

**HIV/AIDS
Pharmaceutical
Management,
Arusha,
Tanzania,
November 13–17,
2006**

***Training Workshop
Report***

Management Sciences for Health
is a nonprofit organization
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February 2007

HIV/AIDS Pharmaceutical Management, Arusha, Tanzania, November 13–17, 2006: Training Workshop Report

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Printed February 2007



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About RPM Plus

RPM Plus works in more than 20 developing and transitional countries to provide technical assistance to strengthen pharmaceutical and health commodity management systems. The program offers technical guidance and assists in strategy development and program implementation both in improving the availability of health commodities—pharmaceuticals, vaccines, supplies, and basic medical equipment—of assured quality for maternal and child health, HIV/AIDS, infectious diseases, and family planning, and in promoting the appropriate use of health commodities in the public and private sectors.

Recommended Citation

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Mwakisu, S., and E. Rutta. 2007. *HIV/AIDS Pharmaceutical Management, Arusha, Tanzania, November 13–17, 2006: Training Workshop Report*. Submitted to the U.S. Agency for International Development by the Rational Pharmaceutical Management Plus Program. Arlington, VA: Management Sciences for Health.

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ACRONYMS

ADR	adverse drug reaction
AIDS	acquired immunodeficiency syndrome
ART	antiretroviral therapy
ARV	antiretroviral
CTC	Care and Treatment Clinic
EGPAF	Elizabeth Glaser Pediatric AIDS Foundation
FBO	faith-based organization
FHI	Family Health International
HIV	human immunodeficiency virus
KCMC	Kilimanjaro Christian Medical Centre
M&E	monitoring and evaluation
MEMS	Mission for Essential Medicines and Supplies
MIS	management information system
MSD	Medical Stores Department
MSH	Management Sciences for Health
MTP	monitoring, training, and planning
MUCHS	Muhimbili University College of Health Sciences
NACP	National AIDS Control Program
NNRTI	non-nucleoside reverse transcriptase inhibitor
NRTI	nucleoside reverse transcriptase inhibitor
NVP	nevirapine
OI	opportunistic infection
PEPFAR	U.S. President's Emergency Plan for AIDS Relief
PMIS	Pharmaceutical Management Information System
RPM Plus	Rational Pharmaceutical Management Plus
RUM	rational use of medicines
SOP	standard operating procedure
TB	tuberculosis
TFDA	Tanzania Food and Drugs Authority
USAID	U.S. Agency for International Development

ACKNOWLEDGMENT

The Rational Pharmaceutical Management (RPM) Plus Program wishes to express sincere appreciation to the National AIDS Control Program (NACP) for enabling the HIV/AIDS Pharmaceutical Management Training to be held in Arusha from November 13–17, 2006. We would also like to extend our sincere gratitude to the Christian Social Service Commission (CSSC) for their continuous support in implementing HIV/AIDS pharmaceutical management systems strengthening activities in faith-based hospitals.

We would also like to thank Family Health International (FHI) and the Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) for their good cooperation during preparation of the training workshop and for their financial and logistic support to the participants from their respective regions.

Moreover, we express our appreciation to the facilitators, Dr. O. Minzi and Dr. A. Kamuhabwa of Muhimbili University College of Health Sciences (MUCHS) and Mrs. E. Muro and Lucas Chagula of Kilimanjaro Christian Medical Centre (KCMC), for their dedication and commitment to this training.

Finally, RPM Plus would also like thank individual participants for their attendance and their valuable contributions and comments.

EXECUTIVE SUMMARY

The HIV/AIDS Pharmaceutical Management Training was held from November 13–17, 2006, at Golden Rose Hotel, Arusha, Tanzania. The training was organized by Management Sciences for Health (MSH)/RPM Plus in collaboration with NACP and CSSC with additional financial support from FHI and the EGPAF.

A total of 30 participants attended the training, of which 13 came from district hospitals, 1 participant each, 3 from regional hospitals, 13 from faith-based hospitals, and 1 participant from Mission for Essential Medicines and Supplies.

The goal of the training was to provide health care professionals responsible for handling antiretrovirals (ARVs) with the basic knowledge and skills needed to address problems related to pharmaceutical management of HIV/AIDS-related commodities at the facility level.

Specific objectives were—

- Explain elements of pharmaceutical management specific to the provision of antiretroviral therapy (ART) services.
- Discuss the pharmaceutical management systems for HIV/AIDS-related commodities with emphasis on quantification, ordering, and inventory management.
- Discuss appropriate processes and tools for management information systems in support of the Tanzania HIV/AIDS care and treatment program.
- Discuss monitoring and evaluation for ART Pharmaceutical Management Systems.
- Provide participants with an understanding of HIV/AIDS drug-related issues for better counseling of HIV patients on medication use.
- Discuss good dispensing practice, including the counseling and monitoring necessary for rational ARV use.

The training workshop was designed to take five days. The first two days were spent on a general overview of HIV/AIDS, and then followed by HIV/AIDS pharmaceutical management. The training methodology involved PowerPoint presentations with each session followed by open discussion and case studies. In addition, exercises and brainstorming methods were employed. It was conducted by two facilitators from MUCHS, two from KCMC, and one from MSH/RPM Plus, and participants were provided with binders covering notes for each course session.

In addition, participants developed action plans for performance improvement. Participants identified gaps that existed in their facilities and prioritized them. Developed plans will be used as a basis for follow-up during supportive supervision to see how much improvement has happened.

BACKGROUND

Management Sciences for Health (MSH) through its U.S. Agency for International Development-funded Rational Pharmaceutical Management (RPM) Plus Program provides support in strengthening pharmaceutical management systems for HIV/AIDS-related commodities through providing technical assistance in different areas of antiretroviral therapy (ART) pharmaceutical services.

ART is a new program and requires proficient knowledge and skills. Assessments done recently in some ART sites in Tanzania revealed several gaps in the management of HIV/AIDS-related commodities that included inadequate skills and capacity of pharmaceutical personnel in managing HIV/AIDS-related commodities, particularly in documentation, quantification, and ordering. Inadequate number of trained personnel in the facilities providing antiretrovirals (ARVs) has also been observed as a problem, hence a need for technical assistance from partners supporting ART sites, including RPM Plus.

