



Transforming Pharmaceutical Services in Ethiopia through Auditable Pharmaceutical Transactions and Services

The **Systems for Improved Access to Pharmaceuticals and Services (SIAPS)** Program works to ensure access to quality pharmaceutical products and effective pharmaceutical services through systems strengthening approaches to achieve positive and lasting health outcomes. SIAPS is funded by the US Agency for International Development (USAID) and is implemented by Management Sciences for Health (MSH).

JANUARY 2017

In the past two decades, Ethiopia improved its primary health care service delivery and began to make great progress toward meeting many of the Millennium Development Goals, particularly with regard to maternal, newborn, and child health (MNCH) and prevention and control of HIV and tuberculosis. However, pharmaceutical services—a crucial point of care for patients and one of the country's single largest health care expenses—remained inadequate.

Medicines in stock sometimes expired, other essential medicines were frequently unavailable, and patients were dissatisfied with the poor quality of services they received. Nationally, stock-outs lasted, on average, 99.2 days per year in public health facilities and 99 days in regional drug stores (27% of the year), and an average of 8% of medicines in health facilities expired. According to the fourth National Health Sector Development Program (2010/11–2014/15), the antibiotic prescribing rate was 58% and antibiotic use in the treatment of non-pneumonia acute respiratory tract infection was 61%, both of which indicate overprescribing. Traceability of pharmaceutical transactions at health facilities is difficult and accountability has been poorly defined. The absence of appropriate tools and systems for tracking products and financial information has made auditing transactions and services almost impossible. The lack of transparency and accountability in managing medicines and financial transactions has exposed the system to theft, pilferage, and misappropriations.

Background

MSH has implemented pharmaceutical management projects in Ethiopia since 2005, through the Rational Pharmaceutical Management Plus Project and the Strengthening Pharmaceutical Systems (SPS) Program and most recently the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. The SIAPS Program (2011 to 2016) aims to reduce morbidity and mortality, primarily for HIV and AIDS, malaria, and priority conditions in MNCH.

One of the most successful SIAPS initiatives in Ethiopia is implementation of Auditable Pharmaceuticals Transactions and Services (APTS), a package of interventions that addresses accountability and transparency; access to information for decision making; efficient use of medicines budgets and human resources; and quality of pharmacy services—all of which affect the performance of hospitals in the public sector.

The idea for APTS emerged when staff and leadership at Debre Markos Hospital in Ethiopia’s Amhara region recognized that the hospital’s poor management of pharmaceutical services prevented the whole hospital from achieving goals set forth in Ethiopia’s Hospital Reform

Implementation Guidelines (EHRIG). In 2010, Debre Markos management approached the SPS Project for technical assistance to improve the quality of pharmaceutical services at the hospital. The response to this request led to the birth of an innovative and comprehensive intervention known as APTS during the first year of the SIAPS Program. SIAPS has collaborated with the regions’ and federal government’s key stakeholders to pilot and implement APTS in more than 75 hospitals in 10 regions and at the federal level.

Strategic Approach

APTS is unique in its systems strengthening approach. It systematically identifies problems and root causes, and then considers interventions for each of the health system components that can help address those causes. During the design phase of APTS, through a collaborative analytical process, technical staff from SPS/SIAPS and pharmaceutical staff and management from Debre Markos Hospital identified the problems and corresponding root causes of the hospital’s pharmaceutical shortcomings (Figure 1). These issues have proven relevant throughout Ethiopia’s public health system and formed the basis for the design and implementation of APTS throughout the country.

