

**Rapid Assessment of
In-Service Training
(Continuing
Education) on
Rational
Antimicrobial Use and
Antimicrobial
Resistance for Health
Care Providers in
Zambia**

May 7–27, 2005

Management Sciences for Health
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Rapid Assessment of In-Service Training (Continuing Education) on Rational Antimicrobial Use and Antimicrobial Resistance for Health Care Providers in Zambia, May 7–27, 2005

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ACRONYMS

AIDS	acquired immunodeficiency syndrome
AMR	antimicrobial resistance
AMU	antimicrobial use
ART	antiretroviral therapy
ARV	antiretroviral
CBoH	Central Board of Health
CHAZ	Churches Health Association of Zambia
CIDRZ	Center for Infectious Disease Research in Zambia
DOTS	Directly Observed Therapy, Short-course
GNC	General Nursing Council of Zambia
GRZ	Government of the Republic of Zambia
HAART	highly active antiretroviral therapy
HIV	human immunodeficiency virus
MCZ	Medical Council of Zambia
MoH	Ministry of Health
MSH	Management Sciences for Health
NMCC	National Malaria Control Centre
OI	opportunistic infection
PMTCT	prevention of mother-to-child transmission
RPM Plus	Rational Pharmaceutical Management Plus
STGs	standard treatment guidelines
STI	sexually transmitted infection
TB	tuberculosis
TDRC	Tropical Disease Research Center
WHO	World Health Organization
ZNA	Zambia Nurses Association

EXECUTIVE SUMMARY

The emergence and spread of antimicrobial resistance (AMR) increasingly threatens the success of infectious disease treatment and prevention. The inappropriate use of antimicrobials—whether it involves overuse, misuse, or underuse—is singled out as the most important factor contributing to the emergence of resistance. The consequences of AMR are severe because infections caused by resistant microbes fail to respond to treatment, resulting in prolonged illness and greater risk of death. This result has led the World Health Organization (WHO) to launch the first global strategy for combating the serious problems caused by the emergence and spread of AMR, the *WHO Global Strategy for Containment of Antimicrobial Resistance* (WHO 2001a).

One of the interventions in containment of AMR is in-service training of prescribers and dispensers on rational antimicrobial use (AMU) and AMR. This intervention requires determining what has already been taught in the area of infectious diseases, AMU, and AMR in order to design training programs for targeted health workers. In response to that need, a rapid assessment of in-service training on rational AMU and AMR for health care providers was conducted in Lusaka, Zambia, from May 7 to 27, 2005. This report presents the results from that assessment.

The aim of the assessment was to identify what has been covered so far in the continuing education programs offered in Zambia to health workers on rational use of antimicrobials. Thirteen institutions of the targeted 19 took part in the study. Data were collected from government institutions, statutory and registration bodies, and local and international nongovernmental organizations. Data were collected through in-depth interviews with key informants from the organizations. Training manuals and guidelines were reviewed and summarized.

The assessment demonstrated that 5 of the 13 institutions assessed were conducting comprehensive and continuous in-service trainings for health workers. Those institutions had conducted from 12 to 72 training sessions in the last three years, and the remainder had conducted from 0 to 6 training sessions. The duration of each training session ranged from 1 to 10 working days with an exposure of 4 to 9 hours per day. However, most of these in-service trainings were on infectious diseases, particularly HIV/AIDS and its opportunistic infections (OIs), and malaria. Only one organization had conducted in-service training on both infectious diseases and rational use of antimicrobials and a small component on AMR.

The assessment further revealed that most health workers were not familiar with the standard treatment guidelines (STGs). The four institutions that were found to be active in conducting in-service trainings reported that they had adopted the STGs from the Central Board of Health (CBoH), but no trainings had been conducted on the STGs. In some organizations the informants were not even aware of the launch and existence of the STGs.

The assessment has shown that not much has been done on in-service training of health care providers on rational use of antimicrobials and AMR. It is therefore necessary for the Rational

Pharmaceutical Management (RPM) Plus Program to plan in-service trainings for all medical officers, clinical officers, nurses, and pharmacy personnel specifically on rational use of antimicrobials. The trainings should be regular and repeated so that all health workers are trained, and special emphasis should be placed on the STGs, which should be integrated into ongoing and established in-service training programs.

INTRODUCTION

Deaths from acute respiratory infections, diarrheal diseases, measles, AIDS, malaria, and tuberculosis (TB) account for more than 85 percent of the mortality from infections worldwide (WHO 2001b). The use of antimicrobials has contributed to the dramatic fall in morbidity and mortality from infectious diseases, although increased incidence of infections leads to excessive antimicrobial use (AMU) and consequently antimicrobial resistance (AMR).

AMR is an increasing problem worldwide with severe consequences because infections caused by resistant microbes fail to respond to treatment, leading to prolonged illness and greater risk of death. Resistance also affects infection control efforts; costs money, livelihood, and lives; and threatens to undermine the effectiveness of health delivery programs. Many old and new antimicrobials are currently on the market, and resistance to some has already been documented and is spreading rapidly, making treatment of infectious diseases difficult and expensive. Many factors contribute to the problem, including unnecessary antimicrobial prescribing by trained and untrained health workers, uncontrolled dispensing by drug vendors, poor antibiotic prophylaxis in surgery, and poor infection control practices coupled with weak regulatory mechanisms on AMU—especially in developing countries.

Factors that contribute to AMR by health providers include prescribers' perception regarding patients' expectations and demands subsequently influencing prescribing practices and inappropriate medicine use. Inappropriate medicine use is characterized by overprescribing medicines when none are needed clinically; using inappropriate dosages, either too high or too low; prescribing for the incorrect duration; causing unnecessary expense by selecting newer and more expensive medicines when older cheaper ones are clinically adequate and using injections or intravenous antibiotics when oral forms would be suitable. Other factors include lack of prescriber knowledge regarding optimal diagnostic approaches and lack of opportunity for patient follow-up. In the private sector, where profit is the driving factor, this motive may influence prescribers to overprescribe in order to raise the profits. In countries where physicians are poorly paid, pharmaceutical companies have been known to pay commissions to prescribers who use their products (WHO 2001b).