In response to this need, MSH/RPM Plus, in collaboration with the National AIDS Control Program (NACP) and Christian Social Service Commission (CSSC), took a lead and organized a training workshop on pharmaceutical management for HIV/AIDS commodities. The workshop was held at Golden Rose Hotel in Arusha, Tanzania, November 13–17, 2006. It attracted a total of 30 participants from 13 district hospitals, 13 faith-based organization (FBO) facilities, 3 regional hospitals, and 1 from Mission for Essential Medicines Services (MEMS).

To leverage resources and improve coordination, U.S. President's Emergency Plan for AIDS Relief (PEPFAR) partners supporting ART sites under regionalization strategy covered the costs of participants from ART sites located in their respective regions. Family Health International (FHI) funded six participants from Dodoma, Elizabeth Glaser Pediatric AIDS Foundation (EGPAF) funded fourteen participants from Tabora, Kilimanjaro, and Arusha, and MSH/RPM Plus funded nine participants from three FBOs and one from MEMS. In addition, MSH/RPM Plus covered other costs (facilitation, training materials, stationery, etc.).

Participants were from the cadres of pharmacists, pharmaceutical technicians, pharmacy assistants, nurse assistants, clinical officers, and nursing officers.

Workshop Goal

- Provide health care professionals responsible for handling ARVs with the basic knowledge and skills needed to address problems related to pharmaceutical management of HIV/AIDS-related commodities at facility level.

Objectives

- Explain elements of pharmaceutical management specific to the provision of ART services.
- Discuss the pharmaceutical management systems for HIV/AIDS-related commodities with emphasis on quantification, ordering, and inventory management.
- Discuss appropriate processes and tools for Management Information Systems (MIS) in support of the Tanzania HIV/AIDS care and treatment program.
- Discuss monitoring and evaluation (M&E) for ART Pharmaceutical Management Systems.
- Provide the participants with an understanding of HIV/AIDS drug-related issues for better counseling of HIV patients on medication use.
- Discuss good dispensing practice, including the counseling and monitoring necessary for rational ART use.

Methodology

The duration of the HIV/AIDS Pharmaceutical Management Training workshop was five days. Two days were spent on providing a general overview of HIV/AIDS and treatment and the remaining days focused on HIV/AIDS pharmaceutical management, with emphasis on good inventory control, quantification and ordering, good storage practice, and rational use of ARVs. The training used NACP training curriculum for national comprehensive training on HIV/AIDS with some additions to complement what is covered under NACP's Module P (specific for pharmaceutical personnel) and was facilitated by four national trainers—two from Kilimanjaro Christian Medical Centre (KCMC) referral hospital, two from Muhimbili University College of Health Sciences (MUCHS), and one facilitator from MSH/RPM Plus.

The training used different learning methods such as presentations, group discussions, case studies, brainstorming, question and answers, and planning sessions.

TRAINING WORKSHOP PROCEEDINGS

Introduction and Welcoming Remarks

Salama Mwakisu of RPM Plus welcomed participants and invited them to introduce themselves and provided a brief background on the course. This was followed by an overview of the training workshop, where the objectives of the training course were highlighted. While sharing the objectives, it was clarified that the workshop is targeted for pharmaceutical personnel who broadly include all health workers handling ARVs and other related commodities at ART pharmacy, including nonpharmacists or pharmacy technicians, such as nurses, clinicians, and others.

Module One

HIV/AIDS Epidemiology

Presented by Eva Muro

The session provided a general overview of HIV/AIDS epidemiology globally and that of Tanzania. The HIV/AIDS subtypes commonly found in Tanzania were mentioned. Counseling patients on the importance of taking precaution even when a person is already infected was explained because it would help to avoid coinfection with various subtypes.

Key strategies for prevention of HIV/AIDS transmission were discussed. Participants were reminded that the methods which have proven to be effective in reduction of HIV/AIDS transmission include voluntary counseling and testing, behavioral change interventions, correct and consistent use of condoms, prevention and treatment of sexually transmitted infections, ART, breastfeeding interventions to prevent mother-to-child transmission, and safe blood transfusion practices.

Addressing socioeconomic and psychosocial factors, such as alcohol consumption and drug use, lack of awareness, poverty, and stigma which prevents acceptance of the problem and early care-seeking, were said to be crucial because addressing these factors would significantly reduce the risk of HIV transmission.

The presenter rounded off the discussion with outlining the socioeconomic impacts of HIV/AIDS.

Pathophysiology of HIV/AIDS

Presented by Dr. A. Kamuhabwa

The presenter began with a general overview of human immunology followed by a detailed explanation of the life cycle of HIV. The possible sites of action of ARV were also mentioned,

enlightening participants on how different groups of ARVs act before introducing the individual pharmacology of ARVs. Furthermore, the pathogenesis of HIV/AIDS, from the acute stage of HIV to the late stage, was highlighted.

Discussion

Participants expressed appreciation on effectiveness of ARVs in controlling the disease, noting that it has been observed that the viral load of some HIV/AIDS-infected persons can decrease up to an undetectable level. In addition, it was pointed out that scientific studies are ongoing and it is possible that new medicines with an ability to clear the disease could be identified or discovered, but currently the available medicines can only suppress HIV proliferation.

HIV/AIDS-Related Illnesses

Presented by Dr. Omary Minzi

The commonly observed illnesses and opportunistic infections (OIs) related to HIV/AIDS were outlined. The diseases include tuberculosis (TB), bacterial pneumonia, *Pneumocystis carinii*, *streptococcal* meningitis, toxoplasmosis, vaginal candidiasis, or pharyngeal candidiasis, esophageal candidiasis, infective diarrhea, herpes zoster, infective dermatoses, and Kaposi's sarcoma.

The discussion covered clinical presentation, signs and symptoms, and management of HIV/AIDS-related illnesses. Photographs were presented to show how these conditions appear.

Module Two

Practical Approach of ARVs

Presented by Eva Muro

The goals of ART were discussed. Participants were reminded that HIV-infected patients are put on ARVs to reduce disease progression through interrupting viral replication and to restore immune function, improving quality of life and hence reducing HIV mortality and morbidity.

Factors which need to be considered when deciding to put HIV-infected persons on ARVs were clarified, which include stage of HIV-related disease, degree of HIV-related immunosuppression, and patient readiness to adhere to ART treatment. Different classes of ARVs were listed and their mechanisms of actions were discussed.

Participants were then taken through a brainstorming session to list recommended regimens for HIV/AIDS treatment in Tanzania and the reasons which could lead to switching a patient from one combination of ARVs to another or stopping treatment.

The importance of having national treatment guidelines was underscored. It was explained that they allow easy training of health workers, easy patient transfer from one Care and Treatment Clinic (CTC) to another, easy monitoring of patients on ART, and reduction of drug resistance.

