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**Consultancy to Strengthen the Rational Use of
Drugs in Kenya (study D1)**



**FINAL REPORT D1
RATIONAL USE OF DRUGS
June 2005**



Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
AMREF	African Medical Research Foundation
ARI	Acute Respiratory Infection(s)
ARV	Anti-Retroviral(s)
BTC	Belgian Technical Cooperation
CEDMAP	Centre for Drug Management and Policy
CEO	Chief Executive Officer
CHMP	Centrale Humanaire Médico-Pharmaceutique
CHW	Community Health Worker
CME	Continuing Medical Education
CPA	Commonwealth Pharmaceutical Association
Danida	Danish International Development Agency
DFID	Department for International Development (UK)
DHMT	District Health Management Teams
DIS	Drug Information Service
DMS	Director Medical Services
DTC	Drugs and Therapeutics Committees
EDL	Essential Drugs List
EPN	Ecumenical Pharmaceutical Network
ERS	Economic Recovery Strategy
EU	European Union
FEFO	First expired, first out
FHI	Family Health International
FIFO	First in, first out
GFATM	Global Fund for AIDS, TB and malaria
GGCH	Gertrude's Garden Children's Hospital
GOK	Government of Kenya
GTZ	German Technical Cooperation
HAI	Health Action International
HERA	Health Research for Action, Belgium Consultancy Company
HF	Health Facilities
HIV	Human Immunodeficiency Virus
HMO	Health Maintenance Organisation
HSRS	Health Sector Reform Secretariat
IEC	Information, Education and Communication
INRUD	International Network for Rational Use of Drugs
JICA	Japan International Development Agency
JSI	John Snow International
KEDL	Kenya Essential Drugs List
KEMSA	Kenya Medical Supplies Agency
KES	Kenyan Shilling
KMA	Kenya Medical Association
KMTC	Kenya Medical Training College
KNDPIP	Kenya National Drug Policy Implementation Plan/Programme
KNH	Kenyatta National Hospital
MEDS	Mission on Essential Drug Supplies
MOF	Ministry of Finance
MOH	Ministry of Health
MSH	Management Sciences for Health (USA based consultancy company)
MTPP	Medium Term Procurement Plan
NBI	Nairobi
NDP	National Drug Policy

NDTC	National Drugs and Therapeutics Committee
NEDL	National Essential Drugs List
NGO	Non Governmental Organization
NHSSP	National Health Sector Strategic Plan
NPTC	National Pharmacy and Therapeutics Committee
NSAID	Non-Steroidal Anti-Inflammatory Drug
NSHIF	National Social Health Insurance Fund
ORS	Oral Rehydration Salts
PEPFAR	Presidential Programme for AIDS relief
PHMT	Provincial Health & Management Team
PPB	Pharmacy and Poisons Board
PRDU	Promoting Rational Drug Use
PSK	Pharmaceutical Society of Kenya
PTC	Pharmaco-Therapeutic Committee
RDF	Revolving Drug Fund
RDU	Rational Drug Use
RHZ	Rifampicin – Isoniazide – Pyrazinamide (fixed dose combination tablet)
RPMPPlus	Rational Pharmaceutical Management Plus program of MSH
RUD	Rational use of Drugs
SIDA	Swedish International Development Agency
STD	Sexually Transmitted Disease
STG	Standard Treatment Guidelines
USAID	United States Agency for International Development
USD	United States Dollars
USP	United States Pharmacopoeia
WHO	World Health Organization

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FINAL REPORT

This is the final version of the HERA report as per Terms of Reference of Ministry of Health.

A draft report was circulated in March 2005; comments were received from KEMSA, PSK, KPA, QC Lab director. Where appropriate, these have been considered for inclusion.

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EXECUTIVE SUMMARY

Within the wider framework of health sector reform the Ministry of Health (MOH) - in partnership with the World Bank and other international agencies - has commissioned a comprehensive review of the pharmaceutical sector with a view to reforming and strengthening the regulation, financing, and provision of pharmaceuticals in Kenya. Four separate studies are undertaken addressing National Medicines Policy, Access to Essential Medicines, Quality Control and Assurance, and Rational Drug Use/Logistics. This report presents the results of Study D1: Rational Use of Drugs.

The complete study D report is presented in two volumes, Volume I containing the main report on the Rational Use of Drugs, and Volume II the main report on Procurement/Logistics.

The historic global '**Rational Use of Drugs**' meeting was convened in November 1985 in Nairobi. Rational use of drugs has been discussed in many pharmaceutical sector documents of Kenya and much work is supposed to have happened to improve prescribing practices of health workers, dispensing practices of pharmacists, and drug taking by the general public. Unfortunately, inappropriate drug use continues to be one of the major problems in Kenya's health care delivery system today. Kenyan literature details a variety of poor drug use practices. Inappropriate drug use has become a serious public health problem in Kenya.

Kenya's **National Drug Policy** (prepared in 1994) contains a chapter on rational drug use, but the contents are not well defined and there is no clear strategy on how to achieve improved drug use. The Pharmacy & Poisons Act has hardly any provisions on rational drug use at all. The former Kenya Drug Policy Implementation Programme (KNDPIP) hardly had activities implemented, including the ones aimed at improving drug use, and an effort to update the national drug use is still in its infancy.

A variety of **prescribing surveys** have been carried out. Most of these are using non-representative samples, but they do provide insight into drug prescribing and consumption practices. An overview of these studies is presented in this report. Information on the costs of inappropriate drug use in Kenya was sought, but not found.

The report continues with a chapter on drug use improvement **tools and strategies** in Kenya. These include the national essential drugs list, the (absent) national formulary, national standard treatment guidelines, hospital drugs and therapeutic committees, mechanisms of audit and feedback of prescribing data, and drug information activities. The common conclusion is that although some of these have been well developed (e.g. the national essential drugs list and standard treatment guidelines), none of them has had much impact on drug use practices. Most of these activities appear to be uncoordinated and not part of a larger strategy to improve drug use in the country.

RDU **training** activities have taken place over time, and the report presents an overview of the programmes that have been set up in the past decade. The conclusion is reached that improved drug use practices are expected to be a natural result of training activities, an assumption that remains unproved. Several Kenyans have been trained in undertaking drug use indicator surveys, but these resources have been little utilised, if at all. There has also been little initiative to establish continued medical education programmes for health professionals. IEC programmes tended to focus on producing posters and delivering of taped messages to waiting patients at health units. What these messages achieved in changing drug use by consumers is unknown.

An interesting finding is that there are a number of well-documented and successful Kenyan **case studies** in improving drug-prescribing practices. These are experiences in improving the use of specific categories of drugs (e.g. antibiotics, antiretrovirals), experiences in improving prescribing practices for inpatients, impact of DTCs in therapeutics in defined health facilities, improvement of practices of drug sellers, and others. The report provides an overview of these experiences.

A **health facility drug use survey** was carried out in October 2004 as part of the Kenya Pharmaceutical Sector Review. 10 governmental and 9 private health facilities, 9 not-for-profit facilities, and 4 private pharmacies were surveyed. The number of drugs prescribed, how many of these were generics, how many figured in the Kenya Essential Drugs List, whether the prescription contained antibiotics, and whether they contained injections was recorded. The findings are broadly in line with findings reported in other Kenyan drug use studies. The average of 2.7 drugs per prescription that was found appears to be high, just as the finding that over 60% of patients received an antibiotic. Injection use (16-19%) is lower than in some other studies in the region, but can probably be improved a lot. Generic drug usage is low with only some 40% of prescribed drugs being generics. Prescribing of drugs from the national essential drugs list (the KEDL) can be much higher than it is now. Worrying is the large variation in prescribing indicator values, pointing to large differences in prescribing practices. There are impressive outlier values (e.g. health facilities where 80% of patients get at least 1 antibiotic prescribed, and those where 60% get at least one injection).

A series of **in-depth interviews** was held with selected members from the Kenyan health care community. 17 senior and knowledgeable individuals from private and public sectors, and from national health related institutes were approached. All completed a questionnaire and were interviewed on the basis of their answers. Findings of the interviews are presented in the report. They include information on the various aspects of drug use in Kenya, as well as its history and reasons why many interventions have not worked. Interviewees provided a large number of ideas and suggestions for more effective interventions. Responses have been categorised in a number of sub-headings:

- Reasons for poor drug use practices
- Why earlier drug improvement efforts in Kenya have not worked
- What might be a new RDU strategy
- Responsibilities for implementing a new RDU strategy
- Priority target groups for RDU activities
- How to improve drug use by patients and consumers
- RDU an opportunity for the New Social Health Insurance Scheme (NSHIF)?
- Issues of broad agreement

Based on the available information, the report presents a discussion and a series of conclusions and recommendations.

The report continues with concluding that poor drug use is a common feature in public and private health care in Kenya, and that these practices continue to worsen. This, in turn, must be regarded as a serious public health problem. Poor drug use also causes considerable waste of scarce resources, because a large fraction of the drugs budget does not translate into therapeutic value. Strengthening RDU in Kenya is therefore not merely desirable; it is a hard requirement in periods of economic hardship.

Large-scale RDU intervention activities have been planned in earlier pharmaceutical sector work, but in reality very little has been implemented. This poor implementation is partly due to the lack of structures and coordination, but may also be caused by a lack of perceived urgency.

Main Recommendations

This report does not present a fully developed RDU strategy for Kenya. Instead, it presents a series of key recommendations for designing such a strategy. Key recommendations and steps in designing a national strategy to improve drug use in Kenya would include the following:

- A national RDU strategy should be designed by a small core group of key professionals, in a dynamic and time saving process. Stakeholder involvement is very much encouraged, but overly bureaucratic procedures should be avoided;
- The strategy should consist of a mix of innovative intervention methodologies and multiple actors and aiming at addressing all sectors of the health care system. It is recommended that this strategy consists of a broad mix of educational, managerial, regulatory, and economic interventions. Training approaches must be applied with care, as training has often been seen as income generating activities. Uncoordinated work must be avoided. Good models are available in Kenya, and in the rest of the world, while excellent literature and a large number of web-based locations are available for further consultation;
- A national representative drug use survey, using internationally accepted methods would need to be implemented every 2 years, to monitor the national RDU strategy implementation. Rapid surveys should be carried out in areas where insufficient data are available (e.g. drug sales practices in private pharmacies and drug use practices in private hospitals). Especially studies that show the scale of economic waste and that produce quantifiable information on poor quality of care are of key value;
- A national rational drug use task force should take responsibility for implementing the national RDU strategy, and have the required budgetary resources to do so;
- Strong commitment and political leadership is needed, and without it there is little point in even starting the process. Especially senior policy makers may need to be convinced of the need for such activities;
- Hospitals and health workers at all levels (including provincial and district levels) should be included, and pharmacists should get a much larger role in drug use improvement efforts. Opinion leaders should be fully involved. Community health workers, nurses, and private pharmacists should be addressed in the new strategy.
- Regularly monitoring drug use practices in institutions and at household level, as well as measuring the impact of interventions is an indispensable part of a national RDU strategy;
- Special attention should be devoted to designing economic strategies to improve drug use, including policies that reduce incentives for poor drug use, and increase incentives for improved drug use. Health insurance companies can assist in designing these policies, including Kenyan health insurance companies.
- Designing prescribing policies for public and private sectors is a key requirement. Major hospitals should lead the way.
- Finally, targeted regulatory interventions may be needed to diminish the detrimental influence of promotional activities by the pharmaceutical industry, especially the activities of drug company representatives in health facilities. Controlling the circulation of non-essential and poor quality drugs in the country may be a difficult but unavoidable step.

