

Building Local Capacity for Clinical Pharmacy Service in Ethiopia through a Holistic In-Service Training Approach

September 2014



USAID
FROM THE AMERICAN PEOPLE

SIAPS 
Systems for Improved Access
to Pharmaceuticals and Services

Building Local Capacity for Clinical Pharmacy Service in Ethiopia through a Holistic In-Service Training Approach

Elias Geremew
Fikru Worku
Hailu Tadeg
Edmealem Ejigu
Dr. Negussu Mekonnen

September 2014



USAID
FROM THE AMERICAN PEOPLE

SIAPS 

The SIAPS logo consists of the word "SIAPS" in a bold, green, sans-serif font, followed by a stylized blue graphic of a person with arms raised in a V-shape.

This report is made possible by the generous support of the American people through the US Agency for International Development (USAID), under the terms of cooperative agreement number AID-OAA-A-11-00021. The contents are the responsibility of Management Sciences for Health and do not necessarily reflect the views of USAID or the United States Government.

About SIAPS

The goal of the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program is to assure the availability of quality pharmaceutical products and effective pharmaceutical services to achieve desired health outcomes. Toward this end, the SIAPS result areas include improving governance, building capacity for pharmaceutical management and services, addressing information needed for decision-making in the pharmaceutical sector, strengthening financing strategies and mechanisms to improve access to medicines, and increasing quality pharmaceutical services.

Recommended Citation

This report may be reproduced if credit is given to SIAPS. Please use the following citation.

Geremew E., F. Worku, H. Tadeg, E. Ejigu, and N. Mekonnen. 2014. *Building Local Capacity for Clinical Pharmacy Service in Ethiopia through a Holistic In-Service Training Approach*. Submitted to the US Agency for International Development by the Systems for Improved Access to Pharmaceuticals and Services (SIAPS) Program. Arlington, VA: Management Sciences for Health.

Key Words

clinical pharmacy, optimizing treatment outcomes, building local capacity, in-service training, clinical pharmacy service, Ethiopia

Systems for Improved Access to Pharmaceuticals and Services
Center for Pharmaceutical Management
Management Sciences for Health
4301 North Fairfax Drive, Suite 400
Arlington, VA 22203 USA
Telephone: 703.524.6575
Fax: 703.524.7898
E-mail: siaps@msh.org
Web: www.siapsprogram.org

CONTENTS

Acronyms and Abbreviations	v
Acknowledgments.....	vi
Executive Summary	vii
Introduction.....	1
Background.....	1
Statement of the Problems: Gaps in Pharmaceutical Use and Services.....	2
In-Service Training for Clinical Pharmacy Services	3
Conceptualization and Implementation	5
SIAPS Approach to Addressing Gaps in Capacity for Pharmaceutical Services	5
Policy-Level Intervention	6
Pre-Service Training	7
In-Service Training of Hospital Pharmacists	8
Stakeholder Involvement	9
Objectives of the In-Service Training.....	11
General Objective	11
Specific Objectives	11
Course Organization and Delivery.....	12
Stakeholders' Participation and Partnership	12
Course Activities.....	12
Course Participants and Trainers	16
Training Productivity	17
Pre- and Post-Tests	17
Daily Feedback and Course Evaluations by Participants	18
Consultative Meetings	20
Institutional Challenges	20
Attitudinal Challenges	20
Training Outcome	22
Opportunities, Challenges, and Lessons Learned.....	23
Opportunities.....	23
Challenges.....	23
Lessons Learned.....	23
References.....	25
Annex A. Sample Class-Based Schedule.....	27
Annex B. Sample Ward-Based Schedule.....	29
Annex C. List of Participants.....	31
Annex D. List of Trainers	37

Annex E. Daily Participant Feedback Form (Sample)..... 41
Annex F. Course Evaluation for Class-Based Training (Sample) 43
Annex G. Overall Course Evaluation 46
Annex H. Summary of Class-Based Overall Course Evaluation Result (Sample)..... 50
Annex I. Summary of Overall Course Evaluation Result (Sample) 54
Annex J. Schedule for the Consultative Meeting..... 59

ACRONYMS AND ABBREVIATIONS

ADR	adverse drug reactions
CEO	chief executive officer
COPD	chronic obstructive pulmonary disease
EHRIG	Ethiopian Hospital Reform Implementation Guidelines
FMOH	Federal Ministry of Health
IV	intravenous
JUSH	Jimma University Specialized Hospital
MDT	multidisciplinary team
PFSA	Pharmaceuticals Fund and Supply Agency
RHB	regional health bureau
SIAPS	Systems for Improved Access to Pharmaceuticals and Services
SNNPR	Southern Nations, Nationalities, and Peoples' Region
SPS	Strengthening Pharmaceutical Systems
USAID	US Agency for International Development
WHO	World Health Organization

ACKNOWLEDGMENTS

SIAPS Ethiopia would like to thank all institutions and their respective staff members who participated in this project. We would specifically like to thank the Pharmaceuticals Fund and Supply Agency for its involvement in the overall planning, organization, and monitoring of the project. Jimma University, the University of Gondar, and Mekelle University are also commended for successfully organizing the training course and for allowing their facilities to be used freely for the in-service training. Our special thanks go to Ephrem Abebe (School of Pharmacy, Addis Ababa University) and Nezif Hussein, Tefahun Chanie, and Legese Chelkeba (School of Pharmacy, Jimma University) for their involvement in the curriculum design and development of training materials.

Elias Geremew, Fikru Worku, Hailu Tadeg, Edmealem Ejigu, and Dr. Negussu Mekonnen are highly praised for their dedication, leadership, and follow-up to this effort from its inception to actual implementation and the write-up of this report. Finally, we would like to thank Shiou-Chu Wang and Dumebi Mordi from the SIAPS head office for their technical review and Mark Morris, Portfolio Manager for SIAPS Ethiopia, for his technical coordination.

EXECUTIVE SUMMARY

Essential medicines save lives and improve health when they are available, affordable, of an assured quality, and properly used. Medicinal therapy is well known as the most frequently used form of treatment intervention in any health practice setting. However, a grim reality is the widespread misuse of medicines: about 50% of medicines are prescribed or dispensed inappropriately, and approximately 50% of all patients fail to take their medicine correctly. The quality of patient care can be improved significantly if care is provided through a multidisciplinary team approach involving all providers responsible for the management of the patient. In line with that approach, pharmacists' involvement in direct patient care has been increasing around the world. Studies have indicated that the involvement of pharmacists in every step of the medication use process results in great health and economic returns.

In the past, pharmacists were responsible only for supplying, compounding, and dispensing medications. Thus, their activities were focused primarily on product, with little emphasis on the individual needs of the patients and the community. The practice of pharmacy in Ethiopia, as in the rest of the developing world, can be regarded as product oriented. Pharmacy professionals working in the health system are engaged mainly in drug supply and related activities.

Recognizing the need for patient-focused services and the competency gap in the curriculum, schools of pharmacy in Ethiopia revised their curricula in 2008 to focus more on the patient. In addition, recognizing the potential benefits of introducing clinical pharmacy to the patients and the health sector, the Federal Ministry of Health (FMOH) has included clinical pharmacy services in the pharmacy chapter of the Ethiopian Hospital Reform Implementation Guidelines (EHRIG) as one of the key services to be provided by hospitals. The pharmacy chapter of the guideline has been implemented in all public hospitals since 2010. The document has explicitly indicated that pharmacists need to contribute to the safe, effective, and economic use of medicines so as to maximize treatment outcomes.

However, introducing clinical pharmacy services in Ethiopia requires pharmacists who are well trained in patient-focused services. That need proved to be a huge challenge in implementing the standards in the EHRIG because all pharmacists in the country were trained using the old product-focused curriculum. As a short-term solution to assist the Government of Ethiopia in commencing clinical pharmacy service at hospitals, SIAPS (and its predecessor program Strengthening Pharmaceutical Systems [SPS]) initiated an in-service training program aimed at building the clinical knowledge and skills of practicing hospital pharmacists. The training program proved to be a successful initiative that has attracted much interest and has brought together universities, the Pharmaceuticals Fund and Supply Agency (PFSA) and SIAPS for a new national objective: the initiation of clinical pharmacy service in Ethiopian hospitals, which is the first of its kind in the country.

The in-service training program passed through a series of stages, starting with curriculum design, training manual development, selection of a host university, and organization of the actual training course. Between May 2012 and September 2014, 200 pharmacists were trained in eight rounds. Those pharmacists came from 65 federal, university, and regional hospitals that were selected from the regions of Amhara, Tigray, Oromia, Harari, Afar, and Benishangul-

Gumuz; the Southern Nations, Nationalities, and Peoples' Region (SNNPR); and the city administrations of Addis Ababa and Dire Dawa. The course was conducted at Jimma University (six rounds), the University of Gondar (one round), and Mekelle University (one round), using each university's school of pharmacy as a focal point. The schools of pharmacy and the university hospitals actively participated and were used as training sites.

The month-long course comprised one week of class-based teaching and three weeks of practical attachment to selected wards. The training showed an immediate knowledge gain in clinical pharmacy: 99% of the trainees scored more than 50% after the training, compared with only 46% of trainees achieving such a score before the training.

The training program and consultative meetings have raised the awareness of the FMOH, the Regional Health Bureaus (RHBs), and the hospitals' management of the importance of clinical pharmacy services to improving the quality of patient care. That awareness has encouraged them to emphasize and support the implementation of the clinical pharmacy initiatives. As a result, 51 (77.3%) of the hospitals are providing the service, 40 (78.4%) of which document their interventions and generate a monthly report on the service. To further strengthen the service, six hospitals so far have paid for their pharmacists to pursue postgraduate study in clinical pharmacy.

The demand from hospitals for support in clinical pharmacy service has increased since the start of the training program. Because of the need to sustain the initiative and respond to the demand, capacity was built in three public universities for any needed future in-service training in the area. Furthermore, the FMOH is assigning the new patient-oriented pharmacy graduates to hospitals to provide clinical pharmacy services. As more pharmacists attend the training program, implementation of the service is expected to accelerate. However, continuous in-service training is always needed because the knowledge and practice of clinical pharmacy are advancing every time.

Important lessons were learned from organizing the in-service clinical pharmacy training course. The following factors created a favorable environment for implementation of the new initiative: (a) a conducive policy environment, (b) strong collaboration with government stakeholders, (c) exploration of opportunities and capacities at local institutions, and (d) assurance of the commitment of the trainees and health system managers.

INTRODUCTION

Background

Essential medicines save lives and improve health when they are available, affordable, of assured quality, and properly used.¹ Medicinal therapy is well known as the most frequently used form of treatment intervention in any health practice setting.² In past decades, medicines have had an unprecedented positive effect on health, leading to reduced mortality and disease burden and consequently to an improved quality of life. However, a grim reality is the widespread misuse of medicines: about 50% of medicines are prescribed or dispensed inappropriately, and approximately 50% of all patients fail to take their medicine correctly.³ Furthermore, the healthcare system is not well prepared to support the rational use of medicines; as a result, the health system suffers from both health and economic losses.⁴

A well-recognized body of evidence now exists that shows that the quality of patient care can significantly improve if care is provided through a multidisciplinary team approach involving all categories of healthcare providers.⁵ In line with that evidence, the involvement of pharmacists in the direct patient care setting has been increasing.^{6,7} A review by Kaboli et al. indicates that pharmacists work directly with providers and patients to deliver services not simply associated with the dispensing of drugs but also associated with medication and disease management.⁸ The involvement of pharmacists in every step of the medication use process results in great returns, including increased patient safety, improvements in disease management and medicine therapy, improved effectiveness in healthcare spending, and improved patient adherence and quality of life.⁹

In their traditional roles, pharmacists are responsible mainly for supplying, compounding, and dispensing medicines. Those major activities of the pharmacy practice have been very much product focused with little emphasis on the individual needs of the patient and the community. However, there is a growing consensus that the pharmaceutical product should be viewed as a means to an end and not as an end in itself. Accordingly, the practice of pharmacy is embracing a paradigm shift in the way the service is being delivered in patient care settings. In accordance with that new philosophy of pharmacy practice, *pharmaceutical care* is defined as “the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve or maintain a patient’s quality of life.”² The adoption of pharmaceutical care in patient care settings is associated with significant reductions in the cost of treatment as well as improvements in the quality of care and outcomes of treatment.^{10–13}

The practice of pharmacy in Ethiopia, as in the rest of the developing world, can generally be viewed as product oriented. Pharmacy professionals are engaged mainly in drug supply and related activities. The only patient-related activity that pharmacists perform is dispensing medications from behind the counter. Medications are dispensed on the basis of a prescription that does not often contain complete information about the patient and the diagnosis. Moreover, the pharmacist works in a separate corner, away from the patient care setting, where most of the clinical decisions are made. The pharmacist’s role in those situations is more reactive than proactive. The pharmacist responds to prescribing errors long after the decision has been made and without having direct clinical knowledge of the patient, which often leads to poor quality of

care and an unacceptable level of treatment outcomes. That practice stems from the product-focused undergraduate pharmacy education.

Cognizant of the global shift in pharmacy education and practice, schools of pharmacy in Ethiopia revised their curriculum in 2008 to be more patient focused. The curriculum aims to produce general pharmacists with the necessary knowledge, skills, and attitude to provide clinical pharmacy services. SPS and its follow-on SIAPS Program were active players in the advocacy and technical support for curriculum revision through the Ethiopian Pharmaceutical Association. The first graduates who were trained according to the new curriculum joined the health system in the summer of 2013.

Recognizing the inefficiencies in the health system and the benefits of introducing clinical pharmacy to the patient and the health sector, the FMOH has included clinical pharmacy in the EHRIG as one of the key services to be provided by hospitals. The guideline was implemented in all public hospitals in Ethiopia in 2010. The SPS Program was a key partner in developing the guideline. The document has explicitly indicated that pharmacists need to provide clinical pharmacy services and to contribute their share in patient care by (a) advising doctors, nurses, and other healthcare workers on the clinical use of medicines and economic drug use and safety; (b) offering direct patient care services; and (c) advising hospital managers, including clinical managers, on medicine policy, procedures, and guidelines designed to ensure safety, effectiveness, and economy in the use of medicines.¹⁴

Statement of the Problems: Gaps in Pharmaceutical Use and Services

The use of medicines at health facilities in Ethiopia suffers from a number of inefficiencies. A cross-sectional survey conducted by the FMOH and the World Health Organization (WHO) in 2002 showed widespread use of antibiotics and injectable medications above the optimum level recommended by WHO; 58% of prescriptions were for one or more antibiotics. The survey also indicated that dispensed medicines lacked appropriate labels, suggesting that patients were receiving little or no information. Only 67% of patients knew how to take the drugs they were prescribed.

