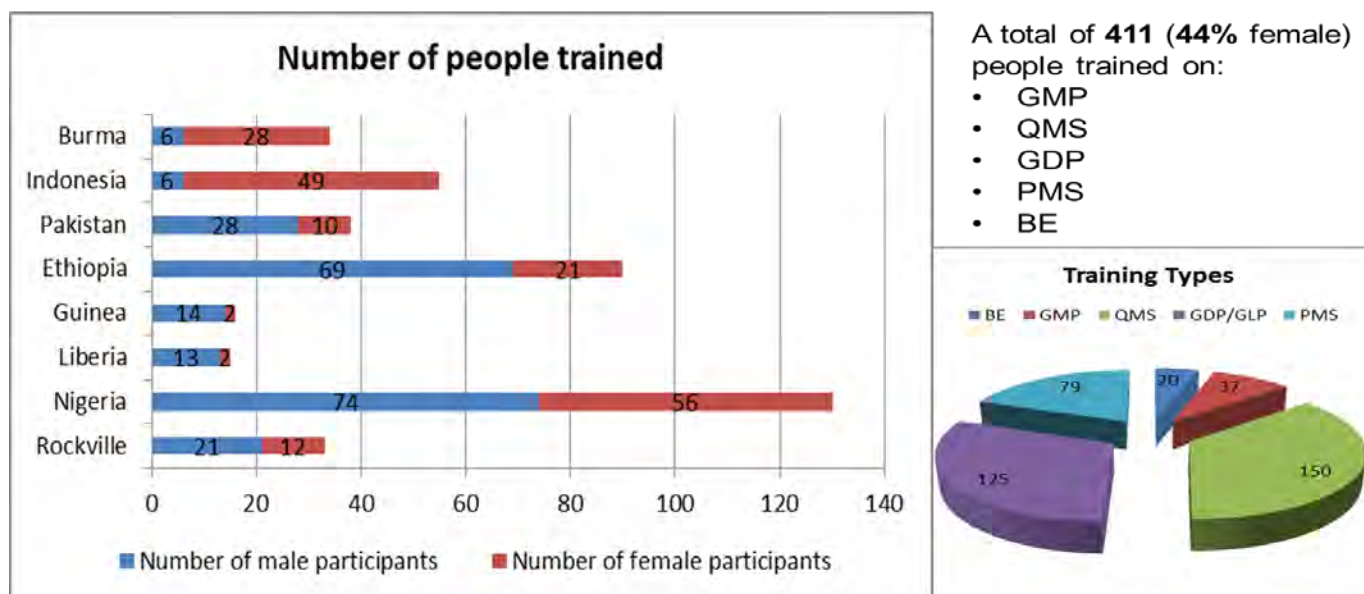
**Burma** To ensure the Burmese government has the ability to properly ensure the quality of medicines, PQM began providing technical assistance in August 2015 to the DFDA laboratory in Nay Pyi Taw. The TA is focused on building the capacity of the laboratory and its subsequent obtainment of ISO/IEC 17025 accreditation. In the third quarter of FY16, the DFDA Nay Pyi Taw lab's QA staff successfully conducted its first internal audit and completed root cause analysis and CAPA plan development; all are examples of strengthened individual and organizational capacity resulting from PQM technical assistance.

**Guinea** Activities this quarter included a launch of the MQM program as part of PMS, which included a designation of the focal person for MQM activities by DNPL, and a list of health programs to be involved in the first stage of launching the MQM program. Refresher training in the use of the Minilab™ for sample screening was also provided to staff.

**Indonesia** PQM is working closely with the MOH and BPOM on drafting the concept note and budget/procurement for the follow-on project to build BPOM lab capacity for TB and HIV medicines testing in 12 to 15 provinces. Final drafts will be discussed and approved during the fourth quarter, with the expectation of a new contract being awarded thereafter. Training on ISO 17025, CAPA, and root cause analysis was conducted for the national QC laboratory of BPOM with trainers from USP headquarters and the Indonesia Field Office. This training was meant to help the lab address the observations and

deficiencies in compliance stemming from last year's extensive QMS assessment of the national laboratory as well as to help in the area of CAPA implementation.

The graph below provides a count of the number of individuals trained in QA/QC by PQM staff or with PQM support during the third quarter.



**Mozambique** During the third quarter, the National Quality Control Laboratory (LNCQM) continued to improve its QC capacity through hands-on training. PQM supported an HPLC training conducted by Microsep, the approved vendor for Waters Instruments. Improvements in the technical capability of the lab in this analytical technique allows the lab to support assay testing of USAID priority medicines, especially those collected as part of the country's medicines quality surveillance. The lab has also registered to participate in ISO 17043 proficiency testing from Sigma Aldrich Corporation. The result of the testing is pending but will compare the proficiency of the lab to other QC laboratories globally. In addition, key equipment was procured and shipped to LNCQM by PQM during the quarter that will enable the lab to function more effectively. For example, dissolution systems and balance and weight sets will enable it to comply with Good Laboratory Practices. Additionally, two staff from LNCQM were supported to participate in a two-part training at CePAT Ghana on QC laboratory techniques. The staffers immediately applied those new skills, thus improving the capacity to assess medicines quality through compendial testing.

**Nigeria** During the quarter, PQM—in its support of NAFDAC's efforts toward a lasting institutional capacity through e-learning technology—completed the content for the GMP module. The module that was developed is being aligned with the same format used for the USP academy platform. As a follow-up to implementation of strategies by USP/PQM to strengthen the pipeline of skilled professionals in the pharmaceutical sector, draft curricula has been developed and compiled to include QA in pharmaceutical manufacturing for bachelor of pharmacy, postgraduate diploma, master of science, and doctorate of pharmacy programs. The compiled draft curricula are awaiting ratification by the constituted committee members before they are presented to the deans of pharmacy schools in Nigeria.

**Pakistan** Two training-of-trainers (TOTs) activities were conducted to prepare QC managers from the central drug testing laboratory (CDTL or CDL) and drug testing laboratories in Quetta, Peshawar, Rawalpindi, Faisalabad, Bahawalpur Gilgit Baltistan, Azad Jammu, Kashmir, and Karachi. In all, 10 technical persons (nine men and one woman) were trained. Hands-on TOT for compendial analysis of chlorhexidine (CHX) 7.1% gel was conducted by two USP scientists at CDTL Karachi over five days in April. Apart from imparting technical knowledge on the QMS requirements of lab maintenance, practical



training on instrumentation was conducted using the facility. After the five days of TOT hands-on training, a two-day training on standards of interlaboratory testing was conducted to the 10 participants who attended the previous training. The aim of the training was to establish the standards of inter laboratory testing to ensure standards of testing and consistency in test results. The training and its contents were well received by the participants who resolved to implement the information to strengthen the standards of the QC Labs in which each of them works.