1. BACKGROUND

Kenya was the place where in November 1985 the historic meeting 'Conference of Experts on Rational Use of Drugs' was convened, a meeting in which for the first time the importance of 'rational', or better 'correct' and 'evidence-based' use of medicines was recognised¹.

Rational use of drugs has been discussed in many pharmaceutical sector documents of Kenya (see list of references, annex 4). The subject has been given importance and much work is supposed to have happened to improve prescribing practices of health workers, dispensing practices of pharmacists, and medicine taking practices of the general public. However, a recent editorial² in the Kenyan journal 'Health Line' admits, "many people involved in health care cherish the concept of rational use of drugs, but in practice not all who embrace it also implement it". Inappropriate drug use is one of the major problems in Kenyan health care today. The editorial explains that the problems are partly caused by the multitude of drugs that are registered on the Kenyan market, amongst them many 'me-too' drugs, and products that "create confusion in the minds of the prescribers and consumers (patients)". The author complains that "very many analgesic and anti-inflammatory products have been registered in Kenya in the last ten years", and that "in the area of antibiotics there are over sixty varieties of ciprofloxacin". The author suspects that prescribers become "flabbergasted" by such over-supply of brands and generics, and that it will result in poor selection of drugs to be prescribed. Another problem leading to poor drug use practices is failing regulation. Currently in Kenya, most prescription drugs can easily be obtained without a prescription, although there is clear regulation against it. "It would appear that Kenyans love enacting legislation, but fail to enforce many of them almost immediately they are sanctioned as laws", according to the author.

Prescribers must acquire correct information from their university education and from continuing medical education programmes. Patients need specific information on side effects, drug interactions, cost, storage conditions and dose schedules. Dispensers need similar information as prescribers, as in the Kenyan context they are often the ones making therapeutic decisions. However, university curricula and continuing medical education do not provide the information that is necessary for better therapeutic decisions. Consumers and drug sellers appear to have been little targeted with specific educational activities. In the absence of independent information or regulatory control of promotional activities, the pharmaceutical industry is freely promoting its products through medical representatives, supply of free samples, sponsorships in symposia, incentives to the prescribers, and other activities that negatively impact on evidence-based drug use.

The following sectors highlight our findings of the current state of drug use practices in Kenya and activities that have been carried out or are planned to improve medicine use. The report also makes recommendations for the future.

¹ In this study the words "drug" and "medicine" are used interchangeable. WHO recommends the use of "medicine" where possible.

² Lore W. Rational use of drugs: The Kenyan scenario (Editorial). Health Line, 6(1), January - March 2002, pp 1-3.

2. RDU POLICIES

Kenya's National Drug Policy (NDP, 1994) contains a chapter 6 on Rational Drug Use (RDU), with statements on treatment guidelines, generic prescribing, education and training, pharmacy and therapeutic committees, drug information and drug advertising and promotion. Whereas the policy addresses the major issues in improving drug use, its contents are not well defined and there is no clear strategy on how to achieve improved drug use. Most activities are presented in the future tense, implying that the implementation of them is a key factor of success. Evaluations of the Kenya Drug Policy Implementation Programme (KNDPIP)³ make clear that the majority of these activities have not taken place.

A renewed effort to update the NDP implementation plan took place in 2003⁴. The RDU section of the draft documents contains little text, and 9 activities are suggested. The document is clearly in an early stage of development and needs to be finalised. The budget is also unfinished and firm conclusions on this document cannot be drawn at this stage.

The Pharmacy & Poisons Act does not refer to rational use; it does define schedules, but adherence to these legal requirements is poor.

3. LITERATURE ON CURRENT DRUG USE PRACTICES

A variety of drug prescribing surveys have been carried out in the past. Most of them have not been on representative samples, but they do provide some insight into drug prescribing and consumption practices in Kenya. Below is an overview of the documents that were identified from the drug use literature.

3.1 Prescribing for outpatients

A prescribing survey in the early 1990s during a 'free health care day' in Eldoret⁵ found an average number of drugs prescribed of around 2, but 33% of patients received 3 or more drugs. Many patients received multiple drugs without a clear diagnosis. Laboratory tests were underused, with only 9% of patients suspected to have malaria having a diagnostic blood smear.

A drug use survey carried out by Mission on Essential Drug Supplies (MEDS) in 1994⁶ found an average of 2.8 drugs prescribed in the outpatient department. 46.9% of prescribed drugs were generics. 65% of patients received at least one antibiotic, and 12% at least one injection. 95% of prescribed drugs were from the national essential drugs list.

WHO, in collaboration with MEDS and the Kenya Medical Training College (KMTCC) conducted some non-representative drug use indicator studies in some health facilities⁷. An average of 2.9 drugs was prescribed per patient, with 30% of facilities prescribing over 3

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3. Haak H, Barillas E, Holloway K, Shariff SK, Kashaija K. External review of the Kenya National Drug Policy Implementation Programme. 3 - 13 October 1999.
Trap B, Chinyanganya F, Chuchu S, Larsson E, Schreuder B. Med-term review of the Kenya National Drug Policy Implementation Programme. 24 January - 4 February 1998.
 4. MOH. Revised Kenya National Drug Policy Implementation Plan and Priority Action Plan. Draft report, Lions Hill, 27-30 October 2003.
 5. Nabiswa AK, Godfrey RC. Diagnoses and prescriptions for patients managed during a free health care day in Eldoret, Kenya. *East African Medical Journal*, June 1994, pp363-365.
 6. Nderitu A, Kirika R, Gatobu A. Report on initial drug usage study at the outpatient and inpatient departments of a 'facility A' hospital. 23-25 August 1994. MEDS.
 7. Joseph M. Pharmaceutical baseline survey, Kenya, undated.

drugs per patient. 78% of the patients were prescribed one or more antibiotics and 28% one or more injections. Adherence to STGs was low; only 25% of diarrhoea cases were treated with ORS and 50% of cases received one or more antibiotics.

A study on the quality of STD case management in 2000⁸ showed that correct history taking in health facilities ranged from 60-92%, correct examination from 31-66% and correct treatment from 30-75%. Overall correct case management was given to 14-48% of patients. Only 13% of the drugs that were prescribed were adequately labelled. Providers trained in STD management showed better practices than those who were not.

A retrospective and prospective drug prescribing survey was recently carried out collecting data from medical records from the Kenya Medical Association and from medical encounters from two medical camps in Nairobi⁹. The average patient received 2-3 drugs, and 46% of encounters received at least one antibiotic. About 77% of prescribed drugs were in accordance with the national EDL, and 32% of prescribed drugs were generics. The percentage of drugs prescribed actually dispensed was 79%. Adequacy of labelling and patient knowledge was 65% and 74%, respectively.

A prescribing survey¹⁰ in outpatients in the Mater Hospital in 2003 found an average of 2.6 drugs prescribed per patient. 61% of patients received at least one antibiotic and 34% an NSAID. The use of brandnames was high, which was attributed to free access of drug representatives to medical doctors.

A non-representative 'spot test' of prescribing practices in district health facilities during the 1998 mid-term evaluation of the Kenya National Drug Policy Implementation Programme (KNDPIP) found on average 2.97 drugs prescribed per patient, with only 27% of them being generics. 50% of patients received at least one antibiotic and 67% at least one injection. Very few patients could explain satisfactory to the surveyors how prescribed antimalarial drugs should be used.

A WHO/HAI pharmaceutical sector survey assessment was carried out very recently and a draft report made available¹¹. Unfortunately its methodology is substantially different from other surveys and its findings difficult to interpret.

3.2 Prescribing for inpatients

Prescribing for inpatients was surveyed in Kenya in the early 1990s¹². Prescribing encounters from a provincial general hospital were sampled cross-sectionally from only one day of a patient's hospitalisation, using 100 prescriptions per prescriber, per ward, or per department (e.g., medicine, surgery, maternity). Patients in medical and surgical wards received, respectively, 3.1 vs. 3.0 drugs per patient; 65% vs. 74% were on antimicrobials, of which 46% vs. 48% were on two or more antimicrobials; 12% vs. 30% received injections; 53% vs. 76% of drugs were prescribed by generic name; 95% vs. 97% of drugs appeared on

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8. Quality of sexually transmitted disease case management in Nairobi, Kenya: a comparison among different types of health care facilities. Voeten HA et al. *Sex. Transm. Dis.* 2001 Nov; 28(11): 633-42.
 9. Orwa J, Ombogo J, Ojoo MA, Oluka M, Ogaja EMA, Wanyanga WO, Thuo M. Assessing Drug Use Practices at Free Medical Camps in Kenya. Abstract ICIUM-2004
 10. Personal communication, Mr Patrick Boruet, Deputy Chief Pharmacist of Mater Hospital.
 11. MOH/HAI/WHO. Monitoring and Assessing the Pharmaceutical Situation in Kenya. 2004.
 12. Quick JD, Thuo HM, Gesami JO. In-patient drug use indicators: A pilot study from Kenya, East Africa. *INRUD NEWS*, 2(4), July 1994, p9.
Quick JD, Thuo HM. Adaptation of WHO drug use indicators in hospitals. *The Lancet*, 343, Jan 22, 1994, p 237.

the Essential Drugs List; 0% vs. 18% of patients were on narcotic analgesics, and 70% vs. 62% with complete drug orders. Completeness of drug administration information was only 6% on the surgery department. In a repetition of this survey methodology in some public and mission hospitals¹³, inpatients were found to receive on average 2.6 - 2.8 drugs per prescription. 87 - 89% of prescribed drugs appeared on the national EDL, and the 86 - 89% of drugs were prescribed as generics. 51 - 68% of patients received at least one antibiotic and 44 - 49% received at least one injection.