The study further indicated the low use of an oral rehydration solution in the treatment of uncomplicated diarrhea in children and the extensive use of antibiotics which are not indicated for the treatment of diarrhea. Also, antibiotic use in acute respiratory tract infections which were not pneumonia cases was as high as 61%. The use of first-line antibiotics in the treatment of mild to moderate pneumonia was 54%, compared with the recommended use of 100%. The prevalence of using more than one antibiotic in treating the same condition was 2%, when antibiotics were not recommended.¹⁵ The combined effect of those practice limitations is huge in aggravating health problems, considering the low level of health literacy among the vast majority of the country's population.

Another survey that assessed the quality of pharmaceutical services at public hospitals in Addis Ababa identified major deficiencies in the way the services were being delivered. The study concluded that the documentation and implementation of therapeutic objectives and the monitoring of plan aspects of pharmaceutical care were the most underperformed domains. It

also showed that the majority of pharmacists never participated in direct patient care. Respondents reported that factor to be a result of the lack of a built-in system in the hospitals for involving pharmacists in the provision of pharmaceutical care.¹⁶

The rapid assessment conducted by SPS in 2011 to serve as a baseline for future interventions in clinical pharmacy services showed that the practice of pharmaceutical care/clinical pharmacy—that is, involvement of pharmacy professionals in direct patient care—was minimal.¹⁷ The results of that study of 20 sites (32 pharmacy professionals) indicated that 72% of the pharmacists had no involvement in morning meetings with the multidisciplinary team (MDT), only 6% of the respondents attended ward rounds, and only 19% of them alerted patients when drugs with a high risk for adverse reactions were dispensed. Just 41% of the pharmacists were involved in providing information on correct dilution procedures and storage of the reconstituted medicines in the wards.

The rapid assessment further identified that only 34% of respondents checked the dosage recommendations of dispensed medications. The same percentage of pharmacy professionals provided advice on specific administration techniques. A little more than a quarter (31%) of them were involved in checking contraindications. Dispensed drugs were not labeled separately for individual patients in the ward, and the pharmacist had no way to identify whether the right drug was delivered and appropriately administered to the right patient. Indications were not checked before dispensing unless an unfamiliar dosage regimen was written on the prescription.

Only 6% of the pharmacists had the opportunity to oversee intravenous (IV) admixture procedures by nurses. Moreover, 31% and 25% of pharmacists, respectively, had access to patient medical information and laboratory results. None were involved in discharge counseling services. Of those facilities with a pharmacist job description (44%), only 13% had a statement reflecting clinical pharmacy services. Only 47% of the respondents indicated that hospital management knew about inclusion of clinical pharmacy service in the EHRIG.

Those facts called for a concerted effort to optimize the outcomes of drug therapy and to ensure the economic use of resources by alleviating the prevailing problems in pharmacy service provision.

In-Service Training for Clinical Pharmacy Services

Since the launch of the EHRIG by the FMOH, the SPS Program and its follow-on SIAPS Program have been involved in providing all-around support to health facilities, RHBs, and the FMOH in implementing the pharmacy chapter, which comprises 12 operational standards. During the process, hospitals were found to lag in meeting some of the operational standards. One of the major gaps was pharmaceutical care services. The major reason for that gap was the lack of appropriately trained pharmacists to provide the services.

SIAPS and its predecessor program, SPS, were actively involved in bringing together concerned stakeholders, such as the PFSA and schools of pharmacy, to respond to current challenges in implementing clinical pharmacy according to the recommendations of the pharmacy chapter of the EHRIG. Accordingly, the relevant stakeholders agreed to provide short-term clinical

pharmacy in-service training to implement the service at selected public hospitals. The aim of the in-service training was to provide hospital pharmacists with the knowledge and skills required to carry out basic pharmaceutical care activities. That training was to be achieved through collaboration with schools of pharmacy. The PFSA was the major stakeholder that played a leadership role in the process from the FMOH side.

The in-service training program began by designing a one-month curriculum, developing training manuals, and selecting a local institution to host the training. The curriculum and training manuals were developed by a consultant with strong involvement of School of Pharmacy at Jimma University. Jimma University was selected to host the training on the basis of its experience in successfully running a clinical pharmacy postgraduate program.

The program initially trained 21 pharmacists from 21 hospitals. To date, 200 pharmacists have been trained in eight rounds. Those pharmacists came from 65 federal, university, and regional hospitals. Those hospitals were selected from the regions of Amhara, Tigray, Oromia, Harari, Afar, and Benishangul-Gumuz; the SNNPR; and the city administrations of Addis Ababa and Dire Dawa. In addition to the training at Jimma University, two rounds of in-service training were conducted at the University of Gondar and Mekelle University with strong support from SIAPS and Jimma University.

On completing their training, the pharmacists were expected to initiate the service immediately on their return to their respective health facilities. To facilitate implementation of the service, consultative meetings were organized on the last day of most of the programs in the presence of officials from the RHBs, hospitals, and the PFSA to build consensus on and to discuss implementation issues. Detailed descriptions of the processes in realizing the training program are provided in subsequent sections of this technical report.

The in-service training ultimately led to the implementation of clinical pharmacy services at selected hospitals. Implementation of those services was a milestone in the history of pharmacy practice in Ethiopia, and it served as a model to other hospitals.

CONCEPTUALIZATION AND IMPLEMENTATION

SIAPS Approach to Addressing Gaps in Capacity for Pharmaceutical Services

Capacity building can take many forms. The most conventional intervention that comes to mind is training. Training interventions, which build an individual's capacity, are often necessary; however, they may not be sufficient to address performance challenges. Individual performance is highly influenced by institutional and systemic context. Therefore SIAPS's approach to capacity building is more holistic than merely training. It considers institutional and individual needs and strengthens institutional capacities and environment (structure, systems, roles, staff, and infrastructure) as a foundation to enable capacity building and performance improvement for individuals' skills and tools) (figure 1).

The clinical pharmacy in-service training program in Ethiopia was planned and organized according to SIAPS's framework for building capacity for pharmaceutical care on the basis of a country-specific need. Some of the institutional and systemic capacity-building interventions were addressed by its predecessor program, SPS, by 2012. The activities included strengthening the pre-service training capacity in the universities and implementing the EHRIG. Those interventions laid the foundation for SIAPS to continue to increase capacities for staff, infrastructure, skills, and tools. The details of the interventions are elaborated in the following sections.

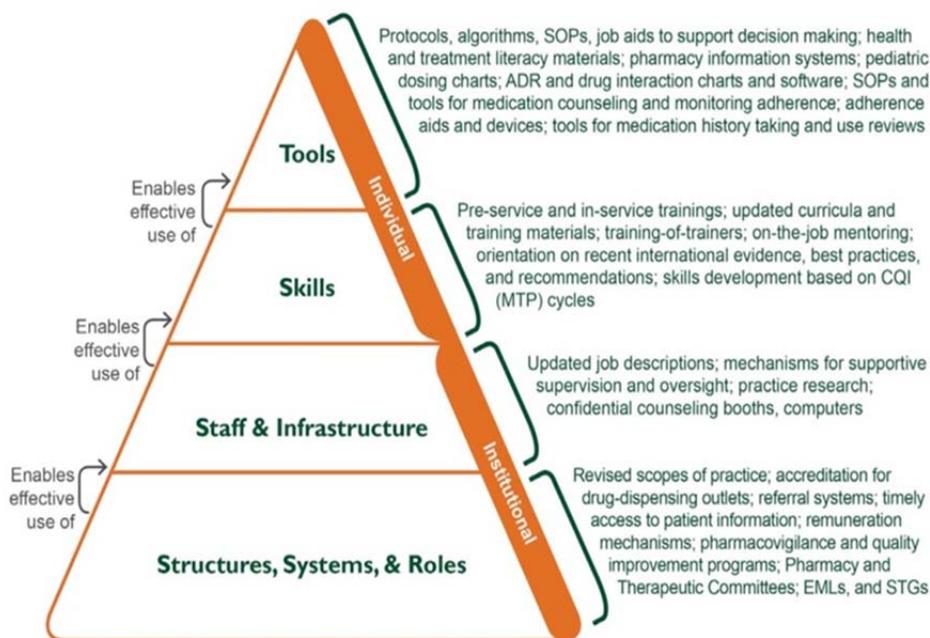


Figure 1. SIAPS approach for building capacity for pharmaceutical care

Adapted from Potter, C., and R. Brough. 2004. Systemic Capacity Building: A Hierarchy of Needs. *Health Policy and Planning*, 19(5): 336-345.

The EHRIG has created a policy environment that is conducive for the successful implementation of pharmacy services. The pharmacy chapter of the EHRIG, which contains standards and guidelines on key pharmaceutical services, including clinical pharmacy, was developed by the FMOH in collaboration with SPS. The in-service training was a response to the policy and the critical shortage of pharmacists who could provide clinical pharmacy services. Before initiation of the in-service training program, gaps were identified in the practice of clinical pharmacy through a baseline assessment conducted in 2011. The identified problems revealed little pharmacist involvement in clinical settings.

SIAPS is assisting health facilities in implementing the EHRIG standards and guidelines to create sustainable pharmaceutical systems and structures. In line with that aim, USAID/SIAPS provided support to establish and strengthen Drug and Therapeutics Committees (DTCs). Such committees have been instrumental in highlighting the importance of implementing clinical pharmacy so as to ensure the rational use of medicines in ward settings. SIAPS has also supported the development of national formularies and standard treatment guidelines, as well as hospital-based medicine lists, that create an enabling environment for the clinical pharmacy service.

The pharmacovigilance system of the country, which is supported by SIAPS, has also signified the importance of clinical pharmacy in protecting the population from harm caused by medicine. There is a marked increase in health facilities' reporting rates for adverse drug reactions (ADR). ADR reports totaled 79, 192, and 271 in 2012, 2013, and 2014, respectively. The initiation of clinical pharmacy services is believed to have contributed greatly to the rise in ADR reports. From September 2013 to January 2015, 93 reports were sent by those pharmacists, accounting for 40.26% of the reports.

Quality improvement programs such as drug utilization reviews are implemented in a number of hospitals and have a direct benefit by showcasing the relevance of clinical pharmacy services. Those SIAPS efforts have resulted in creating appropriate systems and structures whereby clinical pharmacy services can be initiated in Ethiopian hospitals.

SIAPS supported the implementation of clinical pharmacy services by building the capacity of staff and providing the necessary infrastructure. Toward that end, SIAPS helped the PFSA and RHBs revise job descriptions for pharmacists. To create mechanisms for supportive supervision and oversight, SIAPS provided training to regional teams (composed of RHBs, the PFSA, and SIAPS) on how to support clinical pharmacy services. Trainees were also assisted at their work sites through mentoring and supportive supervision. Drug information services were supported with the necessary infrastructure and reference materials that trained pharmacists are using for medicine-related clinical information.

Provision of skills for individual capacity building was accomplished by organizing ward-based clinical pharmacy in-service training. SIAPS Ethiopia supported the development of a practical curriculum for that in-service training to fill the gaps in the knowledge and skills of existing pharmacists. Course materials were also developed and used for the in-service training. Universities were supported in organizing short-term in-service training on clinical pharmacy using the curriculum and course materials. Skill transfer was further achieved through supportive supervision and mentoring by university lecturers and concerned experts from the PFSA, RHBs, and SIAPS. SIAPS also supported the development of tools, such as documentation and reporting formats for clinical pharmacy interventions. Service guides were also developed and distributed to hospitals with trained pharmacists.

Policy-Level Intervention

SIAPS and its predecessor program played a key role in designing, developing, and implementing the pharmacy chapter of the EHRIG, which sets out the foundation for reforming

the practice of pharmacy at hospitals. The pharmacy chapter of the EHRIG emphasizes the importance of clinical pharmacy services in improving treatment outcomes in Ethiopian hospitals. As EHRIG is an official tool of FMOH and RHBs for hospital reform, all hospitals are expected to implement it as part of improving the quality of healthcare services, including pharmacy services, in their respective settings. The guidelines have laid the appropriate policy environment for the initiation of patient-focused pharmaceutical services.

Pre-Service Training

In 2008, all public Schools of Pharmacy in Ethiopia gathered to discuss the need to revise the undergraduate pharmacy curriculum to make it more patient centered. In facilitating that effort, the former SPS, in collaboration with the Ethiopian Pharmaceutical Association, assisted in organizing workshops for stakeholder consultation. In addition, a series of events was organized to standardize and harmonize the pre-service curriculum between public and private sector teaching institutions.

Since 2008, all schools of pharmacy (public and private alike) are implementing the new patient-oriented curriculum. The new curriculum incorporates many clinical courses, including pharmacotherapy (16 credit hours), drug informatics (2 credit hours), communication skills for pharmacists (2 credit hours), and pharmacoeconomics (3 credit hours). Moreover, the curriculum has a one-year experiential training component in hospital outpatient and inpatient settings, as well as in community settings during the final year. So far, two successive groups of pharmacists were graduated and were deployed to hospitals and other areas of the healthcare system in 2013 and 2014.

In 2009, SPS, in collaboration with the School of Pharmacy at Jimma University, organized a five-day training-the-trainers course on pharmaceutical care and pharmacovigilance at Jimma University. That course was intended to build the capacity of faculty members and graduate students of schools of pharmacy to implement the patient-oriented pharmacy curriculum and provision of clinical pharmacy services.¹⁸ Relevant experts from the University of Washington in the United States facilitated that workshop. The training has contributed considerably to the implementation of the new undergraduate pharmacy curriculum at public universities in Ethiopia.

As part of the effort to build the national capacity to train a competent workforce in clinical pharmacy in a sustainable manner, the SPS supported launching a clinical pharmacy master's program at Jimma University in 2009. That program was achieved through a consensus-building forum attended by officials and experts from the university (both academic and hospital), schools of pharmacy, relevant government bodies, and a clinical pharmacy expert from the United States. The participants discussed and agreed on the importance of the program and pledged to provide support to make it successful. The master's program has played a critical role in producing instructors for schools of pharmacy in Ethiopia to implement the new patient-oriented undergraduate pharmacy curriculum. It has also paved the way for short-term in-service training for practicing pharmacists. The program is now mature and is taking applicants from hospitals, in addition to those coming from teaching institutions.

In-Service Training of Hospital Pharmacists

Curriculum and Training Material Preparation

A training program tailored to hospital pharmacists was designed that would address the gaps in pharmaceutical care. To that end, a consultant was hired to develop the curriculum as well as the training materials for the short-term intensive program. Through continuous follow-up and a series of discussions with the consultant, a one-month training curriculum was developed. The curriculum had two components: a one-week class-based training session and a three-week ward-based practical training session. Course materials containing trainers' and participants' guides as well as PowerPoint presentations were developed. A clinical pharmacy course team from Jimma University has made irreplaceable contributions in refining and modifying the curriculum to make it more practical and need based. The team also developed training materials for the pharmacotherapy section of the course.

Selection of a Host Institution

The School of Pharmacy at Addis Ababa University was initially selected to host the training program because of its long history of pharmacy education and the newly launched master's program in pharmacy practice. However, mobilizing senior physicians to facilitate the training together with the pharmacy faculty, securing the hospital setup for training, and ensuring institutional ownership proved challenging.