The effective control measures in reducing AMR lie in addressing the areas mentioned, and it is crucial that we recognize that rational AMU is an essential component in addressing the problem of AMR. Proper training of health workers in the handling and prescribing of antimicrobials can play a big role in addressing the problem of AMR. The Central Board of Health (CBoH) under the auspices of the Zambian government has developed the STGs that are meant to provide comprehensive information on the management of common diseases and conditions. They are used as an informational and educational strategy for the promotion of rational use of medicines (CBoH 2004c). The STGs were launched on November 12, 2004, and their use among health workers has not yet been assessed. The purpose of this assessment is to identify what has been covered in the continuing education programs offered to health care providers—medical, pharmacy, nursing, and clinical officers—in Zambia.

Methodology

The rapid assessment involved two activities—

1. Gathering data on existing local documents, reports, and literature on in-service education for medical, pharmacy, nursing, and clinical officers
2. Contacting and seeking information from relevant contact person(s) at CBoH, training institutions, professional councils and associations, disease programs, local and international organizations, and other relevant bodies to help identify the continuing education

Data Collection Technique

In the collection of data, face-to-face in-depth interviews were conducted with local key informants lasting 20–30 minutes. This method of data collection was preferred because it allowed for probing. Reports and local documents outlining the details of trainings on AMR, AMU, and infectious diseases conducted in the last three years were reviewed and copies made.

Data Collection Instruments

In gathering the data, a structured interview schedule was developed for carrying out the assessment (Annex 1) that had both open-ended and closed questions. The schedule was based on the in-service trainings that are conducted, and it addressed questions about the title of trainings, types/levels of professionals trained, frequency of trainings, dates of trainings and hours/days of exposure, and details of specific topics that have been covered in the trainings. Other data sought through the schedule included information on infectious disease, AMR, AMU, and STGs-related trainings.

Study Sites and Samples

Data were collected from 13 of a targeted 19 institutions and organizations that offer training to health care providers: government health institutions, professional bodies, and local and international organizations in Lusaka, Zambia. The following types of institutions were selected on the basis of a convenience sample because they are health-related institutions and are involved in training of health workers.

Government Institutions

- CBoH
- Ministry of Health (MoH)
- National Malaria Control Centre (NMCC)
- National AIDS Council

Training Institutions

- University of Zambia School of Medicine
- Evelyn Hone College
- Chainama College of Health Sciences
- Lusaka School of Nursing and Midwifery

Research Institutions

- Tropical Disease Research Center (TDRC)
- Center for Infectious Disease Research in Zambia (CIDRZ)

Regulatory Bodies

- Medical Council of Zambia (MCZ)
- General Nursing Council (GNC)
- Pharmacy and Poisons Board

Professional Bodies

- Medical Association of Zambia
- Zambia Nurses Association (ZNA)
- Pharmaceutical Society of Zambia

Local/International Organizations

- Churches Health Association of Zambia (CHAZ)
- JHPIEGO
- HIV/AIDS Alliance

FINDINGS

Of the 19 listed organizations, 13 were interviewed. Some training institutions declined to participate because they mainly offer preservice trainings. Other organizations—that is, the Pharmacy and Poisons Board and National AIDS Council—do not offer any form of training to health workers, while others were not willing to give information.

Details of Interviews

CBoH Pharmacy Unit

The pharmacy unit is a wing of CBoH that ensures drug security; develops, implements, and maintains a functioning logistics management system with regard to pharmacy; gives support to health institutions to ensure that supplies are available; implements rational use of medicines; and also serves as secretariat to the Zambia National Formulary Committee and National Drug Policy. The unit works with all health workers handling medicines.

The key informant was the pharmacy technologist on behalf of the Principal Pharmacy Advisor. She reported that CBoH has conducted in-service training in the form of workshops in AMU, AMR, and infectious diseases, in particular malaria. Only one in-service workshop has been conducted in the last three years—a five-day training session with six hours of exposure per day. The title of the training session was “Rational Drug Use,” and the specific topics covered were patients’ behavior in AMU and education of patients and adherence to prescribed treatment. Participants were drawn from medical officers, clinical officers, laboratory personnel, and nurses. The informant felt CBoH members are familiar with the STGs, especially those at provincial levels where the STGs have been disseminated, although she was not very sure whether all the health workers have access to the STGs. It was also reported that the pharmacy unit of CBoH has not conducted any trainings on STGs.

Lusaka Provincial Health Office

The Lusaka Provincial Health Office is an institution under the CBoH that is responsible for giving technical support and assessing, monitoring, and evaluating performance of district health offices in Lusaka province. The interview was conducted with the Provincial Tuberculosis/Leprosy/HIV focal point person, who reported that several in-service trainings have been conducted among doctors, nurses, clinical officers, and pharmacists. A total of 12 trainings have been done, that is, one training per quarter in AMU and infectious diseases. The specific titles of these trainings were “Management of HIV/AIDS and Opportunistic Infections,” “Training in New Tuberculosis World Health Organization Modules,” “Sexually Transmitted Infections,” and “Management of Malaria.” The TB trainings lasted one week, HIV/AIDS two weeks, and malaria three to four days. The approximate hours of exposure per day were eight.

Specific topics covered included rational use of medicines, HIV/AIDS and malaria in pregnancy, insecticide-treated nets, indoor residue spraying, malaria case management, and the malaria business plan. In TB, specific topics included case detection, TB treatment, continuation of treatment, community Directly Observed Treatment, Short-course (DOTS), record keeping and recording, and monitoring and evaluation. The institution has a standard curriculum it uses to train health workers in those topics. It also uses additional materials with the following titles: “WHO Modules in TB/ National Guidelines,” “Opportunistic Infection Reference Manual” (facilitator’s and participant’s guide), “ART Reference Manual” (facilitator’s and participant’s guides), and “PMTCT Reference Manual” (facilitator’s and participant’s guides), “STI Manuals,” and “National Malaria Control Modules on Malaria.”

For future continuing education, the informant suggested that the priority diseases, which include TB and malaria, should be focused on.

JHPIEGO

JHPIEGO is an affiliate of Johns Hopkins hospital in the United States that works in Zambia to improve the health of women and their families by providing technical assistance to CBoH/MoH, developing training manuals and conducting training for health workers. The institution works with all government institutions as well as private sector and other organizations involved in health service delivery.

