

278400

WHO/EDM/PAR/2002.4

Harmonization of Undergraduate Pharmacy Curricula in Southern and Eastern Africa: Future Trends

**Report of a workshop in Kariba, Zimbabwe
8-11 April 2001**



**Department of Essential Drugs and Medicines Policy
World Health Organization**

© World Health Organization 2002

All rights reserved.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

The mention of specific companies or of certain manufacturers' products does not imply that they are endorsed or recommended by the World Health Organization in preference to others of a similar nature that are not mentioned. Errors and omissions excepted, the names of proprietary products are distinguished by initial capital letters.

The World Health Organization does not warrant that the information contained in this publication is complete and correct and shall not be liable for any damages incurred as a result of its use.

Table of Contents

1. Introduction.....	1
1.1 Background.....	1
1.2 Workshop objectives.....	1
1.3 Workshop methodology.....	2
1.4 Questions raised by the Workshop.....	2
2. Country presentations	5
2.1 Undergraduate curricula in South Africa: an overview	5
2.2 Undergraduate curriculum in Zambia.....	6
2.3 Progress towards undergraduate curriculum in Malawi.....	6
2.4 Progress towards undergraduate curriculum in Botswana.....	7
2.5 Undergraduate pharmacy curriculum in Uganda	7
2.6 Undergraduate pharmacy curriculum in Zimbabwe: an update.....	7
2.7 Undergraduate curriculum in the United Republic of Tanzania	8
2.8 Undergraduate curriculum in Sudan.....	8
3. Small group discussions	9
3.1 Roles of the pharmacist in Southern and Eastern Africa.....	9
3.2 Basic competencies of the pharmacist in Southern and Eastern Africa.....	9
3.3 Group A – Action plan for harmonization	10
3.4 Reporting back by Group A.....	10
3.5 Group B – Action plan for collaboration.....	12
3.6 Reporting back by Group B	12
3.6.1 Areas of harmonization.....	12
3.6.2 Areas for regional collaboration	13
3.7 The way forward for UPC harmonization.....	13
Annex 1: Workshop programme	15
Annex 2: List of participants.....	21
Annex 3: Evening session interventions	25
Annex 4: Subject presentations	29
Annex 5: List of Steering Committee members	39

1. Introduction

1.1 Background

Pharmacy education varies widely in its scope and emphasis throughout the world, and the differences in curricula in the Southern and Eastern African region are no exception.

The WHO-sponsored Nyanga workshop in 1997 issued the Nyanga Declaration, recommending the revision of the Undergraduate Pharmacy Curriculum (UPC) by institutions offering pharmacy education in Southern and Eastern Africa¹.

Recommendations included:

- adoption of a four-year pharmacy degree programme;
- skills, competency, problem-based learning and assessment methods should receive special attention in UPC;
- inclusion of practice-based learning in UPC, e.g. industrial pharmacy, retail pharmacy, hospital pharmacy and rural attachments;
- patient-oriented UPC which covers the ethical responsibilities of professional pharmacists;
- a review of UPC every 5 years.

It was necessary to review the progress made by various pharmacy education institutions and to identify obstacles encountered during the revision exercise and the new strategies being implemented. Against this background the Department of Pharmacy of the University of Zimbabwe proposed, among other things, a follow-up Workshop to consider a harmonization process for UPC in the Southern and Eastern African region. WHO agreed and sponsored the Workshop, which brought together representatives of pharmacy schools and pharmacy councils, and members of UPC review committees from Botswana, Malawi, South Africa, Sudan, Uganda, United Republic of Tanzania, Zambia and Zimbabwe. The Workshop programme is provided in Annex 1 and a detailed list of participants in Annex 2.

1.2 Workshop objectives

The overall objective of the Workshop was to formulate a strategy for the harmonization process of UPC in Southern and Eastern Africa in order to make UPC relevant to the needs of this region by:

- reviewing the progress made so far by individual pharmacy schools in UPC;

¹ WHO. Revision of undergraduate pharmacy curricula. Report of an informal consultation, Nyanga, Zimbabwe, 18-20 April 1997. Geneva: World Health Organization; 1998. WHO/DAP/98.1.

- identifying current strategies for harmonization of UPC and ensuring similar standards of training;
- recommending the adoption of problem-based and skills-based learning;
- exploring the possibilities of mutual recognition of pharmacy qualifications after pharmacy schools have harmonized their curricula;
- promoting linked programmes and the exchange of personnel, expertise and ideas within the region;
- identifying and giving guidance to those countries that do not have schools of pharmacy but intend to establish them;
- agreeing on unit standards of competency for pharmacy graduates in the region;
- identifying methods for strengthening pharmacy councils' and drug regulatory authorities' relations with schools of pharmacy in the region, in order to improve the quality of pharmaceutical services;
- recommending a structured approach for the pre-registration training of pharmacists;
- recommending appropriate postgraduate and continuing education programmes for pharmacists.

1.3 Workshop methodology

The Workshop was held for four days, with participants from schools of pharmacy, pharmacy councils, drug regulatory authorities and resource persons from WHO.

The first evening was taken up with introductory speeches and a group dinner. The opening and welcome address was given by Dr C. Nherera, Acting Vice-Chancellor of the University of Zimbabwe. This was followed by plenary lectures by Professors C. Mackie and R. Summers, both WHO resource persons, working at universities which have WHO Collaborating Centres covering pharmacy curriculum development. The final remarks were made by Professor S. Tswana, Dean of the Faculty of Medicine, University of Zimbabwe. Their presentations are summarized in Annex 3.

On the second day representatives of pharmacy schools from various countries gave presentations on the current status of their UPC, which were followed by plenary discussions. In addition, some representatives made specific presentations. See Annex 4.

The third day of the Workshop focused on issues relevant to UPC, and included small group discussions, while the final day was mainly devoted to reporting back on the various working groups' discussions.

1.4 Questions raised by the Workshop

The following questions were raised during the Workshop's plenary discussions:

- what competencies do pharmacists in Southern and Eastern Africa need?
- what progress has been made in UPC development by the committed pharmacy education institutions?

- what degree of collaboration between pharmacy education institutions will be required to promote UPC harmonization?
- what kind of support will be needed for new schools of pharmacy and the introduction of a harmonized UPC?
- what are the implications of harmonization of UPC in Southern and Eastern Africa?
- what will the future relationship between WHO and schools of pharmacy in Southern and Eastern Africa be?

2. Country presentations

2.1 Undergraduate curricula in South Africa: an overview

Mrs S. Putter, Pharmacy Council, South Africa

A four-year pharmacy training programme is offered at seven schools of pharmacy in South Africa and a joint B. Pharm degree started at MEDUNSA/Technikon Pretoria, in 1999. Traditionally, UPC focused mainly on biopharmaceutical and pharmaceutical outcomes. Selection of students is based on pass-marks in mathematics and science subjects with limited focus on commitment or potential. The UPC endorsed by the South African Pharmacy Council (SAPC) is content-based and no longer outcome-based. Lack of interdisciplinary teaching due to rigid institutional divisions and the fact that educational facilities are not linked to practice sites are other problems encountered with UPC.

Policies and legislation in South Africa, including the National Drug Policy of 1996, the 1997 Pharmacy Amendment Act, and the Medicines and Related Substances Control Act of 1965, have influenced UPC development.

The National Drug Policy defined the role of the pharmacist in drug quality assurance, in the provision of safe and effective drugs, rational drug use, community education, in informing patients about the correct usage of drugs, and in training pharmacy support staff. Thus the overall practice of a pharmacist was identified to be in line with pharmaceutical care.

Education policies and legislation, such as the South African Quality Assurance Act of 1995, establishing national qualifications, and the Higher Education Act of 1997, equally influenced UPC. Moreover, labour legislation, for example, the National Skills Development Act of 1998, had an impact on UPC by directing skills development and career-pathing of professionals.

Unit standards for UPC were developed. They set out the required learning outcomes, entry requirements specific outcomes, embedded knowledge, assessment criteria, critical outcomes, and the range and context of learning.