3.3 Prescribing by community health workers and nurses

Community health workers' drug use for common childhood illnesses was surveyed in the Siaya District in 1998, 1999, and in 2001¹⁴. The proportions of children treated "adequately" were only 57.8%, 35.5%, and 38.9%, respectively, for children with a severe classification and 27.7%, 77.3%, and 74.3%, respectively, for children with a moderate classification. CHWs adequately treated 90.5% of malaria cases (the most commonly encountered classification). Most mistakes were made in assessing symptoms, classifying illnesses, and prescribing correct doses of medications. It was concluded that there were deficiencies in the management of sick children by CHWs, and that complexity of guidelines and inadequate clinical supervision were probably the most important reasons.

3.4 Drug dispensing and sales practices

A drug sellers' survey in the mid-1990s¹⁵ showed that the majority of chemists sell antibiotics without a prescription, and that most of them readily adjust the dose at the request of the patient. Drugs were often sold in envelopes without any instruction, while none of the sold drugs were adequately labelled.

Shopkeepers and their customers were interviewed on their practices and demands for malaria treatment¹⁶. Up to seventeen different brands of antimalarial drugs, including thirteen brands of chloroquine and four different second line antimalarials were stocked in their shops. Shopkeepers applied a large variety of treatments, dosages and combinations of drugs for treating malaria. Despite this, only 38% of the shopkeepers and 23% of customers felt they had correct knowledge of how to treat malaria. Especially the shopkeepers were eager to learn more about evidence based malaria treatment.

A Kenyan study¹⁷ found that most important determinants of pharmacy patronage were the availability of professional and competent pharmacy services, price, and convenience (in that order). Ethnicity, religion, and traditional/social factors (e.g. family tendencies) were not important. This would imply that improving the quality of drug sales practices and lowering drug prices is not only advisable for improving public health, it would also make sense from the business point of view. This observation probably does not only relate to prices in pharmacies, it may also apply to health services in general. An important remark in this report was that "it is considered unprofessional to advertise prices in Kenya". This may need

13. Thuo HM. Intervention to improve drug usage in inpatient settings in Kenya. Health Line, 6(1), January - March 2002.

14. Kelly, J.M., Osamba, B., Garg, R.M., Hamel, M.J., Lewis, J.J., Rowe, S.Y., Rowe, A.K., and Deming, M.S. Community health worker performance in the management of multiple childhood illnesses: Siaya District, Kenya, 1997-2001. Am.J.Public Health 91(10):1617-1624, 2001.

15. Indalo, A.A. Antibiotic sale behaviour in Nairobi: a contributing factor to antimicrobial drug resistance. East African Medical Journal, 74:171-173, 1997.

16. Ongore D, Nyabola L. Role of shops and shopkeepers in malaria control. East African Medical Journal, 73(6): pp390-394, 1996.

17. Thuo HM. Determinants of pharmacy patronage. Health Line, 3(3):pp47-51, July - September, 1999.

to be worked on in future programmes, as making price information widely available is one of the key strategies in bringing down prices.

3.5 Drug use practices at home

Residents' knowledge about malaria and antimalarial drugs and of their treatment-seeking behaviour were studied in a rural area of western Kenya¹⁸. Self-treatment was very common: 60% of episodes of febrile illness were treated at home with herbal remedies or medicines purchased at local shops. Only 18% received treatment at a health centre or hospital; no treatment from health facilities was sought by 22%, and the remainder was managed at home with a variety of traditional remedies and modern pharmaceuticals. 4-Amino-quinolines were used in 58% of febrile illnesses but in only 12% a clinically effective curative dose was employed. Injections were regarded as more effective than oral medications. Attendance at a health centre did not ensure adequate treatment because of the common practice of sharing medication among family members.

3.6 Drug use in specific sections of the health sector

Data on drug use practices in private hospitals and the not-for-profit sector was searched but not found. In addition, it was expected that much specific drug use data could be found on high volume diseases (e.g. ARI, diarrhoea, malaria), as improvement might have important impacts on public health of the Kenyan population. However, apart from the few studies described above, little information was found. Information was also expected in the field of HIV/AIDS, but given that treatment of this condition is still new, no research data was identified. Nevertheless, there are unconfirmed reports that drug use practices in HIV/AIDS care are far from being ideal.

3.7 Cost of inappropriate drug use

It was hoped that specific information could be identified on the cost implications of poor drug use for the health care delivery system and for families. Poor drug use may waste scarce resources of the government and of households. Despite verbal accounts on the availability of such reports, they could not be identified by the review team. Unfortunately the literature on health financing appears to provide only details on trends of essential drugs expenditures as related to expenditures for other health costs¹⁹.

Summarizing the data on drug use in the Kenyan context, one may conclude that a number of (small-scale) studies have been carried out, but that systematic data are not (yet) available. The data that are available consistently show worrisome drug use practices, which may be harmful for the health of the Kenyan population. Efficiency of drug use and possible dangers for public health may not have received sufficient attention, presumably because expenditures for drugs are expected to translate directly into therapeutic value and better health. This may be a serious mistake. Little research appears to have gone into the cost implications of poor drug use, but it is well known that good standard health care, including essential drugs and diagnostics does not need to be expensive. An answer to the question of how current budgets of drugs and diagnostics can deliver better health care is imperative, rather than promoting ever more finance for these commodities.

18. Ruebush, T.K., Kern, M.K., Campbell, C.C., and Oloo, A.J. Self-treatment of malaria in a rural area of western Kenya. *Bull World Health Organ* 73:229-236, 1995.

19. MOH. Public Expenditure Review. 2004.

4. DRUG USE IMPROVEMENT TOOLS AND STRATEGIES

4.1 National Essential Drugs List

The most recent version of the 'Kenya Essential Drugs List' (KEDL) is the third edition of August 2003. Work on this edition started in 1999. Various organizations provided input in developing this version, including the World Health Organization and the Pharmacy and Poisons Board. The 2nd version of the NEDL was issued in 1993.

The introduction of the KEDL states that it is "central to the efforts of the Ministry of Health in harmonising activities in the drug sector", and that it has been prepared in "close collaboration with the Clinical Guidelines for Diagnosis and Treatment of Common Conditions of the Ministry of Health". The KEDL is supposed to serve as the basis for medical, pharmacy, nursing, and other health training programmes; for prescribing in Ministry hospitals, health centres, and dispensaries; for the procurement and supply of drugs to Ministry facilities; and to encourage local manufacturers to adapt their production for the health care needs of the country. The foreword explains that it is expected "that the regular use of the KEDL will improve and encourage the rational use of available drugs and thus contribute albeit in a modest way towards the realization of the health sector vision of creating an enabling environment for the provision of sustainable quality health care that is acceptable, affordable, and acceptable to all Kenyans"

The National Pharmacy and Therapeutics Committee (NPTC), with members from the various regions in Kenya, the Medical and Pharmacy faculties of the University of Nairobi, and KMTC and KNH is responsible for updating the KEDL. The NPTC is also responsible for updating the 'Clinical Guidelines for Diagnosis and Treatment of Common Conditions'. The level of activity of the NPTC is unclear, and reportedly the review and update of the KEDL and the Clinical Guidelines have been done by ad-hoc committees appointed at Ministerial level.

4.2 National Formulary

A National Drug Formulary does not exist in Kenya. The private sector uses commercial, non-independent guides²⁰. The PPB database of registered/deregistered drugs to date is not updated either

4.3 National Standard Treatment Guidelines

The Clinical Guidelines for Diagnosis and Treatment of Common Conditions were printed in 2002 in a limited edition (1000 copies?). However, there are reports that they have been poorly distributed and that the majority of them did not get distributed at all. In addition, they have been criticised by some health workers as not user-friendly, and too detailed to be useful in daily prescribing work. Field observations during KNDPIP evaluations gave little evidence that the guidelines were available in health facilities, nor that they were used in clinical decision-making. The HERA survey found that 40% of government public sector health facilities had copies of Clinical Guidelines, but these were mostly older versions. A number of disease-specific treatment protocols have been developed with donor funding (e.g., Malaria, TB, and HIV/AIDS).

20. Kimotho, Akumu, Muriuki, Ombega (eds). East African Pharmaceutical Loci - A Regional Drug Index, 5th Ed 2003/3, Pharmaceutical Loci Publishers.

4.4 Hospital Drugs and Therapeutic Committees

The establishment of Drugs and Therapeutics Committees (DTC) is embedded in the NDP of 1994. DTCs are active in a number of settings.

In at least two major peripheral hospitals DTCs have been active and successful in the past, Siaya District Hospital and Embu Provincial Hospital, but unfortunately none of these are functional at the moment.

Kenyatta National Hospital set up a DTC in the early 1990s, during which time it was active in developing a hospital drug list/formulary and a patient drug pricing mechanism. However, it has not held regular meetings in the last few years. A reported problem was the frequent change of personnel in the hospital.

Private sector hospitals have also created DTCs in the past few years. Whereas the NPTC and DTCs in MOH health facilities largely failed to function, those in mission facilities and private hospitals saw various degrees of success. Some of the major Nairobi hospitals where DTCs are functioning are a) Gertrude's Garden Children's Hospital, b) Aga Khan Hospital, c) Nairobi Hospital, and d) Mater Hospital. The mandates for these DTCs vary considerably. For example, the DTC in the Aga Khan Hospital approves medicines included in its outpatient formulary, and is responsible for infection control activities. Reportedly the Aga Khan DTC also carries out prescribing audits from computerized pharmacy records, but follow-up action is limited and outpatient prescribing is not monitored at all. The average cost per prescription was reported to be KES 1,500 (US\$ 20). Medical reps are restricted by the DTC, but they continue to be allowed to make 'presentations on their products'. On the other end of the spectrum, the Gertrude's Garden Children's Hospital's DTC handles a wider scope of activities, including aspects of therapeutics. Activities include the development and maintenance of treatment protocols, formulary management, education and information of prescribers and patients, and regular audits of drug use practices. Impacts of two years of consistent work are impressive and some of them are presented below.

MEDS has a Formulary Committee, which reviews its institutional drug list on an annual basis. Its training department trained and facilitated the setting up of DTCs in various mission hospitals.

The organisational set-up of DTCs has been criticized in some reports, calling for members not to be elected only on the basis of representation, but also on the basis of the professional capability.