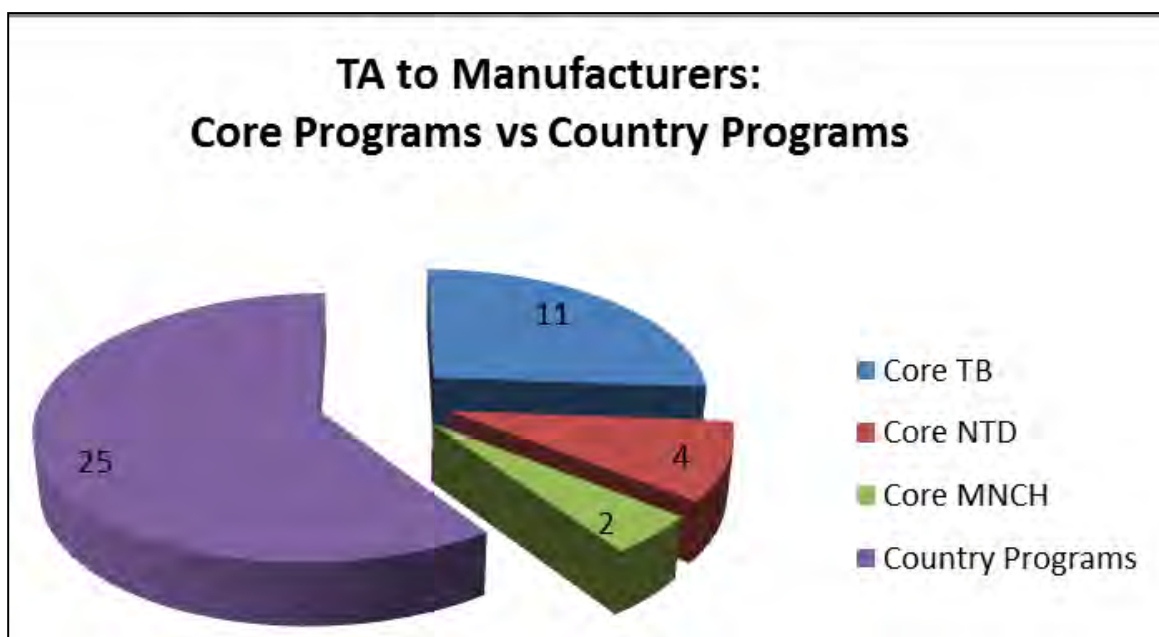
In order to strengthen the skills of drugs inspectors, a three day training on Good Sampling Practice (GSP) and PMS was held in Karachi. The training was attended by nine (six male and three female) Federal Drug Inspectors from Karachi, Lahore, and Islamabad and provincial inspectors from Sindh and Punjab. Two days of the training were classroom based and the third day consisted of a field visit to three different locations in Karachi to conduct hands-on practice of sampling and PMS techniques.

## IR 2: Availability of Quality Medicines Increased

PQM GMP specialists travel to manufacturing sites in order to help companies improve their compliance with WHO standards and develop the dossiers to submit to the WHO PQ program for certification. The goal is to increase the supply of locally produced, quality-assured medicines, targeting those that support USAID priority health programs. PQM delivered broad technical assistance to manufacturers to address GMP and other quality-related issues. Technical assistance ranges from early initiatives to the final submission of the application, or dossier to WHO PQ, a Stringent Regulatory Authority (SRA), or local National Regulatory Authority (NRA).

During this quarter technical assistances provided to 42 manufacturers of priority medicines (ARVs, Anti-malaria, Anti-TB, MCH and NTDs) in 11 countries. Of this:

- ▶ 17 were supported by Core Programs
- ▶ 25 were supported by Country Programs



**Core TB** During the third quarter, PQM continued to provide high-quality technical assistance to manufacturers in support of WHO PQ or other stringent regulatory authority approval for five priority tuberculosis medicines: clofazamine, kanamycin, gatifloxacin, moxifloxacin, and cycloserine.

For clofazamine, a GMP assessment for active pharmaceutical ingredient (API) and finished pharmaceutical product (FPP) facilities were conducted. The assessment resulted in some observations, which when addressed will help to improve the company's compliance with GMP for FPPs. A separate confidential audit report has been sent directly to the company. PQM will assist manufacturers in addressing the deficiencies identified by PQM.

Toward kanamycin API, assistance in process development continues. With assistance from PQM, the supported pharmaceutical company is developing a method to reduce impurities using ceramic membrane separation.

Gatifloxacin is recommended in the new WHO TB treatment guidelines as a part of the short regimens; however, there is no internationally quality-assured gatifloxacin on the market. PQM worked to identify the manufacturers of gatifloxacin API and FPP that have potential for WHO PQ with PQM's technical assistance. As a result of intelligence gathering and evaluation, one manufacturer of API and one manufacturer of FPP were identified. An audit of the API manufacturer was conducted in the third quarter; the assessment report is being developed and will be sent to the manufacturer in the fourth. PQM is in the process of engaging the FPP manufacturer to gather relevant technical information.

Regarding moxifloxacin API, currently, there is only one manufacturer prequalified by WHO. During the quarter, PQM identified a manufacturer that has interest in qualifying for Certificate of Suitability of Monographs of the European Pharmacopoeia. PQM is in the process of engaging the manufacturer.

Finally, for cycloserine API, ST Pharm received full WHO PQ for cycloserine API on June 18, 2016.

**Core MNCH** PQM provided technical assistance to selected manufacturers in support of WHO PQ or other stringent regulatory approval for the following MNCH priority products during the quarter: magnesium sulfate injection, oxytocin API and oxytocin injection, chlorhexidine solution, and amoxicillin dispersible tablets.

A manufacturer was identified for magnesium sulfate injection, a vital maternal health product. The company will manufacture the product on a production line that has successfully undergone WHO PQ for an anti-tuberculosis product. The manufacturer, however, does not have a suitable magnesium sulfate API source. Through discussions with Concept Foundation, two API suppliers have been identified, and PQM will facilitate manufacturer access to magnesium sulfate API from the suppliers.

PQM held discussions with a manufacturer of oxytocin injection. As with magnesium sulfate injection, the product can be produced on the same line where the company's WHO PQ product is currently manufactured. In this case, the company also lacks an API source. To address this issue, PQM has identified an API manufacturer with oxytocin API production capability. However, because of a recent relocation of the API site, the new site needs to be inspected by the European Directorate for the Quality of Medicines and will require PQM technical assistance in order to be successful. Minimal resources would be needed to provide TA to the oxytocin API supplier, which would result in establishing a GMP-compliant source, thus increasing competition and potentially reducing cost. The next steps for PQM are to 1) provide TA to prepare the oxytocin API manufacturer for the European Directorate for the Quality of Medicines inspection proposed for December 2016; and 2) provide TA to the FPP manufacturer of oxytocin injection.