Currently, pharmacy schools are in the process of re-designing their UPC in order to ensure that the unit standards are met by 2002. Multiple exit levels for students are being considered. Additionally, practical training is to be integrated into UPC. Schools of pharmacy still differ as to which course years certain pharmacy subjects are to be introduced and in the level of exposure to pharmacy practice.

Pharmacy graduates undergo a 12-month structured pre-registration internship prior to their registration with the SAPC. This is an attempt to address the

discrepancies students may have in their pharmacy practice experience. The pre-registration year is successfully completed by passing a competency assessment examination.

Current challenges faced in UPC implementation in South Africa are the revision of pharmacy curricula, ensuring and assessing student competency prior to entering the profession, and the training of generalist pharmacists.

2.2 Undergraduate curriculum in Zambia

Dr F. Mutambo, Lecturer, School of Medicine, University of Zambia

In Zambia, an undergraduate pharmacy training programme started in 2001. The development of UPC was influenced by two factors. The first was the results of a situation analysis undertaken in 1997/8 to study human resource development. It was found that there was a lack of practice standards for pharmacists, as pharmacists in Zambia were trained in different countries where different levels of practice standards were applied. Secondly, the National Drug Policy of 1999 directed that pharmacists should be trained locally. A UPC Committee was created with representatives from the School of Medicine, the Pharmaceutical Society of Zambia, Evelyn Hone College, the Pharmacy and Poisons Centre, and the Ministry of Health.

Pharmacy training is coordinated by the Department of Physiological Sciences, University of Zambia, in collaboration with other service departments. The development of the Zambian UPC was inspired by Zambia's National Drug Policy, the American Association of Colleges of Pharmacy, the Unit Standards of South Africa's Pharmacy Council, and UPCs from the United Kingdom and Zimbabwe.

To enter the four-year pharmacy degree programme, A-levels in various subjects or an approved equivalent are required. Holders of a pharmacy diploma are admitted into the second year.

The presentation highlighted that, especially for countries starting pharmacy training programmes, like Botswana and Malawi, the critical requirements for success are sustainable financial support, exchange of lecturers and/or personnel, and technical support in the field of teaching methods and approaches. Some of these requirements may be sought from outside the country. Although Zambia had already developed a core curriculum, it was apparent that the countries developing new programmes could benefit from the experiences of the established schools in the region.

2.3 Progress towards undergraduate curriculum in Malawi

Dr E.L.A. Senga, Lecturer, College of Medicine, University of Malawi

In Malawi, an undergraduate pharmacy training programme had been scheduled to start in 2000, but it was realized in time that more preparation was needed before the pharmacy training programme could commence successfully. Some of the constraints were the absence of pharmacists with postgraduate training in the country, the absence of a UPC and of adequate teaching facilities.

In the discussion after Dr Senga's presentation it was concluded that for successful implementation of UPC in Malawi, regional support from established schools of pharmacy in Southern and Eastern Africa is required, as well as additional support from bodies such as WHO.

2.4 Progress towards undergraduate curriculum in Botswana

**Mr G.S. Rampa, Head, Pharmacy Technician Training Programme,
Institute of Health Sciences, Botswana**

There is no pharmacy training programme in Botswana yet. A consultative process has been initiated between the University of Botswana, the Institute of Health Sciences and the Pharmaceutical Society of Botswana. After a comprehensive consultation process, decisions will be made about the adoption and implementation of UPC.

2.5 Undergraduate pharmacy curriculum in Uganda

Ms P. Nadongo, Pharmacy Department, Makerere University, Uganda

Uganda's UPC was developed from prototypes in Egypt, India, Kenya and Tanzania. The pharmacy training programme started in 1988 at Makerere University. Modifications to UPC were influenced by an International Network for Rational Use of Drugs (INRUD) Workshop in 1996 and the Nyanga UPC Workshop of 1997.

The "semesterization" structure of UPC was completed in 2000. This opened the way to the introduction of modular courses and the spread of exams throughout the year. The UPC is competency- and skills-based. Lectures are provided by the Pharmacy Department as well as by other service-related departments.

Drawbacks associated with semesterization are increased demands on lecturers and students at examination time and greater costs associated with processing exams. Another constraint is that any curriculum change is permissible only after two years. This is felt to be a rather long period for rectifying unforeseen problems.

Various study disciplines have been reorganized, and other courses such as pharmaco-epidemiology and agro-veterinary pharmacy have been introduced. The distribution of the study workload and the degree weighting have also been adjusted.

2.6 Undergraduate pharmacy curriculum in Zimbabwe: an update

Dr O. Munjeri, Pharmacy Department, University of Zimbabwe

In Zimbabwe, the B. Pharm. degree course changed into a four-year degree programme in 1999. The entry qualifications are pass-marks at A-levels, or an approved equivalent, in chemistry and mathematics, and any from a list of subjects, which includes biology and physics. UPC has been revised in line with the 1997 Nyanga Declaration. Courses included in the four-year programme are

pharmaceutics and pharmaceutical technology, pharmaceutical chemistry, clinical pharmacy and pharmacology, and pharmacy practice. The curriculum enables 3000 hours of student contact time out of the total of 4800 hours. The aim of each course and the learning objectives are explained in the new curriculum document. Instruction methods include lectures, coursework (practical and non-practical), managed and non-managed student-centred learning. The required levels of practical skills and compounding are monitored and evaluated. In addition, role-play has been introduced in subjects such as dispensing.

2.7 Undergraduate curriculum in the United Republic of Tanzania **Dr M.H.S. Chambuso, Faculty of Pharmacy, Muhimbili College of Health Sciences, Tanzania**

In Tanzania, the pharmacy degree was introduced with support from the British Council and with assistance from the University of Aston, Birmingham, UK, as a three-year pharmacy training programme in 1974.

Due to policy changes and other influences, UPC was revised into a four-year programme in 1986, with financial assistance from WHO and DANIDA. The course became more attuned to the country's needs, including a wider coverage of hospital and community pharmacy. The entry requirements are A-levels in chemistry, biology and either mathematics or physics. A pharmacy diploma is considered an equivalent qualification for admission to the programme.

UPC aims to produce pharmacists who are capable of functioning in all disciplines of pharmacy. An academic year is divided into terms. There is a period of 30 weeks of student contact time and nine weeks for examinations. During the vacation periods at the end of the second and third years, there are 12-week field attachments in community pharmacy, industry, and natural products growing and fabrication placements. Semesterization of the academic year will be introduced to replace terms and will consist of two semesters of 15 weeks each per academic year.

2.8 Undergraduate curriculum in Sudan **Dr A.M.E. Abdelaziz, Faculty of Pharmacy, Omdurman Islamic University, Sudan**

In Sudan, UPC was revised after the Nyanga Workshop. UPC was reorganized and now offers new subjects, for example, pharmacy practice, practice-based attachments and veterinary pharmacy. Pharmacy degree programmes are offered in only two universities despite the country's large size.

To enter the pharmacy degree programmes A-levels are required or an approved equivalent qualification, including a pharmacy diploma.

Rationalization within the Faculty of Pharmacy has led to the reduction of the size of departments in both universities. The major problem affecting UPC is funding, as is the case in other parts of Africa.

3. Small group discussions

The roles and competencies of pharmacists in Southern and Eastern Africa were discussed and agreed upon by the participants.

3.1 Roles of the pharmacist in Southern and Eastern Africa

The following roles were identified to enable pharmacists to support the health care system and to respond to patient needs in Southern and Eastern African countries:

- custodian of essential drugs and other medicines;
- formulator, manufacturer, distributor and controller of safe, effective and quality drug products;
- adviser on safe, rational and appropriate use of essential drugs and medicines;
- provider of relevant clinical services, including screening and referral services;
- identifier of problems related to drug therapies and finder of possible solutions;
- provider of health education and information;
- provider of pharmaceutical care by taking responsibility for treatment outcomes;
- designer, implementer and evaluator of pharmaceutical care plans;
- provider of cost-effective and efficient pharmaceutical services.