A variety of actions have been undertaken in recent years to revive dormant DTCs. A two-week international training on DTCs was held in Nairobi in October 2001 in which a variety of pharmacists and health staff of MOH, the private sector, KMTC, the Faculty of Pharmacy, University of Nairobi and MEDS attended. The participants developed action plans to either set up or revive their dormant DTCs. The MSH RPM Plus programme had one of its senior programme associates work on reviving the dormant NPTC in 2003. The re-launch meeting was held in Nairobi in May 2003, but it is not clear whether there is progress to date. In addition, RPM Plus organized in February 2004 a regional workshop to train health staff from a large variety of countries in the setting up DTCs. Staff from MOH Kenya also participated.

The apparent inability to get DTCs operational through training needs to be reviewed in the context of a multi-year Rational Drug Use strategy. The few DTCs that seem to function well have either enthusiast staff, or have allocated drug budgeting to the tasks of the DTC. For districts and small hospitals more pragmatic solutions might be needed (drug budgeting and/or rational use as agenda points in the management team meetings, rather than again another committee?)

4.5 Audit and feedback of prescribing data to health workers

Audit and feedback of data to prescribers (drug utilization reviews, drug use indicator studies, consumption and availability studies, cost evaluation) have been discussed, but very little carried out. The review team could not identify any report of such a survey.

In conclusion, a large variety of activities have taken place in recent years to establish, or revive DTCs in Kenya, and Kenyans have participated in a variety of training activities to this respect. Staff from the Ministry of Health, often the same ones, also attended various other training programmes over the years, but it apparently did not lead to improvements in the functioning of DTCs. Currently there are a few major hospitals where DTCs have a key role in drug use decisions, and in most cases they function as formulary committees, rather than therapeutic committees. Good examples are available, though.

4.6 Drug information

There is a clear need for drug information services in Kenya. For example, one report²¹ states that the MEDS Drug Information Service receives around 6 information requests per day (fax, email, telephone, and in person). These requests deal mostly with relatively simple questions, such as dosing and alternative drugs, information that should be provided by dispensing pharmacists, but a 'difficult' question arrives roughly once a week. One official in the MEDS Drug Information centre admitted to be 'overwhelmed' by requests for information. It is therefore not surprising that a variety of initiatives have been worked out to create Drug Information Centres.

In 1994, a Drug Information Centre was set up in the Faculty of Pharmacy, University of Nairobi. It was established to serve both health professionals and the general public, and to function as a joint venture with the Ministry of Health. This Drug Information Centre lasted only two years, as there was no dedicated budget, no infrastructure (telephone), and no computer. In addition, staff salaries could not be sustained.

In 1996, the Ministry of Health sent one staff for Drug Information training to the United States, and in 1997 again to Germany. This pharmacist has been given the responsibility for drug information activities within the Pharmacy and Poisons Board (PPB) but frequent changes in her responsibilities caused limited activity into building up a strong Drug Information unit.

In 2000 Kenyatta National Hospital set up a computerised Drug Information system with Micromedex Software, developed by USP-USA. This software allows for easy searches, but requires a yearly subscription costing between \$ 6,000 and \$ 9,000. The initial subscription for KNH was paid for by a multinational pharmaceutical company and KNH was unable to renew its subscription. The computer has been put to other use in the mean time.

Both Nairobi Hospital and Aga Khan Hospital subscribe to Micromedex, which is used by health care professionals of both hospitals. Nairobi Hospital provides Micromedex services to other health professionals, but there is a per-page printing charge. A small library of books, journals, CDs and videos is also available.

In 2002 Gertrude's Garden Children's Hospital sent one of its pharmacists for training in Drug Information services to Australia. At return she set up a Drug Information service with reference materials, started a regular therapeutics newsletter, and a query-answer

21. Kawasaki E, Patten JP. Drug Supply Systems of Missionary Organizations: Identifying Factors Affecting Expansion and Efficiency: Case studies from Uganda and Kenya.

programme with documentation. Pharmacists of the hospital also write drug information articles in the hospital's customer newsletter.

MEDS has a regular newsletter that goes out to mission health facilities that it serves. In the newsletter there is a section that tackles topics of current relevance, e.g. on tuberculosis and on antiretroviral therapy for children.

To regulate the flow of biased drug information, GGCH developed guidelines to control activities of medical representatives. KNH, Aga Khan and Mater Hospitals later introduced similar controls. Such guidelines are not available in public sector and in mission hospitals, allowing uncontrolled pharmaceutical propaganda in these facilities. ,

Many drug information activities have been going on, but there is little co-ordination to maximise the use of resources. For example, it is not efficient for two private hospitals within a short distance of each other to both subscribe to expensive drug information software when the health professionals who use them are the same. There is a clear need for leadership from somewhere - possibly MOH to coordinate these efforts and optimise them.

The Pharmacy & Poisons Board recently revived its Drug Information Centre. A June 2004 business plan is available, but little action has been noted since. An efficient, pro-active National Drug Information Centre would be a valuable asset for the PPB and Kenya.

5. RDU TRAINING ACTIVITIES

Undergraduate and in-service training, based on the essential drugs concept, have been planned in the past, but implementation has taken off in a fragmentary way only. Funding has been made available within the KNDPIP grant for curriculum review at the university level and in other training institutions, and for development of essential drug policy training materials, in-service training and international short-term courses and workshops on RDU. Progress in this area has been called 'limited, uncoordinated and unstructured'. Several Kenyans have been trained over the years in undertaking drug use indicator surveys, but these resources have been little utilised, if at all. There has also been little initiative to establish continued medical education programmes for health professionals.

IEC programmes have been developed, but not consistently implemented. IEC programmes tended to focus on the production of posters and delivery of taped messages to waiting patients at health units. What these messages achieved in changing drug use by consumers is unknown.

A chapter of the International Network for Rational Use of Drugs was set up in Kenya in April 2002. Its first activity was conducting a two-week training course on "Promoting Rational Drug Use (PRDU) in February 2004. Pharmacists from private hospitals, KNH, MEDS, and some NGOs and the Ministry of Health attended. Next steps are not known.

A number of RDU training programmes have been set up, or will be set up in the future. They tend to have different focuses and durations:

- a. Kenyatta National Hospital: Drug Management and Rational Drug Use. 2-6 week programmes ran between 1992 and 1999.
- b. Centre for Drug Management and Policy (CEDMAP): 4 weeks training on Drug Management and Rational Drug Use (1997-2003).
- c. MEDS: 2-day workshops on focussed aspects of drug use (mostly at the facility level - ongoing).
- d. INRUD Kenya: 2 weeks Promoting Rational Drug Use (PRDU) in Feb 2004.

- e. Ecumenical Pharmaceutical Network (EPN): 3-day workshops on the Rational Use of Antiretrovirals from 2002 -2004.
- f. Kenya Medical Association and the Pharmaceutical Society of Kenya: 2-day workshops on the Rational Use of Antiretrovirals from 2002-2003.
- g. International NGOs such as MSH and Family health International (FHI) conduct training within the facilities where they operate.
- h. The Commonwealth Pharmaceutical Association (CPA) has for a long time conducted a distance-learning programme on drug management for non-pharmacists. Some Kenyans participate in this course, but it is unknown how many and who they are.
- i. African Medical Research Foundation (AMREF) is in the process of developing a curriculum for an RDU training programme at its facility in Nairobi.

The Ministry of Health, with support from WHO, set out to conduct RDU training for staff in peripheral health facilities in late 2003. The status of this attempt is unknown. Several of the district programmes have undertaken ad hoc training in RDU and the use of prescription books is no longer a standard practice in health facilities.

Most important is that there is little of an overall drug use intervention strategy and improved drug use practices are expected to be a natural result of training activities. This assumption remains to be proven.

6. DRUG USE INTERVENTION EXPERIENCES IN KENYA

The remarkable fact about Kenya is that there are a number of well-documented and highly successful experiences in improving drug-prescribing practices. These are experiences in improving the use of specific categories of drugs (e.g. antibiotics, antiretrovirals), experiences in improving prescribing practices for inpatients, impact of DTCs in therapeutics in defined health facilities, improvement of practices of drug sellers, etc. Below is an overview of experiences that have been well described in the literature, or that were made available during the sector assessment. More examples may be available.

6.1 Improving drug use in Gertrude's Garden Children's Hospital

An analysis of drug use data before and after 2 years of persistent activities of its DTC, showed considerable improvement^{22, 23} in Gertrude's Garden Children Hospital Nairobi (GGCH). Especially RDU activities resulted in noteworthy improvements. Between 2001 and 2003, the average number of drugs per prescription decreased from 3.3 to 2.2; the percentage of generics use increased from 6% to 23%; antibiotics use rate decreased from 83% to 42%, while injection use decreased from 17% to 7%. In the same period, the average cost per prescription went down from around KES 1,650 to under KES 1,200. Especially the use of generic drugs resulted in substantial cost savings²⁴. These improvements have been largely achieved because of the continuous nature of activities, and a focus on priority problems, as opposed to providing passive training sessions. In addition to auditing prescription practices, the Pharmacy Department also set clear targets for improvement, based on the findings and their trends. GGCH's Pharmacy Department stated that health insurers, companies and consumers were demanding lower costs for health care. They attributed retained patient volumes to success in bringing prescription

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22. Personal communication Dr Robert Nyarango, Pharmacy Department, Gertrude's Garden Hospital, Nairobi.
 23. Ojoo MA, Waning B, Maina M. Assessing the Effect of Two Policy Interventions on Treatment Costs and Drug Use Patterns in a Private Self Funding Healthcare Institution in Nairobi: The Case of Generic Prescribing and Generic Substitution. Abstract ICIUM-2004
 24. Ojoo MA, Waning B, Maina M. Assessing the Effect of Two Policy Interventions on Treatment Costs and Drug Use Patterns in a Private Self Funding Healthcare Institution in Nairobi: The Case of Generic Prescribing and Generic Substitution. Abstract ICIUM-2004

costs down considerably. Some results of drug use improvement in GGCH are presented in Annex 5.

6.2 Improving diarrhoea sales practices in private pharmacies

In the early 1990s, improvement of diarrhoea case management practices and drug sales for diarrhoea in children was tested in some countries, including Kenya²⁵. The intervention included the identification of problems and their causes in pharmacies, training in correct diarrhoea case management and a training approach based on brief one-on-one meetings between diarrhoea programme educators and pharmacists/owners, and a small group training session with drug sellers working in the pharmacies. Using trained surrogate mothers of a child under five with diarrhoea, sales of oral rehydration salts; sales of antidiarrhoeal agents; and history taking and advice to continue fluids and food was measured. Major discrepancies were found at baseline between reported and observed behaviour. For example, 66% of pharmacy attendants in Kenya reported selling ORS for the previous case of child diarrhoea, but in only 33% and 5% of surrogate patient visits was ORS actually sold for such cases. Knowledge about diarrhoea and its treatment increased significantly among counter attendants in Kenya, and sales of ORS increased by an average of 30% (almost a two-fold increase). Antidiarrhoeal sales declined by an average of 15%.