For chlorhexidine solution, a newborn health product, PQM has provided additional information on an automatic liquid packaging line to a major manufacturer of the product, which was eventually ordered. This equipment will convert the current manual filling system to an automatic system, which PQM flagged during GMP assessment. The equipment was slated to be delivered at the end of June but was slightly delayed. Installation and qualification dates are currently pending; however, once the equipment is installed and qualified, PQM will conduct a follow-up assessment to ensure that the automatic liquid packaging line is GMP compliant. PQM also reviewed the proposed new cap and stopper for the ACI CHX liquid product.

The cap and stopper's change to a flat shape makes it completely different and distinguishable from the traditional eye drop bottle; this difference may help users to avoid accidental misuse.

PQM identified a manufacturer to receive technical assistance for the manufacture of amoxicillin dispersible tablets. The manufacturer currently has a certificate of suitability for the amoxicillin API and has an amoxicillin dispersible tablet product on the market in China. However, further refinement of the formulation is needed to ensure compliance to quality standards. The next steps for PQM will be to perform a gap analysis to evaluate the manufacturer's compliance to GMP, while providing TA on the development of the formulation. (NOTE: The progress made with this manufacturer also impacts newborn health; amoxicillin dispersible tablets are also used in the new WHO short regime to treat clinical severe infection in newborns.)

**Core NTD** PQM provided assistance to selected manufacturers in support of WHO PQ or other stringent regulatory approval for the priority product Praziquantel (PZQ). Full GMP assessment of a major PZQ API manufacturer was conducted during April 18–22. The detail of the report has been issued to the manufacturer, and the company is currently working on the CAPAs. Except for major non-compliance issues, there are no critical observations. The company has submitted its Active Pharmaceutical Ingredient Master File application to WHO PQ, and the application has been accepted, with the dossier under full assessment. During the quarter, the Core NTD team: 1) attended the joint meeting on access to NTD medicine with implementing partners, including the WHO PQ team, WHO NTD, and the Bill and Melinda Gates Foundation (BMGF); 2) was present at the Convention on Pharmaceutical Ingredients; and 3) discussed areas of collaboration to leverage on the PQM technical assistance for manufacturers. Follow-up activities will be conducted regarding technical assistance to manufacturers on PZQ API for WHO PQ. Representatives from the manufacturers that PQM support were present at the meeting between PQM, WHO, and BMGF. During the quarter, the PQM team also conducted onsite hands-on CAPA rectification to manufacturers. The team also attended the Convention on Pharmaceutical Ingredients workshops and the met with five individual companies.

*In addition to supporting manufacturers for priority products of PQM's Core Portfolio, the program also utilized Mission support to provide diverse technical assistance to selected manufacturers in Ethiopia, Indonesia, Kazakhstan, Pakistan, and the Philippines in support of WHO PQ or other stringent regulatory approval during the quarter.*

**Ethiopia** PQM supported EFMHACA to develop a national GMP roadmap to help the authority regulate the compliance of manufacturers with GMP. A workshop on the implementation of a “National GMP Roadmap,” followed by a capacity-building workshop for local stakeholders and local manufacturers, was organized to help them prepare for upcoming GMP audits and to support them in the implementation of the recommended interventions. EFMHACA has indicated that at least five companies should receive GMP certification within the next five years. The capacity-building workshop was officially opened by the State Minister of Industry, attesting to the strong interest of the Ethiopian government to move the pharmaceuticals industries forward while remaining in GMP compliance.

**Indonesia** GMP support to manufacturers and the MOH (Farmalkes) during the quarter was limited due to delay in finalizing legal agreements to implement the Assistance Agreement between USG and GOI. Despite this marked challenge, GMP activities and onsite follow-up continued throughout the quarter. USP PQM convened follow-up visits to all supported manufacturers—together with inspectors from the Production Control of Therapeutic and Household Products of BPOM and the Directorate of Production and Distribution of Farmalkes MOH—to monitor progress on product development. Staff from BPOM and industry were also sponsored to participate in the training on “Validation and Part 11 Compliance of Computer Systems and Data” to comply with FDA requirements (Part 11 and EU/PICS GMP Annex 11) to ensure data integrity, security, and availability. The training course provided the regulatory background and guided the BPOM and industry participants through the complete equipment qualification, calibration, and computer system validation processes, from planning to reporting. It also helped explain the meaning of Part 11 and Annex 11 requirements to ensure document integrity and other requirements for electronic records and signatures. Subsequent to the training, PQM sponsored dissemination events at its institutions to ensure that the knowledge would be shared with colleagues and to build institutional capacity. An extensive GMP audit was conducted at Linaria, an API manufacturer based outside Bangkok, Thailand, for its pyrazinamide production facility. This company is being supported as part of a strategy to ensure stable, high-quality API availability for the state-owned pharmaceutical manufacturers in Indonesia. The dependency on imported API in Indonesia has resulted in

instability of supply and reliance on poor-quality API sources, which is primarily cost driven instead of quality driven. After extensive audits at Linaria, it was determined that its level of GMP compliance is still too low to justify further support at this time. Thus, USP PQM will revise its recommendations on Linaria and discuss other potential API sources that we have identified that will eventually either be WHO PQ or qualified by an SRA. The GMP specialist for the USP PQM Indonesia Field Office participated in a weeklong GMP training on dossier evaluation according to WHO, at USP headquarters in Rockville, MD. This training was designed to assist assessors and PQM staff in better understanding the technical and regulatory requirements for the cumbersome product dossier as well as the way to evaluate and assess its appropriateness for submission to WHO. Plans for the fourth quarter include extensive follow-up, audits, and training on QC (residual solvents, good laboratory practices, and others) for the manufacturers. USP PQM will reevaluate the current support strategies to the manufacturers and formulate strategic guidance for appropriate engagement during FY17, based on progress of the private and public sector companies.