Schools of pharmacy should have UPCs that train students in these roles during the planned academic courses.

3.2 Basic competencies of the pharmacist in Southern and Eastern Africa

The following competencies were identified, to enable a pharmacist to:

- organize and control the manufacturing, compounding and packaging of pharmaceutical products;
- organize the procurement, storage and distribution of pharmaceutical materials and products;
- interpret the medicines laws and the professional and pharmacy regulations in order to dispense correctly;
- provide pharmacist-initiated care to patients and ensure the rational use of medicines;
- provide information and education on health and medicines-related issues;
- promote community health and provide related information and advice;

- participate in research and evaluate critically new therapies and current advances in formulation and modes of drug action to ensure the optimal selection and use of medicines.

Therefore, schools of pharmacy should have a UPC that trains students in these basic competencies.

3.3 Group A – Action plan for harmonization

The following objectives were formulated for the action plan:

- identify strategies for harmonization of the curricula offered in Southern and Eastern Africa to ensure the same standard of training outputs;
- explore the possibilities for mutual recognition of pharmacy qualifications after harmonization of UPC in the region;
- identify methods for strengthening pharmacy councils' and drug regulatory authorities' relations with schools of pharmacy. This is in order to improve the quality of pharmaceutical services offered and to facilitate mutual recognition of drug registration of new pharmaceutical products between countries in the region.

3.4 Reporting back by Group A

a. Clarification of terms

"Harmonization" was described using expressions such as "synchronization", "coming together", "alignment" or "similarity of outcomes". It is not "a common baseline", or an agreement "on commonality" or on "transferability of students between schools". "Strategy" was described as a "deliberate means to an end". "Curriculum" was seen as a "broad framework, including learning outcomes, assessment and teaching methods".

b. Problem definition

The problem with UPC in Southern and Eastern Africa is a lack of common basic competencies of pharmacists within the region. It was identified that:

- pharmacists' skills differ;
- competencies differ, and there is a lack of common basic competencies;
- roles differ;
- practice and training standards differ;
- financial and human resources are not utilized optimally;
- there is no UPC harmonization strategy.

c. Why harmonize UPC in Southern and Eastern Africa?

The first objective of harmonization of UPC is to improve people's health by ensuring a minimum range of competencies for pharmacists in the region. In addition, harmonization would enable the sharing of human, physical and financial resources, which are scarce. While there is a willingness to harmonize

no harmonization strategy has been developed yet. As resources are scarce in all countries, there is a need to raise the efficiency of drug management systems.

d. Elements of a harmonization strategy

The harmonization strategy may be divided into two elements - communication and the processes that are needed to achieve harmonization.

Communication may be considered as a first priority and involves: verifying competencies in the region; identifying and consulting with critical stakeholders; involving all countries of the region; setting up a communications network; and engaging policy makers. Policy makers include representatives from statutory organizations and regulatory authorities.

The processes of a harmonization strategy should include: collecting baseline data from countries of the region, agreeing the roles and competencies of pharmacists ("university exit and professional entry"); developing a process model e.g. a toolkit and resources for the development of a UPC and training for trainers; developing a framework to ensure common outcomes to be achieved e.g. external validation and internal audit; and establishing guidelines and accreditation of trainers through situation analysis and voluntary buy-in. A harmonization strategy should also explore the role of pharmacy technicians.

e. Mutual recognition

Mutual recognition should define competencies in terms of levels of qualification e.g. assistant, technician and pharmacist. The criteria for mutual recognition include a harmonization framework and identification of competencies to be achieved during different stages of the pharmacy training programme.

Mutual recognition should also look into competencies and their assessment, e.g. the practical training year, registration requirements for pharmacists, including legal issues, and entry qualifications at various levels.

f. Strengthening relations

The development of a harmonization framework should involve key stakeholders from schools of pharmacy, pharmacy councils and drug regulatory authorities. There is also a need to lobby for political will and support. An example of a framework is provided below.

Relations can be strengthened by establishing associations e.g. Association of Pharmacy/Medical Councils of Southern African Development Community (SADC). The African Drug Regulatory Network (AFDRAN) is another active network, in which South Africa is responsible for good manufacturing practices (GMP) inspections, and Zimbabwe for legal issues, while Nigeria is involved in issues related to counterfeit drugs.

g. Baseline data

The harmonization process should start with the collection of baseline data on education and training, the roles of various bodies and regulatory information. The data needed on education and training should include entry levels, duration of courses, course outcomes, available resources, assessment and teaching methods, and information on staff and student research projects.

Surveys on the roles of academic and professional councils and drug regulatory authorities, and surveys on societal needs and university requirements should be

undertaken in Southern and Eastern African countries. Regulatory data should also be collected, such as requirements for pharmacist registration and registration requirements for drugs and medicines entering the local market.

Example of a harmonization framework

Level	Category	Competence	Assessment Criteria
1	O-Level		
2	M-Level		
3	A-Level		
4	Basic Technician		
5	Post-basic Pharmacist Assistant		
6	Pharmacist Graduate/Intern		
7	Entry Level Pharmacist		
8	Specialist Pharmacist		

3.5 Group B – Action plan for collaboration

The following objectives were formulated for the action plan:

- to promote “linking” programmes and exchange of personnel, expertise and ideas within sub-regions of Southern and Eastern Africa;
- to give guidance to those countries that do not have schools of pharmacy but intend to introduce UPC. (New UPC programmes are at various stages of development in Botswana, Lesotho, Malawi, Swaziland and Zambia);
- to develop appropriate postgraduate and continuing education programmes for pharmacists.

3.6 Reporting back by Group B

3.6.1 Areas of harmonization

The following areas were identified and recommended for harmonization of UPC in Southern and Eastern Africa:

- entry requirements for degree programmes;
- basic competencies, see sections 3.1 and 3.2;
- duration of degree programmes;
- guidelines for incorporating pharmacy technicians into degree programmes.

3.6.2 Areas for regional collaboration

The following areas were identified and recommended for regional collaboration between schools of pharmacy in Southern and Eastern Africa:

- a network should be set up for all Workshop participants. The Pharmacy Department, University of Zimbabwe, was nominated to host an e-mail conference/discussion group on pharmaceutical education in the region;
- each school of pharmacy in the region should make information available about its current pharmacy training programmes. Each school is encouraged to put information on a web site;
- participants should organize seminars to brief other staff members about this Workshop and to sensitize them to the regional harmonization process of UPC;
- the Workshop report should be circulated to all schools of pharmacy and pharmacy technician programmes in the region;
- training of pharmacy teachers should cover course outcomes, and teaching and assessment methods. Links should be made between pharmacy schools to share ideas regarding teaching and assessment methods. These training courses could last between two and four years. WHO may sponsor these courses in order to continue to strengthen UPC development in Southern and Eastern Africa;
- students/graduates should be involved in UPC development and harmonization processes;
- common priority areas or themes for teaching (e.g., rational drug use, the essential medicines concept, drug regulatory affairs and pharmaceutical care) should be identified;
- joint research projects should be promoted, particularly in the field of pharmaceutical education. Schools of pharmacy should be encouraged to make their student projects and staff research publications available on their web sites;
- specific areas such as traditional medicines/natural products should be included in UPC;
- an Association of Southern and Eastern African Schools of Pharmacy should be established to strengthen collaboration. The University of Khartoum, Sudan, expressed its willingness to host a meeting at which the Association can be set up. Financial requirements for maintaining an Association should be further investigated;
- new schools of pharmacy in the region should indicate their needs so that adequate support can be mobilized within the region and outside.

3.7 The way forward for UPC harmonization

The following recommendations were made for enhancing the UPC harmonization process:

- a network discussion group of pharmacy schools in the region should be hosted by Zimbabwe;
- there is a need to move from a content-based UPC towards an outcome-based UPC in the region. A UPC framework is therefore necessary. The starting

point should be a model UPC, which is subject to “reverse engineering” to make it outcome-based;

- additional support should be requested from WHO for the following areas:
 - ⇒ a multi-country study on UPC baseline data provided by all pharmacy schools in Southern and Eastern Africa (situation analysis of the region);
 - ⇒ an international course on curriculum development for pharmacy teaching staff in the region. The course would cover areas such as competencies, outcomes, learning/teaching and assessment methods;
- a consultancy network of regional experts should be established to assist individual countries in their UPC development and implementation.