Consequently, the School of Pharmacy at Jimma University was asked to host the training program. The school made all the necessary communications, mobilized its staff, and secured the commitment of the university's higher management and senior physicians to host and facilitate the program at the university's hospital. The opportunity of organizing the training was then automatically given to this school. The school's clinical pharmacy staff revised the curriculum developed by the consultant and added topics on pharmacotherapy of common chronic diseases, for which they developed additional training materials. The school was able to communicate with respective clinical departments and recruit trainers for each round of the training. As a result, six of the eight rounds were conducted at Jimma University. The University of Gondar and Mekelle University each hosted one round of in-service training. Thus, those three universities have the capacity to provide in-service training on clinical pharmacy, and hospitals, RHBs, and FMOH can use that expertise to conduct similar training programs as deemed necessary.

Selection of Hospitals and Pharmacists to Participate in the Training

The PFSA branches, RHBs, and SIAPS's regional technical advisers selected the hospitals and pharmacists. The criteria for selecting the hospitals and trainees were developed and communicated to the regional team.

Selected hospitals must meet the following criteria—

- Have a committed management willing to initiate and support the service.

- Apply for the training in writing, expressing a commitment to initiate the service.
- Be able to get a signed commitment from the pharmacists to stay at the facility for at least one year after the training.
- Have enough pharmacists to be able to dedicate at least one pharmacist to providing clinical pharmacy service and to overseeing the overall implementation.
- Have a good track record for implementing the pharmacy operational standards of the EHRIG.

The pharmacists selected for the training program must meet the following criteria:

- Have an interest in providing clinical pharmacy services.
- Be willing and committed to initiating clinical pharmacy service on returning from the training program.
- Be willing to stay at the home facility for at least the next year and to sign an agreement with the hospital.
- Have good background knowledge in pharmacology and pharmacotherapy that can be judged by previous dispensing practices.
- Be committed to fulfilling the monitoring and evaluation requirements of the organizers (i.e., documentation, reporting, and periodic evaluation of the existing service at the hospital).

During each round, the RHBs (with a request from the PFSA) officially notified the selected hospitals to nominate and send one or two pharmacists to the training program. That selection process was repeated for all eight rounds. Strict adherence to those criteria has contributed greatly to the successful implementation of the training program and initiation of the service after the training.

Stakeholder Involvement

From the outset, it was clear that the clinical pharmacy initiative would not succeed without the involvement of all key relevant government stakeholders. Their involvement was deemed necessary for sustaining the intervention and sharing best practices among the implementing hospitals. The PFSA was the major stakeholder involved in the planning, organization, and implementation of the training program. The PFSA was also involved in site-level supportive supervision and follow-up of the hospitals' performance.

The other major stakeholders were the respective RHBs. They were involved in selecting and inviting the hospitals. They were also instrumental in providing site-level support.

SIAPS contributed to the clinical pharmacy initiative by organizing consultative workshops to familiarize RHB and hospital management with the principles, importance, and type of support needed to establish and strengthen clinical pharmacy services.

The role of local universities was also significant. Universities allowed the use of their wards, morning sessions, and training halls for this national initiative. They also allowed their staff to be actively involved in the training programs and subsequent follow-up. Universities also participated in curriculum revision and preparation of training materials. Through the process, local stakeholders have acquired adequate expertise in how to organize clinical pharmacy training and follow-up implementation activities.

OBJECTIVES OF THE IN-SERVICE TRAINING

General Objective

The primary objective of the in-service training is to fill the knowledge and skill gaps of practicing hospital pharmacists to enable them to initiate clinical pharmacy services in their respective hospitals.

Specific Objectives

The one-month training program is designed to enable participants to—

- Collect and interpret patient-specific clinical data
- Identify drug therapy-related problems
- Develop a pharmaceutical care plan in collaboration with patients, caregivers, and other healthcare professionals
- Communicate and implement a pharmaceutical care plan
- Monitor and evaluate therapeutic outcomes
- Document clinical pharmacy-related interventions and facilitate communication and collaboration
- Provide information on medicine use to patients and other healthcare professionals
- Participate in the hospital's quality improvement programs (e.g., drug use evaluation)
- Actively participate on the healthcare team in identifying and managing drug therapy-related problems

COURSE ORGANIZATION AND DELIVERY

A series of activities was conducted to ensure that the training resulted in successful outcomes. Additional related events helped create a conducive working environment for trainees when they returned to their respective hospitals.

Stakeholders' Participation and Partnership

Each of the training sessions was organized jointly by the PFSA, the host university, and SIAPS. At the opening of each session, officials from the PFSA, host university, and SIAPS addressed the trainees and provided guidance. In their opening remarks, the officials addressed the effort to realize clinical pharmacy services in Ethiopia and the respective institutions' commitment in future collaborations to implement clinical pharmacy services at the respective hospitals. They also alerted trainees to the need to attentively participate in the training sessions and to take the initiative to implement the service immediately on return to their facilities.

In addition, a consultative meeting involving officials from the PFSA, RHBs, hospitals, and host university was organized at the end of each training session to achieve consensus on the way forward. The presence of the hospitals' chief executive officers (CEOs) was a key part of that meeting to secure the commitment and necessary support for the trainees and for the initiation of the service at their respective hospitals.

Course Activities

The course had two major components: (a) class-based teaching and (b) experiential training and ward attachment. Details of the course activities are presented in the following subsections. Sample course schedules are provided in annexes A and B.

Class-Based Teaching

The first component was a weeklong class-based teaching session facilitated by clinical pharmacists and senior physicians from the host university. The first topic presented was current trends in pharmacy practice and overview of clinical pharmacy, which covered (a) the current shift in pharmacy practice, (b) the importance of clinical pharmacy services, (c) the role of pharmacists in patient care, and (d) the educational and practice initiatives in Ethiopia. That topic was followed by a discussion of issues related to the implementation of clinical pharmacy services. The discussion was held with senior physicians and clinical pharmacists from Jimma University Specialized Hospital (JUSH), who have been mentoring postgraduate clinical pharmacy students, and with the PFSA and SIAPS representatives. Issues were raised that related to (a) getting the required support from the FMOH, RHBs, and hospital management; (b) accessing patient information; (c) getting acceptance from other healthcare providers; (d) filling the clinical knowledge gap of practicing pharmacists; and (e) deploying the pharmacy workforce .

That discussion was followed by a pre-test to evaluate the trainees' baseline knowledge and skills. The pre-test would be used to measure the immediate outcome of the training. Following the pre-test, was a discussion of the interpretation of common laboratory test results, including (a) liver function tests, (b) hematologic tests, (c) endocrine tests, (d) urinalyses, (e) cardiac tests, (f) gastrointestinal tests, (g) immunologic tests, and (h) diagnostic tests for infectious diseases.

The next sessions were a series of presentations and discussions on the therapeutic management of common chronic diseases (hypertension, heart failure, ischemic heart disease, diabetes mellitus, renal disorders, pain, peptic ulcer disease and upper gastrointestinal bleeding, end-stage liver disease, pneumonia, meningitis, infective endocarditis, stroke, and surgical prophylaxis). Asthma and chronic obstructive pulmonary disease (COPD), ischemic and hemorrhagic stroke, and clinical pharmacokinetics (clinical issues in bioequivalence and generic substitution, as well as IV to oral therapy conversion) were important additions since the third round of training. Both senior physicians and clinical pharmacists were involved in providing the class-based training.

For each disease, the pathophysiology, diagnosis, treatment goals, and approaches were discussed. Following the presentation on each disease, relevant cases were presented for group discussion. Trainees were encouraged to work on each of the cases in a group to assess the information provided on each case, identify the drug-related problems, and recommend appropriate interventions. In addition, trainees were given take-home assignments to work on specific patient cases in groups. On the following day, one or two groups presented their work to the class in the presence of facilitators. Toward the end of the discussion on the group assignments, facilitators summarized the cases and management approaches for each case presented.

The pharmacist's role in patient care was discussed, including (a) an overview of pharmaceutical care; (b) patient assessment; (c) identification of drug-related problems; and (d) development, implementation, monitoring, and review of the pharmaceutical care plan. Additional discussions were held on communication skills in clinical pharmacy practice and medication safety. The pharmacist's role in drug use evaluation, formulary management, and drug information services was also discussed briefly.

Ward Attachment and Experiential Training

The second component of the training course was the three-week ward attachment. The trainees received the attachment schedule along with their group and were given an orientation covering the detailed activities expected during the attachment and the norms and policies pertaining to ward attachment. Trainees were divided into three groups and attached to three selected wards (internal medicine, pediatrics, and surgery) for three weeks with a weekly rotation. The three disciplines were selected to align with the cases discussed during the class-based instruction. In each ward, trainees were assigned to a specific group of patients. They followed the patients and produced daily progress reports on them. In each ward, a team of senior physicians and clinical pharmacists supervised the trainees.

During their ward attachment, trainees reviewed patient charts and interviewed patients daily in preparation for rounds and morning sessions. They attended the following rounds and morning sessions in each of the three wards—

- Multidisciplinary major teaching rounds (two hours per day for three days)
- Bedside teaching and business rounds (two hours per day for two days)
- Pharmacist-only teaching rounds (five hours per day for five days)
- Multidisciplinary morning sessions (two days per week)
- Pharmacist-only morning sessions (three days per week)

Assigned senior physicians and clinical pharmacists facilitated the major teaching rounds and bedside teaching sessions, whereas clinical pharmacists facilitated the pharmacist-only teaching rounds and morning sessions. The rounds and MDT morning sessions were conducted in the respective wards, whereas the pharmacist-only morning sessions were conducted at the school of pharmacy with all the trainees.

Each day, the trainees reviewed their patients' charts for an update on the patients' current medication before going to major teaching or business rounds. They reviewed the charts to identify and prevent or resolve drug therapy problems (if any). The trainees actively participated during major and bedside teaching rounds. Each trainee was allowed to present cases of his or her patient for discussion during the pharmacist-only teaching rounds focusing on medication-related issues.



Figure 2. Physicians, clinical pharmacists, and trainees at Jimma University at (left) bedside rounds and (right) a morning classroom session.

The clinical pharmacists guided the discussion in such a way that trainees grasped the processes of providing pharmaceutical care. During pharmacist-only morning sessions, trainees presented patient cases, focusing on any identified drug-related problems and a care plan. Guided by the clinical pharmacists, all trainees thoroughly discussed the cases presented and the proposed care plan.

In addition to the three wards selected for the attachment, some trainees from specialized hospitals were able to arrange attachment at wards other than the surgical ward, such as psychiatry for trainees from St. Amanuel Mental Specialized Hospital and multidrug-resistant tuberculosis for trainees from St. Peter's TB Specialized Hospital.

While on ward attachment, trainees were encouraged to identify the challenges they would expect to face at their respective health facilities during the implementation of clinical pharmacy services and to think about appropriate interventions. Toward the end of the training course, trainees gathered together and developed a presentation on the lessons they learned, expected challenges, and recommendations for initiating the service. Trainees made their presentation during the closing ceremony. The presentation would be used as a basis for discussion with the RHB and hospital CEOs regarding their roles in the implementation of the service.

Immediately after the ward attachment, the trainees were given a post-test to evaluate the knowledge they acquired during the training program. Finally, the trainees were asked to complete a course evaluation form.

COURSE PARTICIPANTS AND TRAINERS

Table 1 shows the number of hospitals and pharmacists that participated in the in-service training program by region or city administration. In year 1, 78 pharmacists (14 female and 64 male) representing 30 hospitals (8 federal and university and 22 regional hospitals) from five regions and two city administrations attended the training sessions, which were conducted in three rounds. The sessions were facilitated by three clinical pharmacists, one pharmaceuticals expert (PhD), seven internists, four pediatricians, and three surgeons from Jimma University.

In year 2, 76 pharmacists were trained from 35 hospitals, 14 of which were new; 65 (86%) participants were male, and 11 (14%) were female. Six of the new hospitals were from Tigray Region. All trainers were university lecturers and assistant professors from Jimma University (fourth and fifth rounds) and the University of Gondar (sixth round). The training sessions were facilitated by seven clinical pharmacists, one pharmaceuticals expert, eight internists, four pediatricians, and four surgeons from Jimma University and two clinical pharmacists, one pharmaceuticals expert, one pharmacologist, three internists, two pediatricians, and two surgeons from the University of Gondar.

In year 3, 46 pharmacists from 39 hospitals—22 of the hospitals were new— took part in the training program; 39 (85%) were male, and 7 (15%) were female. At the Jimma University training sessions, three internists, two pediatricians, two surgeons, seven clinical pharmacists, and one pharmaceuticals expert took part as trainers or preceptors. At the Mekelle University training sessions, three internists, two pediatricians, two surgeons, five clinical pharmacists, and one pharmaceuticals expert took part as trainers or preceptors from the university; two clinical pharmacy lecturers were also from Jimma University.

Table 1. Distribution of Hospitals and Pharmacists Participating in In-Service Training by Region, May 2012–September 2014

Region/City Administration	Number of Hospitals			Number of Trainees			Total
	Year 1	Year 2	Year 3	Year 1	Year 2	Year 3	
Addis Ababa	3	5	3	8	14	5	27
Amhara	7	9	12	19	20	13	52
Dire Dawa	1	1	0	3	2	0	5
Harari	1	2	0	3	3	0	6
Oromia	8	5	13	20	9	15	44
SNNPR	7	5	3	17	11	5	33
Tigray	3	8	6	8	17	6	31
Benishangul-Gumuz	0	0	1	0	0	1	1
Afar	0	0	1	0	0	1	1
Total	30	35	39	78	76	46	200

In all rounds, clinical pharmacists from the three universities and staff members of the PFSA and SIAPS participated as facilitators and course organizers. (Details of the trainees and trainers are contained in annexes C and D.)

TRAINING PRODUCTIVITY

Pre- and Post-Tests

The course included pre-tests and post-tests that were appropriately designed to cover all aspects of the training. The tests were also designed to measure participants' progress with regard to knowledge in pharmaceutical care. The pre-test was administered before participants started the class-based component of the course, and the post-test was administered on the last day of the one-month training. The aim of the tests was to evaluate the immediate results of the training with regard to improvement in trainees' clinical pharmacy knowledge. Comparison of the pre-test and post-test results showed significant improvement: almost all trainees scored higher on the post-test than on the pre-test. The test results are summarized in tables 2 and 3 and figure 5.

As table 2 clearly shows, the participants made dramatic progress in their test results, which is indicative of the training program's significant contribution to pharmacists' acquiring the necessary clinical pharmacy knowledge and skills. On the pre-test, more than half the participants (105, 53.6%) scored less than 50%, whereas on the post-test, only two trainees (1.0%) scored less than 50%. On the pre-test, only three trainees (1.5%) scored higher than 75%, whereas on the post-test 71 trainees (35.7%) scored higher than 75%.