Pharmaceutical personnel are responsible for ordering and managing ARVs and other HIV/AIDS-related commodities. Participants were advised to consider reducing pill burden to patients by ordering fixed-dose combinations when possible. Fewer non-fixed combinations should be used in case of a need to change a patient's regimen to modified first-line therapy—for example, when a patient experiences side effects or to avoid drug interactions or for treatment of special groups, such as pregnant women.

Discussion

Participants discussed observed improvement in quality and immune status (increase in CD4 cell count) as soon as HIV/AIDS patients are treated with medicines for OIs, even before starting ARVs. It was explained that the CD4 count of HIV/AIDS-infected persons is affected when patients have coinfection with OIs, therefore treating OIs could lead to improved quality of life.

A question was raised on why children of less than eight years of age receive higher ARV doses than children aged more than eight years. The response was that children aged below eight years are faster metabolizers than children above eight years, therefore a higher dose is recommended.

Adverse Drug Reactions

Presented by Dr. Omary Minzi

Various adverse drug reactions (ADRs) associated with ART medicines and their management were discussed, including those caused by non-nucleoside reverse transcriptase, nucleoside reverse transcriptase, and protease inhibitors. It was noted that among the first-line medicines lamivudine is well tolerated when compared to other ARTs.

The session was meant to enable participants to understand the concept of ADRs and their role as pharmaceutical personnel in ADR monitoring. More emphasis was given on counseling patients on tolerable side effects, advising clinicians on proper regimens that reduce chances of ADR, and recording and reporting ADR to the Tanzania Food and Drugs Authority (TFDA) through use of yellow forms. Some strategies for managing ADR in collaboration with other health care staff at ART clinics were also discussed.

Discussion

A question was raised about the possibility of emergence of HIV-resistant strains to ARVs due to frequent changing of regimens caused by development of ADR. The response was that the decision to change regimens should be reached after assessing patients long enough to be sure that the effects are not tolerable. Changing a patient's regimen is a teamwork effort and it should not be done in a rush, but only when necessary and should follow national guidelines.

Some participants expressed their experience with some patients developing skin reactions due to nevirapine-use after completion of a starter pack of ART. Participants were reminded that patient monitoring for up to six weeks is recommended to be able to tell whether ADR will develop or not, as the rate of appearance of ADR differs from patient to patient. Monitoring patients for long periods will help to rule out whether the reaction is nevirapine-induced or not, while at the same time determining if the reaction is tolerable or not.

There was also a question about how to deal with patients who are put in ART and do not adhere to treatment by not attending the clinic regularly. Repetitive adherence counseling was explained to be important. It was also noted that linking patients to the home-based care providers or community-based organization for further follow-up should always be considered, as they are closer to patients and have been helpful in following up the defaulters.

The concern was raised about some clients being suspected to be enrolling themselves in more than one ART site to receive extra ARVs, either to sell or give to their partners. It was noted that because of the issue of stigma some patients will not enroll themselves in an ART program where free ARVs are being provided. Participants recommended that identification procedures in relation to community leaders need to be strengthened to minimize such practices.

ART and Nutrition

Presented by Dr. Kamuhabwa

The role of nutrition in ART was discussed. It was mentioned that ART food-related interactions could result into either positive or negative outcomes. Patients need to be provided with enough information regarding food requirements or diet restriction associated with prescribed medicines—every time a patient goes for refill—to enhance optimal absorption of medications and to ensure effectiveness of medicines and reduction of negative outcomes.

It was further explained that ART can affect the rate of food consumption or nutrient absorption due to ARVs and their side effects, such as anorexia, nausea, diarrhea, vomiting, loss of appetite, taste changes, and dryness of the mouth. Possible side effects of individual ARVs were discussed and recommended nutritional management that can help relieve the side effects were outlined. The presentation was followed by case studies to measure participants understanding of the topic.

Discussion

Participants discussed how to handle HIV patients who are alcoholic and reluctant to stop drinking alcohol despite having reduced CD4 counts. It was agreed that this type of patient is not ready to start ART; further counseling is needed until they are ready to reduce their alcohol intake.

Drug Interaction

Presented by Dr. Omary Minzi

The session began with the definition of drug interaction and its effects, which includes changes in concentration of drug levels, cumulative toxicity, and antagonism. It was explained that drug interaction might result during absorption, metabolism, distribution, and elimination of drugs from the body. The drugs eliminated through the renal system (nucleoside reverse transcriptase inhibitor [NRTI]) were mentioned to have minimal ADR as compared to those metabolized by liver enzymes, such as non-nucleoside reverse transcriptase inhibitor (NNRTI) and protease inhibitor. To help pharmaceutical personnel advise their clients, specific drug-drug interactions were discussed and recommended alternative therapies were explained.

The facilitator emphasized the importance of having a table at the CTC pharmacy indicating various ART drug interactions. An emphasis to avoid coadministration of anti-TBs with nevirapine, antimycotic agents like ketoconazole with nevirapine, and zidovudine with stavudine, was given. During discussions, it was pointed out that drug interactions may lead to reduced effectiveness of treatment and increase drug-induced toxicity while contributing to the cost of health care because of medical care costs that are required to treat ADR. ADR may also decrease patient adherence to treatment and may cause the patient to lose confidence in the health care system or team.

The presentation was followed by case studies, which enabled participants to apply the concept learned in identification of drug interactions involving ART.

Pediatric Dosing Calculations

Presented by Lucas Chagula

A brief presentation on the ARV regimens recommended for pediatric patients was given as outlined in the National HIV/AIDS Treatment Guidelines. The ARVs that are not recommended in children were mentioned and the reasons for their rejection were given. This was followed by sample calculations of ART doses of different ARV regimens using body weight, body surface area, and normogram. The presentation was interactive with more time used for case studies aimed at enabling participants to practice calculating pediatric doses.

Module Three

Pharmaceutical Management Cycle

Presented by Salama Mwakisu

The session outlined the elements of the pharmaceutical management cycle in the context of an ART program, covering selection, procurement, distribution, and use of ARVs within existing policy and legal frameworks. Participants were reminded that the components of the

pharmaceutical management cycle are interdependent and that uninterrupted supply of ARVs and rational use of ARVs will depend on the efficiency and effectiveness of pharmaceutical management systems at ART sites.