A Steering Committee was nominated to advance the harmonization process in Southern and Eastern Africa. Membership details can be found in Annex 5.

Annex 1

Workshop programme

SUNDAY 08 APRIL 2001

- | | |
|--------|---|
| 7.00pm | Welcome address
Speaker: Vice-Chancellor - University of Zimbabwe |
| 7.05pm | Opening remarks
Speaker: Dr C. Nherera, Acting Vice-Chancellor of the University of Zimbabwe, on behalf of The Honourable Minister of Health and Child Welfare, Zimbabwe, Dr T. Stamps |
| 7.20pm | Organization of the Workshop and expected outcomes
Speaker: Dr O. Munjeri, Pharmacy Department, University of Zimbabwe |
| 7.30pm | Plenary lecture I: Priorities in pharmaceutical education in Southern Africa
Speaker: Professor R. Summers, MEDUNSA, South Africa |
| 7.50pm | Plenary lecture II: World trends in pharmaceutical education.
Speaker: Professor C. Mackie, Robert Gordon University, Aberdeen, Scotland |
| 8.15pm | Closing remarks
Dean, Faculty of Medicine, University of Zimbabwe |
| 8.20pm | Cocktail reception
Hosted by the Dean, Faculty of Medicine, University of Zimbabwe |

MONDAY 09 APRIL 2001

Morning session I

Chair: Dr O. Munjeri, Pharmacy Department, University of Zimbabwe

- | | |
|--------|---|
| 8.30am | Case 1: UPC in the Republic of South Africa
Speaker: Mrs S. Putter, Pharmacy Council, South Africa |
| 8.50am | Plenary session |
| 9.00am | Case 2: UPC in Tanzania |

- 9.20am Speaker: Dr M. H. S. Chambuso, Faculty of Pharmacy, Muhimbili College of Health Sciences, Tanzania
Plenary session
- 9.30am Case 3: UPC in Uganda
Speaker : Head of Pharmacy Department, Makerere University
- 9.50am Plenary session

10.00am	TEA BREAK
---------	-----------

Morning session II

Chair: Dr D. Ball, Pharmacy Department, University of Zimbabwe

- 10.30am Case 4: UPC in Zimbabwe
Speaker: Dr O. Munjeri, Chairman, Pharmacy Department, University of Zimbabwe
- 10.50am Plenary session
- 11.00am Case 5: UPC in Sudan
Speaker: Dr. A. M. E. Abdelaziz / Dr. E. I. Elnima, Faculty of Pharmacy, University of Khartoum / Omdurman, Sudan
- 11.20am Plenary session
- 11.30am Case 6: Problem-based teaching in UPC: Technikon Pretoria experiences
Speaker: Mr J. H. Hamman, Technikon Pretoria University, South Africa
- 11.50am Plenary session
- 12.00pm Case 7: UPC in Kenya
Speaker: Professor A. N. Guantai, Dean, Faculty of Pharmacy, Nairobi University
- 12.20pm Plenary session

12.30pm	LUNCH BREAK
---------	-------------

Afternoon Session I

Chair: Dr M. H. S. Chambuso, Dean, Faculty of Pharmacy, Muhimbili College of Health Sciences, Tanzania

- 2.00pm Case 8: Practice-based attachments in UPC - University of Zimbabwe experiences:
1) Rural attachments, 2) Community pharmacy attachments, 3) Clinical pharmacy attachments, 4) Industrial attachments
Speaker: Dr C. C. Maponga, Pharmacy Department, University of Zimbabwe

- 2.20pm Plenary session
- 2.30pm Case 9: Pharmaceutical biotechnology in UPC
Speaker: Professor D. J. Chetty, University of Durban-Westville, South Africa
- 2.50pm Plenary session
- 3.00pm Case 10: The balance between the natural sciences and clinical sciences in UPC
Speaker: Dr B. Summers, MEDUNSA, South Africa
- 3.20pm Plenary session

3.30pm	TEA BREAK
--------	-----------

Afternoon Session II

Chair: Mrs S. Putter, Pharmacy Council of South Africa

- 3.45pm Case 11: Veterinary pharmacy in UPC
Speaker: Mrs R. Hove, Medicines Control Authority of Zimbabwe
- 4.05pm Plenary session
- 4.15pm Case 12: Pharmacist prescribing: implications in UPC
Speaker: Dr D. Ball, Pharmacy Dept., University of Zimbabwe
- 4.35pm Plenary session

TUESDAY 10 APRIL 2001

Morning Session I

Chair: Professor D. J. Chetty, University of Durban-Westville, South Africa

- 8.30am Case 13: Components of Pharmacy Practice/Social Pharmacy/Pharmaceutical Care in UPC
Speaker: Professor B. Futter, Rhodes University, South Africa
- 8.50am Plenary session
- 9.00am Case 14: Components of Pathophysiology in UPC
Speaker: Dr T. A. Morton, Pharmacy Department, University of Zimbabwe
- 9.20am Plenary session
- 9.30am Case 15: Components of Pharmacognosy/Natural Products in UPC
Speaker: Prof. M. G. Gundidza, Pharmacy Department, University of Zimbabwe

9.50am Plenary session

10.00am TEA BREAK

Morning Session II

Chair: Professor B. Futter, Rhodes University, South Africa

10.30am Case 16: Antimicrobial resistance and infection control
Speaker: Ms M. Everard, WHO

10.50am Plenary session

11.00am Case 17: Distance learning and the use of web-based learning - A
medium for delivery of postgraduate training and CPD
Speaker: Mr W. Basson, Potchefstroom University, South Africa

11.20am Plenary session

11.30am **Small Group Discussion Sessions**
**Coordinator: Dr T. A. Morton, Pharmacy Department, University
of Zimbabwe**

GROUP A: **Components of the "Core" UPC in Eastern and Southern Africa**
Competencies for a pharmacist
Entry requirements for degree programme
Duration of degree programme
Core syllabus in UPC
Problem-based and skills-based learning
Relevant attachments

GROUP B: **Enhancement of Collaboration Among Pharmacy Schools**
Joint research programmes
Staff, student exchange mechanisms
Student Federation for Southern & Eastern African Pharmacy
Schools

GROUP C: **Implications of Harmonized UPC in Southern and East Africa**
Mutual recognition of qualifications
Pre-registration training
Implications for drug regulatory authorities
Association of Drug Regulatory Authorities
Regional Drug Quality Assurance Programmes
Registration for cost-effectiveness

Group D: **Postgraduate Training, Specialization and Continuing Education**
Distance education learning
Programmes by Internet

12.30pm LUNCH BREAK

1.30pm Game tour and other activities

WEDNESDAY 11 APRIL 2001

Morning Session I**Chair: Mr W. Basson, Potchefstroom University, South Africa**

8:30am Reporting back from Groups A and B and plenary discussions

10.00am	TEA BREAK
---------	-----------

Morning Session II**Chair: Dr O. Munjeri, Pharmacy Department, University of Zimbabwe**

10.30am Report back from Group D and plenary discussions

11.00am Discussions on the Draft Harmonized UPC for Southern and Eastern Africa
Speakers: Prof. C. Mackie, Prof R. Summers and Ms M. Everard11.30am Way forward on harmonization of UPC for Southern and Eastern Africa
Speakers: Ms M. Everard, Prof. C. Mackie and Prof. R. Summers11.35am Future collaboration with WHO
Speaker: Ms M. Everard11.45am Summary and conclusions
Speakers: Ms M. Everard, Prof. C. Mackie, Prof. R. Summers

