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MINISTRY OF HEALTH OF MOZAMBIQUE
RATIONAL PHARMACEUTICAL MANAGEMENT PROJECT
MOZAMBIQUE PHARMACEUTICAL SECTOR ASSESSMENT
FINAL REPORT

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with support from
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INTRODUCTION

The Rational Pharmaceutical Management (RPM) Project is composed of two centrally-funded cooperative agreements with USAID R&D Health, one is with Management Sciences for Health (MSH) and the other is with the United States Pharmacopeia (USP) RPM has core funding to work in three major technical areas

- Strengthening and automating drug registration procedures
- Rationalizing drug procurement and inventory management
- Promotion of rational drug use/strengthening drug information

This work will emphasize skills transfer and training, including computerization, and close collaboration with counterparts and other organizations Formal pharmaceutical sector assessments, using core funds, have been conducted in Ghana, Nepal, the Organization of Eastern Caribbean States, El Salvador and Ukraine Additional core assessments may be conducted in Ecuador and Bolivia The Mozambique assessment was conducted with USAID Mission funding

The Mozambique assessment included an extensive examination of the UNICEF Essential Drugs Kit Program The main objective of this program is to promote health through the provision of cost-effective treatment of the most common diseases in Mozambique in the form of kits containing a selection of essential drugs USAID involvement has been chiefly to finance the international procurement of these drug kits

With the exception of the assessment of port facilities, the scope of work for the UNICEF portion of the assessment coincided almost completely with the RPM assessment methodology In addition to modifying the standard assessment tool for the local situation in Mozambique, an assessment tool was developed for use in ports of entry

We wish to express our appreciation to all of those individuals who allowed themselves to be interviewed and who conducted tours of their facilities A list of persons who participated in the assessment is included as an annex In particular, we would like to thank Dr Stefano Ferroni of UNICEF for his advanced scheduling of meetings during the first week of the survey, and to Mr Rathod Bachubhai for assistance with the EDP portion of the assessment Additionally, virtually all individuals from both MEDIMOC, the State Company for Importation and Exportation of Medicines and Medical Supplies, and the Pharmaceutical Department of the Ministry of Health were extremely generous with their time and in their willingness to share information

SECTION ONE
SUMMARY OF FINDINGS AND RPM OPPORTUNITIES

I. RPM ASSESSMENT STRATEGY AND METHODOLOGY

A Assessment Objectives and Study Team Involved

The objectives of the Mozambique assessment were as follows

1 For the USAID Mission, an evaluation of the UNICEF Essential Drugs Kit Program would be conducted to assess the impact of the program and make recommendation for further involvement

2 For RPM, the evaluation would help to identify opportunities for possible future work in Mozambique

The study team included the following members

Mr Anthony Savelli	Senior Program Associate, RPM Core Staff Member
Dr Hilbrand Haak	Senior Pharmacy Advisor
Mr Paulo Fumane	Economist
Mr Nicolau Sululo	Economist
Mr Venancio Chirrime	Economist

Mr Savelli and Dr Haak arrived in Mozambique on 10 October 1993 and met with the remaining team members on 11 October for an initial discussion about the assessment

Local counterparts were identified during initial meetings with Dr Stefano Ferroni, Dr Abdul R Noormohamed, members of the Pharmaceutical Department and MEDIMOC

B Data Collection Tools and Tracer Drugs

The data collection tools used in Mozambique were developed by modification of those used in previous assessments in Ghana and The Organization of Eastern Caribbean States This modification was begun at the MSH office in Washington, and completed during the first week of the assessment In particular, modifications were made to ensure that information necessary for the assessment of the Essential Drugs Kit Program would be obtained

The resulting assessment tool contained the following elements

National Survey

1 Survey Questionnaire
2 MEDIMOC Physical Inventory and Stock Records Data Collection Form
3 MEDIMOC Procurement Price Analysis Data Collection Form

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Provincial Survey

1 Port Facilities Questionnaire
2 Provincial Medical Stores Questionnaire
3 Health Facilities Questionnaire
4 Health Administration Questionnaire
5 Provincial Medical Stores Physical Inventory and Stock Record Data Collection Form
6 Provincial Medical Stores Price Analysis Data Collection Form
7 Health Facilities Procurement and Physical Inventory and Stock Record Data Collection Form
8 Health Facilities Price Analysis Data Collection Form
9 Patient Care Data Collection Form
10 Prescribing Indicator Form

Data on patient care and prescribing were collected according to the standard WHO/INRUD methodology, as described in the 1993 WHO publication "How to Investigate Drug Use in Health Facilities Drug Use Indicators "