The findings above were confirmed by later intervention studies into drug sales practices for childhood fevers and malaria by shopkeepers in rural Kenya²⁶. Home treatment of childhood fevers was improved by a training intervention of shopkeepers. Large shifts in practices were observed. Similarly, an intervention into malaria related sales practices²⁷ in private sector outlets demonstrated impacts into stocking patterns and sales practices of shops/kiosks. 73 drug sellers in the Bungoma district were trained and equipped with customized job aids. Six months after the intervention the drug sellers were visited by simulated clients (posing as caretakers of sick children). About 32% of visited shops prescribed the approved first-line malaria drug, as compared to only 3% of control shops. It was concluded that changing private sector knowledge and practices is feasible and can be highly cost-effective.

6.3 Administrative intervention to improve ARV use in a hospital setting

Adoption of simple administrative controls for the prescription and refilling of prescriptions of antiretroviral drugs in Kenyatta National Hospital lead to a large decrease of 'ungenuine' prescriptions of antiretroviral drugs (16% to 2% in the 2-year period 1999 to 2001)²⁸. Compliance with specified prescription refilling dates also improved. Results were obtained through a variety of interventions, including restricting prescribing of ARVs to 3 trained specialists, and according to hospital approved treatment schedules only. Prescriptions can now be dispensed only after authorization by the deputy chief executive officer. A KNH ARV medication monitoring form was introduced, specifying the actual date on which the patient was expected to collect refills.

25. Ross-Degnan, D, Soumerai SB, Goel PK, Bates J, Makhulo J, et al. The impact of face-to-face educational outreach on diarrhoea treatment in pharmacies. *Health Policy Plan.* 11:308-318, 1996.

26. Marsh VM, Mutemi WM, Muturi J, Haaland A, Watkins WM, Otieno G, Marsh K. Changing home treatment of childhood fevers by training shopkeepers in rural Kenya. *Tropical Medicine & International Health* 4(5):383-389, 1999.

27. Phillips-Howard, P.A., Wannemuehler, K.A., ter Kuile, F.O., Hawley, W.A., Kolczak, M.S., Odhacha, A., Vulule, J.M., and Nahlen, B.L. Diagnostic and prescribing practices in peripheral health facilities in rural western Kenya. *Am.J.Trop.Med.Hyg.* 68(4 Suppl):44-49, 2003.

6.4 Continuous medical education to improve hospital prescribing

The impact of training in improved prescribing in hospitals and that of complementing it with an in-house Continuing Medical Education (CME) programme of MEDS were assessed²⁹. Three mission hospitals were assessed, using patients' records. In each, a hundred prescriptions were sampled. The average number of drugs per case; the percentage of generic drugs prescribed; the percentage of cases prescribed antibiotics; and the percentage of cases prescribed injections were determined. Training by external facilitators was found to have mixed success in improving prescribing habits, but when complemented by a CME programme, the impact was much higher.

6.5 Educational interventions to improve antibiotic use

The effectiveness of training to improve hospital prescribing for ARI and malaria in children under 5 was assessed³⁰. STGs were issued, and PTC members actively participated in promoting improved prescribing. It was found that prescribing according to STGs in the treatment of ARI increased by some 15%; and generic prescribing increased for both study conditions. The number of drugs per prescription did not change significantly, and there was no change in the use of antibiotics. PTC members did not take an active role in monitoring prescribing practices. It was concluded that the educational intervention alone had little impact on prescribing practices, and they postulated that interventions that aim at strengthening PTC functions may achieve better results.

6.6 Interventions by health insurers

One private health insurer was visited. Documented evidence was not provided, but it was explained that more control over inefficient prescribing is being sought. The institution is in the process of strengthening adherence to generics prescribing, developing treatment guidelines, stop orders for continuous drug therapy, and application of prescribing software. The current budget for drug benefits was said to be around \$ 1 million, and even a limited reduction would mean considerable savings. Collaboration is ongoing with major health insurers in South Africa, Tanzania and Uganda.

In conclusion, Kenya has a number of well-documented experiences in drug use improvement. These experiences may be readily available of application elsewhere, and at larger scales. Careful planning, coordination, and follow-up is important, as well as leadership that focuses on outputs, as opposed to process only

7. HEALTH FACILITY DRUG USE SURVEY

A health facility drug use survey was carried out in October 2004 as part of the Kenya Pharmaceutical Sector Review. The main purpose was to describe the actual drug use situation in the public sector of Kenya, and compare it with findings from the Kenyan drug use literature. The methodology for the survey has been developed by the World Health Organization, and published in a manual³¹. Use was made of the drug prescribing indicator form in that manual. A convenience sample of health facilities and private pharmacies was drawn, and 30 prescribing encounters sampled from each. The DMS was given a copy of the detailed methodology (as per TORs) and approved the proposed survey methodology on 23

29. Kiambuthi J. The Impact of Continuous Medical Education on Prescribing Habits in Mission Hospitals in Kenya. Abstract ICIUM-2004

30. Gitau L, Kiambuthi J. Effect of an educational intervention on antibiotic use in the treatment of ARI and malaria in six mission hospitals in Kenya.

31. WHO (1993) How to investigate drug use in health facilities. Selected drug use indicators. EDM Research Series No.7. Geneva: World Health Organization. WHO/DAP/93.1.

September 2004. Altogether, 10 governmental and 9 private health facilities, 9 not-for-profit facilities, and 4 private pharmacies were surveyed. The health facilities were a mix of hospital OPDs, Health Centres, and Dispensaries. As the sample covered a broad spectrum of health problems, information on signs and symptoms was not collected.

For each prescribing encounter the number of drugs prescribed, how many of these were generics, how many of them figured in the Kenya Essential Drugs List, whether the prescription contained antibiotics, and whether they contained injections was recorded.

Table 1 Outpatient prescribing in a sample of 28 health facilities and 4 pharmacies

	Average No drugs/ prescription	Percentage prescriptions containing an antibiotic	Percentage prescriptions containing an injection	Percentage of drugs prescribed by generic name	Percentage of drugs contained in KEDL
Average	2.74	61.35	19.03	39.19	74.08
Median	2.77	65.00	16.67	38.30	74.50
Range	1.40 - 4.00	33.33 - 80.00	0.00 - 60.00	10.81 - 91.42	25.37 - 100.00
Typical values in (Kenyan) literature	2.5 - 3.0	45 - 75	10 - 65	25 - 50	--

The findings of this survey are broadly in line with findings reported in the Kenyan drug use literature. An average of 2.7 drugs per prescription is a lot, just as over 60% of patients receiving an antibiotic. Injection use (16-19%) is lower than found in some other studies in the region, but can probably be improved a lot. Generic drug prescribing is low with only some 40% of prescriptions containing generic names. Prescribing of drugs from the national essential drugs list (the KEDL) can be much higher than it is now.

To be noticed are the large ranges of prescribing indicator values in the surveyed facilities, pointing to large differences in prescribing. Prescribing is clearly not uniform, and there are impressive outlier values! Whereas there are positive exceptions, there are also very worrisome exceptions (e.g. health facilities where 80% of patients gets minimally 1 antibiotic prescribed, and those where 60% gets minimally one injection prescribed).

8. IN-DEPTH INTERVIEWS WITH SENIOR STAFF AND OPINION LEADERS

A selection of the most senior and knowledgeable members from the Kenyan health care community were interviewed in a semi-structured way. 31 individuals from private and public sectors and from national health related institutes were approached, of which 17 agreed to complete a questionnaire and be interviewed on the basis of their answers. The objective was to assess perceptions, opinions, views, and to obtain ideas and suggestions on improving drug use in public and private sectors Kenya. The questionnaire was designed to focus the discussions. The interviews followed an open and informal style. Questions were designed to find out not only WHAT current prescribing problems are, but also WHY these practices occur and WHY little improvement has been achieved so far. Extended notes were made during the interviews.

Findings of the interviews have been summarised below. They include information on the aspects of drug use improvement efforts in Kenya, as well as its history and reasons why many of them have not worked. Interviewees provided a large number of ideas and suggestions for more effective interventions.

8.1 Reasons for poor drug use practices

Responses to the question on reasons for poor drug use varied widely. Answers are therefore condensed into a number of categories.

8.1.1 Financial interests and conflict of interest

Financial interests are thought to overrule ethical standards, e.g. doctors have come to dispense drugs and pharmacists prescribe them. All intend to maximise their earnings, and quality of care and patient risks seem to receive less attention. All use large numbers of brand name drugs that are available on the Kenyan market. Medical representatives and pharmaceutical companies continuously influence prescribing, to 'place' their drug favourably in the market. Medical representatives are seen by many as doing a lot of damage by exposing prescribers to all sorts of inappropriate products. This influence has even come to affect selection, procurement and sales of medicines in the public sector.

Most professionals identified conflict of interest as a serious problem. Health care in Kenya has turned into a "profit-making" business. Financial inducement and incentives, such as free holidays, gifts etc, is common marketing practice. Providing appropriate care is not anymore the first interest for all professionals. Consequently, enforcing existing legal controls and introducing codes of professional conduct would be unavoidable to ensure that all patients receive care of acceptable standard. It was often suggested that price controls, and regulation of the pharmaceutical industry might be needed to reduce the level of competition, which is currently leading to poor practice. Marketing activities should be overseen by a regulating body and limited by an accreditation system.

A strong emphasis was put on improving the capacity of drug regulatory authorities and drawing definite separation between dispensing and prescribing to improve RDU and enforcement.

8.1.2 Regulatory and policy issues

Most interviewees felt that there is a lack of a proper regulatory framework within the sector, and that this is one of the main obstacles for improving drug use. This missing regulatory framework allows unqualified people to run pharmacies and even practice as doctors. Pharmacists are not well integrated into the health sector of Kenya. Whereas pharmacists do carry the status of Dr, they are not well accepted by medical practitioners. Hence, their role in drug use is minimal. There is no forum for pharmacists and prescribers, to come together and develop efficient systems and policies for RDU.

Other prescribers (nurses, lab technicians) and dispensers (PharmTechs, pharmacy assistants, and nurses) should not be forgotten.

There is also a lack of technical expertise, due to a shortage of clinical or specialist pharmacists in Kenya. Recognition and inclusion of pharmacists in specialized programs such as the national ARV programme has been difficult, as medical experts often feel that that is not a place where pharmacists are needed.