It was also pointed out that, initially, the major stumbling block to HIV/AIDS treatment was affordability, but with increased financial support for ART programs from different donors, ARVs are available in many places in the country. However, there is a need to strengthen ART pharmaceutical management systems to ensure efficient performance of the program and accountability of the ARVs and also to support the efforts of donors and governments in ensuring availability of ARVs and other commodities.

Discussion

In some facilities medicines are being managed by unqualified staff. Participants raised the following question: what should be done to ensure pharmaceutical personnel are taking the lead in the process? The problem was expressed to be mainly observed in mission hospitals.

The response to this question was that the personnel handling medicines should be qualified and trained for the job; pharmaceutical personnel need to implement and share the knowledge and skills gained through training with other staff in the facilities to enable hospital management to recognize their importance in pharmaceutical management issues.

Inventory Management

Presented by Dr. Omary Minzi

The session extensively covered elements of good inventory management. Different activities relating to flow of ARVs at facility level were well elaborated, including good ordering, receiving, storing, and issuing practice of ARVs from the main pharmacy to the dispensing area and to the outpatients.

It was emphasized that inventory management is a key component of pharmaceutical management concerned with ensuring sufficient stocks of the right quality are maintained at the facility level, avoiding unnecessary stock-outs or overstocking.

Discussion

Challenges associated with handling ARVs with a short expiry date were discussed. Some participants indicated not being familiar with the mechanisms for handling ARVs with a short expiry date, while others reported to have received a circular from NACP directing them to redistribute ARVs with short expiry dates to the nearby ART sites. Participants were urged to follow NACP recommendations regarding how to handle short-dated ARVs and were reminded to update their record-keeping document whenever ARVs or other related medicines are issued to or received from another facility and that the documents should be well filed for future reference. In addition, ART sites were encouraged to have strong collaboration among

themselves by sharing experiences in the implementation of an ART program, as well as challenges faced and interventions that have proven to be effective.

There was also a concern about involvement of Medical Stores Department (MSD) in the redistribution process; facilities recommended that MSD should be involved in facilitating the process by providing information on the facilities in need of extra ARVs. Participants also recommended that a joint meeting with MSD is important to ensure that all matters related to ARV supply are discussed and a consensus is reached between MSD and facilities.

Store and Facility Management

Presented by Dr. Kamuhabwa

Elements of good storage practice were discussed including maintaining good quality of medicines, good arrangement of ARVs and other related commodities in the facilities, good security maintenance, proper disposal of ARVs, record keeping, and good stock control and rotation of ARVs.

Illustrative photos were used to expand participants' awareness of good storage practice. Participants were reminded that they should always arrange their medicines in an orderly system (according to category, formulation, etc.) and ensure that medicines are always issued according to the FEFO system (first expiring, first out).

Discussing temperature control, storing products according to manufacturer's storage requirement was insisted (temperature, humidity, light, etc.). It was emphasized that the temperature within the ARV store and refrigerator should be monitored regularly to ensure that ARVs are stored within recommended range of temperature.

To enhance security of ARVs participants were urged to ensure that ARVs are stored in a locked cabinet or room, with access limited to authorized personnel. Proper recording of all issues and receipt of ARVs and following proper handling procedure was also explained to be crucial to ensure accountability.

Proper disposal of ARVs was also covered where participants were reminded to follow the recommended guidelines for disposal of exposed or damaged medicines to allow enough space for storage of usable medicines and also to protect the public from consumption of expired medicines.

Discussion

To measure participants' understanding of disposal procedure, the presenter queried participants to find out what they know about procedure for disposal of expired medicine. It was observed that participants' understanding of the formal procedure for medicine disposal was limited. The majority expressed that disposal of expired medicines is a challenge and some had a concern that the procedure is cumbersome, which has led to piling up of expired medicines in their facilities taking up valuable storage space. However, the issue of expiry for ARVs was explained to not be

a major problem, since it occurs only during the first supply when ARVs were pushed to the new sites with no established number of HIV/AIDS patients enrolled in ARV treatment.

Some participants raised concern that storage space for ARVs and other related commodities is limited and that there is a need to support expansion of pharmacies.

Dissemination of guidelines for medicine donation by TFDA/Ministry of Health and Social Welfare was requested by participants. Some facilities, especially mission hospitals, receive donations with short expiry dates and some with instructions written in an unknown language.

Documentation and Inventory Control Forms

Presented by Salama Mwakisu

Different inventory control forms used by ART programs were discussed, ranging from transaction records, stock keeping records, and reporting forms. The emphasis was on the use of the ART dispensing register, Request and Report forms, store ledger/bin cards, and ADR reporting forms. Others mentioned were the MSD sales invoice, Good Received Note (GRN), local requests, and issue vouchers.

The ART dispensing register was mentioned to be useful in recording all issues of ARVs to the patients and that the data is important in calculating the total amount of ARVs consumed in a month by regimen and age. Participants were reminded that the register is also important for accountability and that both a patient and dispenser are supposed to countersign in the ART dispensing register before the patient leaves with the medicines.

The importance of information collected in Request and Report forms was discussed. Reporting on amount consumed, loss and adjustment, and stock on hand in a given time frame was explained to be useful in projecting future needs.

ADR monitoring forms were also discussed. The presenter highlighted that ADR monitoring is very important, especially with ARVs that are new medicines in the market. Although clinical trial data were carefully collected during medicine development, new undocumented ADRs are emerging. Therefore, participants were requested to document all reported or observed ADRs in their facilities using pre-paid yellow forms and to send the forms to TFDA.

Discussion

There was a concern raised about untimely availability of inventory control forms and books. Participants were urged to communicate with the responsible authority on time to acquire the respective forms and books.

Availability of yellow forms at facility level was explained to be a hindering factor to effective ADR monitoring—some participants expressed to have not seen the forms in their facilities. There was also a request for sensitization of health care workers on the importance of the ADR

monitoring system, as some health care workers have been reluctant to fill out the forms thinking that the forms are for research purpose and that they need to be paid before completing them.

The discussion was followed by distribution of various documents used in an ART program and case scenarios that enabled participants to practice using different inventory control forms.

Quantification

Presented by Dr. Omary Minzi

The presentation described quantification as the process used to determine medicine and supply requirements for the purpose of procurement, ordering, or budgeting. The factors to be considered when preparing to order ARVs were also discussed. Participants were reminded that ART requires multiple medicine therapy and is a lifelong treatment; therefore stock-outs can lead to serious effects due to quick evolution of resistance.