Table 2. Summary of Pre-Tests and Post-Tests, May 2012–September 2014

Class Score	Pre-test		Post-test	
	Number	Percentage	Number	Percentage
< 50%	105	53.6	2	1.0
50%–75%	88	44.9	126	63.3
> 75%	3	1.5	71	35.7

On further analysis of the minimum and maximum scores on the pre-test and post-test, the trainees registered remarkable changes. Table 3 depicts the consistent increase in test results, indicating once again the effect of the training in improving the pharmacists' clinical knowledge.

Table 3. Minimum and Maximum Pre-test and Post-Test Scores, May 2012–September 2014

Training Round	Minimum		Maximum	
	Pre-test	Post-test	Pre-test	Post-test
First	26.0	66.0	62.0	84.0
Second	21.3	56.0	80.0	87.0
Third	30.0	60.0	72.0	90.0
Fourth	21.0	58.5	71.6	93.6
Fifth	10.8	51.6	66.7	98.5
Sixth	23.0	42.0	71.0	83.0
Seventh	22.4	54.0	77.6	84.2
Eighth	21.0	50.0	76.0	86.0

It is also noteworthy to observe that the average test results before and after the training intervention showed consistent and significant increases in all rounds (figure 5).

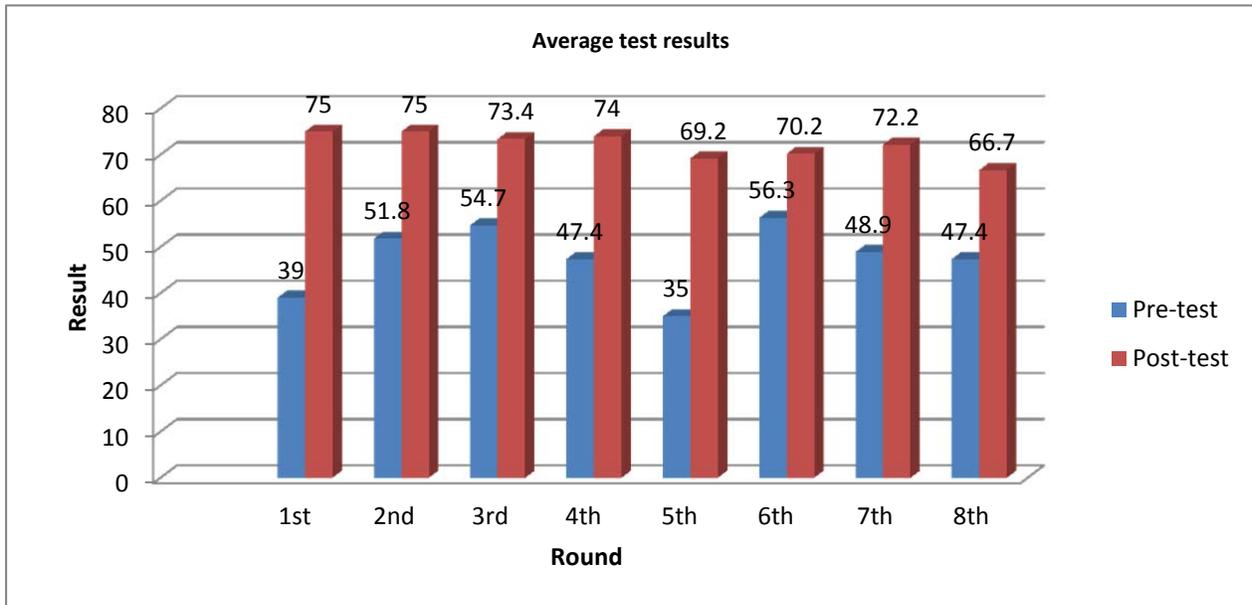


Figure 2. Average test results, clinical pharmacy in-service training, May 2012–September 2014

Overall, the pre-test and post-test results attest to the training’s having indeed tremendously improved the knowledge of participants in all rounds. The trainers routinely assessed the skills of the participants during the three-week ward attachment through case presentations, chart reviews, and bedside teaching rounds. The trainers witnessed the significant changes that trainees made in patient management during their practical attachment. The trainers have stressed that continued change and improvement in case management skills require the trainees to be regularly involved in clinical pharmacy activities and to be supported through mentoring and supervision at their respective practice sites.

Daily Feedback and Course Evaluations by Participants

Throughout the training rounds, feedback was collected from the participants at the end of each day for the class-based training. The objective of daily feedback was to inform course coordinators and trainers of areas of course organization that needed improvement so the facilitators could make the necessary adjustments for the following day. Feedback was provided on a form that assessed the course delivery and facilities daily (annex E).

There were two types of course evaluations. The first was for class-based training, which consisted of evaluation parameters with respect to (a) overall quality of the class-based training and the inputs, (b) relevance of the subject matter, (c) presenter’s skill and knowledge, and (d) adequacy of allocated time. Participants were asked to specify the most useful and least useful

parts of the training, to list areas for improvement, and to provide additional comments (annex F). That evaluation was administered just after the class-based training. In all rounds, participants candidly expressed their opinions about the training program and any areas in need of improvement. All evaluation results confirm that the training was designed, organized, and conducted in a very satisfactory manner. The one area where trainees had several complaints was the inadequacy of time, that is, one month to cover a vast area of knowledge and skills.

The second type of evaluation, administered at the end of the training program, was concerned with the overall course organization for both class-based and ward-based training. The participants evaluated the program on such parameters as (a) overall quality of the training and the inputs, (b) attainment of basic clinical pharmacy competencies, (c) relevance of course organization, and (d) presenter's or facilitator's skills and knowledge (annex G). Once again, participants disclosed the parts of the training that were most and least useful. They were also asked if the course would enable them to initiate the service. Finally, the trainees recommended areas for improvement and offered additional comments. The overall evaluation also indicated encouraging results with respect to all parameters, while the shortage of time once again surfaced as a limiting factor. Sample summaries of the course evaluations are provided in annexes H and I.

CONSULTATIVE MEETINGS

Consultative meetings were arranged for the closing days of the in-service training (annex J). The objective of the meetings was to discuss the follow-up activities needed for the implementation of the clinical pharmacy initiative at the hospitals from which the respective trainees were drawn. The CEOs or medical directors of the selected hospitals, the officials from the RHBs, and the leadership of the organizing institutions (PFSA, SIAPS, and host university) attended the meetings. During the meetings, the benefits of implementing the clinical pharmacy service were first presented along with the experience of senior physicians of the host university hospital who already had worked with pharmacists in the multidisciplinary team. The senior physicians shared their experiences, which clearly showed the necessity of involving pharmacists in patient care to optimize treatment outcomes.

It was pointed out that the stakeholders (FMOH, RHBs, PFSA, universities, and development partners) should work hand in hand to implement the clinical pharmacy services at hospitals. Meeting participants also expressed the importance of making health system managers and healthcare professionals aware of the significance of the service. The trainees expressed the need to involve hospital and RHB management to successfully mitigate the following major challenges in an effort to implement clinical pharmacy services.

Institutional Challenges

- Difficulty in accessing patient information (treatment charts and lab results)
- Lack of complete information on patient charts
- Lack or shortage of important laboratory tests and diagnostic materials
- Shortage of pharmacy staff
- Poor enforcement of existing guidelines pertaining to clinical pharmacy services (e.g., the EHRIG)
- Shortage of some lifesaving drugs

Attitudinal Challenges

- Other healthcare professionals' low awareness of the pharmacist's contribution to quality patient care
- Communication gap between the pharmacists and other healthcare professionals

- Attitude of most members of hospital management, who perceive the role of pharmacists as providing only drugs and medical supplies
- Attitude of pharmacists in limiting their responsibility to dispensing drugs and medical supplies
- Pharmacists' lack of commitment to participating in patient care

The participants of the consultative meetings pledged support for the success of the clinical pharmacy initiative and assured trainees that they would do their utmost to facilitate the entire implementation process by working toward minimizing the stated challenges.

TRAINING OUTCOME

The in-service training program has enabled trainees to acquire the necessary knowledge and skills to provide clinical pharmacy services and to become part of the multidisciplinary team in patient care. The pre-test and post-test results have clearly indicated the knowledge gained, and preceptors indicated that the experiential part of the training helped trainees attain adequate skills in managing patients' medication-related problems. The consultative meetings resulted in RHB and hospital management's awareness of the importance of the service and in their agreement to support the implementation of the clinical pharmacy initiative.

So far, the trained pharmacists have managed to successfully start the service in 51 hospitals (77.3%). Some hospitals, however, reported a major setback because of an inadequate number of pharmacists to perform the other pharmaceutical duties. The main clinical pharmacy activities of the trained pharmacists include (a) reviewing patient charts, (b) participating in morning sessions and bedside rounds, and (c) providing drug information to patients and other healthcare providers. The majority of the pharmacists are attached to either medical or pediatric wards.

Another significant achievement of the training intervention was that six of the hospitals have paid for their pharmacists to pursue postgraduate study in clinical pharmacy at Jimma University. That step is evidence of the major stakeholders' buy-in to the new initiative. The hospital leadership has shown a commitment to implementing clinical services by sending additional pharmacists for training, as well as by demonstrating ownership. Such a commitment is necessary to ensure sustainability of the initiative by creating a larger pool of trained and qualified pharmacists.

As a result of the training intervention and consultative workshops, understanding and consensus were established among all stakeholders on the need to initiate clinical pharmacy services at all hospitals. Moreover, because of new awareness of the importance of clinical pharmacy services, the FMOH assigned new pharmacy graduates to work dedicated to clinical pharmacy services. In addition, the demand from hospitals for support in clinical pharmacy services has increased since the start of the training program.

The following endeavors address the issue of sustainability. Three public universities now have the capacity to provide future in-service training. The government can use those universities to organize in-service training for pharmacists trained in the old curriculum. The training manuals and related instructional materials will also be helpful in future training. Additionally, as successive groups of pharmacists trained in the new patient-oriented curriculum graduate, their numbers will increase, and service implementation is expected to accelerate. However, continuous in-service training will always be needed because the knowledge and practice of clinical pharmacy are always advancing.

OPPORTUNITIES, CHALLENGES, AND LESSONS LEARNED

Opportunities

A number of opportune conditions made the successful conclusion of this undertaking possible, including the following—

- The EHRIG which necessitate the provision of clinical pharmacy services in all hospitals
- A dedicated government agency, the PFSA, which coordinated the activities at the central and regional levels
- Undergraduate education in clinically oriented pharmacy, which provided the setting for the in-service training at the universities
- Regional teams composed of the RHBs, PFSA, and SIAPS, which helped in the selection and invitation of hospitals and trainees

Challenges

Unlike most training, the in-service clinical pharmacy training program was intensive and had a longer duration. Consequently, the training organization faced a number of challenges that had to be systematically managed to ensure proper program implementation. The major challenges in organizing and conducting the training are as follows—

- There was a turnover in trained staff.
- Because they had an inadequate number of pharmacists, some hospitals could not send trainees to the one-month program.
- Schedules clashed with the university's academic calendar. Hence, the best time to conduct the training was during the summer.
- SIAPS had no experience in paying trainers for bedside training. Payment rates needed to be negotiated with the schools of pharmacy. In most cases, the payment rates of the host university were adopted.

Lessons Learned

The following are a few of the lessons learned from organizing the in-service clinical pharmacy training program—

- Having a conducive policy environment: The presence of government-approved policy documents such as the EHRIG have created a favorable environment for the successful implementation of such new initiatives.

- Having a strong collaboration of government stakeholders: Collaboration with the RHBs and PFSA proved to be an effective approach to implementing the training program, because clinical pharmacy is a new practice that needs strong government backing.
- Exploring opportunities at local institutions: Ethiopia's universities and schools of pharmacy have untapped potential. By providing support and guidance to the universities, significant results can be achieved.
- Ensuring commitment: Hospitals were required to enter into written agreements with prospective trainees so that the trainees would remain for at least one year. That approach was viewed as necessary to reduce staff turnover in facilities that strictly implemented it.

REFERENCES

1. World Health Organization. 2004. "Equitable Access to Essential Medicines: A Framework for Collective Action." WHO Policy Perspectives on Medicines no. 8, Geneva, March.
2. Wiedenmayer, K., R. S. Summers, C. A. Mackle, et al. 2006. *Developing Pharmacy Practice: A Focus on Patient Care*. The Hague: World Health Organization and International Pharmaceutical Federation.
3. World Health Organization. 2003. *Adherence to Long-Term Therapies: Evidence for Action*. Geneva: WHO. www.who.int/chp/knowledge/publications/adherence_report/en/
4. World Health Organization. 2012. "The Pursuit of Responsible Use of Medicines: Sharing and Learning from Country Experiences." Geneva.
5. Yarnall, K. S. H., T. Østbye, K. M. Krause, et al. 2009. "Family Physicians as Team Leaders: 'Time' to Share the Care." *Preventing Chronic Disease* 6 (2): A59. www.cdc.gov/pcd/issues/2009/apr/08_0023.htm.
6. Cousins, D., N. Kijlstra, and S. Walser. 2012. "Pharmaceutical Care: Policies and Practices for a Safer, More Responsible, and Cost-Effective Health System." Council of Europe, Strasbourg.
7. Chisholm-Burns, M. A., K. Lee, J. Spivey, et al. 2010. "US Pharmacists' Effect as Team Members on Patient Care: Systematic Review and Meta-Analyses." *Medical Care* 48 (10): 923–33.
8. Kaboli, P. J., A. B. Hoth, B. J. McClimon, and J. L. Schnipper. 2006. "Clinical Pharmacists and Inpatient Medical Care: A Systematic Review." *Archives of Internal Medicine* 166 (9): 955–64.
9. Shah, A. 2010. "Pharmacy Intervention in the Medication Use Process: The Role of Pharmacists in Improving Patient Safety." University of Manitoba, Winnipeg, Canada.
10. Williams, L. E. 1993. "Benefits of Clinical Pharmacy Services in a Community Hospital." *Hospital Pharmacy* 28 (8): 759–63, 766–67.
11. Society of Hospital Pharmacists of Australia. 2003. "Clinical Pharmacists Improve Patient Outcomes." Position statement. www.shpa.org.au/lib/pdf/positionstatement/clin_pharm_ps_aug03.pdf.
12. Perez, A., F. Doloresco, J. M. Hoffman, et al. 2009. "Economic Evaluations of Clinical Pharmacy Services: 2001–2005." *Pharmacotherapy* 29 (1): 128.
13. Giberson, S., S. Yoder, and M. P. Lee. 2011. "Improving Patient and Health System Outcomes through Advanced Pharmacy Practice: A Report to the US Surgeon General." Office of the Chief Pharmacist, US Public Health Service, December.
14. Federal Democratic Republic of Ethiopia, Ministry of Health. 2010. Ethiopian Hospital Reform Implementation Guidelines. Addis Ababa.
15. Federal Democratic Republic of Ethiopia, Ministry of Health, and World Health Organization. 2003. "Assessment of the Pharmaceutical Sector in Ethiopia." Addis Ababa, October.
16. Eshetu, E., and T. Gedif. 2011. "Quality of Pharmacy Services in Government Hospitals in Addis Ababa, Ethiopia." *Ethiopian Pharmaceutical Journal* 29 (2): 108–20.
17. Strengthening Pharmaceutical Systems. 2011. "Rapid Baseline Assessment on Clinical Pharmacy Practice in Selected Hospitals in Ethiopia." Addis Ababa, March.