The key informant was the consultant, who reported that the organization has conducted several in-service trainings for medical officers, nurses, clinical officers, laboratory personnel, pharmacists, pharmacy technicians, and nutritionists from February 2004 to March 2005. In-service training has been conducted in infectious diseases, specifically in HIV/AIDS. More than 20 training sessions have been conducted in the last three years. The titles of these trainings are “Opportunistic Infection Management,” “Antiretroviral Therapy (ART) Management,” and “Prevention of Mother-to-Child Transmission (PMTCT) of HIV/AIDS.” The trainings in opportunistic infection (OI) management and ART management were for one week each, and the PMTCT was for two weeks. The approximate hours of exposure were seven to eight hours per day. Specific topics covered included HIV/AIDS information and management issues, goals and general principles of antiretroviral therapy (ART), managing ART, guiding principles for the management of OIs, and syndromic management of OIs and HIV-related conditions.

Other topics covered included infection prevention and infection control, accurate diagnosis and management of common OIs, and education of patients on antiretroviral (ARV) use and adherence to prescribed treatment. The institution has a standard curriculum it uses to train health workers in these topics. It also has materials that are used with the following titles: “Opportunistic Infection Reference Manual” (facilitator’s and participant’s guides), “ART Reference Manual” (facilitator’s and participant’s guides), and “PMTCT Reference Manual” (facilitator’s and participant’s guides). The trainings are based on the STGs though no specific training has been conducted on them.

The informant suggested that ARV drug resistance and importance of adherence to treatment should be some of the topics to be included in future continuing education.

National Malaria Control Centre

From the NMCC, information was collected from the Case Management Specialist under the directive of the Executive Director. NMCC is a government institution that was set up to facilitate implementation of malaria intervention programs in the country. It works with all health workers from policy makers to medical officers, nurses, clinical officers, pharmacists, and laboratory personnel.

The organization has been conducting in-service trainings for health workers. Areas where in-service trainings have been conducted include infectious diseases, in particular, malaria and antimalarial resistance. In the last three years, 72 in-service trainings have been conducted in Zambia, and all the districts have been covered. The trainings focused on Coartem use and chloroquine resistance. The trainings on chloroquine resistance in the country were conducted between January 2003 and December 2003 and those on Coartem use were conducted from November 2003 to November 2004. These training sessions lasted two days, with six hours of exposure per day. The specific topics that were covered included drug regimens, storage, efficacy, pharmacovigilance (side effects), factors contributing to the development of resistance to antimalarials, how to delay resistance, and consequences of drug resistance. Other topics covered included problems of irrational use of antimalarials, problems of antimalarial resistance, importance of appropriate use of antimalarials, infection prevention and infection control measures, accurate diagnosis and management of malaria, and education of patients on antimalarial use and adherence to prescribed treatment. The cadres who were trained are medical officers, clinical officers, nurses, and pharmacists. The institution has a standard curriculum, and other materials used are a Malaria Case Management manual and monogram on Coartem. The institution has adopted the STGs and has conducted training on the malaria diagnosis and treatment component of the STGs.

For future continuing education in infectious diseases, antimalarial resistance, and AMU, priority topics the NMCC feels should be included are medical ethics as regards malaria medicine prescription and communication skills to patients and the general public.

Center for Infectious Disease Research in Zambia

The key informant from CIDRZ was the Director-Department of Medicine. CIDRZ is a nongovernmental organization that provides technical support to District Health Management Boards on ARV programs. It works with clinical officers, nurses, pharmacists, medical officers, and HIV/AIDS counselors. The organization conducts in-service training in infectious diseases, mainly HIV/AIDS. From May 2004 to December 2004, 15 in-service trainings have been conducted in 15 clinics in Lusaka on ART, which are one-day training sessions with four to six hours of exposure. Clinical officers and nurses were trained, and specific topics that were addressed are HIV/AIDS and ART. Other topics included were infection prevention and control measures, accurate diagnosis and management of OIs, and education of patients on ARV use and adherence to prescribed treatment. CIDRZ has

adopted the CBoH ARV treatment guidelines (STGs on HIV). However, CIDRZ has not conducted trainings on the STGs.

For future continuing education in areas of infectious diseases, AMR, and AMU, a topic that CIDRZ feels should be included is rational prescribing of medicines for OIs, especially cotrimoxazole.

General Nursing Council

The GNC is a statutory body established to conduct registration of nurses and midwives in Zambia; to regulate nursing practice; and to set and maintain standards of education, practice, and research among nurses and midwives. The institution works with all nursing cadres in the country.

The key informant was the Acting Registrar, who reported that the institution has been conducting in-service trainings on behalf of its members, particularly in infectious diseases (“Infection Prevention Practices in HIV/AIDS, TB, and STIs”). So far, six in-service trainings have been conducted in the last three years. The duration of each training session was 10 working days with eight hours of exposure per day. The specific topics that were covered included infection prevention practices in maternal and child health, HIV/AIDS and OIs, infection prevention and control measures, accurate diagnosis, and management of common OIs.

These training sessions have been ongoing since 2002, and the health workers trained were teaching staff members from the schools of nursing and midwifery. The organization has a standard curriculum and it also uses the nursing curriculum and learning guidelines, JHPIEGO training manuals for reproductive health, and JHPIEGO training manuals for Infection Prevention Practices. The informant was not sure whether the nursing fraternity is familiar with the STGs because it was just recently launched and therefore the GNC has never conducted any training on the STGs. For future continuing education in areas of infectious diseases, AMR, and AMU, the topics that the council thought should be included are treatment adherence and side effects, medicine prescription by the nurses (what to look for), and pharmaceuticals and logistics management.

Zambia Nurses Association

ZNA is a nongovernmental organization that was formed to protect and promote the interest of nurses and midwives; to assist members in promoting and improving health services for the public, skills in nursing education, management and leadership, and clinical practice and research; and to promote high professional ideals among members by taking steps necessary from time to time to further the knowledge, education, and experience of members. The association represents all nurses in the country and works with other health bodies. The informant was the Malaria Control Coordinator, who is a member of the National Executive of ZNA.

