

A strategy to improve skills in pharmaceutical supply management in East Africa: the Regional Technical Resource Collaboration for Pharmaceutical Management

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Table of Acronyms

AIDS	Acquired immunodeficiency syndrome
ART	Antiretroviral therapy
ARV	Antiretroviral [medicine]
HIV	Human immunodeficiency virus
INRUD	International Network for the Rational Use of Drugs
MOH	Ministry of Health
MSD	Medical Stores Department
MSH	Management Sciences for Health
MTP	Monitoring, training and planning [approach]
NACP	National Aids Control Program
NASCOP	National Aids and STDs Control Program [Kenya]
NGO	Non-governmental organization
RPM Plus	Rational Pharmaceutical Management Plus Program [MSH]
RTRC	Regional Technical Resource Collaboration for Pharmaceutical Management
TFDA	Tanzania Food and Drug Authority
TRAC	Treatment and AIDS Research Center -Rwanda
USAID	United States Agency for International Development
WHO	World Health Organisation

Abstract

International initiatives such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, the President's Emergency Plan for AIDS Relief and the President's Malaria Initiative have significantly increased the availability and access to medicines in some parts of the developing world. However, despite improved availability, skills to quantify medicines needs, order, receive and store medicines appropriately, record medicines inventories accurately, distribute medicines for use appropriately, and advise patients on how to use medicines appropriately remains limited. The Regional Technical Resource Collaboration for Pharmaceutical Management (RTRC) has been established to help address the problem of skills shortage in pharmaceutical management in East Africa. The initiative brings together academic institutions from four East African countries to partake skills-building activities in pharmaceutical supply management.

The primary objective of the initiative was to develop and foster a regional network of institutions to build capacity for the supply chain management of medicines and related commodities. Capacity building targeted the countries' ability to; conduct assessments on pharmaceutical supply management systems, build in-country and programs' pharmaceutical management skills, and develop and implement effective skills-building approaches for pharmaceutical supply chain management.

Background

International initiatives such as the Global Fund to Fight AIDS, Tuberculosis and Malaria, the President's Emergency Plan for AIDS Relief and the President's Malaria Initiative have significantly increased the availability and access to medicines in some parts of the developing world. However, these increases in medicines supply are straining systems that are already weak in pharmaceutical supply management. These weaknesses include inadequate capacity and skills to quantify medicines needs, order, receive and store medicines appropriately and record medicines inventories accurately.

In addition, increased supply of medicines often means increased opportunity for inappropriate use [1,2,3]. Inappropriate patterns of drug use behaviour can result in unsafe pharmaceutical use, waste of resources, non-compliance, and excessive adverse drug reactions [3].

Training has been documented as the main intervention to improve pharmaceutical management skills in developing countries [4]. However, there is abundant evidence that show that training alone is often insufficiently effective to change practice [5,6,7]. And, where traditional training methods produce positive results, the change has been reported as transient, unsustainable. [5,8]. Other interventions are often necessary to reinforce training as a behaviour change strategy [8]. Locally based interventions that are inclusive of many stakeholders have been reported as effective in producing sustainable change [8,9]. In this paper we describe how, with a focus on

sustainability, acceptability, and achieving long-term capacity, Management Sciences for Health's RPM Plus Program supported Makerere University in Uganda to develop and foster a regional network of academic institutions in East Africa to build in-country and regional capacity on pharmaceutical supply management.

RTRC: What is it?

The RTRC is a network of academic and other institutions brought together to build in-country capacity on pharmaceutical supply management in four East African countries. The initiative includes Makerere University in Uganda, the University of Nairobi in Kenya, the National University Rwanda, and Muhimbili University of Health and Allied Sciences in Tanzania. The concept, represented diagrammatically in Figure 1, is modelled on lessons learnt from the International Network for Rational Use of Drugs [9,10,11]. The RTRC is a cooperative organization whose ultimate goal is to build the skills of health care workers on pharmaceutical supply management.

The RTRC consists of core groups in each of the four countries. Each country core group is multi-disciplinary and draws participants from other in-country institutions apart from academic institutions. In addition to academicians, core group members include pharmacists, social scientists, policy makers, and program implementers with responsibility for pharmaceutical supply management. Each country core group consists of 8-12 people and is coordinated at the academic institutions named above.

In Uganda, the RTRC is coordinated by Makerere University's Departments of Pharmacology & Therapeutics and the Department of Pharmacy. The Uganda RTRC

works with and complements existing country initiatives such as the Academic Alliance which runs programmes for HIV/AIDS treatment and care. The Kenya RTRC is based at the School of Pharmacy at Nairobi University. Other institutions involved in the initiative in Kenya include the Kenya Medical Research Institute, the Ministry of Health (MOH) and the National Aids and STDs Control Program (NASCO). In Tanzania, the RTRC is based in the School of Pharmacy at Muhimbili University of Health and Allied Sciences. Other participating institutions in Tanzania include the MOH, the National AIDS Control Program (NACP) and the Tanzania Food and Drug Administration (TFDA). In Rwanda, the RTRC is based at the Institute of Public Health and the Department of Pharmacy in the School of Medicine at the National University of Rwanda. Other participating departments in Rwanda include the MOH and the Treatment and AIDS Research Centre (TRAC).