18. Odegard, P. S., H. Tadege, D. Downing, et al. 2011. "Strengthening Pharmaceutical Care Education in Ethiopia through Instructional Collaboration." *American Journal of Pharmaceutical Education*; 75 (7): 134.

ANNEX A. SAMPLE CLASS-BASED SCHEDULE

Clinical Pharmacy In-Service Training Course for Pharmacists
Organized by PFSA and Jimma University in Collaboration with SIAPS
Jimma University, May 13–June 8, 2013

Class-Based Training Daily Schedule (May 13–20, 2013)

Day	Time	Session	Presenter	Facilitator
1	8:30 a.m.–9:00 a.m.	Registration	Organizers	Elias G.
	9:00 a.m.–9:10 a.m.	Welcoming Speech	Mr. Nezif Hussein, Head, School of Pharmacy, JU	
	9:10 a.m.–9:45 a.m.	Opening Speech	Mr. Yemanebirhan Tadesse , Deputy Director General, PFSA Dr. Esayas Kebede , Clinical Director, JUSH Dr. Negussu Mekonnen , Country Representative, Chief of Party, SIAPS	
	9:45 a.m.–9:55 a.m.	Program and Introduction	Mr. Elias Geremew, SIAPS	
	9:55 a.m.–10:45 a.m.	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy	Mr. Nezif H.	
	11:00 a.m.–11:15 a.m.	Pre-test	Organizers	Dereje C.
	11:15 a.m.–12:00 p.m.	Common Laboratory Tests and Their Interpretation for Pharmacists–1	Mr. Tewodros E.	
	12:00 p.m.–1:30 p.m.	Lunch Break		
	1:30 p.m.–3:00 p.m.	Common Laboratory Tests and Their Interpretation	Mr. Tewodros E.	
	3:30 p.m.–11:00 p.m.	Common Laboratory Tests and Their Interpretation	Mr. Tesfahun C.	
2	8:30 a.m.–10:00 a.m.	Common Laboratory Tests and Their Interpretation	Mr. Tesfahun C.	Elias G.
	10:30 a.m.–12:00 p.m.	Clinical Pharmacokinetics: Intravenous to Oral Switch	Dr. Wubante Y.	
	12:00 p.m.–1:30 p.m.	Lunch Break		
	1:30 p.m.–3:00 p.m.	Clinical Issues in Bioequivalence and Generic Substitution	Dr. Wubante Y.	
	3:30 p.m.–11:00 p.m.	Cardiovascular Disorders: Hypertension	Mr. Nezif H.	
3	8:30 a.m.–10:00 a.m.	Cardiovascular Disorders: IHD	Mr. Gizat M.	Dereje C.
	10:30 a.m.–12:00 p.m.	Ischemic and Hemorrhagic Stroke	Dr. Belete H.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	

Building Local Capacity for Clinical Pharmacy Service through a Holistic In-Service Training Approach

	1:30 p.m.–3:00 p.m.	Cardiovascular Disorders: Heart Failure	Mr. Nezif H.	
	3:30 p.m.–11:00 p.m.	Endocrine Disorders: Diabetes Mellitus	Mrs. Kabaye K.	
4	8:30 a.m.–10:00 a.m.	Renal Disorders	Mr. Gizat M.	Dereje C.
	10:30 a.m.–12:00 p.m.	Pain Management	Mr. Tewodros E.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
	1:30 p.m.–3:00 p.m.	PUD and Upper GI Bleeding	Mr. Belay Y.	
	3:30 p.m.–11:00 p.m.	End-Stage Liver Disease	Mr. Belay Y.	
5	8:30 a.m.–10:00 a.m.	Asthma and COPD	Dr. Daniel Y.	Dereje C.
	10:30 a.m.–12:00 p.m.	Lower Respiratory Tract Infection	Mr. Mulugeta T.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
	1:30 p.m.–3:00 p.m.	CNS Infections	Mr. Mulugeta T.	
	3:30 p.m.–11:00 p.m.	IE and Surgical Prophylaxis	Mr. Belay Y.	
6	8:30 a.m.–10:00 a.m.	HIV/AIDS	Mr. Tesfahun C.	Dereje C.
	10:30 a.m.–12:00 p.m.	Malaria	Mr. Mulugeta T.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
	1:30 p.m.–3:00 p.m.	Epilepsy	Mr. Belay Y.	
	3:30 p.m.–11:00 p.m.	Pediatric Nutrition	Dr. Mitsiwa R.	
7	8:30 a.m.–10:00 a.m.	Sepsis (Pediatrics)	Mr. Mulugeta T.	Dereje C.
	10:30 a.m.–12:00 p.m.	Preoperative Medication Management	Mr. Tewodros E.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
	1:30 p.m.–3:00 p.m.	The Pharmacist's Role in Patient Care: Introduction and Patient Assessment	Mr. Mulugeta T.	
	3:30 p.m.–11:00 p.m.	The Pharmacist's Role in Patient Care: Identification of Medication-Related Problems	Mr. Nezif H.	
8	8:30 a.m.–10:00 a.m.	The Pharmacist's Role in Patient Care: Care Plan	Mr. Gizat M.	Dereje C.
	10:30 a.m.–12:00 p.m.	Medication Use Policy: Drug Use Evaluation and Medication Safety	Mr. Tesfahun C.	
	12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
	1:30 p.m.–3:00 p.m.	Communication Skills in Pharmacy Practice	Mrs. Kabaye K.	
	3:30 p.m.–11:00 p.m.	Cases and Introduction to Clinical Attachment	Mrs. Kabaye K.	

ANNEX B. SAMPLE WARD-BASED SCHEDULE

Clinical Pharmacy In-Service Training Course for Pharmacists
Organized by PFSA and Jimma University in Collaboration with SIAPS
Jimma University, May 13–June 8, 2013

Ward-Based Training (May 21–June 8, 2013)

Time	Ward/ Rotation Site	Responsible Preceptors/Trainers	Activity				
			Monday	Tuesday	Wednesday	Thursday	Friday
8:15 a.m.– 9:00 a.m.	Pediatrics Ward	Dr. Netsanet Workneh, Dr. Mitsiwa Ruffo, Mr. Mulugeta Tarekegn, and Mr. Tesfahun Chanie	Attending MDT morning session	Attending pharmacist-only morning session*	Attending MDT morning session	Attending pharmacist-only morning session*	
	Internal Medicine	Dr. Essayas Kebede, Dr. Gobeze Tefera, Dr. Behailu Atilaw, Mr. Gizat Molla, Mr. Nezif Hussein, and Mr. Belay Yimam					
	Surgery	Dr. Samson Esseye, Dr. Daniel Getachew, Mr. Tewodros Eyob, and Mrs. Kabaye Kumela					
9:00 a.m.– 10:00 a.m.	Pediatrics Ward	Mr. Mulugeta Tarekegn and Mr. Tesfahun Chanie	Chart review				
	Internal Medicine	Mr. Gizat Molla, Mr. Nezif Hussein, and Mr. Belay Yimam					
	Surgery	Mr. Tewodros Eyob and Mrs. Kabaye Kumela					
10:00 a.m.– 12:00 p.m.	Pediatrics Ward	Critical Unit: Dr. Mitsiwa Ruffo and Mr. Mulugeta Tarekegn	Attending major teaching round (MDT)**	Attending major teaching round (MDT)**	Attending bedside teachings and/or business round	Attending bedside teachings and/or business rounds	Attending major teaching round (MDT)**
		General Ward A: Dr. Netsanet Workneh and Mr. Tesfahun Chanie					
	Internal Medicine	Male–A: Dr. Behaiku Atilaw and Mr. Gizat Molla					
		Male–B: Dr. Essayas Kebede and Mr. Belay Yimam					

		Female–B: Dr. Gobeze Tefera and Mr. Nezif Hussein					
	Surgery	Ward A: Dr. Samson Esseye and Mr. Tewodros Eyob					
		Ward B: Dr. Daniel Getachew and Mrs. Kabaye Kumela					
2:00 p.m.–5:00 p.m.	Pediatrics Ward	Mr. Mulugeta Tarekegn and Mr. Tesfahun Chanie	Attending pharmacist-only teaching round Time for patient monitoring and discussion				
	Internal Medicine	Mr. Gizat Molla, Mr. Nezif Hussein, and Mr. Belay Yimam					
	Surgery	Mr. Tewodros Eyob and Mrs. Kabaye Kumela					

ANNEX C. LIST OF PARTICIPANTS

SN	Name	Hospital	Region
1	Abadi Tsegay	Adigrat Hospital	Tigray
2	Abay Mohammed Genna	Robe Dedeza Hospital	Oromia
3	Abdulahi Jeilan	Chiro Hospital	Oromia
4	Abdulbasit Muhammed	Hidar 11 Hospital	Amhara
5	Abdurahman Shemsu	Zewditu Memorial Hospital	Addis Ababa
6	Abeba Kidane	Woldia Hospital	Amhara
7	Abebaw Tegegne	Boru Meda Hospital	Amhara
8	Abebe Alamneh Kassahun	Ataye Hospital	Amhara
9	Abebe Dagne	Felege-Hiwot Referral Hospital	Amhara
10	Abebe Kebede	Tercha Hospital	SNNPR
11	Abera Milkesa	Jimma University Specialized Hospital	Oromia
12	Abrham Godefay	Wukro Hospital	Tigray
13	Adanech Ajeme	Bisidimo Hospital	Oromia
14	Addis Megersa	St. Peter Hospital	Addis Ababa
15	Addise Bekale Tibamo	Nigist Eleni Memorial Hospital	SNNPR
16	Addisu Atomsa Lemu	Dembi Dolo Hospital	Oromia
17	Addisu Getie	Debre-Markos Referral Hospital	Amhara
18	Addisu Mulugeta	Felege-Hiwot Referral Hospital	Amhara
19	Adem Hanur	Motta Hospital	Amhara
20	Adisu Zenebu	Abi-Adi Hospital	Tigray
21	Ahmedin Fekadu	Nekemte Referral Hospital	Oromia
22	Alemayehu Berhane	Gondar University, School of Pharmacy	Amhara
23	Alemu Gebrie	Felege-Hiwot Referral Hospital	Amhara
24	Amelework Moges	Dessie Referral Hospital	Amhara
25	Amsalu Bokore	Nekemte Referral Hospital	Oromia
26	Anbesse Getaw	Finote Selam Hospital	Amhara
27	Andinet H/Mariam	Bule Hora Hospital	Oromia
28	Aragaw Sisay	Felege-Hiwot Referral Hospital	Amhara
29	Arefat Osman	Jugel Hospital	Harari
30	Ashagrie Abere	Debre-Tabor Hospital	Amhara
31	Ashenafi Bewana	Mizan Aman Hospital	SNNPR
32	Ashenafi Sharew	Kahsay Abera Hospital	Tigray
33	Ashenafi Tsegaye	Asella Referral Hospital	Oromia
34	Assegid Bekele Ashebre	Chiro Hospital	Oromia
35	Assen Muhe	Dessie Referral Hospital	Amhara

SN	Name	Hospital	Region
36	Awlachew Firde	Adama Referral Hospital	Oromia
37	Banchigizie Enyew	Debre-Markos Referral Hospital	Amhara
38	Bayew Tsega	Gondar University, School of Pharmacy	Amhara
39	Bayew Zeleke	Debre-Tabor Hospital	Amhara
40	Beharu Woldemedhin	Dilla University Referral Hospital	SNNPR
41	Belayneh Bogale	Debre-Tabor Hospital	Amhara
42	Beletech Balango	Tercha Hospital	SNNPR
43	Berhane Fikadu	Lemlem Karl Hospital	Tigray
44	Berhanu Desta	Debrebirhan Hospital	Amhara
45	Bezuayehu Weldehitsan	Dilla University Referral Hospital	SNNPR
46	Biratu Mossisa	Ambo Hospital	Oromia
47	Birhan Begashaw	Gondar University Hospital	Amhara
48	Brhanu Fayera Etana	Fincha Hospital	Oromia
49	Bruk Tesfaye	Jugel Hospital	Harari
50	Chalachaw Bayu Gebeyehu	Debremarkos Referral Hospital	Amhara
51	Dagnachew Hailemariam	Bishoftu Hospital	Oromia
52	Daniel Zenebe	Suhul Hospital	Tigray
53	Debebe Hailemariam	Nigist Eleni Memorial Hospital	SNNPR
54	Debesa Doyo	Asella Referral Hospital	Oromia
55	Degefa Uma	Ambo Hospital	Oromia
56	Dejen Nureye	Mizan Aman Hospital	SNNPR
57	Deme Balcha	Shashemene Referral Hospital	Oromia
58	Demelash Dejene	Adare Hospital	SNNPR
59	Demise Mohammed	Woldia Hospital	Amhara
60	Derese Wolde	Adama Referral Hospital	Oromia
61	Elfhareg Tadesse	St. Paul Hospital	Addis Ababa
62	Endale Getachew Assefa	Woldia Hospital	Amhara
63	Endris Sindew	Debre-Berhan Referral Hospital	Amhara
64	Eshetie Shumie	Dessie Referral Hospital	Amhara
65	Esubalew Gizachew	Debre-Tabor Hospital	Amhara
66	Fantaw Yimer	Dessie Referral Hospital	Amhara
67	Fasika Berhanu	Dilchora Referral Hospital	Dire Dawa
68	Fasil Tsegaye	Axum (St. Mary) Hospital	Tigray
69	Fekadu Alemayehu	ALERT Hospital	Addis Ababa
70	Fekerie Mulaw	Gondar University Hospital	Amhara
71	Feki Abdo	Butajirra Hospital	SNNPR
72	Feleke Kefale	Debre-Tabor Hospital	Amhara