**Nigeria** PQM supported a local manufacturer (Emzor) on the production of zinc/oral rehydration solution (ORS) and chlorhexidine gel. A PQM-identified expert in water qualification and validation assisted the company in completing the first and second phase of water qualification, which has improved both processes used at Emzor. The company is currently awaiting NAFDAC inspection of the facility. The supply of locally produced quality assured medicines was increased through consistent technical assistance provided by PQM to 12 local manufacturers. Technical visits were made to supported local manufacturers to provide technical assistance and continuous mentorship for compliance with GMP in line with current national and international guidelines. As a result of these mentorship sessions, during this quarter, a category 1 PQM-supported local manufacturer (CHI) has been engaged by UNICEF (the United Nations Children's Fund) to procure zinc/ORS (co-pack) for four countries, with additional orders expected to also supply the Republic of Niger and other African countries. In addition, two public health organizations (Society for Family Health and Crown Agents) engaged CHI and also procured 337,840 zinc/ORS (co-packs) for their public health intervention in Nigeria. Another category 1 PQM-supported local manufacturer (Drugfield) has been engaged by four public health organizations to procure chlorhexidine in Nigeria and by three public health organizations (Center for Infectious Disease Research for Zambia, PATH Mozambique, and PATH Mali) for the implementation of various public health interventions across Africa.

**Kazakhstan** During this quarter, the pharmaceutical company supported by PQM developed an updated CAPA plan with new timelines according to the results of the latest PQM assessment of their facility; a PQM GMP consultant evaluated the updated CAPAs and provided recommendations on their implementation. The manufacturer also provided appropriate supporting documents confirming their work on CAPAs. The next step will be a series of teleconferences with the PQM GMP consultant to provide remote technical assistance on implementation of corrective actions. Final versions of translated WHO PQ documents after scientific editing were sent to a style editor. Style editing shall be finished in the fourth quarter of FY16.

**Pakistan** The preparation for local production of chlorhexidine digluconate gel is one of the primary outcomes the PQM program in Pakistan. During the first two quarters, PQM technical assistance to ZAFPA, Akhai, and ATCO pharmaceutical companies facilitated the submission of dossiers by each manufacturer. In this quarter, PQM was able to facilitate the evaluation of the submitted dossiers by the Pharmaceutical Evaluation Cell of DRAP and establish a technical evaluation committee by the Drug Registration Board to perform onsite verification of stability data. PQM delivered three-day training on the compendial analyses of chlorhexidine gel, to strengthen the analytical skills of quality control staff of manufacturers receiving TA. In all, nine technical persons from ATCO Laboratories, ZAFPA Pharmaceutical, Akhai Pharmaceuticals, and Friends Pharma attended the training. To deliver TA more responsively, PQM has on-boarded two new local consultants for QC and GMP technical support. The QC and GMP consultants were inducted on June 1, 2016, and were requested to help the manufacturers meet DRAP expectations.

**Philippines** PQM is continuously providing technical assistance to Hizon toward WHO PQ for TB medicines. In April 2016, a PQM senior GMP specialist visited Hizon and reviewed the CAPA plan for the deficiencies observed during the first WHO audit in November 2015. Hizon is tasked to complete and finalize the CAPA plan this quarter and submit it to the PQM GMP team for review before final submission to WHO. However, Hizon is currently facing major issues in addressing the CAPA plan, which delay the submission. The installation of data integrity software will start next quarter. The field office placed this activity on the top priority list to accelerate the process of completion.

## IR 3: Capacity to Detect Poor-Quality Medical Products Increased

PQM combats falsified and substandard medicines in collaboration with a country's medicines regulatory authority and national health programs to establish and enhance PMS systems that regularly examine the quality of medicines circulating in markets. PQM supports the national regulatory authorities to assess existing QA/QC systems by selecting sites to monitor based on criteria such as epidemiology, geography, border region, history of trafficking fake medicines, etc. This also includes training field staff in sampling, testing with Minilab™ methods, and data reporting, as well as training Official Medicines Control Laboratory staff in advanced test methods.

### Capacity to Assess Medicine Quality Improved

PQM assists countries in implementing PMS programs where little capacity exists, and works to enhance existing PMS systems through a wide range of activities, including providing supplies, conducting trainings on use of PMS technologies and inspection processes, strategic planning, strengthening implementation, and conducting studies to inform overall PMS approaches.

*Peru and Ecuador delivered updates on MRA-led implementation of the Three-Level Approach to PMS.*

**Peru** To support Level 1 assessment in the field (Physical and Visual Inspection), PQM is developing an internet-based application that will be completed and deployed in Peru and Ecuador in the next quarter. Toward this, PQM completed Peru's database that will be included in the application. The database contains over 250 products, including all antimalarials registered in the country as well as selected antibiotics and anti-inflammatory medicines. In the past, PQM has supported Peru's MRA (DIGEMID) and Official Medicine Control Laboratory (CNCC) in the implementation of the Three-Level Approach, through assistance in developing sampling and testing protocols, and training in the use of Minilab™ for Level 2 screening of medicines in the field. Currently, Peru has taken total ownership of the Three-Level Approach and implements it without any PQM support. In this process, to address the need to assess in the field the quality of medicines not included in the Minilab™, CNCC established a development and validation program for additional APIs. In support of this initiative, last year PQM trained CNCC personnel on Development and Validation of Analytical Methods. This year, realizing the global impact that newly developed methods could have, PQM coordinated the collaboration between CNCC and the Global Pharma Health Fund (GPHF) to facilitate the inclusion of Peru's newly developed methods in the Minilab™. In this context, the development and validation protocol for a product has been submitted and approved by GPHF.

**Ecuador** Following PQM's recommendation, last year Ecuador's MRA (ARCSA) included the use of Level 2 (Screening Methods) in the PMS guidelines for surveillance of medicines quality. Subsequently ARCSA took ownership of two Minilabs™ originally donated to the National Malaria Control Program in 2005, which had been inactive since 2009; PQM purchased the necessary supplies to replenish those Minilabs™. During the third quarter, PQM supported the participation of two analysts from ARCSA's reference lab in a training on Minilab™ use and implementation of the Three-Level Approach, which CNCC delivered in Peru for Regional Health Offices and the national network of academic laboratories.

*In Angola, Benin, Burkina Faso, and the Philippines, MQM activities utilizing Minilab™ technology ranged from providing supplies, to conducting training, strategic planning, and strengthening implementation.*

**Angola** To date, implementation has focused on a baseline antimalarial medicines quality assessment to show the presence of falsified, substandard, or unapproved products. Following the first quarter antimalarial baseline/pilot assessment, communication with the USAID/Angola Mission and regulatory authority (Divisão Nacional de Medicamentos e Equipamentos) has focused on strategy planning based on the results from the second quarter baseline study and planning the second phase of Minilab™ training for MQM. Activities have also have centered on revising the FY16 work plan, since

not all activities were approved by the Mission, and planning for the upcoming medicines quality monitoring activity in the next quarter. Four Minilabs™ were procured to enable expansion of MQM activities.