Annex 2

List of participants

No.	Organization/ Country	Representative	Title	Contact
1.	WHO	Ms M. Everard	Technical Officer	EDM/WHO 20 Avenue Appia CH-1211, Geneva-27 Switzerland Fax: +41 22 791 4167 E-mail: everardm@who.int
2.	WHO resource person	Prof. C. Mackie	Head	School of Pharmacy Robert Gordon University, Schoolhill Aberdeen, AB10 1FR Scotland, U.K. Fax: +44 1224 262555 E-mail: c.a.mackie@rgu.ac.uk
3.	WHO resource person	Prof. R. Summers	Head of School	School of Pharmacy MEDUNSA P.O. Box 218 Medunsa 0204 South Africa Fax: +27 12 521 3992 E-mail: rsumm@medunsa.ac.za
4.	Botswana	Mr G. Rampa	Head	Pharmacy Technician Training Programme Institute of Health Sciences P.O. Box 985 Gaborone Botswana Fax: +267 300935
5.	South Africa	Prof. B. Futter	Lecturer	Faculty of Pharmacy Rhodes University P. O. Box 94 Grahamstown 6140 South Africa Fax: +27 46 636 1205 E-mail: b.futter@ru.ac.za
6.	South Africa	Prof. D. Chetty	Lecturer	School of Pharmacy and Pharmacology University of Durban Westville P. Bag X 54001 Durban 4000 South Africa Fax: +27 31 2044 792 E-mail: dchetty@pixie.udw.ac.za

Harmonization of undergraduate pharmacy curricula
in Southern and Eastern Africa

No.	Organization/ Country	Representative	Title	Contact
7.	South Africa	Dr B. Summers	Lecturer	School of Pharmacy MEDUNSA P. O. Box 218 Medunsa 0204 South Africa Fax: +27 12 521 3992 E-mail: bsumm@medunsa.ac.za
8.	South Africa	Mr J. Hamman	Dean	School of Pharmacy, Technikon Pretoria P. Bag X680 Pretoria 0001 South Africa Fax +27 12 318 6243 E-mail: HammanJH@Techpta.ac.za
9.	South Africa	Mrs S. Putter	Senior Manager – Professional Affairs	Pharmacy Council of South Africa P.O. Box 40040 Arcadia 0007 South Africa Fax: +27 12 321 1492 E-mail: profaffairs@pharmcouncil.co.za
10.	South Africa	Mr W. Basson	Lecturer	School of Pharmacy Faculty of Health Sciences Potchefstroom University for CHE Potchefstroom 2520 South Africa Fax: +27 18299 2225 E-mail: fptwdb@puknet.puk.ac.za
11.	Malawi	Dr E. Senga	Lecturer	College of Medicine University of Malawi Post Bag 360 Chichiri, Blantyre 3 Malawi Tel: +671911 E-mail: elsenga@yahoo.com
12.	Tanzania	Dr M. Chambuso	Dean	Faculty of Pharmacy Muhimbili College of Health Sciences P.O. Box 65013 Dar es Salam, Tanzania Fax: +255 22 2151596 E-mail: mchambuso@muchs.ac.tz
13.	Tanzania	Dr S. Malele	Lecturer	Faculty of Pharmacy Muhimbili College of Health Sciences, P.O. Box 65013 Dar es Salam Tanzania Fax: + 255 22 2151596 E-mail: Rmalele@muchs.ac.tz
14.	Zambia	Dr F. Mutambo	Lecturer	Pharmacy Department School of Medicine University of Zambia P.O. Box 50110 Lusaka Zambia Fax: +260 1 224822 E-mail: fmutambo@yahoo.com

No.	Organization/ Country	Representative	Title	Contact
15.	Uganda	Dr O. Adome		Ministry of Health P.O. Box 8 Entebbe Uganda Fax: +256 41 231 572
16.	Uganda	Dr P. Nadongo	Lecturer	Pharmacy Department Faculty of Medicine Makerere University Box 7062 Kampala Uganda Fax: +256 41 530 412 E-mail: npamela@hotmail.com
17.	Zimbabwe	Dr O. Munjeri	Chairman	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe Fax: +263 4 317148 E-mail: munjeri@compcentre.uz.ac.zw
18.	Zimbabwe	Dr D. Ball	Organizing Committee	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe Tel: ++263 4 790233 E-mail: dball@healthnet.zw
19.	Zimbabwe	Prof. M. Gundidza	Organizing Committee	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe E-mail: gundi@compcentre.uz.ac.zw
20.	Zimbabwe	Dr C. Maponga	Organizing Committee	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe Fax: +263 4 790 233 E-mail: cmaponga@healthnet.zw
21.	Zimbabwe	Dr T. Morton	Organizing Committee	Pharmacy Department University of Zimbabwe P.O. Box MP 167, Mount Pleasant Harare Zimbabwe Fax: +263 4 790233 E-mail: tmorton@healthnet.zw

Harmonization of undergraduate pharmacy curricula
in Southern and Eastern Africa

No.	Organization/ Country	Representative	Title	Contact
22.	Zimbabwe	Mr C. Makanda	Lecturer	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe Fax: +263 4 307148 E-mail: munjeri@compcentre.uz.ac.zw
23.	Zimbabwe	Mrs R. Hove	Principal Regulatory Officer	Medicines Control Authority of Zimbabwe Box UA559 Union Avenue Harare Zimbabwe Fax: +263 4 736980 E-mail: mcaz@Africaonline.co.zw
24.	Zimbabwe	Dr K. Tisocki	Lecturer	Clinical Pharmacology Department University of Zimbabwe P.O. Box A178 Avondale Harare Zimbabwe Fax: +263 4 707707 E-mail: ktisocki@healthnet.zw
25.	Sudan	Dr E. Elnima	Dean	Faculty of Pharmacy University of Khartoum P.O. Box 1996 Khartoum Sudan Fax: +249 11 780696
26.	Sudan	Dr A. Abdelaziz	Dean	Faculty of Pharmacy Omdurman Islamic University P.O. Box 382 Omdurman Sudan Fax: +249 11 780696
27.	Zimbabwe	Mr D. Tagwireyi	Student	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe E-mail: dtagwireyi@healthnet.zw
28.	Zimbabwe	Mr L. Chitsamatanga	Student	Pharmacy Department University of Zimbabwe P.O. Box MP 167 Mount Pleasant Harare Zimbabwe E-mail: chitsal@compcentre.uz.ac.zw

Annex 3

Evening session interventions

Welcome address by Dr C. Nherera, Acting Vice-Chancellor, University of Zimbabwe

Dr Nherera opened the evening session by highlighting the Workshop's importance to the evolving pharmaceutical sector in Southern and Eastern Africa. He pointed out that the workshop was a result of an ongoing consultative process focusing on revising pharmacy training programmes in the region.

Dr Nherera referred back to the Nyanga Workshop held in 1997 at which one of the recommendations was a review of UPC that each individual country should undertake in the years to come. After the Workshop Zimbabwe and other Southern African countries started to review UPC. Moreover, countries that did not have pharmacy training programmes took steps to introduce them. Pharmacy training programmes offered in Southern and Eastern Africa produce graduates of recognized standards.

Dr Nherera explained further that the expansion of the Department of Pharmacy of the University of Zimbabwe had evolved from an initial intake of about five students in 1974 to 48 students at present. In 1995 it was agreed that the Department of Pharmacy would obtain Faculty status. At the moment, one of the major problems faced is the lack of sufficient laboratory and teaching facilities. Other schools of pharmacy in Southern and Eastern Africa will undoubtedly experience this situation too.

He concluded by saying that the participants with backgrounds as academics, scientists and practitioners from government agencies, universities and other institutions, should take the ongoing process of UPC further and assist schools of pharmacy in Southern and Eastern Africa in their training programmes.

Plenary Lecture I: Priorities in pharmaceutical education in Southern Africa, Professor R. Summers, School of Pharmacy, MEDUNSA, South Africa

Professor Summers introduced his presentation by identifying what pharmacists should be doing in their professional life. Most of the functions are in the field of manufacturing and managing pharmaceutical products, providing pharmaceutical care, identifying and responding to patients' drug needs and reducing the risk of drug-related problems.