The session emphasized how to use the Request and Report form in quantifying the amount of ARVs required per month, explaining how data used in the quantification of ARVs using the consumption-based formula can be obtained and be applied in quantification.

Participants were urged to ensure that the Request and Report form (Form A2) is correctly and completely filled out to enable MSD to use the right information for forecasting the correct quantities of ARVs. Inaccurate figures were noted to be the major source of overestimation or under estimation of medicine requirements, which could result in piling up of ARVs or frequent stock-outs, respectively. The presenter stressed that ordering and reporting in a timely manner is important to enable MSD to plan their distribution schedule.

Quantification Exercise

The session focused on building capacity of participants in doing quantification of ARVs using Form A2. The one hour session was devoted to quantification exercises, followed by presentations from a few selected participants.

The exercises were done individually and repeatedly until all participants were comfortable with using the Request and Report forms for ordering ARVs.

Module Four

Rational Use of HIV/AIDS-Related Commodities

Presented by Dr. Kamuhabwa

Rational use of medicine (RUM) requires that the patient receives medication appropriate to their clinical needs, in doses that meet their own individual requirements, and for an adequate period of time at the lowest cost to them and their community.

The emphasis was on promotion of RUM from the day when a patient starts ARV therapy to avoid treatment failure, rapid development of resistance, decrease of toxicity risk, and avoid waste of money due to treatment failure. Aspects of irrational use of medicines were mentioned to occur at various levels, ranging from diagnosis, prescribing, dispensing, and packaging to patient adherence. Strategies to improve RUM were well described.

The session was concluded by giving participants a case study on RUM, where participants worked to identify problems related to RUM and underlying causes, followed by proposing solutions and how to follow up and measure changes after intervention.

Prescription Handling

Presented by Eva Muro

A need to ensure that ART prescription is in line with National Guidelines for Clinical Management of HIV and AIDS before dispensing ARVs was stressed. Important tips on handling HIV/AIDS prescription were given as follows—

- Honoring prescription with not less than three ARVs prescribed, except in the case of post exposure prophylaxis and prevention of mother-to-child transmission
- ART prescription should originate from trained authorized prescriber
- Nonreplacement of prescribed ARV with other medicines
- Communication between pharmaceutical personnel and prescriber in case of discrepancies before issuing medicines to the patients

Furthermore, characteristics of a good dispenser were outlined. It was highlighted that a dispenser must always be knowledgeable enough about the medicines he or she is handling especially on use, dose, precautions, side effects, interactions, and storage needs. In addition, a dispenser must be skilled in assessing the quality of preparation before dispensing to the client and should have attributes of cleanliness, accuracy, and honesty to the patient. He or she should be able to communicate effectively with patients.

Discussion

Some participants raised concern about increased workload due to the increase in number of patients, hence hindering efficient patient counseling. In response it was advised that increased number of patients should not compromise quality of service given to the patient. Efficient medication use counseling is a vital process to the success of an ART program and should not be given in a rush.

Participants agreed that labeling of ARVs is important and that instructions should be properly written on a container and not on the outer box because some patients throw away the labeled

box as soon as they receive their medicines. In addition, patients should always be educated on the importance of labeling.

Adherence to ART

Presented by Eva Muro

The session described adherence as a process involving mutual decision-making between a patient and a health care provider, contrary to compliance, which is an obedience-based approach. The purposes of adherence counseling were emphasized. Adherence counseling helps patients develop an understanding of the treatment given to them and related challenges, while at the same time prepares them to initiate treatment. It was emphasized that adherence counseling should start before initiation of ART and that there should be ongoing support for patients to adhere to treatment over time. The presenter reminded participants that successful adherence to ART requires an adherence level of more than 95 percent.

To elaborate, the relationship between adherence and viral load was explained, where it was observed that the higher the percentage of adherence to ART the lower the viral load. The examples made participants appreciate the importance of adherence to ART.

Factors which influence adherence to ART at different levels were outlined. These include personal- and family-related factors, patient provider interactions, drug regimen-related factors, and psychosocial factors. Side effects are the major barrier to poor adherence, hence it was insisted that a patient needs to be well informed about the possible side effects related to the medicines they are taking beforehand and how to deal with them.

Different methods for measuring adherence were discussed including pill count, self reporting, pharmacy records, prescription refill monitoring, and viral load assay. Approaches to improvement of adherence to ART were then clarified. It was emphasized that adherence counseling should always be a teamwork effort involving pharmaceutical personnel, nurses, and clinicians and should be repetitive carrying the same information while modifying the message to meet the needs of the particular patient.

To enhance patient adherence to ART, participants were advised to make sure that the regimen fits into the person's daily routine and where possible, the patient should be helped to identify reminders or tools to help in taking pills at the set time. Participants were encouraged to take an active role in identifying and addressing the barrier to ART adherence and to link them to a community-based organization or home-based care organization for continuous follow-up.

Before closing the session it was noted that pharmacy staff play a key role in promoting patient adherence and all information gained during this training should contribute to improving quality of adherence counseling to ART patients.

Discussion

Participants shared some observations on patients on ARVs who tend to discontinue ARV therapy once they get relief and disappearance of AIDS symptoms. Knowledge of HIV pathogenesis as well as ARV mechanism of action is critical to make patients understand the limits of ARVs in controlling HIV/AIDS. Participants were reminded to always discuss the limits of ARVs with patients and to remind them that ARVs are not a cure.

The issue of patients moving from one ART site to another either permanently or temporarily was discussed. Participants wanted to know how these patients should be accommodated. For a patient who moves permanently to another site he or she has to be handled with referral documents to the new site. For those on temporary stay a CTC2 form will need to be opened or used.

A recommendation was made that pharmaceutical personnel working for private pharmacies, which have been allowed to stock ARVs, should be involved in the training programs on HIV/AIDS pharmaceutical management to ensure increase in adherence to ARVs and reduce misconduct.

Medication Use Counseling

Presented by Eva Muro

Procedures for counseling patients on ART were discussed. Participants were reminded about the need to confirm who the medication-use counseling is being provided for before starting the counseling process to ensure that the counseling is given to the right person. To understand how much information the patient has with regard to HIV/AIDS, assessment on patient knowledge on the disease condition and the prescribed medicines was explained to be important.

Checking patient understanding of key issues was also stressed to be of paramount importance—for example, asking a patient to repeat back the key information provided to them followed by checking for patient concerns and questions before dispensing ARVs.