8.1.3 Knowledge of health care professionals

Many expressed the problem of poor knowledge of correct drug use amongst health care professionals at pre- & post-service levels. This includes dispensers and pharmacists. Training is not standardised and emphasis varies amongst the various institutions. Follow-up hardly exists and an integrated multi-disciplinary approach is completely absent. This lack of a quality approach has led to a mushrooming of training activities for reasons other than

improving practice. Professionals spent much time in courses and workshops, while there has been very little effort to see how it affects their prescribing or dispensing.

8.1.4 Knowledge of patients

A general feeling amongst interviewees was that poor patient knowledge is an important reason for poor drug use. One interviewee expressed it as *"Irrational use of drugs is a win-win situation for both patient and doctor - It fits well with human interest."* The following comments were common among all interviewees:

- There is insufficient access to quality health services delivery systems;
- Patients lack proper knowledge about the risk involved with inappropriate use of drugs;
- Patients prescribe themselves using comparable clinical histories of peers;
- There is often a lack of finance to buy and use a full course of a treatment regimen. Hence, patients get exposed to partial treatments and irregular use of prescribed courses of medicines;
- There is a lack of proper referral systems, and supportive means.

8.1.5 Lack of leadership

Leadership has been expected from MOH, but the lack of a clear vision, a national strategy, and budgetary allocations for drug use interventions, have led to the poor situation in which the Kenyan health sector now finds itself. This has a serious impact on the way drugs are used by doctors and patients.

8.2 Why earlier drug improvement efforts in Kenya have not worked

Almost all the interviewees felt that until now there have hardly been serious and coordinated efforts to improve use of drugs in Kenya. Some isolated initiatives or activities have taken place by individuals, but even then all stakeholders have not been involved. Although the National Drug Policy assigns the Ministry of Health the responsibility for promoting RDU, there is neither an effective organ nor a specific budgetary vote to carry out RDU studies and implement corrective interventions. The Pharmacy Unit at MOH did not have enough implementation capacity for a long-term RDU programme. Drug use practices are not part of routine audits.

Interviewees felt that drug use practices are deteriorating and there is a need to become serious about interventions. A new approach would need to incorporate drug use interventions in routine work and practice, as part of strengthening quality assurance in care delivery. Many also suggested the use of different forums / methodologies, and to target directly the various actors of irrational drug use. A long-term RDU programme would need to involve other sectors and actors in a national effort.

8.3 A new RDU strategy

When asked about how to promote RDU more effectively in a new approach, interviewees gave many different responses. Short- or long-term training approaches were approved, but the need for linking training with clinical audits, and the need for monitoring and measure impacts, was strongly emphasised. The overall feeling was that until now training had mostly been done without consideration of "value for money", and that therefore most of the current investments in training must be considered lost. In addition, fragmentation of training has caused it to lose most of its potential impact, as improving drug management and use requires representation from all actors in the commodity management cycle, and from all prescribing levels.

Printed materials (e.g. newsletters from professional bodies) were little approved. Such printed materials are thought to have a minimal impact only, as their impact depends on the quality, availability, and accessibility to targeted communities. Another expressed fear was that newsletters from professional bodies are all too often sponsored by the pharmaceutical industry, and that the information is therefore mostly biased.

It was also felt that professional bodies should be more involved in improving drug use in Kenya. Improvement of drug use practices will need stringent measures to deter professionals from unethical practices, and only full collaboration from professional bodies can ensure that.

8.4 Responsibilities for implementing a new RDU strategy

The overall sentiment was that RDU is a multidisciplinary responsibility and that all health professionals have a role in it, e.g. doctors, pharmacists, nurses, clinical officers, national procurement centre, etc. All health personnel should be involved and take ownership, as all will be needed during implementation. No one can be left out. Pharmacists continue to be a highly under-utilised source of patient care and improving drug use.

Most interviewed professionals favoured the National Drugs and Therapeutics Committee (NDTC) and the Pharmacy and Poisons Board (PPB) to manage RDU activities at the national level. The suggestion was to have a representative body (NDTC) with a clear mandate and a decentralised structure to be responsible for RDU activities. MOH should be involved in formulating policies. The NDTC should be the advisory body and draw up lists of drugs to be procured, conduct monitoring and evaluation activities and also effectively implement a policy that requires all institutions to have functional DTCs. Promoting a comprehensive RDU programme is part of the Terms of Reference of the NDTC.

At the institutional level, multidisciplinary DTCs that include pharmacists and other health professionals were most favoured. The DTC is seen to be an advisory body to the institution. Several interviewees explained that pharmacists are well placed to understand, sort out, list, suggest, recommend and guide physicians in determining therapeutic options based on the most frequent health problems in the country. Depending on the TORs, the DTC should have a collective responsibility to technically guide, advice, and control the use of drugs. The high turnover of medical practitioners in institutions is another reason for pharmacists to be more involved in efforts to promote improved drug use. Others have suggested that DTCs aren't working because of overburdened professionals, vested interests and lack of strong leadership.

8.5 Priority target groups for RDU activities

There was unanimous response to target RDU activities to all health workers involved in health care delivery. Consumers were also highly favoured. Much attention was also asked for appropriate patient information, in large volumes and through a variety of media. This was expected to decrease inappropriate demands from patients.

8.6 How to improve drug use by patients and consumers

A supportive environment for consumer information and education (including funding of relevant NGO groups) and providing patient education at health facilities scored highly. Some interviewees had reservations, as Kenyan patients are known to have much faith in their health providers. Therefore, patient education would depend on who provides it and how. Orientation of journalists to drug policy and drug use issues, or public information campaigns (covering, for example, comparative drug information, and consumer-oriented therapeutic information) were also favoured. The danger of media not using the right

language and not distinguishing itself from medical advertisements was seen to require strong regulation and monitoring. RDU programmes should also take patient literacy levels into consideration.

8.7 RDU an opportunity for the New Social Health Insurance Scheme?

Whereas most believe that the proposal is insufficiently developed and that proper preparation of health care providers and institutions will be needed, some see it as a rich area to exploit for promoting RDU. The NSHIF can actually restrict funding to medicines in the KEDL and prescription according to national clinical guidelines (a tool for promoting RDU). In effect, it will require a strong promotional undertaking to strengthen national and institutional formulary systems. Payment should be combined with standardized treatment guidelines and payments be made only for prescriptions by approved accredited prescribers.

8.8 Issues of broad agreement

A number of issues were mentioned by almost all interviewees at some point during the discussions:

1. Appropriate RDU training can only take place if records are better kept, and if key tools, e.g. dispensing equipment, are available.
2. All health facilities should develop RDU guidelines to assist in efforts to improve drug use practices.
3. Credible information sources, e.g. Formulary, STGs, EDLs, literature, should be made available to prescribers and pharmacists. To improve adherence, a more involving process of developing the guidelines is recommended.
4. There is a need to conduct more operational research on drug use, i.e. drug consumption, prescribing practices, and dispensing practices as a monitoring and evaluation tool.
5. Data on drug use practices should be routinely collected, and a proper system should be in place to do so.
6. DTCs should be activated at all levels, and involve managerial aspects such as formulary management, STG updating, drug use audits and feedback. To make them more "powerful", the DTC could be discussing the facility drug budget, and what to prioritise. In districts or small hospitals, Management Teams could perform DTC functions by putting drug selection and procurement on the regular agenda.
7. Patient awareness and rights should be improved by using innovative educational methods, and by using credible communication channels.
8. Regulation should be strengthened, especially of current practices, functioning of PPB, and activities of medical representatives. The Central Drug Information Centre should provide updated information and receive complaints on poor drug use.
9. The National Drug Policy needs to be updated after 10 years. The RDU component should be consolidated and a coordinating office established.
10. The Pharmaceutical Society of Kenya (PSK) and Kenya Medical Association must participate, as it can be a very good campaigner in the consortia.
11. Information sharing within and between institutions should be improved; sharing is easier if there is a coordinating body.
12. There is insufficient discipline amongst health personnel. Conflict of interest must be addressed.

9. DISCUSSION AND CONCLUSIONS

9.1 Problem

Existing literature indicates that poor drug use is a common feature in health care delivery in Kenya. The problem has not improved in recent years; drug use practices seem to have worsened instead.

Poor drug use may cause considerable waste and poor quality of care in both public and private health sectors. Especially in Kenya's reality, waste is unacceptable. A breakdown of MOH's spending³² shows that drugs and medical consumables received 11% of its budget in 2003. Health Centres received US\$ 0.02 per capita per unit for curative services, and US\$ 0.28 per capita per unit for preventive services. These budget allocations for drugs are certainly too small (compared to WHO recommendations), but become dramatic if one realises that a large fraction of this budget may not translate into therapeutic value. Poorly prescribed drugs may not only be useless to patients, they may also be harmful.

Strengthening RDU is therefore not merely desirable; it is a requirement in current times of economic hardship. Both government and household budgets are limited, and obtaining more efficiency is critically important. Private hospitals have started to discover that, and some of them have started to implement a variety of activities to lower costs per prescription. Some of those strategies have demonstrated impact, and deserve to be replicated also in public settings.

There is a fair amount of data available on drug use practices in Kenya. However, available studies have mostly been done at a small scale. Representative national surveys, or surveys per category of health facility have not been carried out. Such surveys are needed for an effective intervention strategy. A drug use survey recently carried out by WHO and Health Action International could be of use, but the data are difficult to interpret, as its methodology is considerably different from other surveys and outcomes not easy to use for strategy purposes.

In a number of specific areas available information is clearly insufficient, e.g. on drug sales practices in private pharmacies, and drug use practices in private hospitals. Incidental observations of serious polypharmacy practices, overuse of antibiotics and injections, low use of generic drugs and low use of KEDL drugs are available from these facilities though.

Additional survey work must be done in these fields to allow for designing a national drug use intervention strategy. Especially studies that show the scale of economic waste and that produce quantifiable information on poor quality of care would be very useful.

9.2 Working towards a solution

RDU intervention activities have been planned in earlier pharmaceutical sector work, but in reality very little has been implemented. This poor implementation is partly due to the lack of structures and coordination, but may also be caused by a lack of perceived urgency.

Improving prescribing is a major undertaking, more so if improvement is expected at a national level. A sound strategy, consisting of multiple intervention modes and multiple actors is therefore needed. One Department should take responsibility for this process, and have the required budgetary resources to do so. A special "Quality of Care" Department (DSRS) exists since 2001, but has not yet initiated rational drug use activities except in

32. MOH. Public Expenditure Review. 2004

certain disease programmes. There is also a need to review the whole MOH pharmacy structure.