Regional Coordination and Technical Assistance

Regionally, the RTRC is coordinated by Makerere University. Makerere University's central role includes coordinating regional activities, identifying and mobilizing resources for regional activities and centralised monitoring and evaluation. Technical assistance for the RTRC is provided by Management Sciences for Health's RPM Plus Program. RPM Plus is a United States Agency for International Development supported program that has vast international experience on addressing pharmaceutical supply management challenges. RPM Plus' areas of expertise include designing and applying tools to understand pharmaceutical management systems, providing technical guidance in strategy development, program implementation, training local healthcare staff to improve the efficiency of pharmaceutical supply

systems and working with policymakers, researchers and managers in the public and private sectors to implement new and proven interventions. Using limited resources, RPM Plus worked closely with the RTRC to build their skills and competencies in many areas of pharmaceutical supply management.

Why was it formed?

The RTRC was formed to build regional and in-country capacity on pharmaceutical management, including addressing bottlenecks on commodities supply chain.

Capacity building activities are linked with national needs. Activities are identified, designed, and conducted according to their relevance to national priorities and if they can be linked to country-level interventions. For example, the development of training programs for HIV/AIDS pharmaceutical management in Uganda (to be discussed later) was linked to the NACP's goal to build the skills of facility-level healthcare workers involved in the supply management of HIV/AIDS medicines and related commodities.

What activities is the RTRC involved in?

Assessment of HIV/AIDS Pharmaceutical Supply Management Systems

One of the main activities undertaken by the RTRC was conducting assessments of the HIV/AIDS pharmaceutical supply management systems in the four countries. The assessments sought to; determine the capacity of the healthcare systems of the four countries to select, quantify, distribute, and appropriately use ARVs and related commodities; determine the categories of healthcare workers involved in the supply

chain management of HIV/AIDS pharmaceuticals and assess their knowledge, skills and practices.

The results of the assessments showed that problems with ART commodities supply management existed widely in Uganda, Kenya, Tanzania, and Rwanda. These problems ranged from the inability of the existing systems to adequately handle scale-up programs to lack of readiness of the workforce to efficiently use and manage large supplies of antiretrovirals, including inadequate capacity to quantify needs, distribute the medicines, to inappropriate medicines distribution practices. Inadequate skills were cited as the main reason for the identified problems in all four countries. There was thus need to build skills in HIV/AIDS pharmaceutical supply management in all four countries. Skills building processes that included local institutions were preferred as these would cover wider geographical areas. These were also regarded as more sustainable. The methodology and comprehensive results of this assessment have been described elsewhere [12].

Developing HIV/AIDS Pharmaceutical Management Training Materials

In 2006, the RTRC participated in a materials-development workshop in Kampala in Uganda and contributed to the development of comprehensive HIV/AIDS pharmaceutical management training materials. The workshop, facilitated by RPM Plus, resulted in the development of generic HIV/AIDS pharmaceutical management training materials. These materials can be easily adapted for local use to support ART programs. Following the development of the materials, Uganda, Kenya, and Tanzania succeeded in adapting the material for local use. These materials have been widely used for HIV/AIDS pharmaceutical management training in all four countries. Other

countries including Ghana, Namibia, and Liberia have since adapted these materials for local use.

Training on HIV/AIDS Pharmaceutical Management

In Uganda and Tanzania the RTRC has been actively participating in the training of healthcare workers on HIV/AIDS pharmaceutical management. In Uganda, this training has been supported by the NACP, WHO, Catholic Relief Services and other non-governmental organizations. In Tanzania, it has been supported by the NACP, WHO, the National Medical Stores and NGOs. To date, the Uganda RTRC has conducted three national training courses on HIV/AIDS pharmaceutical management. This translates to over a hundred healthcare workers involved in managing commodities at facilities providing ART services. In Tanzania, the RTRC has trained over sixty healthcare workers from different parts of the country on HIV/AIDS pharmaceutical management. In all four countries, many organizations, including the NACP, WHO, MSD and others involved in the management of ART commodities, have routinely used the RTRC as consultants or as facilitators for courses on pharmaceutical supply management.

Conducting Operations Research

The RTRC has been involved in conducting operations research to find solutions for their countries' skills shortage problems. Some of the interventions they tested include applying and evaluating the effectiveness of the Monitoring-Training-Planning (MTP) approach as a skills building approach for pharmaceutical supply management. MTP is an innovative approach to capacity building that empowers participants to solve

their own problems [13, 14]. It is a simple, low cost intervention that seeks to capacitate participants within their place of work. The RTRC applied MTP to 34 facilities providing ART services in Uganda, Kenya and Tanzania. The process involved working with NACP to prioritize and select facilities for skills building in each of the three countries. Workers from the selected facilities were invited to attend a skills building workshop at a central place, where results of a prior assessment on ART pharmaceutical management practices at their sites were discussed and solutions suggested. Each facility then worked on implementing suggested solutions, developing timelines for implementation and setting targets for improvement. The RTRC, together with NACP conducted follow-up visits to each of the facilities 6-weekly for a total of three visits. The results showed that MTP is an effective and sustainable intervention to build the skills of low-level healthcare workers managing commodities at ART facilities. Plans are currently underway to scale-up MTP in all three countries.