Module Five

Standard Operating Procedures for ART Pharmaceutical Management

Presented by Salama Mwakisu

The presentation provided a general overview of standard operating procedure (SOPs). SOPs were defined as instructions that are approved, written, and detailed enough to cover all activities. SOPs explain what should be done, when, where, by whom, and how.

Apart from ensuring quality and consistency of health care services, SOPs were mentioned to be an important tool for training on ART pharmaceutical management and can also be used as

standards for monitoring and supervision. It was emphasized that in order for a SOP to serve its purpose, it must be clearly written and tested and kept updated and relevant.

Areas of ART pharmaceutical management which might need SOPs were highlighted, including inventory management, dispensing, and performance monitoring. It was further explained that the SOPs are normally developed based on what already exists (that is, on forms regulations, guidelines, and systems). At the end of the session participants could define SOPs, the features and benefits of SOPs, and they also appreciated the need for having SOPs for ART pharmaceutical services in their facilities.

Participants were then divided into four groups. Each group practiced developing an SOP in one of the following areas based on the daily activities they perform at their facilities, the knowledge gained through training, and in accordance with national guidelines—disposal of ARVs, ensuring security of ARVs, validation of ART prescription, and preparing ARVs for issue to a client or his/her relative. This was followed by a plenary session where the results of discussion provided information that could be modified to develop SOPs for the mentioned areas. The exercise also provided opportunity to measure participants understanding on the mentioned areas and corrections and more explanation was given where the procedures were not clear.

Monitoring and Evaluation System for ART Pharmaceutical Management

Presented by Eva Muro

The objectives of the presentation were to discuss how M&E applies to daily work at the pharmacy, discuss the use of indicators in M&E, and describe the relationship between the Pharmaceutical Management Information System (PMIS) and M&E. Participants were informed that through M&E they will be able to assess if their work is going on as planned, be able to make necessary changes to correct any gaps observed, and follow up to see if a change made is working. The result is improved quality of work by facilitating informed decisions regarding implementation of different activities.

Participants were reminded that existing MIS tools for ART pharmacy are enough source of information and data for M&E. Examples of the tools mentioned were bin cards, MSD sales invoices, Request and Report forms for ARVs, local request and issue vouchers, ART dispensing registers, store ledger, and other PMIS forms. Facilities were urged to develop a culture of documenting all observations related to performance of ART pharmaceutical management systems and use of the results in increasing efficiency and effectiveness of ART pharmaceutical management systems at facility level.

In addition, selecting a few indicators which could be used to assess the extent to which the targets set are being achieved was stressed to be important. Some examples of indicators which could be used at facility level in monitoring of ART pharmacy activities were mentioned. These include—

- Percentage of expired ARVs per quarter
- Number of days that ARVs by type were out of stock per quarter

- Percentage of ARVs or other related commodities whose physical count exactly match the records in the bin cards

Participants were informed that the above mentioned indicators are a few examples, but they can develop their own list of indicators based on their set objectives. Challenges related to M&E for pharmaceutical management were then discussed, which include lack of reliable data, increased workload, time constraint, incomplete or incorrect data, lack of follow-up or action, and lack of qualified personnel to maintain a monitoring system.

Monitoring, Training, and Planning

Presented by Dr. Appolinary Kamuhabwa

The key concepts of monitoring, training, and planning (MTP) were presented. MTP was defined as a continuous process for performance improvement which involves monitoring, training, and planning. Monitoring in this context was explained to be a process of assessing the current situation through problem identification and quantification, while training involves a problem solving process by finding out why problems occur and deciding on how to solve the problem. Planning was explained to involve setting achievable targets for improvement followed by assigning responsibility and implementation of proposed interventions to a specific person.

The aim of MTP was explained as a process that helps build capacity of pharmaceutical personnel trained in pharmaceutical management of HIV/AIDS-related commodities. The trained personnel apply the knowledge acquired through training at their workplace.

For successful implementation of MTP, participants were advised to share the concept with the management and other staff involved in pharmaceutical management and if possible, include other CTC members in regular meetings conducted to discuss and solve problems related to ART pharmaceutical services.

Action Plans

Preparation of action plans facilitated by Ms. Salama Mwakisu, Dr. Minzi, Dr. Kamuhabwa, and Mrs. Muro

As part of MTP, this session was followed by a planning session, where participants from each facility developed individual action plans showing how they are going to implement the knowledge and skills learned at the training workshop.

End-of-Course Workshop Evaluation

At the end of the course a general evaluation was carried out. Review of the evaluation forms indicated participants were highly satisfied with the training course, with the participants overall rating for the course as 4.5 (1 = poor, 5 = excellent). There was high satisfaction regarding format of the sessions, case studies, discussions, and training materials.

In addition to rating, participants were requested to give their general comments relating to how the course could be improved. The most common comments were—

- Duration of training should be extended to allow more time for exercises.
- In the future, participants with different levels of education should not be mixed to ensure adequate understanding of all participants.
- Field practical should be included in the training to augment the knowledge gained in the class.
- Some topics should be more detailed such as adherence to ARVs, ART and nutrition.
- Regular refresher course should be arranged in order to reinforce knowledge and skills gained.
- Maximize number of participants trained in ARV management per facility.
- The training was highly participatory and should be maintained.

CONCLUSION

A total of 30 participants attended the training workshop, among which 17 were being trained for the first time. The workshop provided a valuable opportunity for participants to develop and reinforce their skills in HIV/AIDS pharmaceutical management. A comparison of results of a pre-test and end-of-workshop test given to participants indicated that the training was beneficial to participants: average performance before training was 44, while average performance was 63 after training.

Through this workshop participants were able to discuss and share ideas, challenges, and success regarding implementation of pharmaceutical services related to HIV/AIDS. One of the most important outputs of the workshop was development of facility-specific action plans. In developing the plans—

- Participants identified gaps that existed in their facilities and prioritized them.
- Participants proposed solutions for solving the identified problems and gaps that are within their ability and others that would be referred to partners, hospital management, and NACP.
- The developed plans will be used as a basis for follow-up during supportive supervision to see how much improvement has occurred.

In general, the workshop success was due to several factors, including the use of the national curriculum for comprehensive training on HIV/AIDS and the involvement of dedicated national facilitators experienced in training on pharmaceutical management, from both MUCHS and KCMC, and support provided by NACP, CSSC, and PEPFAR partners (FHI and EGPAF) in financial and logistic input.

ANNEX 1. PHOTOS FROM THE WORKSHOP



Participants during Module One: HIV/AIDS Epidemiology.