Because of the large number of provincial data collection forms that needed to be reviewed and finalized prior to commencing with data collection, some of the introductory meetings originally scheduled for the first week of the assessment were postponed This allowed for training of the provincial data collectors The training consisted of classroom review of the questionnaires and forms, and site visits to a Maputo Health Center, the Central Hospital of Maputo, and the Maputo Provincial Medical Stores

A tentative list of tracer drugs for which data would be collected was drafted by Dr Haak prior to arrival in Mozambique The initial list of tracer drugs was based on an ABC analysis of drugs most frequently included in kits of ten country programs This list was modified slightly as a result of findings in the site visits in Maputo and discussions with EDP staff The list of tracer drugs included both EDP kit drugs and those which are distributed through the "*via classica*" (the traditional drug distribution system) The list of tracer drugs can be found on the following page

TRACER DRUGS USED IN THE MOZAMBIQUE PHARMACEUTICAL SECTOR ASSESSMENT

EDP Drug Kit A*
EDP Drug Kit B
EDP Drug Kit C
Acetylsalicylic Acid 500 Mg Tablet
Paracetamol 500 mg Tablet
Procaine Penicillin 4 mu Vial
Ferrous Salt/Folic Acid Tablet
Tetracycline Eye Ointment
Benzoic Acid/Salicylic Acid Cream
Mebendazole 100 mg Tablet
Chloroquine 150 mg Tablet
Lidocaine with Epinephrine Vial
Phenoxymethyl Penicillin 250 mg Tablet
Methylergometrine 0 5 Mg Vial
Epinephrine 1 mg Vial
Metronidazole 250 mg Tablet
Cotrimoxazole 400/80 Tablet
Kanamycin 2 gm Vial
Multiple Vitamin Tablet
Nalidixic Acid 500 mg Tablet
Prednisolone 5 mg Tablet

*Sealed kits were counted as a tracer "drug "

C Survey Methodology

Central Survey

Central level information was obtained through

- interviews, using the standard survey instrument
- assessment of conditions and equipment at selected institutions
- data collection from documents and records

Study instruments were applied in relevant institutions including
- Ministry of Health
- MEDIMOC
- FARMAC, the state company of pharmacies
- Several NGOs

Provincial Survey

Regional and district information was obtained through

- interviews, using the standard survey instrument
- assessment of conditions and equipment at selected institutions
- data collection from records
- observation of health worker-patient interactions

The provincial data collectors collected data in the following provinces
- Gaza
- Sofala
- Zambezia
- Nampula
- Niassa

In each province, the following institutions took part in the survey
- The Provincial Health Administration
- The Provincial Medical Store
- The Provincial Central Hospital
- One district hospital
- One district health center

Additionally, port facilities were visited in Maputo, Beira, Quelimane and Nacala

Training was conducted in health facilities in Maputo province in preparation for the provincial survey

D Description of the Assessment Process

The assessment plan was discussed in a meeting with USAID and UNICEF on 11 October Meetings with the Pharmaceutical Department, MEDIMOC, FARMAC and the Director of the National Health Direction had been pre-arranged by Dr Ferroni for the first week of the assessment Meetings and training sessions were held with the remaining members of the assessment team throughout the first week

The provincial assessment team departed for Gaza, Niassa and Nampula during the weekend of 15-16 October The assessment of these provinces took place during the week of 18-22 October Two members of this team proceeded to Nampula and Zambezia at the end of the second week, and completed the provincial assessment during the week of 25-29 October All three members of the provincial team took part in debriefings during the final week of the assessment

The Maputo assessment team completed the majority of data collection and interviews during the second and third weeks of the assessment The draft report was completed during the week of 1 November and the oral debriefing at USAID was held on 4 November

E Summary of Findings - Pharmaceutical and Development Indicators

There are two on-going efforts directed at developing sets of indicators which will measure the status of public sector pharmaceutical systems The WHO Drug Action Programme is developing a large set of indicators which will be used by member countries for self assessment The other effort is by USAID, through the Latin America Caribbean/Health, Nutrition and Sustainability Contract (LAC/HNS) In this work, coordinated by MSH, 32 indicators have been field tested in Guatemala, Ecuador and Jamaica In addition, through the RPM Project, the indicators have been field-tested in Ghana, the Eastern Caribbean, El Salvador and Nepal

Although the term "indicators" is used in this report, "standard measurements" is a more accurate description since world-wide norms for the measurements have not been established

The indicator data collected in Mozambique have been compared to data collected in Ghana, Guatemala, Ecuador, and Jamaica These surveys were all conducted in 1992 or 1993 In each country, a different set of tracer drugs was chosen, based on differing morbidity patterns

The drug use indicators were developed by the International Network for Rational Use of Drugs (INRUD) to quantify drug utilization in outpatient health care facilities