Figure 1. Identified Pharmaceutical Problems and Root Causes

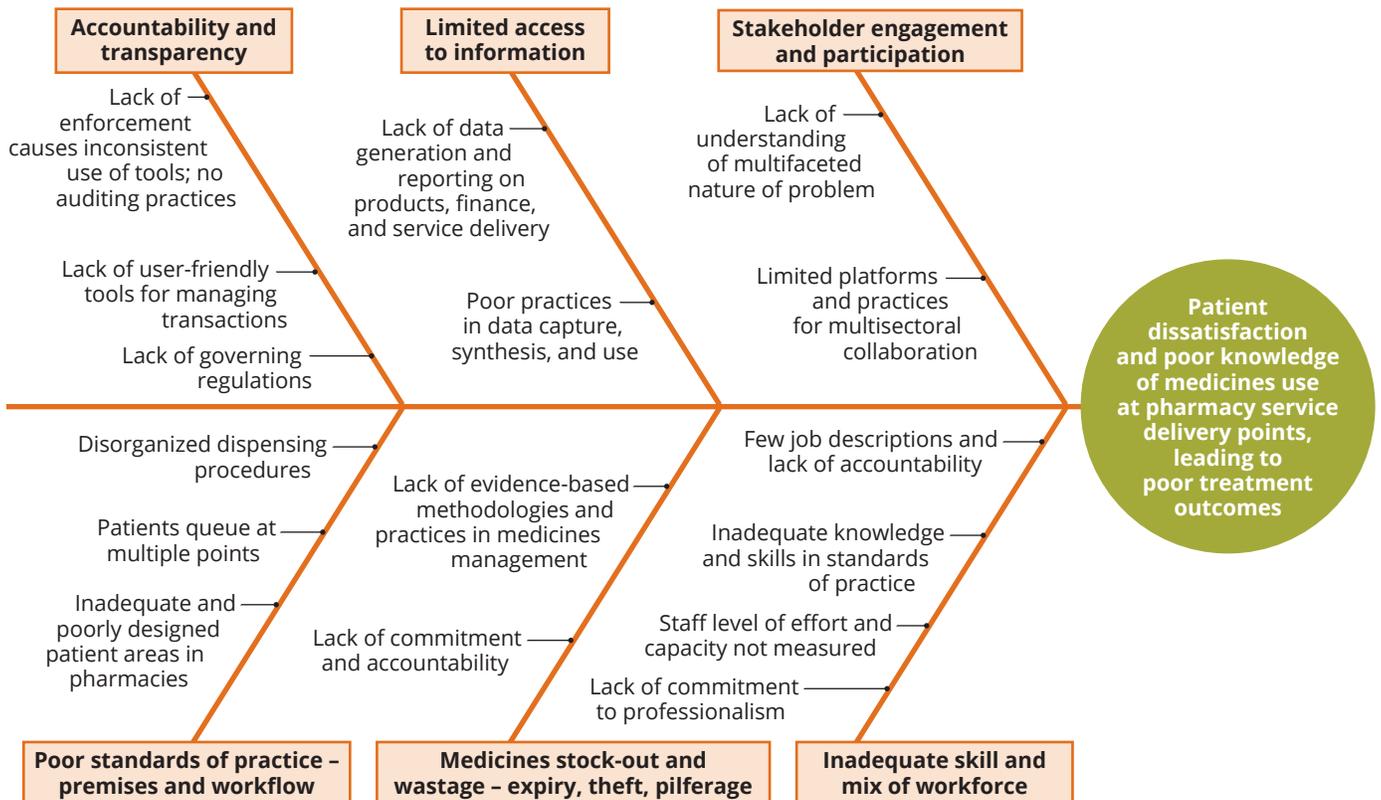
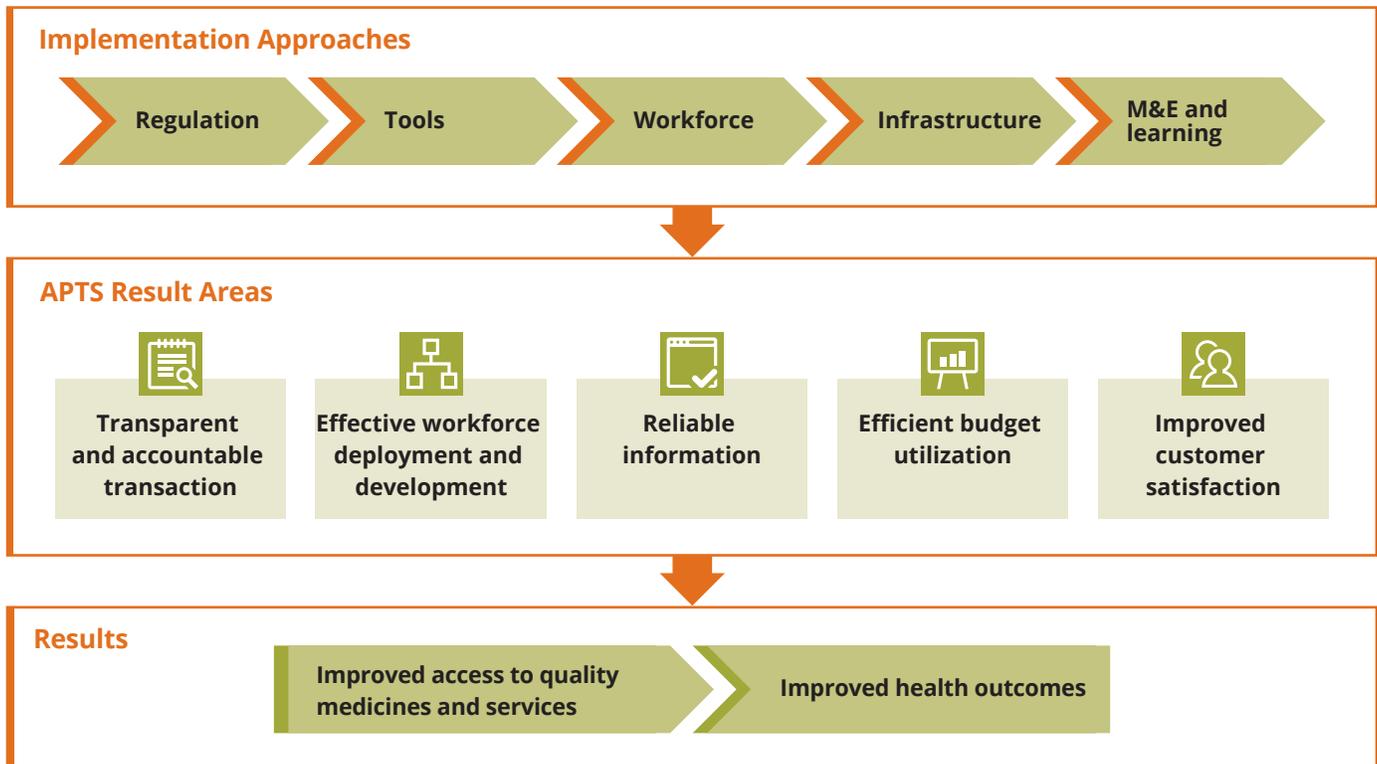