To realize its objectives and functions, the organization has been conducting in-service trainings in the form of workshops in all the provinces of Zambia. The trainings have focused on infectious diseases, particularly malaria and HIV/AIDS. Under HIV/AIDS, three training sessions have been conducted in each of the nine provinces in the last three years. These are five-day training sessions with eight hours of exposure. The titles of the trainings covered were “HIV/AIDS Infection Control and Prevention” and “Malaria Control and Prevention.” Specific topics covered under HIV were HIV/AIDS infection control, OIs, and treatment, while in malaria specific topics included prevention of malaria, use of antimalarials, and chloroquine resistance. The association has a standard curriculum it is using and also uses the National Malaria Control Manual, ZNA-Norvatis Manual (still in draft form), and JHPIEGO Training Manuals for ART. The informant felt that ZNA members are not familiar with the STGs, which coincides with the GNC view. For future continuing professional education, the topics that should be included are new antibiotics and their efficacies and medicines that are resistant and alternatives.

Churches Health Association of Zambia

CHAZ is a nongovernmental organization formed as an umbrella for church-run health institutions. It is involved in resource mobilization, capacity building, logistics support, and health care delivery. The informant was the Pharmaceutical and Logistics Manager. He reported that CHAZ runs mission health institutions in the country and therefore works with all health workers—medical officers, pharmacists, nurses, pharmacy technologists, clinical officers, laboratory personnel, and environmental health technologists. The organization has conducted in-service trainings, particularly in AMU and infectious diseases (HIV/AIDS and TB). During the last three years, seven training sessions have been conducted in AMU and nine training sessions in infectious diseases (HIV, STI, and TB DOTS). These spanned from December 8, 2002, to August 28, 2004. The duration of each training session was six days, with eight to nine hours of exposure per day. Health workers trained included medical officers, nurses, pharmacy technologists, clinical officers, and environmental health technologists.

The titles of these trainings included “Drug Management and Rational Use,” including sessions on AMU; “HIV/AIDS Clinical Management,” including ARTs; “TB DOTS”; and “Adherence to ARVs.” The specific topics covered include principles of AMU, problems of AMR, importance of rational use of antimicrobial drugs, choice of antimicrobial drugs, HIV/AIDS clinical management including highly active antiretroviral therapy (HAART), TB DOTS, and adherence to ARVs.

The organization has a standard curriculum that was adopted from WHO/Management Sciences for Health (MSH) rational medicine use training materials, the International Dispensary Association (managing pharmaceutical supplies, managing HIV supplies), and the World Bank (managing, procurement, and use of HIV/AIDS-related supplies). The informant reported that for future in-service training, the following topics should be considered: resistance to TB drugs, resistance to antimalarials, and strategies in delaying and preventing development of drug resistance.

Lusaka School of Nursing and Midwifery

The informant was the Nursing Education Manager, and she reported that the institution is a government training institution formed to train nurses and midwives. It offers preservice training for nurses, midwives, and theater nurses. The institution does not conduct any in-service training, not even for its staff. However, for training of would-be nurses, the institution feels a need exists to conduct in-service training for its teaching staff in AMU, AMR, and infectious diseases.

School of Medicine (University of Zambia)

The interview was conducted with the dean of the school. The School of Medicine is a teaching institution under the University of Zambia offering preservice training for medical officers, physiotherapists, pharmacists, and biomedical scientists. The institution also conducts research and consultancy in the field of medicine. At the preservice level, topics on AMU, AMR, and infectious diseases are taught in the form of lectures and seminars. The lectures are one-hour long while the seminar sessions last three to four hours. No in-service training is conducted.

Medical Council of Zambia

MCZ is a statutory body established to determine, maintain, and develop optimal standards of medical, dental, pharmaceutical, biomedical, and paramedical practice in Zambia aimed at protecting the patients and guiding the professionals by registering health professions and regulating their professional conduct.

The informant was the Registrar heading the council. The council does not conduct any in-service training for its members. However, because of the emerging problems of AMR, the council suggested that for future continuing education in this area, topics addressing alternative drug regimens should be offered in in-service trainings.

Dental Training School

Lusaka Dental Training School is a government training institution offering preservice training in dental therapy and dental technology. It also provides clinical and laboratory service to outpatients. An interview with the Principal Tutor revealed that the institution does not conduct any in-service training in AMU, AMR, or infectious diseases.

Pharmaceutical Society of Zambia

The Pharmaceutical Society of Zambia is an organization that represents pharmacists and all pharmacy cadres. The institution has conducted trainings in the form of workshops for its members. The key informant was the president and he reported that one training has been done so far. The specific topics that were covered included HIV policy and access to ART, TB, pneumocystis carinii, STIs, malaria, the role of the pharmacist in the fight against the

HIV/AIDS pandemic, concepts of rational ART commodity use and the drug use process, dispensing practices, and STGs.

Summary of Findings

Table 1 shows the organizations and key informants who were interviewed. These key informants were either heads of the organizations or representatives directed by the head to participate in the interviews.

Table 1. Inventory of Key Informants

N = 13

Organization	Informant
Central Board of Health–Pharmacy Unit	Pharmacy Technologist
Lusaka Provincial Health Office	Provincial Tuberculosis/Leprosy/HIV focal point person
JHPIEGO	Consultant
National Malaria Control Centre	Case Management Specialist
Center for Infectious Disease Research in Zambia	Director–Department of Medicine
General Nursing Council	Acting Registrar
Zambia Nurses Association	Malaria Control Coordinator
Churches Health Association of Zambia	Pharmaceutical and Logistics Manager
Pharmaceutical Society of Zambia	President
School of Medicine–University of Zambia	Dean–School of Medicine
Medical Council of Zambia	Registrar
Lusaka Dental Training School	Principal Tutor

The results in Table 2 show that of the 13 organizations assessed, 5 conducted comprehensive in-service trainings ranging from 12 to 72 trainings in the last three years. The duration of training ranged from 1 to 10 working days.