He then suggested verifying the end-point of pharmaceutical education by posing three questions. The first, "what are pharmacists doing?" can be answered by mentioning activities like manufacturing, distributing, storing and dispensing

pharmaceutical products. The second question, "what are pharmacists doing that could be done by others?" can be answered by activities such as procurement, distribution, storage and some aspects of dispensing, which may be performed by non-pharmacists.

The third question, "are they doing it right, and if not, what are the constraints pharmacists face in Southern Africa?" can be answered by the constraints encountered, such as: changing values; lack of practice standards; non-compliance with pharmacy laws; economic hardship; undue influence; natural and man-made disasters; disease burden; dispensing doctors; lack of financial and human resources and suitable physical facilities; and the "brain drain". Professor Summers concluded that pharmaceutical education should ideally train pharmacists who are care-givers, managers, life-long learners, teachers, leaders, decision-makers and communicators. These functions are in line with the "seven-star pharmacist" profile as was agreed by a WHO Consultative Group in collaboration with FIP².

Professor Summers explained further that the objective of pharmaceutical education is to produce adequate numbers of pharmacists who can function ethically and effectively in a changing world. The pharmacist should thus manage pharmaceuticals, information and resources (human, financial, inventory and facilities) in addition to providing pharmaceutical care at community and individual patient levels. This is in line with the FIP guidelines on Good Pharmacy Education Practice that recommended that good pharmaceutical education should, among others, be university-based or controlled, consistent with and reflective of course outcomes and student-centered³.

The process of UPC development deals with aspects like numbers of students to be trained, topics to be included, methods of learning/teaching, constraints faced and programme evaluation.

Approaches that can be considered for UPC development are subject-based (integrated or thematic methodology), outcome-based with defined competencies (unit standards), defined learning objectives, varied learning activities, and the multi-disciplinary group approach.

Another important UPC issue is the methods of learning/teaching. The different methods are student-focused (with responsibility and accountability accepted by the students rather than teacher-centred), regular or continuous assessment, small groups (no lectures) and structured, experimental learning (practice rotations and attachments).

Constraints encountered with UPC development are human and financial resources and a shortage of role models. Opportunities in UPC development can be realized by learning from each other, communicating regularly, the use of information technology and the sharing of (human and financial) resources.

Professor Summers concluded that curriculum evaluation should be based on unit standards (for measuring quality), inspection visits by the national statutory

² WHO. The role of the pharmacist in the health care system. Preparing the future pharmacist. Report of a 3rd WHO Consultative Group on the Role of the Pharmacist, Vancouver, Canada, 27-29 August 1997. Geneva: World Health Organization; 1997. WHO/PHARM/97/599.

³ FIP. Good pharmacy education practice. The Hague: International Pharmaceutical Federation; 1998.

body, internal and external assessors, student evaluation, completion rates, remedial measures and staff assessment.

Plenary lecture II: World trends in pharmaceutical education, Professor C. Mackie, The Robert Gordon University, Aberdeen, Scotland, UK

Professor Mackie set the stage with her presentation, in which she said that health care systems throughout the world are rapidly changing, and that the roles of the pharmacist continue to evolve to meet professional aspirations and societal needs. Individual schools of pharmacy and national bodies need to revise their curricula to meet those needs. It is vital that special attention should be given to knowledge, skills, behaviour and attitudes that together will support a pharmaceutical care model. The focus should, therefore, be on learning methods, such as student-centered and life-long learning. Harmonization of UPC should be pursued through a structured approach to curriculum development.

Professor Mackie stimulated audience debate by saying that the Workshop should “not waste time trying to identify a core curriculum” but should rather “focus on establishing a regional framework for curricular development”, in which educational outcomes should be based on societal needs. This view served as a discussion issue throughout the Workshop.

Final remarks by Professor S. Tswana, Dean, Faculty of Medicine, University of Zimbabwe

Professor Tswana closed the evening session by highlighting that after the Nyanga Declaration, the Pharmacy Department of the University of Zimbabwe had organized a UPC review workshop in 1998, in which stakeholders were involved. This resulted in the implementation of a four-year pharmacy training programme.

He explained that UPC development could not be separated from the training of doctors, nurses, dentists and other health workers. They are inter-linked and should be adjusted at regular intervals. Professor Tswana expressed his pleasure that UPC is receiving the attention it deserves and his confidence that the Workshop, with the majority of participants from schools of pharmacy in the Southern and Eastern African region, would produce good recommendations for future development.

Annex 4

Subject presentations

Problem-based teaching in UPC: Technikon Pretoria experiences

Mr S. Hamman, Lecturer, Technikon Pretoria University, South Africa

Mr. Hamman presented problem-based pharmacy teaching as an alternative to the traditional method of lecturing. A paradigm shift should be made in order to adopt the problem-based teaching approach. The changes to be made are moving away from trainer-centred, fixed pace, subject-based learning and towards student-centred, individual pace learning, and outcome-based teaching. This will allow students to develop their own learning style.

Practice-based attachments in UPC: University of Zimbabwe experiences

Dr C.C. Maponga, Pharmacy Department, University of Zimbabwe

Dr. Maponga introduced his topic by highlighting three components of professional education:

- **Attitudinal development** - to foster the development of attitudes compatible with progressive and humanitarian pharmacy practice;
- **Cognitive learning** - to enhance the students' factual knowledge of health care in general and drug therapy in particular;
- **Psycho-motor skills development** - to enhance the students' skills of good pharmacy practice through their own experiences.

The field attachment programmes focus mainly on psycho-motor skills development. Dr. Maponga explained the various types of attachment at the University of Zimbabwe, such as rural setting, hospital (ward and pharmacy), community pharmacy and the pharmaceutical industry.

Rural setting attachments

Rural setting attachments originated from the primary health care strategy adopted after independence in 1980. The pharmacist was expected then to be a hospital pharmacist/secretary of a district hospital. The current student learning objectives are to explore the role of the pharmacist in the rural health care system, to solve some health care problems in the rural areas, to work in a multi-disciplinary health care team, and to provide multi-disciplinary, primary care-oriented pharmacy education. The attachment is a one-week period in the second and fourth years. The attachment programme covers the work of the district pharmacist, the district medical officer, the district nursing officer, the community nurse and village health workers.

Hospital (ward and pharmacy) attachments

Hospital attachments originated from the fact that the UPC of 1973/4 was mainly clinically biased. The current student learning objectives are to: manage different

disease status with special emphasis on drug treatments for in- and out-patients; to handle drug information requests from patients and health care personnel; to counsel patients on their drug therapies; to undertake research projects on drug supply and rational use problems; and to develop good relationships with other health care professionals. The attachment is a six-week period of full-time clinical orientation followed by weekly attachments in the final year. The attachment programme covers the medical, paediatric and psychiatric wards, the hospital pharmacy and the drug information service.

Community pharmacy attachments

Community pharmacy attachments originated because the best way to get acquainted with over-the-counter (OTC) products is in a retail pharmacy setting. The student learning objectives are to work under the supervision of qualified pharmacists in a community pharmacy, to carry out projects on OTC products, and to solve community-based health problems with emphasis on pharmaceutical care issues. The attachment programme covers the areas of work of health clinics and general hospitals.

Pharmaceutical industry attachments

Pharmaceutical industry attachments originated from a shortage of state of the art equipment in the university laboratories and the need for a good relationship with the pharmaceutical industry. The student learning objectives are to explore the role of an industrial pharmacist, and to become familiar with pharmaceutical manufacturing processes and equipment. Students make one-day visits to pharmaceutical companies.

Dr. Maponga concluded by saying that the various field attachments focus on the development of psycho-motor skills and are important for promoting team work, problem-based learning and multi-disciplinary teaching.

The balance between the natural and clinical sciences in UPC

Dr B. Summers, School of Pharmacy, MEDUNSA, South Africa

Dr. Summers introduced her topic by reflecting on pharmacy education with its objective of producing competent professionals capable of adapting their roles, to change practice methods, to handle the information explosion, and to become a life-long learner. Therefore, UPC in the 21st century must be able to deal with changes.