Figure 2. APTS Result Areas and Implementation Approaches



APTS embodies the SIAPS pharmaceutical system strengthening (PSS) framework.¹ Using specific root causes identified at Debre Markos Hospital and assigning them appropriately to each component of the PSS framework, leaders and staff from SPS/SIAPS and Debre Markos designed APTS interventions to fall under the following five results areas, which correspond to the five system strengthening building blocks (in parenthesis):

- Transparency and accountability in managing medicine transactions (governance)
- Effective workforce deployment and development (human resources)
- Reliable information (information)
- Efficient budget utilization (financing)
- Improved customer satisfaction (service delivery)

Through strengthening critical elements of the building blocks, the SIAPS PSS approach aims to improve pharmaceutical system performance, increase access to quality pharmaceuticals and services that support their appropriate use, support progress toward universal health coverage and disease-specific targets, and ultimately contribute to achieving and sustaining positive health outcomes and impact.

Implementation

APTS implementation involves multiple processes within which there are collections of interventions. These processes are managed at multiple levels of the health system and may be implemented concurrently.

They include:

- Developing and enacting regulation (regional/federal)
- Design and printing of APTS tools (regional/federal)
- Workforce adjustment and development (facility, regional/federal)
- Infrastructure improvement and reorganization of pharmacy units (facility)
- Baseline assessment (facility)
- Inventory of all medicines and APTS launch (facility)
- Continuous monitoring of progress and performance (regional/federal and facility)

Each process, the interventions within it, and the overall implementation timeline will vary depending upon the setting. Variables include the state of existing infrastructure and capacity and political commitment.

APTS implementation does not have an end point; its resulting systems and structures allow for continuous

improvement and institutionalization. For example, tools are developed once, but facility staff continually monitor tool use and train new staff. When implementing APTS at a new site, teams consider each process in each of the results areas (Figure 2). For example, to achieve transparent and accountable transactions, the needed processes/interventions concerning appropriate regulations, tools, and workforce resources must be addressed.

Pilot: Debre Markos Hospital

Debre Markos leadership approached SPS for support in early 2010. The collaborators designed APTS in June 2010 and began implementation in January 2011. By April 2011, preliminary results were so promising that the Amhara Regional Health Bureau (RHB) collaborated with the SIAPS-Debre Markos team to organize a workshop to share progress and encourage scale-up to other facilities.

APTS Roll-Out

After the April 2011 consultative workshop, the Amhara Regional State decided to develop an implementation guide, finalized in May 2012, and enacted legislation to enforce implementation of APTS at all hospitals and health centers in the region in early June 2012. Dire Dawa City Administration followed in late 2012; SNNPR (Southern Nations, Nationalities, and People's Region) and the federal government in 2014; and Tigray, Addis Ababa, and Oromiya in 2015. Different entities learned about APTS' successes, mainly by word of mouth, including informal champions (see Lessons Learned), as well as formal information exchange. To foster a better understanding of the interventions among interested parties, SIAPS coordinated numerous site visits to Debre Markos Hospital and Amhara RHB, where the visitors learned first-hand about the real benefits of APTS and the efforts needed at the RHB level for implementation. This facilitated buy-in for APTS. Some individual hospitals requested technical and financial assistance from SIAPS, while others were encouraged or required to do so by their own or respective RHBs.

Monitoring and Evaluation

The M&E approach for APTS has enabled expansion from a pilot intervention to a national strategy used in over 75 facilities. Facility-level indicators have been rigorously and consistently measured, but outcome measures (e.g., decision making based on information made available by APTS interventions) are limited, as are health-impact measures, which can be difficult to isolate for system strengthening.

Interventions by APTS Results Area

APTS is not a single intervention, but rather a package of interventions. Many of the interventions affect change in more than one result area; the interventions that follow are discussed broadly and by primary result area.

Crosscutting: Legislation and Guidelines

SIAPS supported actions taken by federal and regional governments to develop, enact, and popularize legislation to establish and adopt APTS. The resulting legislation defines pharmaceutical management systems and roles and responsibilities of different bodies, thereby improving practices related to transparency and accountability.

To prepare teams for these challenges and to better understand the tools, concepts, and processes that make up APTS, SIAPS and RHBs collaborated to develop an implementation guide and in-service training materials (approved by the Federal Ministry of Health [FMOH]) for finance and pharmacy staff at participating APTS sites.

Transparent and Accountable Transactions

Prior to APTS, hospitals lacked systems and structures to track incoming and outgoing medicines at dispensing units—a deficiency that impacted both patient access to medicines and management of limited financial resources. At the facility level, APTS establishes a set of fundamental pharmaceutical management processes, which are applicable to all products and transactions where medicines are handled (e.g., regular physical inventories and auditing and the use of forms customized for medicines). Transactional tools designed to capture key information enable transparent practices as medicines move from store to dispensing units to patients. Vouchers are used to receive and issue medicines at stores and at various units, respectively. Registers are used for both credit and for free-of-charge transactions between providers and patients, and receipts are issued for cash payments at time of dispensing. Medicines carry unique identifying codes and prices to trace their journey along the process from store to patients. Also critical is individual bin management, a system whereby each pharmacist is responsible for a “bin” containing a set number of medicines that must be reconciled with records at set periods of time to track expiry dates and refill stock.