**Benin** In preparation of the first round of post-marketing surveillance of antimalarial medicines, PQM procured and delivered Minilab™ supplies to the NQCL of Benin. PQM discussed the budget of the activity as well as the areas that the surveillance will cover. PQM will facilitate sampling and screening of antimalarial medicines in the fourth quarter at six departments.

**Burkina Faso** To strengthen post-marketing medicines surveillance in Burkina Faso, PQM procured and delivered one Minilab™ and additional supplies, and trained staff from the National Laboratory of Public Health; General Directorate of Pharmacy, Medicine, and Laboratories; Central Medical Store; National Malaria Control Program; and University of Ouagadougou on sampling and screening of antimalarial medicines. Following the training, DGPML took the lead to facilitate a sampling plan with all the participants. Two sampling teams were formed. A total of 126 samples were collected and screened. The National Laboratory of Public Health will analyze the data and work with PQM to set a date for dissemination of the survey results.

**Philippines** The FDA had screened 118 anti-tuberculosis medicines using the Minilab™ kit during the third quarter. The findings show that one out of 118 samples was reported failed after confirmatory testing (Brand: Fixcom 3/Batch No. 14FXC3 06). Through PQM's effort, the failed sample was found to be in violation of regulation 9711 under the FDA Act of 2009. Upon evaluation, the sample submitted was found to be an unregistered drug product. The registration number does not belong to any registered drug product. The FDA authority is now taking legal actions against the manufacturing company of this product (Brand: Bacciter/Generic: Isoniazid/Dosage: 400mg tablet/Lot No. 4C54/Drug Registration No. DR-XY13907).

*High-level trainings impacting national PMS systems took place in Burma and Ethiopia.*

**Burma** Falsified, substandard, and unapproved medicines are imported into Burma through various means due to lax regulatory settings. In order to strengthen the key regulatory functions of the Burmese DFDA, PQM conducted a national workshop on pharmaceutical supply and distribution chain inspection in Nay Pyi Taw. Twenty-four inspectors from DFDA Nay Pyi Taw and all 14 state/regional offices participated in the training workshop. PQM helped standardize inspection practices to enhance the knowledge and technical expertise of the DFDA inspectorates. A practical inspection exercise was performed in the nearby town of Lewe to evaluate performance of the inspectors. A post-workshop knowledge assessment found that 83 percent of the participants had increased their knowledge on the subject matter.

**Ethiopia** Previously, inspectors at EFMHACA branch offices collected and tested samples of medicines, as there was no dedicated lab staff. However, in the second quarter, PQM assisted in the recruitment of four lab analysts who received hands-on training through attachment in the third quarter. As a result, during the quarter, the staff were able to test 58 samples using this method. No samples failed. In addition, 41 samples were collected (Chloroquine, metronidazole capsule, Quinine sulphate, and ceftriaxone) and tested using Minilab™. All samples passed, including the 10 samples that were sent to the central laboratory for confirmatory testing. Also in the quarter, as part of the national PMS activity, PQM provided training for PMS sample collectors in areas including introduction to PMS protocols, techniques of sample collection, field communication, and sampling tools. A total of 27 staff from EFMHACA, ports of entries, and regional/city administrations attended the training and then were immediately deployed to various collection sites. Tools for sample collection were improved and simplified to minimize data entry errors. The anti-malarial, opportunistic infection, and MNCH medicine samples collected are expected to be tested next quarter at EFMHACA's main laboratory using compendial test methods.

*PMS systems were established in Guinea, and existing PMS procedures were enhanced for Core MNCH medicine. A high-level regional meeting demonstrated varied country level progress on PMS system implementation across Latin America.*

**Guinea** One of the DNPL's primary functions under the newly revised but yet to be finalized pharmaceutical law is to have a department in charge of post-marketing surveillance of the medicines circulating in the market. The lack of such a department limits the DNPL function in regulating the pharmaceutical market post-marketing authorization. To build DNPL capacity with respect to this critical regulatory function, during this quarter PQM initiated plans for monitoring the quality of

medicines as part of PMS. A focal person for MQM activities has been designated by DNPL, and a list of health programs to be involved in the first stage of launching the MQM program has been compiled. PQM is planning to work closely with the identified stakeholders in order to be part of the first baseline MQM activities in Guinea in the next quarter.

**Core MNCH** PQM developed quality control screening procedures for penicillin G benzathine, penicillin G sodium, penicillin G procaine, and gentamicin injectable products. Hard copies of the procedures were provided to the USAID MNCH team.

**Amazon Malaria Initiative (AMI)** AMI countries provided data on antimalarials quality routinely until 2011, but no results have been reported since then. To address the lack of information, PQM included in the work plan surveying QC activities performed in AMI countries during the last two years. The following is a summary of the information received and presented during the quarter at the 2016 AMI/Amazon Network for the Surveillance of Antimalarial Drug Resistance meeting:

1) Of the 11 countries currently participating in AMI to whom the survey was sent, Colombia, Guatemala, Guyana, Honduras, and Peru provided data on the lots of antimalarials received, but only Colombia and Peru performed QC. Belize has no QC capabilities and sends antimalarials abroad for testing; however, it has not assessed the quality of the antimalarials utilized in the country since 2013.

2) Worth noting is that Colombia and Peru are the only AMI countries that fully integrated the Three-Level Approach for QC of *all medicines* in their regulatory system; though only Peru utilized Level 2 (Field Screening Methodologies) for the assessments of antimalarials reported in this survey. Since antimalarials were not routinely assessed before PQM interventions, it could be inferred that PQM regulatory system strengthening resulted also in the continuous and sustainable PMS of medicines utilized by the National Malaria Control Programs.

3) In most countries, medicines were procured through the Pan American Health Organization's Strategic Fund and in some, including Guyana, they were obtained through other internal processes, such as national tenders. In Guyana, which did not perform any QC on antimalarials, Chloroquine was purchased from the same local manufacturer that in the past had two failed samples of the same product in similar packages.

**Core Malaria** Preparation for the study to assess the diversion of antimalarial medicines (namely, Coartem by Novartis and Artesunate Amodiaquine by Sanofi, donated by the U.S. government) from public to private sectors is in its final stages. The study will be implemented in Malawi, Nigeria, and Benin as was agreed with USAID's President's Malaria Initiative Team. The samples of Coartem and/or Artesunate Amodiaquine will be collected from randomly chosen informal and formal drug stores by mystery shoppers. Both urban and rural areas will be covered. Studies will begin in July 2016 and reports generated from the studies will be submitted one month after each study is completed.