Table 2. Institutions/Organizations That Have Conducted In-Service Training for Health Workers in the Last Three Years

N = 13

Organization	Number of In-Service Trainings Conducted	Duration per Training Session	Hours of Exposure per Day	Health Workers Trained
CBoH	1	5 days	6½	Medical officers, clinical officers, laboratory personnel, pharmacists, and nurses
Lusaka Provincial Health Office	12	TB: 1 week HIV/AIDS: 2 weeks Malaria: 3–4 days	8	Medical officers, clinical officers, pharmacists, and nurses
JHPIEGO	More than 20	ART: 1 week OIs: 1 week PMTCT: 2 weeks	8	Medical officers, clinical officers, laboratory personnel, pharmacists and nurses, nutritionists
NMCC	72 (all districts in Zambia)	2 days	8	Medical officers, clinical officers, pharmacists, and nurses
CIDRZ	15 (in 15 clinics under Lusaka District Health Management Board)	1 day	4–6	Clinical officers and nurses
GNC	6	10 days	8	Teaching staff from schools of nursing and midwifery
ZNA	4	5 days	8	Clinical officers, laboratory personnel, pharmacists, and nurses
CHAZ	16	6 days	8–9	Medical officers, clinical officers, lab personnel, nurses, environmental technologists, and community health workers
Pharmaceutical Society of Zambia	1	2 days	9	All pharmacy cadres
Lusaka School of Nursing	0	not applicable	not applicable	not applicable
School of Medicine	0	not applicable	not applicable	not applicable
MCZ	0	not applicable	not applicable	not applicable
Lusaka Dental School	0	not applicable	not applicable	not applicable

From Table 3, it can be seen that most of the organizations conducted in-service training in infectious diseases (malaria, HIV/AIDS, and TB), including aspects of ARV management and antimalarials. Only three organizations (CHAZ, CBoH, and Pharmaceutical Society of Zambia) did some training in rational use of antimicrobials.

Table 3. Titles of Trainings Offered

N = 13

Organization	Titles of Trainings Offered
CBoH	AMU/Infectious diseases: Rational Drug Use
Lusaka Provincial Health Office	AMU/Infectious diseases: Management of HIV/AIDS and Opportunistic Infections, Training in New Tuberculosis World Health Organization Modules, Sexually Transmitted Infections, Management of Malaria
JHPIEGO	Infectious diseases: Opportunistic Infection Management, ARV Management, and PMTCT
NMCC	Infectious disease: Coartem Use and Chloroquine Resistance
CIDRZ	Infectious diseases: ARV Therapy
GNC	Infectious diseases: Infection Prevention Practices in Maternal and Neonatal Health, Infection Prevention in HIV/AIDS, and Opportunistic Infections
ZNA	Infectious diseases: HIV/AIDS Infection Control and Prevention, Malaria Control and Prevention
CHAZ	AMU/AMR: Pharmaceutical Management and Rational Use of Antimicrobials Infectious diseases: HIV/AIDS Clinical Management including ART, Adherence to ARVs, DOTS in TB
Pharmaceutical Society of Zambia	AMU/AMR: HIV Policy and Access to ART, TB, pneumocystis carinii, STIs, Malaria, The Role of the Pharmacist in the Fight against the HIV/AIDS Pandemic, Concepts of Rational ART Commodity Use—the Drug Use Process, Dispensing Practices, and STGs
Lusaka School of Nursing	None
School of Medicine	None
MCZ	None
Lusaka Dental School	None

Table 4 shows specific topics that are covered during in-service trainings. Most organizations conducted in-service trainings on infectious diseases, mainly HIV/AIDS and malaria. CHAZ went further to train on rational use of antimicrobials.

Table 4. Specific Topics Covered in the Trainings

N = 13

Organization	Specific Topics Covered
CBoH	AMU/AMR— <ul style="list-style-type: none"> • Patients' behavior in use of antimicrobials and education of patients and adherence to prescribed treatment
Lusaka Provincial Health Office	AMU/Infectious diseases— <ul style="list-style-type: none"> • Rational use of medicines, malaria in pregnancy, malaria case management, and the malaria business plan • TB case detection, TB treatment, continuation of treatment, community DOTS, record keeping and recording, monitoring and evaluation
JHPIEGO	Infectious diseases— <ul style="list-style-type: none"> • HIV information and management • Guiding principles for OIs, syndromic management of OIs and HIV-related conditions • Goals and general principles of ARV therapy, managing ARV therapy
NMCC	Infectious diseases— <ul style="list-style-type: none"> • Factors contributing to development of antimalarial drug resistance, how to delay drug resistance, and consequences of drug resistance • Dosage regimens, storage, and drug efficacy, pharmacovigilance (side effects), irrational use of antimalarials, importance of appropriate use of antimalarials, infection prevention and infection control measures, accurate diagnosis and management of malaria, education of patients on antimalarial use and adherence to prescribed treatment
CIDRZ	Infectious diseases— <ul style="list-style-type: none"> • HIV and ARV therapy, infection prevention and control measures, accurate diagnosis and management of OIs, education of patients on ARV use and adherence to prescribed treatment
GNC	Infectious diseases— <ul style="list-style-type: none"> • STIs, HIV/AIDS, TB, OIs, accurate diagnosis and management of common OIs, infection prevention practices in maternal and child health
ZNA	Infectious diseases— <ul style="list-style-type: none"> • HIV/AIDS infection control and treatment of OI • Malaria prevention, use of antimalarials, and chloroquine resistance
CHAZ	AMU/AMR/Infectious diseases— <ul style="list-style-type: none"> • Principles of AMU, choice of antimicrobial drugs • Problems of AMR and Importance of rational use of antimicrobial medicines • TB DOTS • HIV/AIDS clinical management including HAART and adherence to ARVs
Pharmaceutical Society of Zambia	AMU/AMR— <ul style="list-style-type: none"> • HIV policy and access to ART, TB, pneumocystis carinii, STIs, malaria, the role of the pharmacist in the fight against the HIV/AIDS pandemic, concepts of rational ART commodity use—the drug use process

Table 5 shows some of the topics that organizations recommended for inclusion in future continuing education. Almost all the organizations recommended that AMU and AMR, including infectious diseases, should be considered for continuing professional education.