Annex C. List of Participants

SN	Name	Hospital	Region
73	Fentaw Girmaw	Woldia Hospital	Amhara
74	Fetalem Haile Hagos	Axum (St. Mary) Hospital	Tigray
75	Feven Fekede	Jimma University Specialized Hospital	Oromia
76	Fikadu Debissa	Ambo Hospital	Oromia
77	Fikadu Getachew Meferesa	Shashemene Referral Hospital	Oromia
78	Fikadu Woldemariam	ALERT Hospital	Addis Ababa
79	Firezewd Getachew	Zewditu Memorial Hospital	Addis Ababa
80	Fisseha Mezgebe	Mekelle Hospital	Tigray
81	Fitsum Kidane Kifle	Mizan Aman Hospital	SNNPR
82	G/Haweria Kidanu G/Medhin	Dubti Hospital	Afar
83	Gashaw Belete	Debre-Markos Referral Hospital	Amhara
84	Gashaw WorKalemahu	Enat Hospital	Amhara
85	Gebremariam Gebrehaweria	Ayder Referral Hospital	Tigray
86	Gebretsadkan Gebremariam	Axum (St. Mary) Hospital	Tigray
87	Gedfew Admasu Abate	Debre Markos Hospital	Amhara
88	Gelana Urgessa	Jinka Hospital	SNNPR
89	Gemechu Feyera	Shashemene Referral Hospital	Oromia
90	Genale Wabe	Jimma University Specialized Hospital	Oromia
91	Georgebush Diriba	Hawassa University Referral Hospital	SNNPR
92	Getachew Adera	Zewditu Memorial Hospital	Addis Ababa
93	Getachew Asfaw	Amanuel Mental Specialized Hospital	Addis Ababa
94	Getachew Befekadu	Metu Karl Hospital	Oromia
95	Getachew Jirra	Pawi Hospital	Benshangul-Gumuz
96	Girmay Tesfay	Suhul Hospital	Tigray
97	Girum Bekele	Shashemene Referral Hospital	Oromia
98	Gizachew Terega	Butajirra Hospital	SNNPR
99	Gizew Dessie	Enat Hospital	Amhara
100	Gulelat Tefera	Enat Hospital	Amhara
101	Guluma Daba	Jimma University Specialized Hospital	Oromia
102	Gutema Misgana	St. Paul Hospital	Addis Ababa
103	Habiba Nuri	Hawassa University Referral Hospital	SNNPR
104	Habtamu Acho	Mizan Aman Hospital	SNNPR
105	Habtamu Demisse	Nigist Eleni Memorial Hospital	SNNPR
106	Habtamu Samuel	Wolaita Soddo Hospital	SNNPR
107	Hailemichael Embafrash	Ayder Referral Hospital	Tigray
108	Haimanot Dibaba	Axum (St. Mary) Hospital	Tigray
109	Hana Likas	Tirunesh Beijing Hospital	Addis Ababa

SN	Name	Hospital	Region
110	Hawi Befekadu	Bishoftu Hospital	Oromia
111	Henok Woldeamlake	Butajirra Hospital	SNNPR
112	Hilawie Hawaz	Dilchora Referral Hospital	Dire Dawa
113	Ibrahim Ahmed	Dilchora Referral Hospital	Dire Dawa
114	Jemal Maeruf	Axum (St. Mary) Hospital	Tigray
115	Jemal Washo	Asella Referral Hospital	Oromia
116	Kassahun Bogale	Woldia Hospital	Amhara
117	Kibue Hailelassie	Adwa Hospital	Tigray
118	Kidist Mulugeta	ALERT Hospital	Addis Ababa
119	Lamessa Fekadu	Nekemte Referral Hospital	Oromia
120	Lema Tefera	Debre-Berhan Referral Hospital	Amhara
121	Lemlem Molla Nega	Mearg Hospital	Tigray
122	Mahlet Berehie	Bishoftu Hospital	Oromia
123	Mama Abdula	Asella Referral Hospital	Oromia
124	Mandida Jirata	St. Peter Hospital	Addis Ababa
125	Marew Bante	Mizan Aman Hospital	SNNPR
126	Markos Berhane	Wukro Hospital	Tigray
127	Mekbib Lalensa	Jimma University Specialized Hospital	Oromia
128	Mekdes Kebede	Butajirra Hospital	SNNPR
129	Mekonen Yigzaw	Mekelle Hospital	Tigray
130	Melak Gedamu	Amanuel Mental Specialized Hospital	Addis Ababa
131	Melal Bekele	Adama Referral Hospital	Oromia
132	Mena Wubet	St. Paul Hospital	Addis Ababa
133	Merima Awol Mohammed	Gandhi Memorial Hospital	Addis Ababa
134	Mesaud Tareke	Wukro Hospital	Tigray
135	Meskerem Adugna	Hiwot Fana Hospital	Harari
136	Mestawet Getachew	Jimma University Specialized Hospital	Oromia
137	Moges Dagnew	Ayder Referral Hospital	Tigray
138	Mohamad Hassen	Minilik II Hospital	Addis Ababa
139	Muez Mamu Abebe	Kahsay Abera Hospital	Tigray
140	Mulat Degefa	Lemlem Karl Hospital	Tigray
141	Mulatu Kotiso	Hawassa University Referral Hospital	SNNPR
142	Mulugeta Nigatu	Dessie Ref Hospital	Amhara
143	Nigatu Nigus	Tirunesh Beijing Hospital	Addis Ababa
144	Niguse Abegaz	Nigist Eleni Memorial Hospital	SNNPR
145	Nigussie Debero	Amanuel Mental Specialized Hospital	Addis Ababa
146	Nuhamin Zeru	Gondar University Hospital	Amhara

Annex C. List of Participants

SN	Name	Hospital	Region
147	Rediet Belay	Dilla University Referral Hospital	SNNPR
148	Remedan Ebrahim	Jugal Hospital	Harari
149	Remzi Bahredin	Jugal Hospital	Harari
150	Roman Fikereselessie	Debre-Berhan Referral Hospital	Amhara
151	Rosa Mitku Desta	Wonji Hospital	Oromia
152	Samuel Eshetu Kassahun	Minilik II Hospital	Addis Ababa
153	Samuel Fufa	Ambo Hospital	Oromia
154	Samuel Teshome	Hawassa University Referral Hospital	SNNPR
155	Seifu Moges	Boru Meda Hospital	Amhara
156	Shimelis Birhanu	Hiwot Fana Hospital	Harari
157	Shimelis Sahile	Tercha Hospital	SNNPR
158	Shumete Eshete	Dilchora Referral Hospital	Dire Dawa
159	Sileshi Tadesse	ALERT Hospital	Addis Ababa
160	Siraj Adem	PFSA	Addis Ababa
161	Sisay Fisseha	Wolaita Soddo Hospital	SNNPR
162	Solomon Abdellah	Hawassa University Referral Hospital	SNNPR
163	Solomon Asmamaw	Gondar University Hospital	Amhara
164	Sultan Duba Kurka	Yabello Hospital	Oromia
165	Tariku Worku	Dilchora Referral Hospital	Dire Dawa
166	Tasisa Ketema	Hawassa University Referral Hospital	SNNPR
167	Tazebew Alemu	Axum (St. Mary) Hospital	Tigray
168	Teame Aredom	Lemlem Karl Hospital	Tigray
169	Teame Aregay	Adigrat Hospital	Tigray
170	Tefera Samate	Dilla University Referral Hospital	SNNPR
171	Teklay H/Mariam T/Haimanot	Quiha Hospital	Tigray
172	Tekleab Teklehaimanot	Kahsay Abera Hospital	Tigray
173	Teklehaymanot Gebregiorgis	Adwa Hospital	Tigray
174	Temesgen G/Michael Ayichew	Adare Hospital	SNNPR
175	Tesfahun Girma Mulat	Metu Karl Hospital	Oromia
176	Tesfay Mehari	Lemlem Karl Hospital	Tigray
177	Tesfaye Mamo	Metu Karl Hospital	Oromia
178	Tesfaye Mekonnen	Bisidimo Hospital	Oromia
179	Tewodros Mitku Admasu	Lalibela Hospital	Amhara
180	Tigestu Alemu	Debre-Markos Referral Hospital	Amhara
181	Tilahun Alemayehu	Hawassa University Referral Hospital	SNNPR
182	Tizita Refera	Amanuel Mental Specialized Hospital	Addis Ababa
183	Tsegay Belete	Suhul Hospital	Tigray

SN	Name	Hospital	Region
184	Tsegaye Tulu	St. Peter Hospital	Addis Ababa
185	Woinshet Bayen Motbynor	Debretabor Hospital	Amhara
186	Wolyou Seman	Butajira Hospital	SNNPR
187	Wondimu Gichle	Nekemte Referral Hospital	Oromia
188	Wondwosen Kumsa	Jimma University Specialized Hospital	Oromia
189	Wondwossen Gashaw	Boru Meda Hospital	Amhara
190	Wubishet Mosisa	Bedele Hospital	Oromia
191	Yabibal Zemene	Woldia Hospital	Amhara
192	Yared Hailu	Jimma University Specialized Hospital	Oromia
193	Yibeltal Assefa	Felege-Hiwot Referral Hospital	Amhara
194	Yikeber Gebeyaw	Debre-Berhan Referral Hospital	Amhara
195	Yitbarek Alayou	St. Paul Hospital	Addis Ababa
196	Yonas Ashebir	ALERT Hospital	Addis Ababa
197	Yonas Sisay	Tirunesh Beijing Hospital	Addis Ababa
198	Yoseph Yilma W/Selbet	Bule Hora Hospital	Oromia
199	Zebenay Shewangizaw	Gandhi Memorial Hospital	Addis Ababa
200	Zeyneb Mohammednur	Gondar University Hospital	Amhara

ANNEX D. LIST OF TRAINERS

First Round Clinical Pharmacy In-Service Training, Jimma University March 4–30, 2012

SN	Trainer	Position
1	Mr. Nezif Hussein	Lecturer and Clinical Pharmacist
2	Mr. Legese Chelkeba	
3	Mr. Tesfahun Chanie	
4	Dr. Belete Habte	Assistant Professor of Internal Medicine
5	Dr. Esayas Kebede	
6	Dr. Behailu Atlaw	
7	Dr. Netsanet Workineh	Assistant Professor of Pediatrics and Child Health
8	Dr. Samson Nadew	
9	Dr. Daniel Getachew	Assistant Professor of Surgery
10	Dr. Samson Esseye	

Second Round Clinical Pharmacy In-Service Training, Jimma University July 9–August 4, 2012

SN	Trainer	Position
1	Mr. Nezif Hussein	Lecturer and Clinical Pharmacist
2	Mr. Legese Chelkeba	
3	Mr. Tesfahun Chanie	
4	Dr. Daniel Yilma	Assistant Professor of Internal Medicine
5	Dr. Leja Hamza	
6	Dr. Tadesse Dukessa	
7	Dr. Sitota Ganjula	Assistant Professor of Pediatrics and Child Health
8	Dr. Tsinuel Girma	
9	Dr. Daniel Getachew	Assistant Professor of Surgery
10	Dr. Chuchu Girma	

**Third Round Clinical Pharmacy In-Service Training, Jimma University
October 1–27, 2012**

SN	Trainer	Position
1	Mr. Nezif Hussein	Lecturer and Clinical Pharmacist
2	Mr. Legese Chelkeba	
3	Mr. Tesfahun Chanie	
4	Dr. Sintayehu Fekadu	Assistant Professor of Internal Medicine
5	Dr. Daniel Yilma	
6	Dr. Belete Habte	
7	Dr. Netsanet Workineh	Assistant Professor of Pediatrics and Child Health
8	Dr. Samson Nadew	
9	Dr. Daniel Getachew	Assistant Professor of Surgery
10	Dr. Samson Esseye	
11	Dr. Wubeante Yenets	Assistant Professor of Pharmaceutics (PhD)

**Fourth Round Clinical Pharmacy In-Service Training, Jimma University
March 4–30, 2013**

SN	Trainer	Position
1	Dr. Daniel Yilma	Assistant Professor of Internal Medicine
2	Dr. Leja Hamza	
3	Dr. Belete Habte	
4	Dr. Ermias Habte	
5	Dr. Maekel Belay	
6	Dr. Samson Nadew	Assistant Professor of Pediatrics and Child Health
7	Dr. Sitota Ganju la	
8	Dr. Chuchu Girma	Assistant Professor of Surgery
9	Dr. Alaje Tekie	
10	Mr. Nezif Hussein	Lecturer and Clinical Pharmacist
11	Mr. Tesfahun Chanie	
12	Mr. Mulugeta Tarekegn	
13	Mr. Gizat Molla	
14	Mr. Tewodros Eyob	
15	Mr. Belay Yimam	
16	Dr. Wubeante Yenets	Assistant Professor of Pharmaceutics (PhD)

**Fifth Round Clinical Pharmacy In-Service Training, Jimma University
May 13–June 8, 2013**

SN	Trainer	Position
1	Dr. Daniel Yilma	Assistant Professor of Internal Medicine
2	Dr. Gobeze Tefera	
3	Dr. Belete Habte	
4	Dr. Behailu Atilaw	
5	Dr. Essayas Kebede	
6	Dr. Mitsiwa Ruffo	Assistant Professor of Pediatrics and Child Health
7	Dr. Netsanet Workneh	
8	Dr. Samson Esseye	Assistant Professor of Surgery
9	Dr. Daniel Getachew	
10	Mr. Nezif Hussein	Lecturer and Clinical Pharmacist
11	Mr. Tesfahun Chanie	
12	Mr. Mulugeta Tarekegn	
13	Mr. Gizat Molla	
14	Mr. Tewodros Eyob	
15	Mr. Belay Yimam	
16	Mrs. Kabaye Kumela	
17	Dr. Wubeante Yenet	Assistant Professor of Pharmaceutics (PhD)

**Sixth Round Clinical Pharmacy In-Service Training, University of Gondar
August 15–September 7, 2013**

SN	Trainer	Position
1	Dr. Zinahbizu Abay	Assistant Professor of Internal Medicine
2	Dr. Desalew Mekonen	
3	Dr. Nebiyu Mesfin	
4	Dr. Zemene Tigabu	Assistant Professor of Pediatrics
5	Dr. Abayneh Girma	
6	Dr. Shibikom Tamirat	Assistant Professor of Surgery
7	Dr. Mohammed Alemu	
8	Mr. Bayew Tsega	Lecturer and Clinical Pharmacist
9	Mr. Alemayehu Berhane	
10	Mr. Tesfahun Chanie	
11	Mr. Nezif Hussein	
12	Mr. Tadesse Mekonnen	Lecturer and Pharmaceutics Expert
13	Mr. Zewdneh Shewamene	Lecturer and Pharmacologist

Trainers at the Jimma University Training

SN	Trainer	Position
1	Dr. Gari Negeri	Assistant Professor of Internal Medicine
2	Dr. Mohammed Mecha	
3	Dr. Cherinet Abebe	
4	Dr. Samson Esseye	Assistant Professor of Surgery
5	Dr. Daniel Getachew	
6	Mr. Tesfahun Chanie	Lecturer and Clinical Pharmacist
7	Mr. Nezif Hussein	
8	Dr. Netsanet Workneh	Assistant Professor of Pediatrics and Child Health
9	Dr. Demeke Mekonnen	
10	Mr. Mulugeta Tarekegn	Lecturer and Clinical Pharmacist
11	Mr. Belay Yimam	
12	Mr. Tewodros Eyob	
13	Mrs. Kabaye Kumela	
14	Mr. Girma Mamo	
15	Mr. Fekede Bekele	
16	Mr. Dereje Kebebe	Lecturer of Pharmaceutics

Trainers at the Mekelle University Training

SN	Trainer	Profession
1.	Haftay Berhane Mezgebe	Lecturer and Clinical Pharmacist
2.	G/Hiwot Teklay Gebremeskel	
3.	Teshager Aklilu Yesuf	
4.	Eskinder Ayalew Sisay	
5.	Senait Melaku Gebremariam	
6.	Fantahun Molla Kassa	Lecturer of Pharmaceutics
7.	Dr. Dawit Seyoum Gebremariam	Assistant Professor of Pediatrics and Child Health
8.	Dr. Temesgen Tsega Desta	
9.	Dr. Hagos Kahsay	Assistant Professor of Internal Medicine
10.	Dr. Hagazi Tesfay Haddush	
11.	Dr. Hagos Abreha Teka	
12.	Dr. Mizan Kidanu W/Mariam	Assistant Professor of Surgery
13.	Dr. Fasika Amdeslasie G/Kirkos	
14.	Mr. Nezif Hussein Dekama	Lecturer and Clinical Pharmacist
15.	Mr. Tesfahun Chanie Eshetie	

ANNEX E. DAILY PARTICIPANT FEEDBACK FORM (SAMPLE)

Daily Participant Feedback Form

Course Title: Clinical Pharmacy in-service Training Course for Pharmacists
Organized by PFSA, UoG and USAID/SIAPS
University of Gondar • August 15-22, 2013

The purpose of this evaluation form is to gather your input on this training. We are very interested in your feedback and use your suggestion to improve the next version of this training.