### **Enforcement Actions Against Falsified, Substandard, and Unapproved Medicines Strengthened**

**Liberia** MQM activities in Liberia continue to provide major support to the LMHRA in addressing the problems of poor-quality medicines in circulation. As reported in quarter 1, out of the 230 samples tested in round 5, 18 samples failed. Most of the failed samples were collected from Bong and Nimba counties. Based on MQM round 5 results, an additional 10 new regulatory actions have been taken, including the confiscation of poor-quality quinine and amodiaquine monotherapy from Monrovia and Nimba. MQM round 5 was completed and the associated Fixed Obligation Grant was closed after LMHRA submitted all reports and signed a close-out packet. However, MQM round 5 results continue to provide evidence for enforcement actions. MQM stakeholders meetings and enforcement actions continue even in the absence of LMHRA. Local authorities have confiscated a consignment of unregistered medicines (total and price not yet established) entering Liberia via Nimba county. Part of PQM's strategy for MQM round 5 was a stakeholders meeting with the local authorities and civil society groups with the intent of creating awareness about poor-quality medicines in circulation. Three Minilabs™ were procured to assist with MQM activities at sentinel sites, ports of entry, or other places to be identified by National Malaria Control Program and LMHRA.

**Senegal** PQM is providing technical support to DPM to implement "Operation Coup de Point," a campaign against illegal medicines aimed at encouraging regulatory enforcement action. During this quarter, PQM organized a meeting with the DPM director, key stakeholders, and Inter Ministerial Committee members to plan the technical approach and logistics of Operation Coup de Point.

## IR4: Use of Information for Decision-Making Increased

PQM serves as a global technical leader in medicines quality assurance and an advocate for medicines quality in collaboration with a number of partners. Technical leadership entails contributing to expanding pharmaceutical quality-related health systems research, as well as developing innovative and efficient quality testing techniques and approaches. Advocacy efforts involve the promotion of quality medicines and eradication of falsified and substandard products, forged through collaboration with diverse partners at local, national, and international levels, as well as visibility in external information outlets.

### Availability of Information Related to Quality of Medicines Increased

Poor quality medicines pose a grave threat to patients in developing countries, but their presence remains a largely unknown problem—a problem that USAID, PQM, and national authorities are working diligently to combat. PQM uses a variety of methods to raise awareness about the potential dangers of using substandard or counterfeit medicines, each tailored to best reach the individual audience.

**Core TB** In order to provide high-quality technical assistance, PQM staff are required to stay abreast of the current industry practice and current regulatory requirements. During the third quarter, two GMP staff members attended the training Assessment of the Quality Part of the Dossier, organized by WHO in Copenhagen, Denmark. The workshop helped increase PQM's knowledge of key dossier requirements, some commonly encountered deficiencies, and how to provide better technical assistance to manufacturers interested in pursuing WHO PQ for second-line TB medicines. The training was facilitated by WHO PQ team. Attending this training helped increase the knowledge of key dossier requirements and commonly encountered deficiencies. PQM staff attended the Global Drug Facility (GDF) Manufacturer's Meeting in Da Nang, Vietnam. During this meeting, PQM presented an overview of the PQM program, GDF shared their new strategy and framework, and other partners also presented information on their organizations. WHO presented information on upcoming new WHO guidelines, which would include some significant changes in terms of the recommended treatment for drug resistant-TB patients, which would affect the global demand for the different anti-TB medicines. Throughout the meeting, PQM staff also met and held discussions with GDF and WHO. Also, PQM had meetings with manufacturers—both new and existing—within the public health market, on how PQM can provide technical assistance to achieve WHO PQ.

**Core MNCH** PQM developed a draft outline of a paper describing the impact of USAID support to local manufacturers of MNCH medicines in low-resource countries. In addition to the outline, the literature search continued along with data collection of information to be included in the subsequent analysis. A desk review of current oxytocin pharmacopeial and other validated methods was conducted; a comparison of the assay procedures was performed to identify differences that may cause challenges in analysis. PQM in collaboration with the health systems nonprofit, PATH, developed a short presentation to deliver at the Health Research Program closeout to highlight achievements related to CHX through collaboration with PATH and the chlorhexidine working group. PQM continued to prepare the technical brief on packaging by capturing information from USP experts responsible for the development of packaging standards. This included identifying current international standards. To support the preparation of the bioequivalence technical brief, PQM continued compilation of relevant information.

**Core Malaria** The PQM Core Malaria team continues its work on trend analysis of antimalarial medicines quality control data from the medicines quality database. Data analysis is organized by region: Africa, Asia, and Latin American countries between 2005 and 2015. Also, PQM is working on developing country profiles in terms of available trends, tools, and systems to support quality assurance of Malaria medicines in the countries. This information will help PQM and USAID in informed decision-making and planning the interventions.



**Cross Bureau** PQM launched the Poor-Quality Medicines ALERT, which may be accessed at the Medicines Quality Database (MQDB) home page. Originally the ALERT was meant to provide rapid access to information on poor-quality medicines identified in post-marketing surveillance activities in PQM countries, avoiding the time lag in the process of introducing it in MQDB together with the information from all the other medicines that had not failed testing. However, currently it also contains information on poor-quality medicines from multiple sources, reported to or identified by PQM. In pursuit of the latter, PQM will proactively seek information from different sources. Fifteen new reports on incidences relating pharmaceutical products quality issues were added to the compilation of media reports. One highlight of the report is the Indonesian police uncovering a fake vaccines syndicate in June 2016. The vaccines for polio and hepatitis B were intended for children under five.

### **Regional and Global Collaboration for Medicine Quality Enhanced**

PQM raises awareness about the dangers of falsified and substandard medicines and provides information to ensure access to the public and respective governments. PQM supports regional and global initiatives to promote medicines quality via regional partner meetings, development of regional databases and alert systems, as well as encouraging collaboration among stakeholders.

**Cross Bureau** In April, PQM attended the 4th Implementation Steering Committee Meeting on the East African Community (EAC) Regional Pharmaceutical Manufacturing Plan of Action, as well as the Planning Workshop for the Second Phase of the EAC-Physikalisch-Technische Bundesanstalt (PTB) Project on the “establishment of a regional quality infrastructure for the pharmaceutical sector” in Nairobi, Kenya. Major actors included members of the EAC Secretariat, PTB, Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), national regulatory authorities and national quality control laboratories, United Nations Industrial Development Organization (UNIDO), and the Federation of East African Pharmaceutical Manufacturers. As a result of earlier discussions with EAC and meetings, PQM committed to providing a concept note for review and discussion with EAC. The concept note to form the basis of a memorandum of understanding between EAC and PQM was submitted to EAC in May. An additional outcome of the meetings was expanded partnership with PTB. During the second half of the third quarter, PQM held discussions with both PTB and EAC to make initial plans for a joint workshop to provide training on qualification and validation, as well as dossier assessment. In May, PQM also attended the first Expert Working Group on Regional GMP Roadmaps for implementation of the African Union Pharmaceutical Manufacturing Plan for Africa in Dakar, Senegal. PQM shared its experience in establishing a GMP Roadmap based on PQM technical assistance for the WHO PQ process and establishing a GMP Roadmap for UNIDO in the past. As a result of the trip, the New Partnership for Africa’s Development and PQM are discussing how PQM can provide technical assistance to implement GMP Roadmaps in different regions of Africa.