Effective Workforce Deployment and Development

To operate efficiently and provide quality patient care, facilities implementing APTS work with government bodies to determine, recruit, and deploy the appropriate number and

mix of pharmacy staff. Factors used to determine workforce deployment include average workload (e.g., number of patients and number of medicine-use counseling sessions per day per person), necessary skills (e.g., for pharmacists or accountants), and areas of engagement (e.g., supply chain, clinical pharmacy, dispensing). Facilities have also been reorganized according to EHRIG requirements, with separate pharmacy services for outpatient, inpatient, and emergency departments, and an overarching supply management function for individual hospitals. Once appropriately staffed, personnel are trained and receive supportive supervision on APTS principles, systems, and tools. Staff also receive regular performance reviews and supervision.

Reliable Information

With sound information, pharmaceutical managers can make decisions that improve pharmacy efficiency to ensure access to medicines and patient care. APTS implementation begins with a baseline physical inventory of all medicines and supplies, during which staff learn to accurately and quickly conduct inventories, and introduction of tools, such as sales tickets and forms/templates for daily and monthly reporting on financial transactions and services. Key information collected each month for decision making is categorized as product, finance, or services information, and includes revenue from sales, gross profit,

wastage rate, availability of key medicines, affordability (for acute and chronic conditions), various categories of patients served and counseling made (per pharmacist, per health facility), number of medicines per encounter, and stock status indicators (consumption-to-stock and stock turnover ratios).

Efficient Budget Utilization

To minimize wastage and stock-outs, pharmaceutical budget use must be optimized. APTS includes several interventions to (1) track medicine supply through efforts to improve transparency and accountability described above; (2) use ABC and VEN analyses (see definitions below) and reconcile the two to evaluate medicines purchasing and ensure value for money as per disease prevalence in the health facility's catchment area; (3) collect information about the monetary value of medicines dispensed and cost recovery (i.e., through cash or voucher reimbursement); and (4) generate and use reports on that information. Stock on-hand is evaluated monthly by using general stock movement indicators (stock turnover and consumption-to-stock ratios) automatically produced from the monthly reports, and then conducting stock status analysis for individual medicines based on the general information. Subsequent measures may include exchange, return, and sharing information to prescribers on overstocked medicines to prioritize for prescribing.

Definition of ABC and VEN Systems

ABC analysis examines the annual consumption of medicines and expenditures for procurement by dividing the medicines consumed into the following three categories:

- **Class A** includes the 10% to 20% of items that account for 75% to 80% of expenditures.
- **Class B** includes the 10% to 20% of items that account for 15% to 20% of expenditures.
- **Class C** includes the 60% to 80% of items that account for only about 5% to 10% of expenditures.

The **VEN system*** assigns each pharmaceutical product on the formulary or essential medicines list to one of the following three categories:

- **V: Vital medicines** are potentially lifesaving, have significant withdrawal side effects (making regular supply mandatory), or are crucial to basic health services.
- **E: Essential medicines** are effective against less severe but significant forms of illness, but are not vital to providing basic health care.
- **N: Nonessential medicines** are used for minor or self-limited illnesses, are of questionable efficacy, or have a comparatively high cost for a marginal therapeutic advantage.

Once a VEN analysis is done, a comparison should be made between the ABC and VEN analyses to identify whether there is relatively high expenditure on low-priority drugs. In particular, effort should be made to delete any 'N' drugs that are in the high cost/high consumption category A of the ABC analysis.‡

* Rankin J, Graaff P, Dias V, Quick JD. Analyzing and Controlling Pharmaceutical Expenditures. In: MDS-3: Managing Access to Medicines and Health Technologies. Sterling, VA: Kumarian Press; 2012; <http://apps.who.int/medicinedocs/en/d/Js19617en/>

‡ Holloway K, Green T. Drug and Therapeutic Committees—A Practical Guide [Internet]. Essential Medicines and Health Products Information Portal; 2004. Available from: <http://apps.who.int/medicinedocs/en/d/Js4882e/>



Before APTS (above)—disorganized and inconvenient resulting in lack of privacy for proper counseling, long wait times, and lack of safety, especially for mothers and children

After APTS (right)—improved premises and workflow for improved convenience, privacy, counseling, and safety



Improved Customer Satisfaction

A strengthened pharmaceutical system is an interim goal of APTS; ultimately, all efforts seek to improve patient care and make an impact on the health of the facility's clients. Customer satisfaction is one measure of improved patient care (as determined by the Ethiopian Hospital Alliance for Quality Initiative). More efficient systems serve clients by improving the availability and affordability of medicines, but factors such as privacy and convenience at the dispensing counter, waiting time, and customer service from well-trained and available staff are vital, too. Most visibly, APTS improves the infrastructure and premises of pharmacies. The APTS specifications include adequate patient waiting areas (e.g., shelter and places to sit), private areas for patients to ask questions and receive counseling, and efficient workflow. Inherent in the design of APTS is “one-stop shopping,” where prescription review and payment and dispensing/counseling services are provided at the same place. This design completely changes the existing practice in which a patient has to queue at least three times: (1) to get the prescription reviewed and payment determined at the pharmacy, (2) to pay at the finance unit (usually outside the pharmacy), and (3) to get the prescriptions filled at the pharmacy.