Please respond to the following questions about sessions presented **TODAY**. Thank you for your input.

Date: _____

1) What did you enjoy most about today?

2) What did you learn today that you will use in your work?

3) What did you not understand?

4) Any questions/comments?

ANNEX F. COURSE EVALUATION FOR CLASS-BASED TRAINING (SAMPLE)

Course Title: Clinical Pharmacy in-service Training Course for Pharmacists

Organized by PF SA, JU and SIAPS

Jimma University, Jimma • May 13 –June 8, 2013

Dear course participant: Now that you have completed the **Clinical Pharmacy in-service Training Course for Pharmacists**, please take a few minutes to fill the following course evaluation.

Please complete the following by ticking the column of your choice.

1. Rate the quality of the following

Items	Poor	Fair	Good	Very Good	Excellent
Overall content of Course					
Overall objectives were met					
Overall time allocation					
Slides					
Participant Handbook					
Participant /Group Activities					
Organization/conduction of the course					

2. Evaluate subject matter, presenters and allocated time

Evaluation Point	Relevance of Subject Matter	Presenter Skill and knowledge	Duration (Allocated Time)
0	Not useful	Poor	Too short. Couldn't learn enough in such a short time.
1	May be useful	Fair	A little too short
2	Useful	Good	Just fine
3	Very useful	Very good	A little too long
4	Essential	Excellent	Definitely too long. The concepts could be learned in much less time.

Days	Course Title	Subject Matter						Presenter						Allocated Time				
		0	1	2	3	4		0	1	2	3	4		0	1	2	3	4
1	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy																	
	Common Laboratory Tests and their Interpretation for Pharmacists-1&2																	
	Common Laboratory Tests and their Interpretation for Pharmacists-3																	
2	Common Laboratory Tests and their Interpretation for Pharmacists-4																	
	Clinical Pharmacokinetics: Intravenous to Oral Switch																	

Building Local Capacity for Clinical Pharmacy Service through a Holistic In-Service Training Approach

Days	Course Title	Subject Matter					Presenter					Allocated Time				
		0	1	2	3	4	0	1	2	3	4	0	1	2	3	4
2	Clinical Pharmacokinetics: Clinical Issues in Bio-equivalence and Generic Substitution: with Specific Disease Examples															
	Cardiovascular Disorders: Hypertension															
3	Cardiovascular Disorders: IHD															
	Ischemic Hemorrhagic Stroke															
	Cardiovascular Disorders: Heart Failure															
	Endocrine Disorders: Diabetes Mellitus															
4	Renal Disorders															
	Pain Management															
	PUD and Upper GI Bleeding															
	End Stage Liver Disease															
5	Asthma and COPD															
	Lower Respiratory Tract Infection															
	CNS Infections															
	IE & Surgical Prophylaxis															
6	HIV/AIDS															
	Malaria															
	Epilepsy															
	Pediatric Nutrition															
7	Sepsis (Pediatric)															
	Preoperative Medication Management															
	The Pharmacist's Role In Patient Care: Introduction and Patient Assessment															
	The Pharmacist's Role In Patient Care: Identification of Medication Related Problems															
8	The Pharmacist's Role In Patient Care: Care Plan															
	Medication Use Policy: Drug Use Evaluation and Medication Safety															
	Communication Skills In Clinical Pharmacy															
	Cases and introduction to Clinical Attachment															

Annex F. Course Evaluation for Class-Based Training

3. What part/s of the training was the most useful and least useful for your work?

- | Most Useful | Least useful |
|-------------|--------------|
| 1. _____ | 1. _____ |
| 2. _____ | 2. _____ |
| 3. _____ | 3. _____ |

4. How should the course be improved?

6. Any other comments?

Which days did you attend? Day 1 __ Day 2 __ Day 3 __ Day 4 __ Day 5 __ Day 6 __ Day 7 __ Day 8 __

Thank you for completing this form

ANNEX G. OVERALL COURSE EVALUATION

Course Title: Clinical Pharmacy in-service Training Course for Pharmacists
Organized by PF SA, UoG and USAID/SIAPS
University of, Gondar • Aug 15-Sept 7, 2013

Dear course participant: Now that you have completed the **In-service Training Course on Clinical Pharmacy for Pharmacists**, please take a few minutes to fill the following course evaluation.

Please complete the following by ticking the column of your choice.

1. Please rate the Clinical Pharmacy Training using the following overall parameters

Please write explanations in the *Comments* column.

Items		Poor	Fair	Good	Very Good	Excellent	Comments
Overall Content of Course							
Overall training objectives were met							
Overall time allocation							
Slides							
Participant Handbook							
Participant /Group Activities							
Overall Organization/ conduction of the course							
Trainee Evaluations	Pre & post tests						
	Mid tests						
	Assignments						

2. Please rate the following basic clinical pharmacy competencies were attained due to the one month clinical pharmacy training intervention

Please write explanations in the *Comments* column.

Basic Competencies	Strongly Agree	Agree	Disagree	Strongly Disagree	Comments
Collection and interpretation of patient-specific data					
Identifying drug-therapy related problems					
Developing pharmaceutical care plan in collaboration with patients, caregivers and other					

Annex G. Overall Course Evaluation

Basic Competencies	Strongly Agree	Agree	Disagree	Strongly Disagree	Comments
healthcare professionals					
Communicating and implementing the pharmaceutical care plan developed with patients, caregivers and other healthcare professionals					
Monitoring and evaluating therapeutic outcomes					
Documentation of clinical pharmacy services to facilitate communication and collaboration					
Provision of medication information to patients and other healthcare professionals					
Participation in quality improvement programs of the hospital: DUE					
Participation in the healthcare team in identifying and managing drug-therapy related problems					

3. Please rate the relevance of the course organization to attain the objectives of the course:

(Please explain why you chose one of the three answers)

Course Organization		Not Useful	Useful	Very Useful	Comments
Class Based Training/Lecture (One week)					
Morning Sessions	Pharmacist-only				
	MDT				
Bed-side teaching/Rounds	Pharmacist-only				
	MDT				
Chart review with clinical pharmacists					
Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists					

4. Please rate trainers/facilitators in the following:

(Please explain why you chose one of the five answers)

Course Organization		Poor	Fair	Good	Very good	Excellent	Comments
Class Based Training/Lecture (One week)							
Morning Sessions	Pharmacist-only						
	MDT						
Bed-side teaching/Rounds	Pharmacist-only						
	MDT						
Chart review with clinical pharmacists							
Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists							

5. What part/s of the training was the most useful and least useful for your work?

Most Useful

1. _____

2. _____

3. _____

Least useful

- 1.
- 2.
- 3.

6. Do you think the one month clinical pharmacy training will enable you to initiate clinical pharmacy services at your hospital? Yes No

If your answer is No to the above, please explain why?

7. How should the course be improved?

8. Any other comments?

10. How many days of this training you attended?

- All days,
- Missed ____ days of class based training,
- Missed ____ days of experiential training

Thank you for completing this form

ANNEX H. SUMMARY OF CLASS-BASED OVERALL COURSE EVALUATION RESULT (SAMPLE)

3rd Round (N=28)

i. Overall quality of the training and the inputs

S.NO	Process/milestone for evaluation	Average
1	Rate the quality of the training based of the parameters (0-4 represents, 0= poor, 1=fair, 2=good,3=very good, 4=excellent)	2.6
1.1	Over all content of the Course	2.8
1.2	Overall objectives were met	2.6
1.3	Overall time allocation	2.3
1.4	Slides	2.7
1.5	Participant handbook	2.4
1.6	Participant/group activities	2.6
1.7	Organization/conduction of the course	2.9

ii. Relevance of the subject matter

S.NO	Process/milestone for evaluation	Average
2	Evaluate relevance of subject matter (0-4, represents 0=not useful, 1=maybe useful. 2=useful, 3=very useful, 4=essential)	3.7
2.1	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy	3.5
2.2	Common Laboratory Tests and their Interpretation for Pharmacists-1&2	3.6
2.3	Common Laboratory Tests and their Interpretation for Pharmacists-3&4	3.6
2.4	Clinical Pharmacokinetics: Intravenous to oral	3.7
2.5	Clinical Pharmacokinetics: clinical issues in Bio-Equivalence and generic substitution: with specific disease examples	3.7
2.6	Cardiovascular Disorders: Hypertension	3.8
2.7	Cardiovascular disorders: IHD	3.8
2.8	Ischemic Hemorrhagic stroke	3.6
2.9	Cardiovascular Disorders: Heart Failure	3.7
2.1	Endocrine Disorders: Diabetes Mellitus	3.8
2.11	Renal Disorders	3.7
2.12	Pain Management	3.7
2.13	PUD and Upper GI Bleeding	3.8
2.14	End Stage Liver Disease	3.8
2.15	Asthma COPD	3.8
2.16	Lower Respiratory Tract Infection	3.7
2.17	CNS Infections	3.7
2.18	IE & Surgical Prophylaxis	3.8
2.19	The Pharmacist's Role In Patient Care: Introduction	3.7
2.2	The Pharmacists role in Patient care: patient assessment 1 & 2	3.8
2.21	The pharmacists role in patient care identification of medication related problems 1 & 2	3.7

Annex H. Summary of Class-Based Overall Course Evaluation Result (Sample)

S.NO	Process/milestone for evaluation	Average
2.22	The pharmacists role in patient care: care plan	3.8
2.23	Medication use policy: drug use evaluation and medication safety	3.6
2.24	Communications skills in clinical pharmacy	3.7

iii. Presenter's skill and knowledge

S.NO	Process/milestone for evaluation	Average
3	Evaluate presenter's/facilitator's skill and knowledge (0-4, represents 0=poor, 1=fair,2=good,3=very good,4=excellent)	3.5
3.1	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy	3.5
3.2	Common Laboratory Tests and their Interpretation for Pharmacists-1&2	3.2
3.3	Common Laboratory Tests and their Interpretation for Pharmacists-3&4	3.2
3.4	Clinical Pharmacokinetics: Intravenous to oral	3.7
3.5	Clinical Pharmacokinetics: clinical issues in Bio-Equivalence and generic substitution: with specific disease examples	3.6
3.6	Cardiovascular Disorders: Hypertension	3.5
3.7	Cardiovascular disorders: IHD	3.5
3.8	Ischemic Hemorrhagic stroke	3.3
3.9	Cardiovascular Disorders: Heart Failure	3.5
3.1	Endocrine Disorders: Diabetes Mellitus	3.5
3.11	Renal Disorders	3.6
3.12	Pain Management	3.6
3.13	PUD and Upper GI Bleeding	3.7
3.14	End Stage Liver Disease	3.6
3.15	Asthma COPD	3.8
3.16	Lower Respiratory Tract Infection	3.5
3.17	CNS Infections	3.5
3.18	IE & Surgical Prophylaxis	3.3
3.19	The Pharmacist's Role In Patient Care: Introduction	3.6
3.2	The Pharmacists role in Patient care: patient assessment 1 & 2	3.4
3.21	The pharmacists role in patient care identification of medication related problems 1 & 2	3.5
3.22	The pharmacists role in patient care: care plan	3.5
3.23	Medication use policy: drug use evaluation and medication safety	3.5
3.24	Communications skills in clinical pharmacy	3.5

iv. Adequacy of allocated time

S.NO	Process/milestone for evaluation	Average
4	Evaluate Allocated time (duration) (0-4, represents 0=Too short, 1=A little too short,2=just fine,3=little too long,4=Definitely too long)	2.5
4.1	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy	2.3
4.2	Common Laboratory Tests and their Interpretation for Pharmacists-1&2	2.3
4.3	Common Laboratory Tests and their Interpretation for Pharmacists-3&4	2.1
4.4	Clinical Pharmacokinetics: Intravenous to oral	2.4
4.5	Clinical Pharmacokinetics: clinical issues in Bio-Equivalence and generic substitution: with specific disease examples	2.6

4.6	Cardiovascular Disorders: Hypertension	2.4
4.7	Cardiovascular disorders: IHD	2.4
4.8	Ischemic Hemorrhagic stroke	2.3
4.9	Cardiovascular Disorders: Heart Failure	2.5
4.1	Endocrine Disorders: Diabetes Mellitus	2.5
4.11	Renal Disorders	2.6
4.12	Pain Management	2.6
4.13	PUD and Upper GI Bleeding	2.7
4.14	End Stage Liver Disease	2.4
4.15	Asthma COPD	2.6
4.16	Lower Respiratory Tract Infection	2.6
4.17	CNS Infections	2.6
4.18	IE & Surgical Prophylaxis	2.6
4.19	The Pharmacist's Role In Patient Care: Introduction	2.7
4.2	The Pharmacists role in Patient care: patient assessment 1 & 2	2.7
4.21	The pharmacists role in patient care identification of medication related problems 1 & 2	2.6
4.22	The pharmacists role in patient care: care plan	2.7
4.23	Medication use policy: drug use evaluation and medication safety	2.6
4.24	Communications skills in clinical pharmacy	2.7

v. Most useful part of the training

S.NO	Process/milestone for evaluation	Percentage
5	Which part of the training was most useful for your work?	178.5714
5.1	No comment	10.7
5.2	All are useful	35.7
5.3	Rounds	7.1
5.4	Chart review	10.7
5.5	Bed side teaching	7.1
5.6	Pharmacy only morning session	14.3
5.7	Laboratory interpretation	17.9
5.8	Chronic diseases	7.1
5.9	Seminar	3.6
5.10	Ward	3.6
5.11	Class lecture	7.1
5.12	On the presentation and case differentiation	3.6
5.13	Drug therapy problem identification	3.6
5.14	Non-communicable disease	3.6
5.15	Disease course	3.6
5.16	CNS infections	3.6
5.17	Cardiovascular disorder	7.1
5.18	Communications skills	3.6
5.19	Clinical pharmacokinetics	7.1
5.20	Ischemic hemorrhagic stroke	3.6
5.21	MDT round	3.6
5.22	Methods of teaching	3.6