### **Innovative Tools and Approaches to Strengthen Medicines Quality Assurance Introduced**

PQM strives to develop innovative tools and novel approaches to medicines quality by interfacing with academia.

**Cross Bureau** Representatives from Boston University (BU) visited USP headquarters on May 10, 2016, to demonstrate progress made on the PharmaChk tool with PQM staff. Staff members were shown the improved capabilities of the tool and had the opportunity to ask questions regarding its functionality and planned application. The BU representatives then had a discussion with the PQM leadership team on progress against milestones and the path forward for the project. This demonstration and focused discussion allowed the PQM team to have a more in-depth understanding of the PharmaChk progress and make decisions about the future of the project. PQM engaged with partners at the University of Washington during the third quarter to plan a service contract that will develop a framework for projecting return of investment of quality assurance systems. A representative from the University of Washington visited with PQM leadership in June and was briefed on the project. Also during the third quarter, the PQM team made preparations for a consultative meeting that will engage PMS subject matter experts and PQM staff. As a result of the meeting, guidelines for implementing efficient and sustainable PMS of products, which addresses the regulations, structures, human and financial resources, and flow of information/communication among stakeholders concerned with ensuring the quality of medicines will be developed. The meeting scheduled for August 22–23, 2016, at USP. In preparation for the meeting, PQM identified minimum requirements

for a functional PMS program based on the WHO global Regulatory System Strengthening tool and collected information from the field. PQM is also identifying minimum requirements for functional inspection.

## Key Challenges

Challenges are an inevitable part of program implementation as well as an important source of strategy recalibration and experiential-based growth. PQM programs operate in collaboration with multiple partners under the leadership of national authorities to implement countries' overall pharmaceutical quality systems strengthening objectives. The most overwhelmingly common challenge identified during the quarter was delay due to budgetary and human resource constraints faced by partners. These often-cited challenges serve as a reminder to proactively mitigate common hazards by adapting quickly and developing practical contingency plans that enable the work to continue in some capacity—working remotely when travel is precluded, preparing to swiftly execute work when authorization is granted after prolonged a waiting period, etc. The second category of challenges—delays due to burdensome bureaucratic processes—poses greater impediments to program implementation. These delays require coordination at high levels of government to address systemic issues.

The most common program challenge encountered was delay due to limited funding by local regulatory authorities, laboratories, and manufacturers to purchase necessary equipment and supplies. Regulatory authorities and laboratories commonly face general equipment shortages of essential items. For some manufacturers, WHO PQ has been delayed due to shortages in investment to critical equipment.

Lack of resources—physical and human—was also reported as a bottleneck to program implementation. In Ethiopia, the implementation of post-marketing surveillance activities was impacted by delays in the procurement of chemicals. In numerous other programs, human resources, specifically high personnel turnover rates, yielded less than optimal program results.

Bureaucratic processes in Indonesia pose a challenge to continued program implementation, while bureaucratic setbacks in Pakistan and Uzbekistan pose a challenge to initiating nascent programs, as PQM managers face the difficult task of entering uncharted territory to establish a presence.

Staff working to build nascent programs inevitably face challenges establishing a presence in new environments. In Pakistan, a program in which PQM presence is relatively new, key challenges in implementation of the program are logistic in nature, restricting the ease of travel and activity implementation in Pakistan. The Ministry of Interior of Pakistan does not allow a multiple entry visa to the PQM team travelling to Pakistan to provide technical assistance. Thus, the visa submission process and ensuing six-week wait is mandatory for every in-country visit. An absence of a PQM office in Pakistan created a challenge. Changes in the political landscape also pose difficulty to future operations as a constitutional amendment has transferred the authority of regulation of drugs to provinces; there is a chance that all provinces may ultimately decide to have their own regulations of drugs which will severely damage quality control in the country and PQM efforts to strengthen the country's regulatory system. In Uzbekistan, PQM has also experienced significant challenges in terms of PQM program approval by the government. The main problem is meeting the requirement of the Uzbekistan government for PQM to procure equipment as part of its activities. PQM was not able to include procurement of equipment into the work plan, as no assessment had been done and no information on what equipment (if any) was needed to strengthen quality-assurance system of TB medicines manufacturer(s) had been available. At the same time, such assessment could not be done without approval of the project by the government. Currently PQM and USAID/Uzbekistan are working on approvals for assessment visits to manufactures of anti-TB medicines. The PQM Manager of Core and CIS Programs visited Uzbekistan and had a meeting with the USAID/Uzbekistan country office to discuss possible ways to overcome the challenges and kick-start the implementation of the program.

## Sustainability, Partner Contributions, and Ownership

PQM strives to embed sustainability in its programming in an effort to create strengthened systems capable at one point in the future of taking ownership and assuming responsibility of all relevant processes and operations. Sustainability, in this context, is defined as the set of physical resources, processes, regulations, and partnerships that enables the eventual independent operation and full function of the institution or program in compliance with its mandate. During the third quarter,

PQM portfolios built sustainability by transferring ownership of medicines quality activities, by enabling countries to assume responsibility over portions of processes, and by diversifying partnerships. Transference of activities to local government authorities signals an increased degree of technical and financial competence, and thus a more sustainable health system. Lastly, forging partnerships allows regulatory agencies to decrease reliance on a single funding or technical source and, conversely, expands access to more diverse funding and resources.

In Peru, Ethiopia, and Ghana, government medicines regulatory authorities, previously supported by PQM, either assumed complete ownership or continued the successful ownership over medicines quality activities. The most comprehensive local ownership occurred in Peru; the regulatory authority (CNCC) continued to fully implement medicines quality monitoring in the form of the Three-Level Approach independent of external assistance. The success of the Peruvian program has resulted in positive spillover effects for the region as the CNCC provides technical assistance to other countries, thus supporting regional sustainability. In Ethiopia, branch laboratories also successfully continued to independently operate post-marketing surveillance activities. And finally during the quarter, the Ghanaian FDA assumed complete control of zinc sulfate tablet collection and testing.