Results

Performance Data and Achievements

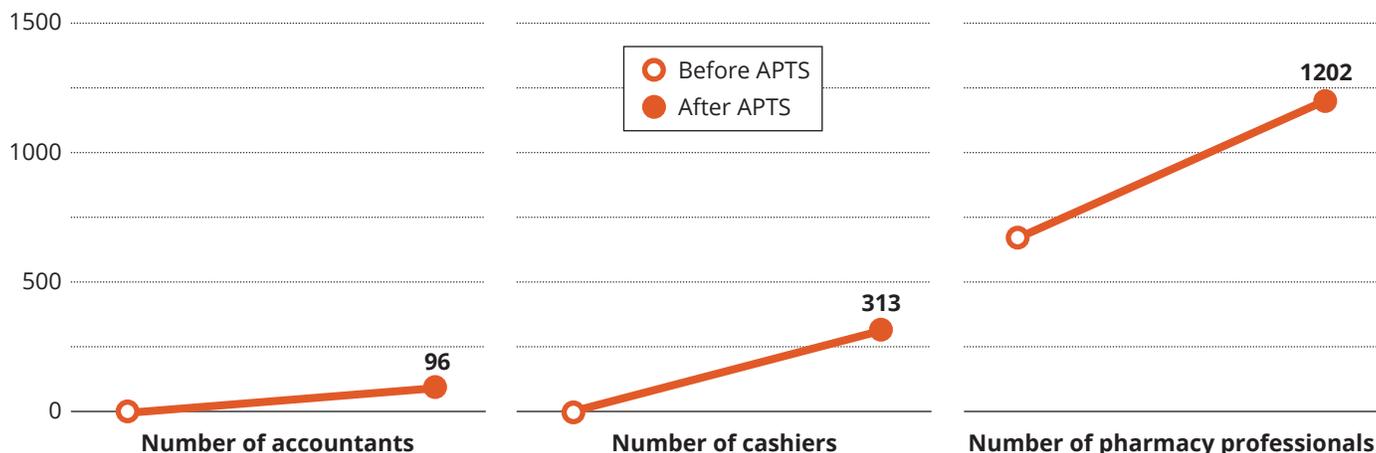
Because APTS began as a pilot activity in Debre Markos Hospital, the first indicators (used for the baseline assessment) corresponded to the problems and root causes

identified specifically at Debre Markos (e.g., medicine expiry and wastage rates or staffing). As APTS expanded, SIAPS added indicators to measure new efforts (e.g., number of regional states enacting legislation) and next-level outputs (e.g., percentage of hospitals submitting financial reports each month and percentage of hospitals that perform ABC value analysis) to allow for relevant measurements and accurate comparisons across facilities.

APTS interventions have yielded changes in the way pharmacy services are managed in all participating hospitals. Each of the hospitals implementing APTS completely redesigned their physical infrastructure, creating a more efficient and higher quality space for both patients and service providers. The change in pharmacy layout improved patient convenience at service delivery points, especially for mothers with young children and the elderly. Medicines are more consistently available and affordable, and pharmacies have seen dramatic declines in medicine expiry and wastage, as products are tracked throughout the facilities (Figure 4). Pharmacies can more easily evaluate their medicine or financial transactions, and patient satisfaction is tracked and improving in many sites.

In most hospitals, the availability of essential medicines increased from 65% to more than 95%, nearly reaching the national health sector development goal of 100%.² Eleven of 14 APTS implementing hospitals achieved 100% availability of tracer medicines by 2015.² Wastage of medicines due to expiry has been reduced from 8.24% to less than 2% in most facilities.² APTS helps facilities determine their

Figure 3. Selected Workforce Improvements from 48 APTS Implementing Facilities



human resource needs, which facilitates pharmacy workforce hiring, leading to an optimized pharmacist-to-patient ratio. The introduction of new personnel, such as pharmacy accountants and cashiers, has increased access to financial information on medicine sales, reduced leakage, and contributed to a substantial reduction in waiting time and greater patient convenience.²

Although the implementation of APTS is an on-going and involved process, some results may be both quick and dramatic. Such was the case with the Debre Markos pilot, where the high turnover of medicines and retention of income from medicine sales increased financial resources available for medicine procurement by 89.1% between June 2010/11 and June 2011/12.² Such progress helped to inspire broad APTS scale-up.

Transparent and Accountable Transactions

SIAPS has worked with government entities to adapt APTS financial and transactional tools, including introducing a new way of auditing and coding medicines, to federal and regional contexts. Prior to APTS, none of the hospitals tracked sales of medicines and reconciled them daily with actual medicines dispensed, nor did they generate monthly service delivery reports. At the end of 2015, nearly 73% of APTS-implementing facilities conducted all of these activities.² Health facilities now can generate monthly sales reports by category (cash sales, credit sales, and items freely dispensed to patients and staff), enabling CEOs to see progress in terms of financial gains and losses.