Table 5. Suggested Priority Topics for Future Continuing Professional Education

N = 13

Organization	Priority Topics
CBoH	<ul style="list-style-type: none"> • Infectious diseases: HIV/AIDS, STIs management
Lusaka Provincial Health Office	<ul style="list-style-type: none"> • Infectious diseases: TB and malaria
JHPIEGO	<ul style="list-style-type: none"> • ARV and drug resistance • Importance of adherence to treatment
NMCC	<ul style="list-style-type: none"> • Medical ethics in prescribing of antimalarials • Communication skills to patients and the general public
CIDRZ	<ul style="list-style-type: none"> • Rational prescribing of medicines for OIs, especially Septrin
GNC	<ul style="list-style-type: none"> • Drug adherence versus side effects • Sensitization and effects of AMU • Medicine prescription by nurses, what to look for • Pharmaceutical and logistics management
ZNA	<ul style="list-style-type: none"> • Drug resistance and alternative regimens • New antibiotics and their efficacy
CHAZ	<ul style="list-style-type: none"> • Resistance to ARVs • Resistance to anti-TB medicines • Resistance to antimalarials • Strategies to delay and prevent development of drug resistance
Lusaka School of Nursing and Midwifery	<ul style="list-style-type: none"> • Antimicrobial use and resistance
School of Medicine, University of Zambia	<ul style="list-style-type: none"> • HIV/AIDS-related medicine interactions • Systemic pharmacology
MCZ	<ul style="list-style-type: none"> • Emerging epidemics • Alternative drug regimens
Lusaka Dental Training School	Not applicable

Summaries of Teaching Materials and Documents Collected

It was difficult to get some documents, such as the curricula for certain organizations. Others indicated that their teaching manuals were still in draft form and therefore could not be released. However, the following documents were reviewed and summaries made. In summarizing these documents, the title of the document and main topics and issues highlighted in the documents are discussed. Copies of these documents are compiled separately.

CBoH/Government of Zambia (GRZ). 2004. *Antiretroviral Therapy, Course Notebook for Participants*. (March 2004 edition)

This is a training manual for participants for management of ART. It has guiding principles for providing ART, patient assessment, when to start the therapy, when to change the regimen, what to change to, when to stop, and when to refer and follow up care of patients on ARVs.

The manual highlights the ARV combinations available in Zambia, and it describes the drug actions, interactions, and side effects.

CBoH/GRZ. 2004. *Management of Antiretroviral Therapy, a Reference Manual for Health Workers*. (November 2004 edition)

This is a training manual for health workers for management of ART. It has guiding principles for providing ART, patient assessment, when to start the therapy, when to change the regimen, what to change to, when to stop, and when to refer and follow up care of patients on ARVs.

The manual highlights the ARV combinations available in Zambia, and it describes the drug actions, interactions, and side effects.

GRZ. 2004. *Management of Opportunistic Infections and Neoplasms, a Reference Manual for Workers*. (November 2004 edition)

This manual is on OIs that come along with HIV/AIDS, such as TB, pneumonia, malaria, septicemia, and pneumocystis. It highlights how these infections can be prevented, successfully treated, and prophylaxis initiated to prevent disease recurrence. It outlines the methods of diagnosis and treatment regimen of these infections and conditions.

CBoH/MoH. 2004. *Prevention of Mother to Child Transmission of HIV (PMTCT), a Reference Manual for Health Workers*. (May 2004)

This manual addresses the basic PMTCT services. The manual incorporates four arms of PMTCT. It includes primary prevention of HIV, prevention of unwanted pregnancies, prevention of perinatal infections for babies born to infected mothers, and linkages to long-term care and support for those infected. It also has a component on community partnership, primary prevention, and family planning; counseling and testing for HIV; prenatal care, labor, and delivery, and postnatal care to prevent MTCT; mother and young child nutrition; ARVs in pregnant women, including both short-course ART and linkages to clinical care services providing HAART; and basic management of quality PMTCT services.

GRZ. 2004. *Malaria Case Management. Educational Programme*.

This teaching material was adopted from a Malaria Case Management educational program that was held at Mulungushi International Conference Center in Lusaka, Zambia, September

20–24, 2004. It discusses malaria in general, in children, and in pregnancy and diagnostic methods. It highlights treatment regimens of malaria in adults, pregnant women and children; preventive methods resistance to antimalarial medicines; cost-effectiveness, pharmacovigilance, and monitoring; Novartis (Coartem) clinical programs, logistics (pharmaceutical supply management of Coartem), and the role of communication in malaria case management.

CBoH/GRZ. 2004. *Standard Treatment Guidelines, Essential Medicines List, and Essential Laboratory Supplies List for Zambia*. 1st edition.

These STGs are the first of their kind in Zambia. They are comprehensive treatment guidelines for management of common diseases and conditions and provide for the rational use of medicines and supplies. The book describes the disease condition in detail, highlighting clinical features and methods of diagnosing the disease. The last component of any disease condition described is the list of drug regimens and the alternatives that can be used to treat the condition. The complications or sequelae of the condition are listed, and prevention and control measures are described for some conditions. The STGs were designed to suit the Zambian situation, placing emphasis on cost-effective management of disease conditions, thereby making them an easy tool for prescribers and procurers to use.

CHAZ Pharmaceutical Management and Rational Use Teaching Materials

This course is designed in such a way that it addresses issues of pharmaceutical management and rational use from the stage of planning drug requirements, to decision making for rational medicine use interventions.

The specific topics that are covered in this teaching material are—

- Planning medicine requirements. This topic highlights methods of estimating medicine requirements (consumption method and morbidity method), and steps in planning medicine requirements.
- Pharmaceutical management information systems. The topic highlights the importance of a pharmaceutical management information system.
- Problems of irrational medicine use.
- Learning about a medicine use problem.
- Sampling to study medicine use.
- Implementing a medicine use indicators study.
- Field visit to learn about medicine use. This is a practical session involving visits to a local health facility so that participants can be able to—
 - Identify quantitative and qualitative data available about medicine use in a variety of local health facilities.

- Plan the logistic aspect of data collection process in these facilities.
- Framework for changing medicine use practices. In this session, factors that influence medicine use are identified and interventional strategies to improve medicine use are given.
- Standard treatments. This session highlights advantages of standard treatments, key features of standard treatments, and development and implementation of standard treatments.
- Role of dispensers in promoting rational medicine use. A dispenser is described, as well as dispensing processes, dispensing practices that enhance rational medicine use, roles of prescribers and dispensers, and promoting correct dispensing methods to improve compliance with therapy, public versus private sector dispensing.
- Decision making for rational medicine use interventions. This topic covers choosing strategies to test and implement. It includes methods of choosing managerial and regulatory strategies in pharmaceutical management, testing the strategies, and implementing them.

Discussion of the Findings

Introduction

This study was a rapid assessment on in-service training on rational AMU and AMR provided to medical officers, pharmacists, nurses, and clinical officers in Zambia. The study was conducted in Lusaka, the administrative capital of Zambia. The objective of the study was to assess the in-service trainings that have been conducted in AMU, AMR, and STGs among institutions that provide preservice and in-service training to health workers in the country. It was a four-week assessment with one week of data collection.