She continued that the sciences relevant to pharmacy education can be divided into natural sciences (systematized knowledge of nature, including biology, chemistry and physics), applied sciences (to work out practical problems) and clinical sciences (to observe and treat patients). Other sciences such as behavioural and communication sciences are equally important.

The 'balance' between natural and clinical sciences has to be addressed. Deliberations should include the quantity (length of course, time spent on subjects); juxtaposition (linear or modular courses); contents; teaching methods (lectures versus problem-based learning); and student activities (e.g. practicals, tutorials, site visits, ward rounds, reports, portfolios, diaries, projects).

Moreover, Dr Summers stressed that curriculum topics must be relevant, appropriate, applicable to the local setting, up-to-date and outcome-oriented. To find the ideal balance between the various sciences in pharmacy education can be complex and may be heavily influenced by the professional needs of a particular country. She concluded that it might not be relevant or possible to work towards a core UPC with core contents and harmonized degree standards, as professional requirements vary from country to country.

Veterinary pharmacy in UPC

Mrs R. Hove, Medicines Control Authority of Zimbabwe

An introduction to veterinary pharmacy was given by Mrs Hove of the Medicines Control Authority of Zimbabwe (MCAZ), which registers all human and veterinary medicines. Product files submitted for market authorization should be reviewed by a professional who has both pharmaceutical and clinical backgrounds. Therefore, pharmacists should have some basic understanding of animal anatomy and physiology in addition to biochemistry, Mrs Hove told participants.

In Zimbabwe, anyone involved in drug dispensing needs to be licensed. MCAZ, the licensing authority, recognizes that pharmacists are the custodians of medicines. Ideally, pharmacists should be the only dispensers of medicines but often situations dictate that other health and veterinary practitioners should be allowed to dispense. Medical practitioners located not less than 5 kilometers from the nearest pharmacy may have dispensing licences. This does not apply to veterinary practitioners yet.

Pharmacists are not always keen on stocking veterinary medicines because they may not be familiar with these products and treatments, which are generally bulky and occupy a lot of storage space.

Most retail pharmacies are located in urban areas and clients rarely require medication for their pets. The focus is more on food producing animals, as Zimbabwe is an agricultural country. Therefore, sale transactions of veterinary medicines take place more in farming and communal areas. Farmers tend to be knowledgeable about animal treatments. Due to the scarcity of pharmacies, MCAZ had to allow normally prescription-only veterinary medicines to be classified as OTC medicines, with the result that veterinary practitioners deal with very few prescription-only medicines. In addition, an increased number of drug stores are opening to make veterinary medicines more widely available in rural areas.

The issue here is whether a pharmacist or a veterinary practitioner should supervise drug dispensing. On the one hand pharmacists are licensed to dispense medicines but have limited knowledge of veterinary medicines, and on the other hand veterinary practitioners lack adequate pharmaceutical knowledge. MCAZ has approved that veterinary practitioners can supervise these drug stores.

Mrs Hove concluded that if pharmacists are to be the custodians and distributors of veterinary pharmaceuticals, the following components of veterinary medicine should be included in UPC: insect control, mastitis and dairy hygiene, infectious diseases in cats and dogs, management of veterinary wounds, management of helminthes in sheep, cattle, pigs, poultry etc., vaccines for poultry, cattle and canines, and chemicals for crop protection.

Pharmacist prescribing: implications for UPC

Dr D. Ball, Department of Pharmacy, University of Zimbabwe

Dr. Ball introduced his topic by highlighting that prescribing and dispensing functions are divided among health care professionals. This separation has been influenced by factors such as historical roots, conflicts of interest, training and specialized skills.

The cost of health care is increasing and budgets are limited or constrained in the public and to some extent in the private health care system. This calls for evolving roles, better management of cost reduction and maintenance. One way to achieve this is to reduce patient visits and costs to conventional prescribers (medical doctors) and to increase the use of alternative prescribers, such as pharmacists. In this respect the pharmacist should be allowed to treat minor ailments. However, the pharmacist is not yet recognized as a prescribing authority.

Dr Ball quoted from a 1994 WHO document that recognizes the need for pharmacist prescribing, "The pharmacist receives requests from members of the public for advice on a variety of symptoms and, when indicated, refers the inquiries to a medical practitioner. If the symptoms relate to a self-limiting minor ailment, the pharmacist can supply a non-prescription medicine, with advice to consult a medical practitioner if the symptoms persist after more than a few days. Alternatively, the pharmacist may give advice without supplying medicine."⁴

Different countries present different scenarios. For example, in the UK, the Crown Review on the prescribing, supply and administration of medicines led to a recommendation for "dependent" and "independent" (medically qualified) prescribers within recognized institutions. For example, in the USA, pharmacists in some states have prescriptive authority by protocol (dependent prescribers), which allows them to get involved in therapeutic decision-making. In Zimbabwe and other developing countries, nurses prescribe drugs, mainly due to the lack of health professionals outside urban areas. Moreover, the law in Zimbabwe allows for certain pharmacist-initiated treatments.

Dr Ball concluded that the level of prescribing authority will depend on a country's specific needs. Moreover, the acceptance of pharmacist prescribing will have implications for pharmacy training programmes; especially in providing the additional skills and competencies needed to become a prescriber pharmacist.

Evidence-based pharmacy practice and medical informatics

Dr K. Tisocki, Clinical Pharmacology Department, University of Zimbabwe

Dr Tisocki explained that evidence-based pharmacy practice is an integral component of evidence-based health care. It is centred on information and the skills needed to find this information. Essential clinical informatics skills are based on information retrieval and critical appraisal of available evidence, and communicating and applying new knowledge. The collection of new knowledge can be undertaken by information retrieval from all available sources.

As medical knowledge evolved continuously, self-directed learning should be the way to maintain knowledge and to keep up-to-date. The application of new

⁴ WHO. The role of the pharmacist in the health care system. Geneva: World Health Organization; 1994. WHO/PHARM/94.569.

knowledge requires a basic understanding of logical and statistical models of diagnostic processes, skills to interpret uncertain clinical data, the adaptation and application of new clinical decisions to individual patients, and the adaptation of local treatment guidelines.

Dr Tisocki explained further that efficient communication is based on three components. Firstly, the ability to structure and record clinical data in such a way as to communicate effectively with colleagues. Secondly, the selection and use of an appropriate communication method for a given task, e.g. face-to-face conversation, telephone, videoconference, e-mail, or printed materials. Thirdly, the selection and use of a suitable communication medium for an identified recipient.

Pharmacy practice: the ugly duckling
Professor B. Futter, Rhodes University, South Africa

Professor Futter reflected that pharmacy practice has been viewed as an "ugly duckling" and wondered whether this duckling would turn into a swan and fly one day. Traditionally, UPC was focused on three subjects namely pharmaceutical chemistry, pharmaceuticals and pharmacology. Subjects that could not be fitted into these topics, such as forensic pharmacy, ethics, communication and business, were "dumped" into pharmacy practice.

The philosophy behind pharmacy practice is pharmaceutical care. It also has to do with quality assurance based on competence, outcome-based education, academic pharmacy practice and research, and the integration of pharmacy practice and pharmacology. However, pharmacy practice remains fragmented, with no clear agreement on what it is, and therefore it needs to focus on role clarity.

UPC should produce pharmacists who are distributors, educators, diagnosers, and prescribers, and who are able to make cost-effective decisions. Pharmacy practice should focus on the identification of and responses to the drug-related needs of the community and the individual patient. Additionally, it should enable pharmacists to understand and influence the attitudes and behaviour of patients, prescribers and policy makers.

The course structure of pharmacy practice should cover subjects such as pharmaceutical chemistry, pharmaceuticals, pharmacology, pharmacotherapy, social pharmacy (law, ethics, sociology, psychology, anthropology), administrative pharmacy (drug supply management, pharmaco-economics). In other words, behavioural and social sciences should underpin pharmacy practice.