Participants during Module Two: Drug Interaction.



Dr. Kamuhabwa presenting Module Three: Store and Facility Management.



Module Three: Quantification Exercise.



Participants and facilitators involved in HIV/AIDS Pharmaceutical Management Training.



ANNEX 2. TRAINING WORKSHOP AGENDA

Day 1

TIME	ACTIVITY	FACILITATOR
8.30–9.00	Registration	All
9.00–9.30	Opening and Self-Introductions	Ms. S. Mwakisu
9.35–9.45	Norms/identifying a Chairperson, Secretary and Time-keeper	Dr. A. Kamuhabwa
9.45–10.00	Objectives of the course	Dr. O. Minzi
10.00–10.30	Pre-training evaluation	All
10.30–11.00	TEA BREAK	
11.00–11.30	M1 Session 1: Epidemiology of HIV/AIDS	Mrs. E. Muro
11.30–12.30	M1 Session 2: Pathophysiology of HIV/AIDS	Dr. A. Kamuhabwa
12.30–13.30	M1 Session 3: HIV/AIDS-related illnesses	Dr. O. Minzi
13.15–14.00	Lunch	
14.00–15.00	Question and answers	
15.00–16.00	M2 Session 1: Practical approach of ART	Mrs. E. Muro
16.00–16.30	Evening Coffee break	
16.30–16.45	Facilitators' Meeting	Facilitators

Day 2

TIME	ACTIVITY	FACILITATOR
8.30–8.45	Day one proceedings	Rapporteur
8.45–10.15	M2 Session 2: ARV adverse reactions	Dr. Minzi/Ms. Mwakisu
10.15–10.45	TEA BREAK	
10.45–11.30	M2 Session 3: ART and Nutrition	Dr. A. Kamuhabwa
11.30–12.15	M2 Session 4: Drug Interaction	Dr. O. Minzi
12.15–13.00	Case studies and discussions	All
13.00–14.00	Lunch	
14.00–15.30	M2 Session 5: Pediatric ART dosing	Mr. Lucas Chagula
15.30–16.00	M3 Session 1: Pharmaceutical Management cycle	Ms. S. Mwakisu
16.00–16.30	Tea break	

Day 3

TIME	ACTIVITY	FACILITATOR
8.30–8.45	Day two proceedings	Rapportuer
8.45–9.45	M3 Session 2: Inventory management	Dr. O. Minzi
9.45–10.30	M3 Session 3: Store and Facility Management	Dr. A. Kamuhabwa
10.30–11.00	Tea break	All
11.00–12.00	M3 Session 4: Documentation and Inventory Control Forms	Ms. Mwakisu/Dr. Minzi
12.00–13.00	Case Scenario	All
13.00–14.00	Lunch	All
14.00–15.00	Case Scenario	All

Day 4

TIME	ACTIVITY	FACILITATOR
8.30–8.45	Day three proceedings	Rapportuer
8.45–10.00	M3 Session 5: Quantification	Dr. O. Minzi
10.00–10.30	Tea Break	All
10.30–11.30	M3 Session 6: Quantification Exercise	All
11.30–12.30	M4 Session 1: Rational Use of Medicines	Dr. A. Kamuhabwa
12.30–13.30	M4 Session 2: Prescription Handling	Mrs. E. Muro
13.30–14.30	Lunch	
14.30–15.30	M4 Session 3: Adherence to ART	Mrs. E. Muro
15.30–17.00	Case Study and Scenarios	All

Annex 2. Training Workshop Agenda

Day 5

TIME	ACTIVITY	FACILITATOR
8.30–8.45	Day three proceeding	Rapporteur
8.45–9.15	M4 Session 4: Medication Use Counselling	Mrs. E. Muro
9.15–10.15	M5 Session 1: Standard Operating Procedure	Ms. S. Mwakisu
10.15–10.45	Tea Break	
10.45–11.30	M5 Session 2: Monitoring and Evaluation and PMIS	Mrs. E. Muro
11.30–12.15	M5 Session 3: Monitoring, Training, and Planning	Dr. Kamuhabwa
12.15–12.30	Post test	All
12.30–13.30	Lunch	All
13.30–15.00	Group work: Action plan	All
15.00–15.20	Course evaluation	All
CLOSURE		

ANNEX 3. LIST OF PARTICIPANTS

No.	Name	Title	Name of Organization/ Facility	E-mail Address	Phone Number
1	Mwanaidi Msangi	Pharm. Assistant	Usangi Hospital		0754 382105
2	Lucy Chale	Pharm. Technician	Mirembe Hospital		0784 399072
3	George Hondi	Pharm. Technician	Mpwapwa District Hospital		0784 463392
4	Mudhihiri Ngakula	Pharm. Technician	Dodoma Regional hospital		0756 919185
5	George Hanta	Pharmacist	Kongwa Hospital	kamuhanta@yahoo.com	0784 299117
6	John Paschal	Pharmacist	Mt. Meru Hospital	mkalagalleh@yahoo.com	0784 472225
7	Christina Chamwela	Nurse Midwife	Village of Hope		0784 514119
8	Magreth Masha	Nurse Midwife	TPDC Moshi		0784 419499
9	Sr. Lucia Minja	Pharm. Technician	Huruma DDH		0787 280900
10	Dr. Samweli Kiwesa	MD	Nkoaranga Lutheran Hospital	samkiw22@yahoo.com	0786 166022
11	Robert Samson	Pharm. Technician	Mawenzi Hospital		0754 884236
12	Mika Iloti	Nursing/officer	Mvumi Hospital	ilotimika@yahoo.com	0717 625599
13	Marco Phillip	Pharm. Technician	Mvumi Hospital		0713 425015
14	Milangros Tumonong	Pharmacist	Mvumi Hospital	mlanayo@hotmail.com	0717 399 804
15	Omari Charaza	Enrolled Nurse	Muheza DDH		0787 580050
16	Agatha Kombo	Pharmacy Assistant	Muheza DDH		0754 476256
17	Nickombolwe Kangero	Pharmacy Assistant	Gonja Lutheran Hospital	gonjahospital@yahoo.com	0784 989 258
18	Dorothea Mmasy	Nursing Officer	Ndala Hospital Tabora		0784 485076
19	Redempta Joseph	Nursing Officer	St. Elizabeth Hospital		0784 320318
20	Martha Enock	Pharmacy Assistant	St. Elizabeth Hospital		0756 346214
21	Frank J. Ndunguru	Acting Pharmacist	Kondoa Dist. Hospital	kdc@habari.co.tz	0756 300225
22	Mr. Mark B. Nyaki	Pharmacy Assistant	St. Elizabeth Hospital	mark-nyaki@yahoo.com	250 6665
23	Ernest Mdoe	Pharmacist	Muheza DDH	ernestmdoe@yahoo.com	0754 613877
24	Prosper Muro	Pharm. Technician	Machame Hospital	saulpro2001@yahoo.com	0784 357869
25	J. Ndimbenya	Pharm. Technician	Arumeru Dist Hospital	josepharm-4@yahoo.com	0754 431087