Effective Workforce Deployment and Development

Many APTS hospitals can prepare and analyze monthly reports on the pharmaceutical services they provide (e.g., workload). This information has enabled hospital managers to monitor the level of effort (LOE) of pharmacists and determine the need for more, or a different mix of, human resources. As a result of APTS implementation, hospitals have improved their institutional capacity by increasing their trained workforce to deliver appropriate pharmacy services (Figure 3).

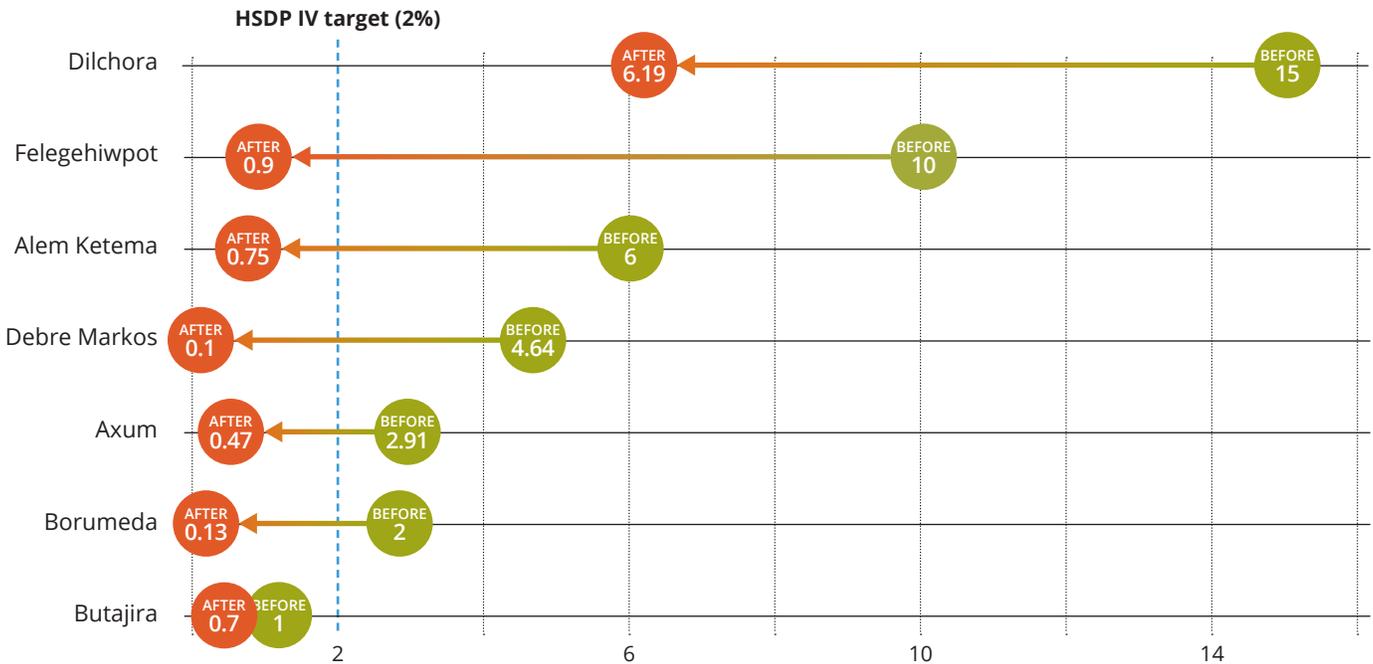
Reliable Information

Hospital pharmacies implementing APTS now generate key information related to products, finance, services, and staff LOE by using predefined indicators that can be monitored continually to track progress and make timely decisions (Table 1). For example, medicine affordability (based on the standard wage of the lowest-paid government worker) is an important measure of patient access to medicines, and unique identifier codes for each medicine allow for more precise accounting.

Table 1. Selected Improvements in Collecting Information for Decision Making, 2011–2015*

Indicators	2015
% of hospitals that measure affordability of medicines on a monthly basis	72.9
% of hospitals that use unique identifying codes for each medicine	72.9
% of hospitals that conducted transaction auditing	71.0
% of hospitals that took measures based on audit findings	31.0
% of hospitals that report product, finance, and service-related data	75.0

* APTS baseline was zero in 2011

Figure 4. Reduction of Medicines Wastage Rate (%) in Some Hospitals Before and After APTS (December 2014)

Efficient Budget Utilization

Appropriate purchasing and stock management are critical to optimal use of funds in virtually any resource-constrained environment. After implementing APTS, a 2014 ABC analysis at three Tigray region hospitals found that more than 96% of items procured were on the hospitals' medicine lists. Hospitals used the VEN system to reconsider (or confirm) that the medicines being purchased are appropriate based on the health needs of the hospitals' catchment population. The hospitals went on to identify unnecessary medicines (i.e., medicines for health conditions not common in their patient population), which led to significant reductions in the quantities purchased (for example, X-ray films) and the transfer of overstocked medicines to other health facilities that needed them, avoiding unnecessary expiry and wastage of resources.