Discussion

The RTRC initiative demonstrated a capacity building model that is effective and has tremendous potential to be sustainable. Potential for sustainability is enhanced by the fact that participating institutions and groups are supported through funding for commissioned activities and products, rather than grants to support non-specific capacity building. For example, funding for Makerere University to conduct HIV/AIDS pharmaceutical management training was received from NACP, WHO and the Catholic Relief Services. Focusing on a service-oriented approach and using local institutions to address country-specific needs helps to ensure long term availability of

skills. From January 2006 to December 2007 the RTRC mobilized over four hundred thousand US dollars to support in-country programs. Table 1 shows the resources mobilized by the initiative over a period of two years.

A number of junior academic members of staff within the aforementioned institutions were targeted for capacity building. This allowed the system to build a significant pool of professionals with skills and competencies in pharmaceutical supply management. At Tanzania's Muhimbili University College of Health and Allied Health 10 academic members of staff have developed competences and skills in pharmaceutical management. These include three senior members of staff and seven junior members of staff. Makerere University in Uganda have 13 members of staff who have developed competences on pharmaceutical management, including five senior members of staff and nine junior members of staff. Makerere University has gone further and has hired three junior academic members of staff from the proceeds of their pharmaceutical management activities. The ability to build the skills of member of staff and to hire new staff demonstrates the long term potential of the model.

Following the development of the training materials and the training of a number of their academic members of on pharmaceutical supply management, Makerere University's department of Pharmacy has now adapted various components into their pre-service pharmacy curriculum. In addition, both the school of Pharmacy in Tanzania and in Uganda have plans to develop Masters of Science programs in pharmaceutical supply management that draws largely from the initiative. The development of a new curriculum and the establishment of new courses on

pharmaceutical supply management also demonstrate the potential of this approach to be sustainable.

Challenges

The main challenge faced with the program was a severely understaffed academic system. Involving academic members of staff, who were already overburdened with teaching commitments in service delivery activities was always going to present a challenge. This barrier was ameliorated by the inclusion of other institutions in the scheme and the ability of the institutions to build the skills of junior members of staff.

Conclusion

Nurturing collaboration between regional institutions in resource-limited countries to build in-country skills on pharmaceutical supply management appears to be an effective intervention. Support from local programs and technical assistance from organizations and institutions with the necessary expertise is critical for success particularly at inception. The skills acquired by local institutions can be incorporated into both pre-service and in-service teaching curricula. This ensures long term availability of skills in-country. The ability of capacitated institutions to mobilize their own resources for skills building activities is critical for the success and sustainability of the program.

Competing interests

The authors declare that they have no competing interests.

Authors' contributions

LM coordinated the RTRC for Management Sciences for Health, provided technical assistance to the initiative and coordinated and helped to draft the manuscript. PW and RO coordinate the RTRC at Makerere University and helped to draft the manuscript. IK, OM, and EB coordinate the RTRC in Kenya, Tanzania, and Rwanda respectively and all contributed to the manuscript.

Acknowledgements

This article was made possible through support provided by the U.S. Agency for International Development, under the terms of cooperative agreement number HRN-A-00-00-00016-00. The opinions expressed herein are those of the author(s) and do not necessarily reflect the views of the U.S. Agency for International Development.

The authors would like to thank Douglas Keene and David Lee both of Management Sciences for Health for helping to shape this framework.

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Tables

Table 2 –Resources Generated by the RTRC between January 2006 and December 2007

Activity	Countries	Source of Funding	Amount (US\$)
Assessment of ART commodity management practices in Uganda, Kenya, Tanzania and Rwanda	Uganda, Kenya, Tanzania, Rwanda	USAID/RPM Plus Program	\$100,000
National HIV/AIDS pharmaceutical supply management training programs	Uganda, Tanzania	National AIDS control programs, WHO, Catholic Relief Services, Medical Stores Department	\$80,000
HIV/AIDS pharmaceutical supply management training consultancies	Uganda, Kenya, Tanzania	Various in-country organizations e.g. MSD in Tanzania, NASCOP in Kenya	\$60,000
Evaluating MTP as a skills building approach for HIV/AIDS pharmaceutical management	Uganda, Kenya, Tanzania	USAID/RPM Plus Program	\$90,000,
Conducting locally-based Drugs and Therapeutics Committee Course in Uganda and Tanzania	Uganda, Tanzania	Fee paying courses	\$80,000
Total			\$410,000.00

Figure 1 - The Regional Technical Resource Collaboration for Pharmaceutical management concept