No.	Name	Title	Name of Organization/ Facility	E-mail Address	Phone Number
26	Baraka Kabudi	Pharmacist	MEMS	baraka@mems.or.tz	0784 341345
27	Orgenes Lema	Project Manager	MEMS	orgenesl@mems.or.tz	0754 470141
28	Flora Lungwecha	Assistant Pharmacist	Nzega District Hospital		0784 359870
29	Peace Nyankojo	Pharmacist	MEMS	info@mems.or.tz	0713 300688
30	Joseph Ndosi	Pharm. Technician	Same Hospital		0754 831915
31	John P. Makundi	Acting Pharmacist	Monduli Hospital	jmakundi@yahoo.co.uk	0754 568817
32	Lucas Chagula	Pharmacist-Facilitator	KCMC	lohya@yahoo.com	0754 344339
33	Dr. Apolinary Kamuhambwa	Pharmacist-Facilitator	MUCHS	akamuhabwa@muchs.ac.tz	0755 576985
34	Eva P. Muro	Pharmacist-Facilitator	KCMC	muroeva@hotmail.com	0784 468553
35	Dr. Minzi Omary	Pharmacist-Facilitator	MUCHS	ominzi@muchs.ac.tz	0754 394715
36	Salama Mwakisu	Pharmacist-Facilitator	MSH/RPM Plus	smwakisu@msh.org	0754 855065

**ANNEX 4. ACTION PLAN FOR STRENGTHENING
HIV/AIDS PHARMACEUTICAL MANAGEMENT SYSTEMS IN ART SITES**

Area/Issue	Identified Problem	Name of Facility	Proposed Solution	Timeline
1. Infrastructure	1. Lack of shelves, cupboard for storage of ARVs			
		1. Usangi Hospital	Inform management on importance of having	Six months
		2. Same Hospital	Inform management on importance of having	
		3. Mpwapwa District Hospital	Inform management on importance of having	
		4. Mirembe Hospital	Communicate with management on importance of having	Six months
		5. Mvumi Hospital	Communicate with management on importance of having	
2. Human resource	2. Inadequate number of staff trained on ART management	6. Usangi Hospital		
		1. Mirembe Hospital	On site training of other staff	Six months
		2. Mawenzi Hospital	On site training of other staff	One month
		3. St Elizabeth Hospital	On site training of other staff	
		4. Muheza DDH	On site training of other staff	
3. Quantification of ARVs	3. Poor quantification	5. Arumeru District Hospital	On site training of other staff	
		Nzega Hospital	Improve quantification by using the Form A1 properly	ASAP
4. Storage and distribution of ARVS	4. Poor arrangement of medicines			
		1. Mount Meru Hospital	Arrange ARVs and other related commodities in good order	
		2. Arumeru District Hospital		

Area/Issue	Identified Problem	Name of Facility	Proposed Solution	Timeline
5. Pharmaceutical management information system	1. Limited availability of SOPs	1. Mirembe Hospital	Develop SOPs	Three months
		2. Mpwapwa District Hospital	Develop SOPs	
		3. Usangi Hospital	Develop SOPs	
	2. Inadequate record keeping	1. Mvumi Hospital	Strengthen record keeping system	Three months
		2. St Elizabeth Hospital	Strengthen record keeping system	One month
		3. Arumeru District Hospital	Strengthen record keeping by introducing bin cards	
		4. Nzega Hospital	Introduce bin cards	ASAP
		5. Ndala Hospital	Ensure records are updated regularly	ASAP
		6. Gonja Lutheran Hospital	Strengthen record keeping system	
	1. Inadequate medication use counseling.	1. Mirembe Hospital	Improve medication use counseling	
		2. Dodoma Regional Hospital	Improve medication use counseling	
		3. Kondo District Hospital.	Improve medication use counseling	
	2. Prescription Forms not used, patient files are used for refill	Mvumi Hospital	Communicate with hospital management and introduce prescription	Three months
	3. Lack of proper labeling of drugs	1. Mvumi Hospital	Improve labeling	Three months
2. Gonja Hospital		Improve labeling	ASAP	
3. Muheza DDH		Improve labeling procedure	Three months	
4. Inadequate reference materials	1. Muheza DDH	Communicate with management to get more reference books		

Annex 4. Action Plan for Strengthening HIV/AIDS Pharmaceutical Management Systems in ART Sites

Area/Issue	Identified Problem	Name of Facility	Proposed Solution	Timeline
6. Monitoring, training, and planning	Lack of regular meeting to discuss issues related to drug	1. Mirembe Hospital	Set MTP schedule, regular meeting	Six months
		2. Dodoma Regional Hospital	Set MTP schedule, regular meeting	
		3. Kongwa District Hospital	Set MTP schedule, regular meeting	
		4. Muheza DDH	Set MTP schedule, regular meeting	
		5. Arumeru Hospital	Set MTP schedule, regular meeting of all CTC team	
		6. Machame Hospital	Introduce monitoring, training and planning approach	
		7. Ndala Hospital	Introduce monitoring, training and planning approach	ASAP

Results of Workshop Evaluation

No.	Satisfaction with Overall Course	Overall Format of the Sessions	Satisfaction with Materials for this Course
1	5	5	4
2	5	5	5
3	5	3	4
4	3	4	2
5	5	5	4
6	4	4	5
7	5	4	5
8	4	5	5
9	4	4	5
10.	4	5	4
11.	5	5	5
12.	5	5	5
13.	4	5	4
14.	5	4	4
15.	5	5	5
16.	5	4	4
17.	4	5	5
18.	5	5	5
19.	4	4	5
20.	5	5	5
21.	3	4	5
22.	5	3	3
23.	5	5	4
24.	4	4	4
25.	5	4	4
26.	5	5	5
27	4	4	5
28	4	4	5
29.	4	4	4
30.	5	5	5
Average score	4.5	4.4	4.5