The institutions that took part in the study were selected for convenience to meet the objective of the study. These institutions were either government or nongovernmental organizations with local and international affiliation. Nineteen institutions were targeted to take part in the study. However, only 13 institutions were able to provide the comprehensive information desired. Other institutions declined to take part because they felt the information sought was outside their functional and operating spheres.

The 13 institutions that took part in the study are the following: CBoH–Pharmacy Unit, Lusaka Provincial Health Office, NMCC, MCZ, GNC of Zambia, ZNA, JHPIEGO, CIDRZ, CHAZ, Pharmaceutical Society of Zambia, School of Medicine, Lusaka School of Nursing and Midwifery, and Lusaka Dental Training School.

The findings will be discussed under the following subheadings—

- Institutions assessed
- In-service training
- STGs

Institutions Assessed

The study findings revealed 5 of the 13 institutions assessed conduct comprehensive and continuous in-service trainings for health workers. These institutions had conducted from 12 to 72 training sessions in the last three years. The organizations that had comprehensive training programs are Lusaka Provincial Health Office (12), CHAZ (16), NMCC (72), JHPIEGO (more than 20), and CIDRZ (15). Other institutions from the 13 had conducted from 0 to 6 training sessions and are GNC (6), ZNA (4), CBoH (1), Pharmaceutical Society of Zambia (1), MCZ, School of Medicine, Lusaka School of Nursing and Midwifery, and Lusaka Dental Training School (0).

JHPIEGO was found to be instrumental in conducting continuing education for health workers and developing teaching materials in the country. The organization has conducted more than 20 refresher courses and developed teaching materials. The assessment showed that its in-service programs are well organized. The rational use of ARVs and STGs is well stipulated in their teaching materials, and many institutions have adopted their teaching materials for training purposes. However, those materials were limited to HIV/AIDS and ART management. The area of AMU and resistance is not dealt with except for a small component on management of OIs. JHPIEGO's successful organization of in-service training programs could be partly attributed to the good funding system that the organization enjoys and the vision it has on improving the health of women and their families.

The local nongovernmental organization that has made strides in training health workers in church health institutions is CHAZ. It is the only organization that was found to be training health workers in AMU and AMR. In the last three years, the organization had conducted 16 in-service training courses from pharmaceutical management and rational use, HIV/AIDS and ART management, to DOTS in TB.

CIDRZ is a research institution providing technical support to Lusaka District Health Management Board in ARV programs. The organization has conducted one-day trainings in 15 clinics in Lusaka. The focus has been in HIV/AIDS and ART management.

NMCC is a government institution that has conducted 72 refresher courses on antimalarials in all Zambian districts. This achievement could be owing to the Zambian government's embarking on phasing out chloroquine and replacing it with Coartem as the first-line drug in treating malaria. As an institution created by the government to facilitate implementation of antimalarial interventions, NMCC had to do a lot of work to educate the health workers and public on the new drug.

The institutions that had not conducted any in-service training primarily offer preservice trainings. However, it was mentioned that their members (teaching staff) have attended in-service trainings offered by other organizations. MCZ was involved solely in regulatory functions of the medical standards in the country and does not conduct any refresher courses for its members. Resources and funding could be one of the factors that may have caused those institutions to stick to preservice trainings. International and local nongovernmental

organizations that had donor support were observed to be active in the in-service training of their members.

The health workers trained come from all levels—medical officers, clinical officers, nurses, pharmacists, laboratory personnel, and environmental health technicians. CHAZ had gone further to train community health workers in DOTS (see Table 2).

In-Service Trainings

Refresher courses (in-service training) for health care providers are a well-recognized tool for improving rational medicine use because it is accompanied with the dissemination of new information, thereby allowing the health care provider to fully comprehend the change. Of the 13 institutions that provided the comprehensive information desired in the assessment, 9 had conducted in-service trainings or refresher courses.

The duration of each training session ranged from 1 to 10 working days with an exposure of four to nine hours per day (see Table 2). Most of the in-service trainings were in infectious diseases, particularly HIV/AIDS and its OIs and malaria. This bias toward HIV/AIDS and malaria could be caused by the magnitude of the impact the two infections are having on the health sector in Zambia. The other factor could be because of the recent introduction of ARVs on the Zambia scene, requiring extensive training of health care providers in managing these medicines. CHAZ was the only organization assessed that is conducting in-service training in both HIV/AIDS and rational use of antimicrobials.

Standard Treatment Guidelines

The STGs for Zambia were launched for the first time in November 2005 by CBoH. They are a comprehensive tool for the prescribers and procurers of medicines in pharmaceutical management for the country. If properly used by the health worker, STGs can address issues of cost, efficiency, and appropriate use of medicines. The factors most contributing to the resistance of antimicrobials arise from the prescribers' attitudes, knowledge, and prescribing practices. The assessment revealed that most health workers were not familiar with the STGs; even the CBoH, which is responsible for the dissemination, was only certain of health workers being familiar with the STGs at provincial levels. The four institutions that were found to be active in conducting in-service trainings—JHPIEGO, CHAZ, CIDRZ, and NMCC—showed that they had adopted the HIV/AIDS component of the STGs from CBoH, but no trainings had been conducted on the STGs. In some organizations (specifically, statutory bodies and training institutions), they were not even aware of the launch and existence of the STGs. If the heads of institutions representing health workers are not familiar with the STGs, then there is a likelihood that the health workers at the grassroots involved in prescribing and dispensing are not aware of the STGs despite being in existence for over five months. Factors contributing to low familiarization and use of the STGs could be inadequate publicity and dissemination mechanisms by CBoH. The other reason could be because they were just recently launched and trainings have not yet been planned.

CONCLUSION AND RECOMMENDATIONS

Conclusion

The assessment was useful in identifying in-service trainings that have been conducted so far in areas of infectious diseases, AMU, and AMR in Zambia. The assessment demonstrated that some organizations in Zambia have been conducting trainings, especially in the area of infectious diseases and drug resistance to antimalarials and ART. It is evident, however, that not much has been done in Zambia on AMU and AMR, although most heads of the organizations that were involved in this assessment acknowledged the importance of training health care workers on AMU and AMR. Interestingly, in topics that should be included for future continuing education in Zambia, most organizations—especially those that are instrumental in conducting in-service training—felt topics on ARV resistance should be included. A standard treatment guideline manual for health workers exists in Zambia, but very few health workers are familiar with the manual and no training has been conducted in the use of STGs to date. Most organizations felt that continuous in-services trainings in promoting appropriate use of antibiotics, ARVs, and antimalarials should be embarked on.