Professor Futter also said that the challenge for the future would be to develop activities to improve professional competencies and to further develop UPC to ensure these competencies are acquired. The criteria for success for pharmacy practice are academic and professional credibility, integrated UPC, an increased number of pharmacy practice staff and relevance to national needs. He concluded that pharmacy practice must change from an ugly duckling and become a swan.

Pathophysiology in UPC

Dr T. A. Morton, Department of Pharmacy, University of Zimbabwe

Dr Morton introduced his presentation by emphasizing that pathophysiology is a patient-oriented subject. Training of students must focus on how to improve and enhance patient care. The aim of pathophysiology is to introduce the students to the functions of organs involved in diseases, and to teach them vocabulary and terminology. A course in pathophysiology should be problem-based, and enhance students' communication and practice skills. It is an important component of UPC as it forms a bridge between science and patient care. Pathophysiology was introduced after the revision of UPC in Zimbabwe.

Dr. Morton pointed out that in the early 1960's in the USA, the pharmacy profession lost an opportunity to assist anaesthesiologist/surgeons in their operating theatre work, with drug interactions and drug administration. At that time, treatments were "hidden" from patients because prescriptions were written in Latin, and patient counselling was uncommon.

It is still unclear in Zimbabwe and other Southern and Eastern African countries what role pharmacists should have in patient management. Most pharmacists work in retail or hospital pharmacies, but are not involved in clinical services. The current "brain drain" of nurses and medical doctors leaving the country creates opportunities for pharmacists to step into this gap. Some pharmacists in Harare have taken the challenge to become more involved in clinical work.

The current trend in the USA is that pharmacists run clinics for diabetes, hypertension, asthma and anticoagulation under doctors' supervision. To perform such tasks pharmacists need to be properly trained. Policies and practice guidelines are needed in Southern and Eastern African countries to meet these new opportunities.

The profession should declare that pharmacists, together with doctors and nurses, are equally responsible for patient care, and the focus should be shifted from mainly drug supply activities to patient care. Dr Morton concluded that UPC changes are needed to train students to become competent specialists in this field. Pathophysiology provides the scientific foundation for the specific knowledge and skills needed by pharmacists involved in patient care.

Pharmacognosy/natural products in UPC

Professor M. G. Gundidza, Department of Pharmacy, University of Zimbabwe

Professor Gundidza indicated that the practice of traditional medicine is on the increase worldwide - a trend that is expected to continue. In many African countries, traditional medicine practitioners have no formal training and work without any type of registration or licensing. This situation means that they cannot practice officially without drawing protests against their unlawful practices from allopathic medical practitioners.

Professor Gundidza pointed out that when a pharmacy school wants to train students in pharmacognosy, it should be included in UPC and integrated with other topics taught in pharmacy. In addition, a continuous education programme should be developed on traditional medicine.

The aims of a pharmacognosy course are to:

- stimulate interest in the cultivation and use of medicinal plants;
- encourage natural unprocessed foods and organic gardening;
- promote the general health and well-being of the whole community;
- provide a recognized qualification for natural medicine practitioners;
- consolidate natural medicine knowledge and promote research;
- promote cooperation between all health professionals, including traditional healers;
- prevent incidences of toxic poisoning from plants and animal products.

The general objectives of a pharmacognosy course are to teach students to:

- identify a wide variety of medicinal plants and animal products;
- investigate medicinal plants and their effects;
- tabulate the main medicinal characteristics of medicinal plants and animal products;
- know the growing conditions required for various medicinal plants;
- manufacture various natural medicinal plant products;
- use medicinal plants for anaesthetic purposes and crafts;
- define natural medicine practitioner terminology
- draw and label botanical structures
- draw and label diagrams of the human anatomy
- use various forms of massage
- diagnose various illnesses
- use essential oils effectively
- understand the concepts of diet and disease.

Antimicrobial resistance and infection control

Ms M. Everard, WHO/Essential Drugs and Medicines Policy

Due to time constraints, copies of Ms Everard's presentation on the impact of antimicrobial resistance on mortality, morbidity and cost of health care as a result of misuse of antibiotics were handed out. The presentation also outlined WHO's strategy on the surveillance and containment of antimicrobial resistance.

Distance learning and web-assisted learning programmes - a medium for delivery of postgraduate training and continued professional development

Mr W. Basson, Potchefstroom University, South Africa

Distance learning and web-based learning programmes progressed in line with other developments in pharmacy education in South Africa. Pharmacy schools in South Africa started to implement the new UPC based on unit standards in 1998.

The development of postgraduate programmes at Potchefstroom University for Christian Higher Education commenced in January 1998. This was followed by the introduction of distance learning courses in June 1998 and web-based learning courses in June 2000.

Because of the changing standards for pharmacists entering the profession, the need for continued professional development in the fields of management, pharmaceutical care, clinical pharmacology, pharmaceutical information systems, pharmaceutical production and pharmaceutical services in hospitals became apparent.

Potchefstroom University identified two non-residential delivery systems, Internet and web-based learning programmes, and distance learning programmes. These programmes have a flexible, modular structure. The programmes' target population is pharmacists in practice, pharmaceutical technologists, medical practitioners, dentists and other pharmaceutical personnel. The programmes' objectives are to improve health services provided by pharmacists and other health care professionals, in support of South Africa's national health policy. This will be done through continued professional development courses, to create opportunities in practice for pharmacists and other health care professionals nationally and internationally.

Admission requirements include degrees, such as B.Pharm or B.Sc Pharmacy, MB ChB, B.ChD or approved equivalents. Pharmacy Diploma holders can enrol for two modules and after successful completion can progress to degree level. The courses involve 1280 study hours. The minimum study period is one year full-time or two years part-time with a maximum study period of three years. The final qualification upon completion of all modules is an honours degree.

Mr Basson concluded with an example of one of the University's distance learning programmes that had attracted 24 pharmacy technologists from Evelyn Hone College in Lusaka, Zambia. These students enrolled for modules of the industrial pharmacy programme, a non-pharmacist required training course.

Pharmaceutical biotechnology in UPC

Professor D. J. Chetty, School of Pharmacy & Pharmacology, University of Durban-Westville, Durban, South Africa

Professor Chetty introduced his presentation by defining biotechnology as the application of molecular biology and recombinant DNA technology to influence specific biological processes that are largely related to human needs. Biotechnology is not new and has been used in the past to produce pharmaceuticals and vaccines derived from microorganisms.

The recent expansion of South Africa's biotechnology industry is shown by the tripling of the number of companies since 1987, with the sector now employing over 300,000 people. There are about 20 approved recombinant or synthetic protein drugs, and more products are being clinically tested at the moment.

The essential components of pharmaceutical biotechnology include therapeutic products of recombinant DNA technology, peptide and protein drug delivery, gene delivery and ethical issues. The production of therapeutic products of recombinant DNA technology makes use of various techniques such as cloning, transcription and translation.

Ethical issues present a major challenge to pharmaceutical biotechnology as general concern is raised about human genetic manipulation and genetic screening. Another current debate concerns the fact that scarce resources are allocated to biotechnology that could be better spent on prevailing health problems.

A pharmaceutical biotechnology course in UPC should cover cell biology, molecular biology, pharmaceutical microbiology, biochemistry and genetics. Teaching materials should be relevant and up-to-date as the technology is changing rapidly.

Professor Chetty concluded that biotechnology provides new scientific opportunities for the development of novel therapies for cancers, genetic defects and viral infections. UPC should make future pharmacists aware of the potential, applications and implications of biotechnology in health care.

Annex 5

List of Steering Committee members

Dr O. Munjeri - Pharmacy Department, University of Zimbabwe

Professor C. Mackie - School of Pharmacy, Robert Gordon University, Aberdeen, Scotland

Professor R. Summers - School of Pharmacy Medunsa, South Africa

Mr G. S. Rampa - Institute of Health Sciences, Gaborone, Botswana

Mrs S. Putter - Pharmacy Council of South Africa

(See Annex 2 for contact details).