A recent assessment of outcomes at health facilities implementing APTS revealed that the overall budget utilization efficiency had shown incremental improvement by 16% from 2003 to 2008 EC or 2011 to 2016 GC. It was also reported that 25% of hospitals did financial auditing of pharmaceutical transactions, while random product auditing was reportedly practiced by more than two-thirds of the APTS sites.³

Improved Customer Satisfaction

Although the national baseline for patient satisfaction is 74.4%, three sites that were among the first to implement APTS (Axum, Felegehiwot, and Debre Markos Hospitals)

reported upwards of 90% patient satisfaction based on exit interviews. Notably, APTS helped Felegehiwot Hospital to more than double its reported patient satisfaction (the hospital's baseline was only 40%). Patients were more likely to receive the medicines they needed: 97.5% of the requested medicines were on hand, up from 64.6%. The improved availability of medicines, reduced waiting time, improved workflow (privacy and convenience), and improved dispensary arrangements that logically contributed to patient satisfaction.

APTS Scalability and Sustainability

Five years after APTS was piloted, the intervention has been implemented in more than 75 health facilities throughout the country across 10 regions, including city administrations and the federal government, that have enacted APTS regulations. Further expansion of APTS is planned, as new legislation has already been developed in some regions, and an increasing number of health facilities continue to request support for training and mentoring to implement APTS tools. APTS is one of the key strategies included in the guiding policy documents of Ethiopia's health sector, namely, the Health Sector Transformation Plan (HSTP) and the EHRIG, which will further advance the institutionalization of APTS.

Some of the factors enabling APTS scalability include the support from political champions at both the national and regional levels, engagement of stakeholders from multiple

sectors who actively participate in the development of APTS goals and have a clear understanding of their roles and responsibilities, and the availability of data collected through a baseline assessment. However, several factors challenge the ultimate goal of implementing APTS nationwide and will need to be addressed to achieve the intended coverage, including the lack of adequate manpower to coordinate the scale-up process at federal, regional, and lower administrative levels and the high turnover of current trained staff. Insufficient resources for training and premises improvement could also threaten scalability of the intervention.

APTS is not yet at a stage of nationwide scale-up and maturity where it can be deemed fully sustainable. However, based on the APTS approach to implementation and results so far, it is on track to achieve sustainability based on several factors that contribute to a program's capacity for sustainability:⁴

- **Political ownership:** The strong political commitment of the FMOH has been paramount through the development and adoption of APTS regulations at the federal and regional (RHBs) levels. Also, the support of political champions at the regional level has created widespread awareness of the APTS interventions' impact and success.
- **Stakeholder engagement:** Multisectoral partners at the federal and regional levels include, but are not limited to, the Audit Bureau, Finance and Economic Development Bureau, and Justice Bureau. At the hospital level, board members, managers,



Inauguration of APTS at Ayder Specialized and Teaching Hospital. Ribbon cutting by H.E. Dr. Kesete-Birhan Admasu, Minister of Health, and First Lady Roman Tesfaye.

“APTS is one of the key thematic areas of the Ministry of Health as it maximizes efficiency in our resource utilization through ensuring transparency and accountability in the management of medicines and improves pharmacy service delivery which was one of the major sources of patient dissatisfaction in hospitals and health centers. Teaching hospitals like Ayder will take this system one step forward and create opportunities for others to learn from best practices.”

H.E. Dr. Kesete-Birhan Admasu,
Minister of Health, Ethiopia

clinicians, pharmacists, and patients are all involved in some capacity in the planning, implementation, or monitoring of APTS. Collectively, these diverse partners have contributed to making APTS a package of intervention that serves multiple interests.

- **Program adaptation:** APTS adaptation has been driven by qualitative and quantitative data obtained from health facilities implementing the package of interventions. For example, facilities' workflow design and dimensions of new infrastructure improved over time, based on practical experiences. Also, the content of APTS regulations changed over time with the most recent APTS regulations incorporating a wider range of pharmaceutical services, including clinical pharmacy, pharmacovigilance reporting, and drug information services.
- **Program evaluation:** Although improvements are still needed at the regional level to ensure reliable and consistent data collection and analysis, APTS helps to establish and institutionalize regular program evaluation. The APTS implementation guide used in regions and facilities implementing the interventions defines a system for program M&E, recommends development of performance indicators, and states the

“We used to sit in the sun, in the rain, and get exhausted. ...To compare what it was like before and how it is now, there is such a big difference. There are seats where we can sit and wait. We don’t panic for fear of hearing [that] medicines prescribed to us are not available. We spend less time at the pharmacy and get treated with respect.”

Aster Amanuel Desalegn, Debre Markos patient for nearly 20 years

importance of supervision and regular review meetings to monitor the progress of interventions and promote experience sharing and continuous improvement.

APTS’ approach, in combination with its major achievements, particularly adoption of federal and regional legislation, has created an enabling environment for both the scale-up and sustainability of its interventions. As the expansion of APTS continues, however, attention must be given to ensuring that scale-up does not threaten the potential sustainability of APTS by overextending resources, bypassing or rushing essential steps and processes, or undermining any of the other factors that contribute to its promise as a sustainable intervention for continuous improvement in pharmaceutical services.

Lessons Learned

Transformation Is Possible, and Essential

The baseline assessment and subsequent root causes analysis at Debre Markos Hospital, and later at other facilities, revealed multiple, systemic problems with pharmaceutical management. Each intervention seemed to require other interventions first, such as new regulations, new equipment or facilities, new tools, or more regulations. There were no “quick fixes.” While initially discouraging, the stark problem became an asset—the need for wholesale transformation was undeniable, and APTS’ comprehensive package could make it possible.