Recommendations

- A need exists for a countrywide situational analysis among the health care providers to assess how much knowledge they have on rational AMU and AMR. This analysis should involve interviewing the medical officers, clinical officers, nurses, and pharmacists working in the hospitals and health centers. The findings of the current study may not fully reflect the countrywide picture because most of the nongovernmental organizations, which are active in training health workers, are located centrally and only benefit health workers in urban areas; CHAZ mostly targets church health institutions.
- In-service training for health care providers and dispensers of medicines on rational AMU and AMR should urgently be planned. All health care providers should be targeted for in-service training, including employees in the private and public sectors, pharmacy operators, and drug vendors. Teaching staff in the institutions that offer preservice training should be included in these trainings because they are responsible for training future health workers.
- Special emphasis should be placed on the STGs as trainings are planned, and it should be integrated into ongoing and established in-service training programs for RPM Plus. Efforts should be made to have the STGs integrated into curricula for all training institutions. Partners already involved in training should be requested to assist with the process.
- Training should be regular and repeated so that all health workers are trained, and training should be decentralized—that is, taken to the provincial and district levels. This strategy will ensure that all health workers involved in prescribing and dispensing the medicines understand the problem of AMR and improve on rational use of antimicrobials. It would be helpful to conduct training of trainers, which could speed up the process of covering as many health workers as possible.

- In planning for training, RPM Plus should involve all stakeholders, especially the beneficiaries. Consultations among organizations conducting in-service training will reduce duplication of training programs. As already observed, many stakeholders are conducting trainings in HIV/AIDS, which has led to neglecting the issue of AMU. Involving the stakeholders will also assist in identifying accurate training needs of health care providers.
- A monitoring and evaluation mechanism should be put in place to ensure that the trained personnel are implementing the knowledge they are empowered with if the problem of irrational AMU is to be addressed. Indicators need to be developed for this monitoring and evaluation.

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ANNEX 1. INTERVIEW GUIDELINES

RAPID ASSESSMENT OF IN-SERVICE TRAINING (CONTINUING EDUCATION) ON RATIONAL ANTIMICROBIAL USE AND AMR TO HEALTH CARE PROVIDERS IN ZAMBIA

Date:

1. Informant (position) _____

2. Name of the institution/organization _____

3. What is main function the organization? _____

4. Which health workers does your organization represent?

5. Do you conduct any in-service training for your members/employees?

- a) Yes
- b) No

If “YES” have you ever conducted any in-service training in the following areas?

- a) Antimicrobial use
- b) Antimicrobial resistance
- c) Infectious diseases (specify) _____

6. How many of these in-service trainings have you conducted in each of the following in the last three (3) years?

a) AMR _____

b) AMU _____

c) Infectious diseases _____

7. What were the specific titles of these trainings? _____

8. Which were the dates for these trainings? _____

9. Which health professionals were trained?

10. How often did you conduct these in-service trainings per year?

11. What was the duration of each training session (in months, weeks, or days)?

12. Approximately how many hours per day were allocated in a training session?

13. Which specific topics were covered in relation to

AMU _____

AMR _____

Infectious diseases

14. Were any of these topics included during these trainings?
- a) Problem of irrational use of antimicrobials
 - b) Problem of antimicrobial resistance (drug resistance)
 - c) Importance of appropriate use antimicrobials
 - d) Disease prevention and infection control issues
 - e) Accurate diagnosis and management of common infections
 - f) Education of patients on antimicrobial use and adherence to prescribed treatments
15. Do you have a standard curriculum that you have been using to conduct these trainings?
- a) Yes
 - b) No
16. Are there any other training materials that you have been using in training your employees/members?
- a) Yes
 - b) No

If yes, what are they? (List)

- a)
- b)
- c)
- d)

17. Are your members/employees familiar with the Standard Treatment Guidelines (STGs)?

18. Have you conducted any training to your employees/members on the STGs?

19. If yes, which component of the STGs did you focus on?

20. For future continuing education of physicians/nurses/pharmacists/clinical disease, AMR, and AMU, what do you think are the priority topics in the current context?

21. Do you have any other recommendations concerning in-service trainings of health care providers on AMR, AMU, infectious diseases, and STGs in Zambia?

ANNEX 2. NAMES OF KEY INFORMANTS

Organization	Informant
CBoH (Pharmacy Technologist)	Mrs. Handala
CBoH Lusaka Provincial Health office (Provincial TB/Leprosy/HIV/AIDS focal person)	Dr. Kasoma
JHPIEGO (consultant)	Dr. Nikisi
National Malaria Control Centre (Case Management Specialist)	Dr. Kango Katwiza
Center for Infectious Disease Research in Zambia (Department of Medicine)	Dr. Bolton
General Nursing Council (Acting Registrar)	Mrs. B. Chipepo
Zambia Nurses Association (Malaria Control Coordinator)	Mrs. Gertrude Mwape
Churches Health Association of Zambia (Pharmaceutical and Logistics Manager)	Mr. Chipupu Kandeke
Lusaka School of Nursing and Midwifery (Nursing Education Manager)	Mrs. Fridah Zulu
School of Medicine–University of Zambia (Dean)	Prof. Mulla
Medical Council of Zambia	Registrar
Lusaka Dental Training School	Principal Tutor

ANNEX 3. TRAINING MATERIALS USED FOR IN-SERVICE TRAINING OF HEALTH CARE PROVIDERS IN ZAMBIA

CBoH/GRZ. 2004. *Antiretroviral Therapy, Course Notebook for Participants*. March 2004 edition.

CBoH/GRZ. 2004. *Management of Antiretroviral Therapy, a Reference Manual for Health Workers*. November 2004 edition.

GRZ. 2004. *Management of Opportunistic Infections and Neoplasms, a Reference Manual for Workers*. November 2004 edition.

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GRZ. 2004. Malaria Case Management. Educational Programme.

CBoH/GRZ. 2004. *Standard Treatment Guidelines, Essential Medicines List and Essential Laboratory Supplies List for Zambia*. 1st ed.

CHAZ Drug Management and Rational Use Teaching Materials.

WHO modules in TB/National Guidelines (not collected).