Another requirement is strong commitment and political leadership. Experiences in the past have shown that without such leadership there is little point in initiating RDU activities. As RDU activities have often been seen as undesirable because of perceived lower profits, the Kenyan Government may want to emphasise the need for improvement of quality of care, which will lead to increased confidence in health providing institutions. Especially senior policy makers may need to be convinced of the need of such activities.

A comprehensive approach to improve drug use in Kenya will need a clear strategy, systematic intervention efforts, and co-ordination of activities. Ad-hoc, uncoordinated activities, without a strategy and without measuring impact are unlikely to yield much impact and will probably lead to a waste of resources.

Good models are available in Kenya, and in the rest of the world. Within Kenya there is the excellent model of Gertrude's Garden Children's Hospital (see Annex 5) and health insurance companies are working hard to get control over inappropriate prescribing through economic incentives for improved behaviour. Good drug use intervention literature is available for further consultation³³, as well as a large number of web-based locations³⁴.

9.3 Key components of a drug use improvement strategy

Reliance on one intervention activity is not advisable. Multiple activities are needed, designed in such a way that they reinforce each other and that target the various determinants of poor drug use. It is recommended to implement a broad mix of educational, managerial, regulatory, and economic interventions.

It is important to involve hospitals and health workers at all levels (including provincial and district levels). Pharmacists should get a much larger role in drug use improvement efforts, especially in training in optimal pharmacotherapy, EDL selection, DTCs, etc. Opinion leaders should be fully involved.

Community health workers, nurses and pharmacists are often the most accessible provider of health care to the community, and are sometimes even the gateway to the formal health care system³⁵⁻³⁶. To improve drug use and lower the cost of health care to the population, it is important to invest in this system.

33. Laing, R.O., Hogerzeil, H.V., Ross-Degnan, D. (2001) Ten recommendations to improve use of medicines in developing countries. *Health Policy and Planning*; 16(1): 13-20. (downloadable from <http://dcc2.bumc.bu.edu/richard/IH820/resource.htm>).

34. See for example:
<http://www.icium.org>
<http://www.who.int/medicines/>
<http://www.essentialdrugs.org/edrugs/about.php>
<http://www.msh.org>
<http://www.haiweb.org>
<http://www.msf.org>
<http://dcc2.bumc.bu.edu/richard/IH820/resource.htm>
<http://www.socialaudit.org.uk/5100what.htm#5.1>
<http://www.who.int/dap-icium/index.html>
<http://dcc2.bumc.bu.edu/prdu/default.html>

35. Thuo HM, Fujisaki T, Ross-Degnan D, Beracochea E. Role of the pharmacist in antenatal care: Evidence from a simulated purchase study from community pharmacy settings in Nairobi and its environs. *Health Link*, 4(2), April - June, 2000.

Drug use surveys must be undertaken regularly at all levels to determine current prescribing practices and impact of activities to change prescribing practices. The same is true for dispensing practices and drug use at home.

Resistance of health staff to monitoring drug use practices and interventions has been noted before³⁷. A careful strategy with follow-up measures is suggested, including feedback to individual prescribers or departments, review of patient records for "outlier" wards or prescribers, and regular reassessment of changes in the indicators.

Given the large variety of responses of key informants in the in-depth interviews, it is clear that work needs to be done to design a comprehensive drug use improvement strategy. Such work, including research work, will need sufficient attention. However, serious delays caused by designing a strategy must be avoided at all cost. The time to act is now.

An important factor in poor drug use is a lack of accountability for what gets prescribed and who pays for it. This is true for the public, as well as the private sector. Any strategy to improve prescribing will need to address accountability. Part of designing a strategy is therefore setting prescribing policies for public and private sectors. The major hospitals cannot stay behind in this attempt, as they often act as examples for other hospitals. A strategy that leaves the major hospitals without improving its prescribing practices is doomed to fail.

Effective drug use improvement may generate savings that easily compensate for the investment in RDU activities. Incentives for poor drug use therefore need to be reduced, while incentives for improved drug use need to be increased. Economic strategies must be an integral part of any strategy to improve drug use. Whereas prescribers are not always willing to listen to recommendations of MOH committees, they may want to 'listen' to economic incentives for improved practice, e.g., health insurance demanding better prescribing and rewarding improved practice. Practical incentives, e.g. overseas training, scholarships, specializations, etc may be part of an effective RDU strategy. Accreditation systems have a large potential in demanding improved drug use by individual prescribers and by health institutions.

Knowledge improvement may be a component of an integral RDU improvement strategy, but the way it has been done in the past is largely inefficient and maybe ineffective. Training as a hidden way of income generation must be discouraged.

New methodologies may need to be used and reliance on outdated training methods must be avoided. Training new prescribers only (e.g., strengthening undergraduate curricula) is doomed to fail if in-service prescribing is not addressed simultaneously. New prescribers may instantly forget their newly acquired skills if prescribing environments in health facilities are grossly inadequate. CME is important, but only if impact can be demonstrated in selected inefficient or outdated prescribing practices. For an efficient and effective training strategy, good supervision and auditing mechanisms need to be designed and its outcomes be used for continuous improving of applied training methods. Part of an effective strategy to improve prescribing is to improve supervision by good prescribers.

Part of the strategy to improve drug use is to improve the availability of unbiased information. Providing information, however, is not a solution in itself. Information is only as effective as it

36. Thuo HM, Ombaka E. Drug donation practices in East Africa: An explanatory study from mission health care facilities. *Health Line*, 4(1), January - March 2000, pp 2-11.

37. Quick JD, Thuo HM, Gesami JO. In-patient drug use indicators: A pilot study from Kenya, East Africa. *INRUD NEWS*, 2(4), July 1994, p9.

is used, preferably by many. Such information must be from independent sources (e.g. WHO, NDTTC, MSH, INRUD, etc).

Patient education is crucially important, as currently too much responsibility for drug use is left with prescribers. A variety of methods can be applied, not only classical group approaches in health facilities.

Finally, without targeted regulatory interventions, better use may not be achieved. This includes limiting promotional activities by the pharmaceutical industry, especially the activities of drug reps in health facilities. Controlling the circulation of non-essential drugs, and poor quality drugs in the country may be a difficult but unavoidable step.

ANNEXES

Annex 1 – Terms of Reference study D

D. Consultancy to Strengthen the Logistics Management and the Rational Use of Drugs in Kenya

1. A consultancy is being solicited to work with the Ministry of Health (MOH) in Kenya, the World Bank, and other partner institutions to undertake a detailed evaluation of logistics management systems of the MOH, KEMSA, and the private sector (including NGOs), as well as the rational use of drugs (RUD) at the central and provincial level and to develop a plan for improving the prescribing, dispensing and consumption of drugs in both the public and private sectors.

2. The consultant firm should have a minimum of five years of experience of working in the area of pharmaceutical policy and management. The firm should have a minimum team of 3 people involved in the consultancy with expertise in and extensive knowledge of a) drug logistics, and b) the formulation and implementation of national or provincial level programs for the rational use of drugs. Consultants included in the team should have at least graduate level training appropriate to and 5 years of work experience in the respective fields of specialization noted above. Prior experience with large programs for RUD in developing countries is required.

3. The specific responsibilities of the consultant firm will include:

- Describing and analysing the existing patterns of drug prescription, dispensing, and consumption in the public and private sectors in Kenya. This should include a detailed review of all past studies on RUD in Kenya, undertaken with or without the support of the MOH and its partners.
- Reviewing the logistics management system in the public and private sectors and making recommendations for strengthening and developing a national procurement and logistics management action plan (emphasizing essential drugs).
- Evaluating the existing policies, norms, standards, and practices related to the use of pharmaceuticals by health professionals and consumers, the level of adherence to these guidelines, the incentives to follow/ignore these guidelines, and the extent of training in RUD among health professionals and paraprofessionals in Kenya.
- Developing, on the basis of the above assessments, alternative proposals for the establishment of an effective program for rational drug use (including an essential drugs policy and generics strategy) in Kenya. This should include recommendations to ensure a therapeutically sound and cost-effective use of drugs by health professionals and consumers at all levels of the health system in both the public and private sectors.

4. The assessment will be based on a survey of a sample of drug outlets and health facilities in various provinces across Kenya, using relevant standardized indicators from the rapid assessment methodology developed by WHO, and modified and used by the World Bank in other countries. In addition, the study may involve conducting interviews with the key individuals and groups (including through stakeholder workshops, as necessary), field visits, and reviews of existing reports and other documents relevant to drug quality assurance in Kenya. In this context, the MOH shall ensure access to the consulting firm to all relevant reports, studies, data and information undertaken by the MOH with or without the support of its development partners.

5. Prior to undertaking the assessment, the consultant firm should submit a detailed outline of the proposed methodology to the Director of Medical Services (DMS) in the MOH.

6. The consultant firm should submit a draft report on the assessment to the DMS in the MOH no later than 6 weeks from the date of commencement of the contract, and the final report, based on comments received (to be provided within 2 weeks of submission of draft report), no later than three months from the commencement of the contract.

Annex 2 – Key informants of in-depth interviews

Government Institutions

1. Deputy Chief Pharmacist based at NBI Provincial HQ's - Tel: 333551
- Dr. Mucheru
2. Pharmacy and Poisons Board - 2716905 / 2716906
- Dr. Sarah Chuchu (Drug Information Centre) - 0722 745 610
- Dr. Bibiane Njue (Deputy Chief Pharmacist) - 0733 778219
- Dr. Jayesh Pandit - Pharmacovigilance Centre
3. NASCOP - Adherence support program -
Two pharmacists based at KEMSA / JSI Deliver offices - 554864 / 559786
- Cecilia Muiva - 0722 780 786
- Doreen Kagai - 0721 466 075

Teaching Institutions

4. Kenyatta Hospital - 2726300 / 2726450 ext. 44365
- Dr. Mwangi Maina - 0722 882592 (mwangimaina2@yahoo.co.uk)
- Dr. Elizabeth Ogile - 0722 840262 (lizogile@yahoo.com)
5. Kenya Medical Training Centre - 2725711/2/3/4
- Dr. W B Odinga - Head of Department of Pharmacy - 0721 379 452
6. Nairobi University -2726771 / 2726300 ext. 43791
- Dean of Faculty - Prof. Isaac Kibwage
- Dr. Margaret Oluca - 0722 604 216

Private Sector

7. Gertrude's Hospital -
- Chief Pharmacist - Dr. Charles Ouma
8. A medical representative of Kenyan drug manufacturer - Regal Pharmaceuticals
- Marketing Manager - Shalin VORA
9. Health Maintenance Organization, AAR - 271531
- Dr. Priya Karia - Chief Pharmacist