In Kazakhstan, Indonesia, and Core TB portfolios, strong commitment from government regulators resulted in incremental ownership of activities. The Kazakh FDA improved laboratory quality by designating a dedicated staff member to participate in the needs assessment of three national QC labs and to oversee potential ways to improve and to facilitate sharing between all the labs in Kazakh FDA network. The Indonesian Ministry of Health agreed to facilitate and co-sponsor high-level regional workshops on joint sampling, together with the regulatory agency (BPOM). In Core TB, technical assistance provided by PQM enabled manufacturers to utilize the knowledge gained through the WHO PQ and/or Stringent Regulatory Authority accreditation process and apply it to other products in their pipeline.

Similarly, in Liberia, Guinea, Indonesia, and Nigeria, regulatory agencies assumed greater financial responsibility over medicines quality activities, signaling incremental progress toward sustainability. Provincial and district health offices in Indonesia are seeking local government budget support for QC testing of medicines, as the testing has been identified as a key component of overall service delivery. The Nigerian regulatory agency's (NAFDAC) Director of Laboratory Service supported the purchase of equipment necessary for ISO 17025 accreditation and increases in staff benefits to discourage attrition. Of the seven areas identified as vital to ISO accreditation, four areas have received government-financed support to improve utilities (power and water), staffing, preventive maintenance of equipment, and purchase of key equipment. In addition, the government also equipped Yaba, Agulu, and Kaduna labs with water purification units, and the Agulu lab received a new dissolution apparatus and Karl-Fischer Titrator for proficiency testing in preparation for the September ISO accreditation audit. In response to laboratory staff attrition, NAFDAC leadership deployed 30 staff from other directorates to the Yaba lab and introduced fringe benefits, such as an increase in hazard allowance, specifically to further motivate the laboratory staff and reduce staff attrition.

During the quarter, PQM fostered partnerships that gave rise to new opportunities for government regulatory authorities to strengthen health systems in Ethiopia and Senegal. The Inter-Ministerial Act, signed in 2014, calls upon 35 representatives from different ministries and other enforcing entities to implement effective health policy. The Act continues to be a rich source of collaboration and fortifies medicines quality activities in the country. In Ethiopia, government bodies participated in a GMP revitalization workshop emanating from the national roadmap. The workshop culminated in commitments from multiple collaborative stakeholders: PQM, WHO, UNIDO, Ministry of Industry, the Ethiopian regulatory agency (EFMHACA), and local manufacturers agreed to work collectively to revitalize the implementation of the GMP road map. Additionally, the PQM facilitated agreement between EFMHACA and an equipment repair vendor, which now allows for reliable equipment maintenance. The vendor is financed solely by EFMHACA.

## Lessons Learned

The experiences during the quarter are crucial for the PQM program to continuously improve program delivery, building on the lessons learned, avoiding pitfalls, and exploiting opportunities for synergy.

The experience of the Amazon Malaria Initiative program exhibits the multiplicative effect successful programs have and may potentially have on national as well as regional stakeholders. In Colombia and Peru, robust post-marketing surveillance systems resulted in tangible benefits to national health programs, such as the National Malaria Control Program, as improved medicines quality simultaneously improved the malaria program's objectives. In Peru, the successful implementation of the Three-Level Approach to medicines quality monitoring and the development of novel strategies to support innovative methods of quality control in decentralized areas may be applied to other countries that reach the same level of advanced ownership as Peru.

PQM programs experienced coordination of stakeholders quite differently, highlighting the simultaneous importance yet fragility of coordination. The lesson learned is that coordination and collaboration among stakeholders is essential, yet a high degree of awareness and diplomacy is required in order to decipher when to expend efforts to take the lead to organize disparate partners and when to identify and invest in collaborative efforts that yield fruitful returns. In Burma, coordination among various implementing partners working to strengthen the regulatory agency (DFDA) is insufficient; currently, only one coordination meeting between DFDA, WHO, UNOPS, and PQM occurs annually. PQM has identified the benefit in taking a leadership role to coordinate streamlining respective work plans and individual activities to produce maximum impact. Other programs encountered highly coordinated stakeholder engagement in which PQM's participation was found to be synergistic. The Core NTD program identified a high-level meeting held in China between USAID, BMGF, WHO, the NTD team, and NTD manufacturers' representatives as a vital opportunity for improved collaboration among implementing partners to fulfill the unmet demands of NTD medicines. Similarly, in Ethiopia, collaborative efforts are a vital means to receive buy-in from government decision makers, which will ultimately facilitate PQM's objectives as demonstrated by the success of the GMP Roadmap revitalization process, which involves diverse partners from government, non-government, and private organizations.

## Management Overview

In June, PQM was informed by the USAID Agreement Officer's Representative (AOR) team that the USAID Mission in Dhaka, Bangladesh, decided to subscribe to the PQM mechanism to address pharmaceutical quality issues in Bangladesh. The invitation promises a multi-year engagement through the end of the PQM program's period of performance and requests that PQM's proposed approaches are linked to the Bangladesh Five-Year Health Sector Plan. To begin this work, the PQM Asia Regional team will participate in annual work plan review meetings with the Mission during the fourth quarter.

During the third quarter, PQM announced a newly designed PQM program logo. The logo was revised in order to be compliant with USAID's branding guidance, and as a result, PQM has phased in the new logo on new communications materials that are being developed. The full transition period to phase out the old logo on all other communication materials will occur over the course of six months through a thoughtful process.

A major accomplishment for PQM's management and operations teams during the third quarter was successful acquisition and application of a platform for project management, monitoring, and evaluation. The platform will allow program staff to easily design, manage, monitor, and evaluate individual portfolios collectively across the entire PQM program. It will also provide collaborative tools for improved productivity, workflow management, and reporting.

From June 13 to 17, 2016, the PQM program held an FY17 Work Plan Development Week. The main objectives of the week were to review the technical and operational elements of the work plan lifecycle for successful design, implementation, monitoring, and reporting; provide guidance on country and core portfolio FY17 work plans design, with an emphasis on sustainability and innovation; ensure a systems approach is applied across all portfolios through consultations with the PQM technical support team; and draft initial performance monitoring plans for each country and core portfolio. To bring external perspectives to PQM's critical work, the opening days of the week included guest speakers Joseph B. Babigumira, MBChB, MS, PhD, Assistant Professor at the University of Washington Global Medicines Program; Michael A. Ibara, PharmD, Head of Digital Healthcare at Clinical Data Interchange Standards Consortium; and Dennis Ross-Degnan, ScD, Associate Professor at the Department of Population Medicine at Harvard Medical School and Director of Research at Harvard Pilgrim Health Care Institute. PQM partners from the USAID AOR team—Anthony Boni, Elisabeth Ludeman, and Tobey Busch—

also participated in the FY17 Work Plan Development Week and provided the team with recommendations for increased effectiveness. The week culminated with portfolio managers developing and presenting performance monitoring matrices to their colleagues.