Annex H. Summary of Class-Based Overall Course Evaluation Result (Sample)

S.NO	Process/milestone for evaluation	Percentage
5.23	Quality of teachers	3.6
5.24	Case presentations	3.6

vi. Areas of improvement

S.NO	Process/milestone for evaluation	Percentage
6	How should the course be improved? (N=28)	103.6
6.1	None/no comment	28.6
6.2	Add one more month	3.6
6.3	Other chronic diseases should be added	7.1
6.4	By training and awareness creation to all other healthcare staff	3.6
6.5	The trainer should be equipped with much knowledge to train others	3.6
6.6	Allocating sufficient time for the theoretical part	21.4
6.7	Availability of physicians in ward (pediatrics, surgery)	3.6
6.8	Add with presentation (theoretical) time and physician (senior) awareness of whole objective of clinical pharmacy one day program	3.6
6.9	Specific case presentation should be added in the class based training and discussed with trainees that could serve as a hint to do so forward	3.6
6.10	Let it be given as post graduate for hospital pharmacists	3.6
6.11	There should be computer, internets and offices in each hospital for clinical pharmacists	3.6
6.12	By giving additional trainings as refreshment on coming months or years	3.6
6.13	Better to add cases in the teaching material, because this will help trainees to memorize the subject matter easily irrespective of time	3.6
6.14	By giving additional trainings and allocate enough time to the course	3.6
6.15	By Integrating the theory part with the practical session	3.6
6.16	There should be CEO/Medical director orientation because they can be part of better outcome so hospitals send responsible persons not oneself	3.6

vii. Additional comments

S.NO	Process/milestone for evaluation	Percentage
7	Any other comments?	100.0
7.1	No comments	39.3
7.2	Thank you I learned a lot, keep it up!	21.4
7.3	Approach of teachers and trainers was good but respect should be of first concern	3.6
7.4	Together with previously trained, I will try to strengthen the practice	3.6
7.5	The duration of the training should be longer if it's possible	7.1
7.6	The training is useful that it would be great if given again at another time	3.6
7.7	I gained knowledge only from bedside teaching	3.6
7.8	Trainers should be strict in follow up but in a friendly manner	3.6
7.9	When we go to our hospitals there is shortage of man power	3.6
7.10	Strict follow up of the group/trainee during round	3.6

ANNEX I. SUMMARY OF OVERALL COURSE EVALUATION RESULT (SAMPLE)

1. Clinical Pharmacy In-service Training at Jimma University, May 13-June 8, 2013
 - a. Evaluation based on important event milestones

S.NO	Process/milestone for evaluation	Average
1	Overall Course Evaluation on Clinical Pharmacy Training (0-4 represents, 0= poor, 1=fair, 2=good,3=very good, 4=excellent)	2.9
1.1	Over all content of the Course	3.2
1.2	Overall objectives were met	3.2
1.3	Overall time allocation	2.0
1.4	Slides	3.0
1.5	Participant handbook	3.2
1.6	Participant/group activities	3.0
1.7	Organization/conduction of the course	3.0
1.8	Pre & Post tests	3.0
1.81	Mid Tests	2.5
1.82	Assignments	3.2
2	Rate the following basic clinical pharmacy competencies were attained due to the one month clinical pharmacy training intervention (1-4, represents 1=strongly disagree 2=disagree, 3=agree, 4=strongly agree)	3.6
2.1	Collection and interpretation of patient-specific data	3.7
2.2	Identifying drug-therapy related problems	3.7
2.3	Developing pharmaceutical care plan in collaboration with patients, caregivers and other healthcare professionals	3.6
2.4	Communicating and implementing the pharmaceutical care plan developed with patients, caregivers and other healthcare professionals	3.6
2.5	Monitoring and evaluating therapeutic outcomes	3.3
2.6	Documentation of clinical pharmacy services to facilitate communication and collaboration	3.6
2.7	Provision of medication information to patients and other healthcare professionals	3.6
2.8	Participation in quality improvement programs of the hospital: DUE	3.7
2.9	Participation in the healthcare team in identifying and managing drug-therapy related problems	3.7
3	Please rate the relevance of the course organization to attain the objectives of the course (1-3, 1=Not useful ,2=useful ,3=very useful)	2.8
3.1	Class Based Training/Lecture (One week)	2.9
3.2	(Morning Sessions) Pharmacists only	2.9
3.3	(Morning Sessions) MDT	2.5
3.4	(Bed-side teaching/Rounds) Pharmacists only	2.9
3.5	(Bed-side teaching/Rounds) MDT	2.8
3.6	Chart review with clinical pharmacists	2.9
3.7	Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists	2.8

Annex I. Summary of Overall Course Evaluation Result (Sample)

4	Please rate trainers/facilitators in the following(0-4, represents 0=poor, 1=fair,2=good,3=very good,4=excellent)	3.3
4.1	Class Based Training/Lecture (One week)	3.2
4.2	(Morning Sessions) Pharmacists only	3.6
4.3	(Morning Sessions) MDT	2.9
4.4	(Bed-side teaching/Rounds) Pharmacists only	3.4
4.5	(Bed-side teaching/Rounds) MDT	3.2
4.6	Chart review with clinical pharmacists	3.4
4.7	Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists	3.5

b. Evaluation based on participants reflections

SN	Questions	Response	Percentage
5	Which part of the training was most useful for your work?		
5.1	No Comment	8	30.8
5.2	All are useful	4	15.4
5.7	The bedside teaching	4	15.4
5.3	Chart review with clinical pharmacists	3	11.5
5.6	Pharmacist only morning session	2	7.7
5.9	DTP identification	2	7.7
5.4	Care Presentation	1	3.8
5.5	Pharmacist only bedside rounds	1	3.8
5.8	Morning sessions	1	3.8
5.10	Changing drug with consultation with physicians	1	3.8
5.11	IV-PO Conversion	1	3.8
6	Do you think the one month clinical pharmacy training will enable you to initiate clinical pharmacy at your hospital?		
6.1	None/no comment	7	26.9
6.2	Yes	9	34.6
6.3	No	3	11.5
7	How should the course be improved?		
7.1	No comments	8	61.5
7.5	To extend the class based training	5	38.5
7.3	One month is not enough/increase the training time	4	30.8
7.2	By increasing the duration of the ward attachment	2	15.4
7.4	Include emergency ward /c there is a lot of unnecessary drug use	1	7.7
7.6	By giving refreshment trainings	1	7.7
8	Any Other Comments?		
8.1	No comments	9	34.6
8.2	The training duration needs to be increased for each ward	1	3.8
8.3	Good Keep it up, thank you	1	3.8
8.4	Time is very short	1	3.8
8.5	Giving daily assignment and monitoring the training is a must	1	3.8
8.6	Follow-up the implementation	1	3.8
8.6	communicate with RHB to give us chance for further education	1	3.8

2. Clinical Pharmacy In-service Training at University of Gondar, August 15-September 7, 2013
 - a. Evaluation based on important event milestones

S.NO	Process/milestone for evaluation	Average
1	Overall Course Evaluation on Clinical Pharmacy Training (0-4 represents, 0= poor, 1=fair, 2=good,3=very good, 4=excellent)	2.9
1.1	Over all content of the Course	3.4
1.2	Overall objectives were met	3.2
1.3	Overall time allocation	1.9
1.4	Slides	3.2
1.5	Participant handbook	3.1
1.6	Participant/group activities	2.8
1.7	Organization/conduction of the course	3.0
1.8	Pre & Post tests	3.6
1.81	Mid Tests	2.3
1.82	Assignments	2.9
2	Rate the following basic clinical pharmacy competencies were attained due to the one month clinical pharmacy training intervention (1-4, represents 1=strongly disagree 2=disagree, 3=agree, 4=strongly agree)	3.3
2.1	Collection and interpretation of patient-specific data	3.5
2.2	Identifying drug-therapy related problems	3.3
2.3	Developing pharmaceutical care plan in collaboration with patients, caregivers and other healthcare professionals	3.2
2.4	Communicating and implementing the pharmaceutical care plan developed with patients, caregivers and other healthcare professionals	3.4
2.5	Monitoring and evaluating therapeutic outcomes	3.4
2.6	Documentation of clinical pharmacy services to facilitate communication and collaboration	3.1
2.7	Provision of medication information to patients and other healthcare professionals	3.2
2.8	Participation in quality improvement programs of the hospital: DUE	3.2
2.9	Participation in the healthcare team in identifying and managing drug-therapy related problems	3.3
3	Please rate the relevance of the course organization to attain the objectives of the course (1-3, 1=Not useful ,2=useful ,3=very useful)	2.9
3.1	Class Based Training/Lecture (One week)	2.9
3.2	(Morning Sessions) Pharmacists only	2.9
3.3	(Morning Sessions) MDT	2.8
3.4	(Bed-side teaching/Rounds) Pharmacists only	3.0
3.5	(Bed-side teaching/Rounds) MDT	2.9
3.6	Chart review with clinical pharmacists	3.0
3.7	Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists	3.0
4	Please rate trainers/facilitators in the following(0-4, represents 0=poor, 1=fair,2=good,3=very good,4=excellent)	3.3
4.1	Class Based Training/Lecture (One week)	3.4
4.2	(Morning Sessions) Pharmacists only	3.5

Annex I. Summary of Overall Course Evaluation Result (Sample)

S.NO	Process/milestone for evaluation	Average
4.3	(Morning Sessions) MDT	2.9
4.4	(Bed-side teaching/Rounds) Pharmacists only	3.5
4.5	(Bed-side teaching/Rounds) MDT	3.2
4.6	Chart review with clinical pharmacists	3.4
4.7	Afternoon bed-side rounds and seminars for case presentations with clinical pharmacists	3.6

b. Evaluation based on participants reflections

SN	Questions	Response	Percentage
5	Which part of the training was most useful for your work?		
5.1	All are useful	5	19.2
5.2	Chart review with clinical pharmacists	7	26.9
5.3	Case Presentation	4	15.4
5.4	Pharmacist only bedside rounds	5	19.2
5.5	Class Based Training/Lecture (One week)	7	26.9
5.6	Pharmacist only meeting	5	19.2
5.7	The bedside teaching	10	38.5
5.8	MDT bedside	2	7.7
5.9	The manual	1	3.8
5.10	Interventions	1	3.8
5.11	DTP identification	3	11.5
5.12	Pharmacists and doctors	1	3.8
5.13	Internal medicine	2	7.7
5.14	Laboratory result interpretation	1	3.8
5.15	The pediatric session	1	3.8
5.16	Communication with patients	1	3.8
6	Do you think the one month clinical pharmacy training will enable you to initiate clinical pharmacy at your hospital?		
6.1	None/no comment	2	7.7
6.2	Yes	20	76.9
6.3	No	4	15.4
7	How should the course be improved?		
7.1	No comments	8	44.4
7.2	By increasing the duration of the course and expanding the title or topics to cover more things	4	22.2
7.3	By using and providing good practice with health providers	1	5.6
7.4	By giving the attention to the course due to its usefulness	1	5.6
7.5	By having good communication skills with other healthcare providers	1	5.6
7.6	Every lecture should better be accompanied by ward demonstration	1	5.6
7.7	It should cover like all the overall departments like the missing ones OPD MCH	1	5.6
7.8	Allocate many technical manpower in hospital and apply patient specific knowledge in hospitals	1	5.6
7.9	Through the pharmacist own effort	1	5.6
7.10	By giving the training to all pharmacy personnel	1	5.6

Building Local Capacity for Clinical Pharmacy Service through a Holistic In-Service Training Approach

SN	Questions	Response	Percentage
7.11	The course should involve microbiologist	1	5.6
7.12	To extend the class based training	1	5.6
7.13	It should be added to post graduation	1	5.6
7.14	By monitoring and evaluation all the facility activities	1	5.6
7.15	By giving refreshment trainings	2	11.1
8	Any Other Comments?		
8.1	No comments	15	57.7
8.2	The training would have to be continuous	1	9.1
8.3	The training duration needs to be increased	1	9.1
8.4	The communication between pharmacists and doctors is still poor so to strengthen this you can give trainings for doctors and pharmacists together	1	9.1
8.5	Good Keep it up	5	45.5
8.6	DIC topics was better to be included in the training	1	9.1
8.7	Microbiology should be included in the course	1	9.1
8.8	It should cover like all the overall departments like the missing ones OPD MCH	1	9.1

ANNEX J. SCHEDULE FOR THE CONSULTATIVE MEETING

Clinical Pharmacy In-Service Training Course for Pharmacists

Jimma University, May 14–June 9, 2012 Schedule for the Consultative Meeting on the Closing Day

Time	Activity	Responsible Body	Facilitator
8:30 a.m.–8:45 a.m.	Registration (Guests)	Organizers	Mr. Yared Yiegezu, PFSA
8:45 a.m.–8:50 a.m.	Welcoming Address and Program Introduction	Mr. Nezif Hussein (Head, School of Pharmacy, Jimma University)	
8:55 a.m.–9:05 a.m.	Self-Introduction	All participants	
9:05 a.m.–9:20 a.m.	Purpose of the Consultative Meeting	Dr. Negussu Mekonnen (Chief of Party, SIAPS)	Mr. Fikru W., SIAPS-PFSA
9:20 a.m.–10:20 a.m.	Current Trends in Pharmacy Practice and Overview of Clinical Pharmacy	Mr. Nezif Hussein (Head, School of Pharmacy, Jimma University)	
10:20 a.m.–10:40 a.m.	Physicians' View on Clinical Pharmacy Service: Jimma University Specialized Hospital	Senior Physician, JUSH	Mr. Dereje Chemed, SIAPS
10:40 a.m.–11:00 a.m.	Tea Break	Organizers	
11:00 a.m.–11:30 a.m.	Lessons Learned from the Training, Existing Challenges, and the Way Forward	Trainees	
11:30 a.m.–12:00 p.m.	Group Discussion on Steps to Be Taken to Implement Clinical Pharmacy Services (by Region)	All participants	
12:00 p.m.–1:30 p.m.	Lunch Break	Organizers	
1:30 p.m.–2:45 p.m.	Group Discussion Continued	Participants	Mr. Fikru W.
2:40 p.m.–3:30 p.m.	Group Presentation and Discussion	Participants	
3:00 p.m.–3:40 p.m.	Group Presentation and Discussion	Participants	
3:40 p.m.–4:00 p.m.	Tea Break	Organizers	
4:00 p.m.–4:20 p.m.	Way Forward	Dr. Negussu Mekonnen/Mr. Yemaneberhan Tadesse	Mr. Fikru W.
4:20 p.m.–4:45 p.m.	Certification and Closing Remarks	Professor Abraham Haile-Amlak (Dean, College of Public Health and Medical Sciences, Jimma University)	