Non-Governmental Organizations

10. MEDS - 551633 / 42
- Mr. Mujomba (Training Manager)
11. MSF Belgium - 570021
- Dr. Moses - Medical Coordinator for Kenya Programs

Donor Agencies

12. UNICEF
- Health Coordinator - Ms. Iyabode OLUSANMI - 622 160
13. GTZ- Work 020-2721187 / Mob 0733-603488
- Health Advisor - Henri van den Hombergh

Professional Bodies

14. Pharmaceutical Society of Kenya Council -
 - Chairman (Prof. Kibwage)

15. Centre for Drug Management and Policy - 2733733 / 577202
 - Dr. Rashid Aman - raman@africaonline.co.ke

16. A Consumer Organization - HAI AFRICA - 4444835
 - Mrs. Mebrat Woldetensaie - Regional Coordinator
 - Christa Cepuch, pharmacist - 0733 615189 / 0722 393194

17. Kenya Medical Association /Thika District Hospital - 067 31174
 - Dr. Onchwari - 0720 905 220

Annex 3 – List of persons met

Date	Name(s)	Designation(s)	HERA team members	Subject
06.09.2004	Michael Thuo - MSH		Hilbrand & Tina	Data Collection – Articles written by himself in various local magazines – Healthline & EAMJ
07.09.2004	Sital Shah & Harvinder– Aga Khan Hospital	Chief Pharmacist Deputy chief pharmacist	Hilbrand & Tina	The RDU system in the private hospital setting
07.09.2004	Dr. Robert Nyarango – Gertrude's Garden Hospital	Deputy Chief Pharmacist	Hilbrand & Tina	The RDU system in the private hospital setting.
10.09.2004	Dr. Rashid Aman Prof. Kokwaro - CEDMAP	A member for CEDMAP	Hilbrand & Tina	CEDMAP activities on RDU in the past, present and future
10.09.2004	Dr. Alice Kamau Dr. Mpungu - AAR	Chief pharmacist Clinical Service Manager	Hilbrand & Tina	How does an HMO try to manage RDU issues and its impact on cost?
15.09.2004	Dr. Shariff	Provincial Medical Officer	Tina	Efforts on RDU at coast province and Nairobi province
.9.2004	Dr. Jayesh Pandit	Pharmacovigilance Officer - PPB	Tina	Plans for the future pharmacovigilance centre
14.09.2004	Dr. Eva Ombaka - EPN	EPN	Tina	Past and Current EPN activities
23.09.2004	Dr. Lillian Gitau - SHEF	Training Coordinator	Tina	RDU -
10/09/2004	Dr. Mwangi Maina Dr. Elizabeth Ogile	Kenyatta National Hospital	Hilbrand & Tina	RDU system in Parastatal Hospital
14.09.2004	Dr. Patrick Boruet	Deputy Chief Pharmacist at Mater Hospital	Hilbrand & Tina	RDU system in private hospital (faith based)
27/09/2004	Dr. Dorothy Mumesi	Pharmacist at National Malaria Control Program	Tina	National program and pharmaceutical related activities.
24/09/2004	Dr. Tom Mboya	DSRS	Wilbert & Tina	Role of DSRS association to logistics, procurement, access and RDU
30/09/2004	Dr. Midiwo	NSHIF	Tina + Ruth + Birgit	About NSHIF plans – relation to access and rational drug use
22/09/2004	Mrs. Stephanie Nduba	AMREF		
01/10/2004	Dr. Mary Wangai	NASCOP	Tina	RDU and Adherence strategies
08.11.2004	Dr. Sarah Chuchu	Pharmacy and Poisons Board	Tina	Previous RDU Efforts
24/09/2004	Mr. John Kiambuthi	MEDS	Tina	RDU training at MEDS

Annex 4 – List of documents reviewed

Agwanda RO, Kwamanga DO, and Kiugu SK. Essential drugs supply and usage as a reflection of outpatient morbidity in Kirinyaga District, Kenya. *East African Medical Journal*, 73:120-125, 1996.

Gitau L, Kiambuthi J. Effect of an Educational Intervention on Antibiotic Use in the Treatment of ARI and Malaria in Six Mission Hospitals in Kenya. Abstract ICIUM-2004

Haak H, Barillas E, Holloway K, Shariff SK, Kashaija K. External review of the Kenya National Drug Policy Implementation Programme. 3 - 13 October 1999.

Hamel, M.J., Odhacha, A., Roberts, J.M., and Deming, M.S. Malaria control in Bungoma District, Kenya: a survey of home treatment of children with fever, bednet use and attendance at antenatal clinics. *Bull World Health Organ* 79(11):1014-1023, 2001.

Hook C, Van Herp M, Checchi F, Van der Meer J. Médecins Sans Frontières (MSF) Findings Support WHO's Approval for Use of Artemisinin-Based Combination Therapy in Malaria Epidemics. ICIUM-2004

Indalo, A.A. Antibiotic sale behaviour in Nairobi: a contributing factor to antimicrobial drug resistance. *East African Medical Journal*, 74:171-173, 1997.

Karuri GM, Ojoo MMA, Mwangi M. Evaluation report of "Drug Management Module III: Towards Developing an Internal Management Training Capability for Kenyatta National Hospital and Ministry of Health. 13 February - 17 March 1995.

Kawasaki E, Patten JP. Drug Supply Systems of Missionary Organizations: Identifying Factors Affecting Expansion and Efficiency: Case studies from Uganda and Kenya.

Kelly, J.M., Osamba, B., Garg, R.M., Hamel, M.J., Lewis, J.J., Rowe, S.Y., Rowe, A.K., and Deming, M.S. Community health worker performance in the management of multiple childhood illnesses: Siaya District, Kenya, 1997-2001. *Am.J.Public Health* 91(10):1617-1624, 2001.

Kiambuthi J. The impact of continuous medical education on prescribing habits in mission hospitals in Kenya. Abstract ICIUM₂₀₀₄

Laing, R.O., Hogerzeil, H.V., Ross-Degnan, D. (2001) Ten recommendations to improve use of medicines in developing countries. *Health Policy and Planning*; 16(1): 13-20. (Downloadable from <http://dcc2.bumc.bu.edu/richardl/IH820/resource.htm>).

Lore W. Rational use of drugs: The Kenyan scenario (Editorial). *Health Line*, 6(1), January - March 2002, pp 1-3.

Marsh, V.M., Mutemi, W.M., Muturi, J., Haaland, A., Watkins, W.M., Otieno, G., and Marsh, K. Changing home treatment of childhood fevers by training shopkeepers in rural Kenya. *Tropical Medicine & International Health* 4(5):383-389, 1999.

MOH/HAI/WHO. Monitoring and Assessing the Pharmaceutical Situation in Kenya. 2004.

MOH. Public Expenditure Review. 2004.

MOH. Revised Kenya National Drug Policy Implementation Plan and Priority Action Plan. Draft report, Lions Hill, 27-30 October 2003.

Nderitu A, Kirika R, Gatobu A. Report on initial drug usage study at the outpatient and inpatient departments of a 'facility A' hospital. 23-25 August 1994. MEDS

Ogile EA. Promoting Rational Use of Antiretrovirals at Kenyatta National Hospital, Kenya. Abstract ICIUM-2004

Ongore D, Nyabola L. Role of shops and shopkeepers in malaria control. *East African Medical Journal*, 73(6): pp390-394.

Ojoo MA, Waning B, Maina M. Assessing the Effect of Two Policy Interventions on Treatment Costs and Drug Use Patterns in a Private Self Funding Healthcare Institution in Nairobi: The Case of Generic Prescribing and Generic Substitution. Abstract ICIUM₂₀₀₄

- Phillips-Howard, P.A., Wannemuehler, K.A., ter Kuile, F.O., Hawley, W.A., Kolczak, M.S., Odhacha, A., Vulule, J.M., and Nahlen, B.L. Diagnostic and prescribing practices in peripheral health facilities in rural western Kenya. *Am.J.Trop.Med.Hyg.* 68(4 Suppl):44-49, 2003.
- Ross-Degnan D, Soumerai SB, Goel PK, Bates J, Makhulo J, Dondi N, Sutoto Adi D, Ferraz-Tabor L, and Hogan R. The impact of face-to-face educational outreach on diarrhoea treatment in pharmacies. *Health Policy and Planning* 11:308-318, 1996.
- Ruebush, T.K., Kern, M.K., Campbell, C.C., and Oloo, A.J. Self-treatment of malaria in a rural area of western Kenya. *Bull World Health Organ* 73:229-236, 1995.
- Tavrow, P., Shabahang, J., and Makama, S. Vendor-to-vendor education to improve malaria treatment by private drug outlets in Bungoma District, Kenya. *Malaria Journal* 2(1):10, 2003.
- Thuo HM. Intervention to improve drug usage in inpatient settings in Kenya. *Health Line*, 6(1), January - March 2002.
- Thuo HM, Quick JD. Improving rational drug use in in-patient hospital settings: The use of audit and feedback as the intervention mechanism. *Health Line*, 5(4), October - December 2001.
- Thuo HM. Determinants of pharmacy patronage. *Health Line*, 3(3): July - September, 1999.
- Thuo HM. Dominant forces which impact on pharmacy practice environment in Kenya. *Health Link*, 3(2), April - June, 1999.
- Thuo HM. Role of the pharmacist in antenatal care: evidence from a simulated purchase study from community pharmacy settings in Nairobi and its environs. *Health Link*, 4(2), April - June, 2000.
- Thuo HM, Ombaka E. Drug donation practices in East Africa: An explanatory study from mission health care facilities. *Health Line*, 4(1), January - March 2000, pp 2-11.
- Trap B, Chinyanganya F, Chuchu S, Larsson E, Schreuder B. Mid-term review of the Kenya National Drug Policy Implementation Programme. 24 January - 4 February 1998.
- Nabiswa AK, Godfrey RC. Diagnoses and prescriptions for patients managed during a free health care day in Eldoret, Kenya. *East African medical Journal*, June 1994, pp363-365.
- Agwanda RO, Kwmanga DO, Kiugu SK. Essential drug supply and usage as a reflection of outpatient morbidity in Kirinyaga district, Kenya. *East African Medical Journal*, February 1996, pp120-125.
- Quick JD, Thuo HM, Gesami JO. In-patient drug use indicators: A pilot study from Kenya, East Africa. *INRUD NEWS*, 2(4), July 1994, p9.
- Quick JD, Thuo HM. Adaptation of WHO drug use indicators in hospitals. *The Lancet*, 343, Jan 22, 1994, p 237.

Annex 5 – Some results of drug use improvement efforts in GGCH

[removed as these graphs made the file too big; available on demand from HERA]