The first APTS implementers adopted the complete package and found almost immediate success—typically in declining wastage, as inventory management efforts curtailed expiry, loss, and pilferage. Declining wastage is also easy to assign monetary value to, helping win over financial and administrative stakeholders.

Conversely, some later implementers tried to apply only select APTS components, with disappointing results. Addis Ababa City Administration adopted certain APTS tools (e.g., vouchers, sales tickets, and registers) and trained pharmacy staff on APTS principles and implementation. However, problems with wastage, stock-outs, poor medicine management, and customer dissatisfaction continued. Without the appropriate legislation (part of the full APTS package), the hospital CEO did not have the authority to allocate budget for infrastructure improvement or staff recruitment, limiting what the existing pharmacy staff could do. In short, the pharmacy had sales tickets and registers but



Woldiya Hospital Pharmacy pharmacy outpatient service before (above) and after (right) APTS.





no place to put them or personnel to staff them. Additionally, the new tools were not supported by legal frameworks, thus limiting ownership and applicability by different stakeholders.

Cultivating Consensus and Champions

The health sector is the primary APTS stakeholder, but most interventions require involvement from multiple sectors. For example, the Justice Bureau is authorized to draft legislation and submit to a law-enactment body, the Finance Bureau is responsible for financial and property management tools in public sector institutions, and the Civil Service Bureau oversees any workforce issues. Given the range of actors and priorities, building consensus around APTS was sometimes difficult; thus SIAPS, RHBS, and facility APTS teams engaged stakeholders throughout each process (e.g., responding to draft legislation).

SIAPS facilitated these consensus-building processes through sharing experiences with others from the pioneer Amhara region, but learned to let stakeholders work through the issues or draft materials in their own way. Regional government authorities discussed issues point-by-point and part-by-part until they internalized, understood, and owned the changes.

Individual champions and facility-level buy-in are also vital to APTS successes. Initially, some may resist change and others may benefit from the malfunctioning system. Having both baseline and interim data proved effective in inspiring change among staff, particularly when the data are “translated” to personal, patient-centered stories (e.g., patients who cannot

manage a chronic health condition because of stock-outs). The contribution of experience-sharing visits organized by SIAPS was effective in inculcating the role of APTS in improving access to medicines and quality services among multiple stakeholders from different regions.

Financial data also are compelling. The finance manager at Debre Markos Hospital was initially skeptical of APTS; yet within months, medicine wastage dropped and revenue from medicine sales increased so dramatically, the hospital actually had more money than anticipated. This manager became an asset at Debre Markos and a champion for APTS expansion.

Rethinking Data

A wealth of data is available, and the SIAPS team has worked to hone existing indicators without threatening any data continuity and to develop new indicators that can be measured for the duration of the interventions (i.e., “back-filled” with existing, valid data). Additionally, APTS’ staggered implementation skews any set of aggregated data, as new sites are grouped with sites that began their APTS transformation four years earlier. To better compare APTS effects, it is critical to develop more efficient ways to compare each site to its own baseline and to aggregate site data by elapsed time or stage of implementation.

Way Forward

APTS is a key strategy of Ethiopia’s HSTP (2015/2016-2019/2020), and is planned for use in every health facility in every region and city administration. Modern software will



upgrade current Excel-based systems, and the incorporation of APTS in university preservice curricula will prepare new graduates to apply and implement APTS as soon as they enter the professional realm. SIAPS will continue to provide technical support in the immediate term as coverage is far below what was envisaged, including the demand to expand to health-center level (more than 3,200 health centers) and increasingly complemented by local champions and experts, such as staff from RHBS or hospitals that have successfully implemented APTS.

Although it is beyond the scope of the current SIAPS Project, individual hospitals are already working to expand APTS to laboratory and radiology units, and the approach may be adaptable to other aspects of service delivery in the health system, or even to other sectors.

Conclusion

APTS interventions consider each PSS component to improve access to quality medicines and services for improved health outcomes. By improving systems and structures at facility, regional, and federal levels with deliberate focus on pharmaceuticals, APTS produced stunning results; it is an undeniable proof of concept for PSS.

SIAPS supported government stakeholders to develop local solutions leading to country ownership in a relatively short period of time. APTS has become a model solution and is a vehicle for change to improve the country's pharmaceutical service delivery system created through packaging and revitalizing multiple pieces of initiatives and innovative approaches including legislative mechanisms in the context of Ethiopia. Implemented in more than 75 health facilities and 10 regions and the federal government and incorporated in the country's HSTP, APTS has demonstrated that transforming the management of pharmaceutical services in Ethiopia is both possible and essential. APTS scalability is evident from its widespread acceptance and impact to date on pharmaceutical systems and services in Ethiopia. It has also identified several prerequisites for achieving sustainability of interventions and effect, including broad political support across sectors and levels of Ethiopian government, institutionalization, and enhancement of local capacity.

Acknowledgements

This publication was written by Rebecca Bennett with contributions from Hailu Tadeg, Edmealem Ejigu, Ayalew Adinew, Melissa Thumm, and Tanya Malpica-Llanos. Thank you to all of the staff from SIAPS Ethiopia for their support in the development of this technical brief.

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