The full set of indicator results from Mozambique and the comparison countries are presented on the following page Also included are the average results from ten country studies which looked only at drug use indicators (Yemen, Uganda Sudan, Malawi, Indonesia, Bangladesh, Zimbabwe, Tanzania, Nigeria and Nepal)

MOZAMBIQUE INDICATOR RESULTS-COMPARISION WITH OTHER COUNTRIES

	MOZAMBIQUE	GHANA	GUATEMALA	ECUADOR	JAMAICA
PUBLIC SECTOR BUDGET AND FINANCE					
1 Public sector pharmaceutical expenditure per capita	$ 0 62	$0 46*	$3 93	$0 09	$1 98
2 Public sector revenue from pharmaceutical cost recovery per curative encounter	N/A	N/A	N/A	N/A	N/A
3 % of total government expenditures used for health budget	6 0%	14 1%	15 0%	7 5%	3 4%
4 % of total government health expenditures used for pharmaceuticals	2 0%	No budget all cost sharing	26%	1 3%	8 0%
PUBLIC SECTOR PROCUREMENT					
1 Existence of policy to limit public sector procurement to items on National Formulary or EDL	Yes	Yes	Yes	Yes	Yes
2 Coverage by centralized system for routine procurement of public sector drugs	Yes	Yes % not available	27 0%	<50 0%	80 0%
3 % of average international price paid for last regular procurement of indicator drugs	76 205%	79%	164 371%	161%	145%
4 % of MoH drugs purchased through competitive methods	91%	87%	10%	45%	95%
PUBLIC SECTOR LOGISTICS					
1 % variation between inventory records and physical stock (CMS) — Tally	123 8%	0 0%	not calculated		48 4%
1 % variation between inventory records and physical stock (CMS) — Ledger	159 3% (Central)	14 6%	5 0%	2 6%	
2 Availability in warehouses and facilities of set of tracer drugs — CMS	66 7%	100 0%	93 0%	93 3%	100 0%
2 Availability in warehouses and facilities of set of tracer drugs — RMS	79 8%	87 0%		86 7%	
2 Availability in warehouses and facilities of set of tracer drugs — H C	58 6%	60 0%	60 0%	38 0%	
3 % of time out of stock for tracer drugs (CMS)		8 0%	32 0%	79 0%	27 0%
POLICY, LEGISLATION AND REGULATION					
1 Existence of National Drug Policy	No	No	Yes	Yes	Yes
2 Existence of components of drug legislation	Yes	Yes	Yes	Yes	Yes
3 Proportion of sampled products licensed or registered	N/A	N/A	92 6%	100 0%	79 0%
4 Type of registration system	None	Mixed	Computerized	Mixed	Manual
5 Law regarding generic substitution	N/A	No law	No law	No law	No law
FORMULARY/ESSENTIAL DRUGS LISTS & DRUG INFORMATION					
1 # drugs on national formulary	323	222	428	438	1010
2 # drugs on sub-set EDL	32	No list	50	237	VEN lists***
3 Existence of National Formulary or EDL with basic therapeutic information revised within last 5 years	No	No	Yes	Yes	Yes
4 % of visited public facilities with most current formulary or ED Manual at public health facilities	100%	45%	30%	25%	100%
DRUG UTILIZATION					**INRUD Avera**
1 Population per health facility	13,798	34,308	8,529	6,310	5,800	
2 Average number of drugs prescribed per curative encounter	2 4	4 3	1 4	1 3	2 4	2 1
3 % of drugs prescribed by generic name	98 9%	59 4%	72 0%	37 0%	39 5%	66 7%
4 % of patients receiving injections	20 4%	55 7%	13 0%	19 0%	3 7%	24 7%
5 % of patients receiving antibiotics	52 3%	46 6%	27 0%	27 0%	30 0%	43 2%
6 % of drugs prescribed which are actually dispensed	77 2%	86 0%				76 5%
7 Average duration of dispensing interaction (seconds)	13	125				58 8
8 % of drugs adequately labelled	96 3%	12 0%				
9 Patient knowledge of correct use of dispensed drugs	53 3%	76 0%				64 0%
PRODUCT QUALITY ASSURANCE					
1 Use of WHO Certification Scheme	No	Limited	Limited	Yes	Limited
2 Existence of functioning system of reporting product quality complaints	No	No	No	No	No
PRIVATE SECTOR PHARMACEUTICAL ACTIVITY					
1 Population per licensed private sector drug outlet	285,156	3,438	4,805	3,419	9,700
2 Drug outlets per government drug inspector	19	262	947	13	62 5
3 Value of total private sector pharmaceutical sales per capita	$ 0 08	N/A	$10 98	$7 87	$10 28
4 Total value of drug market, public and private sectors per capita	$ 0 85	N/A	$14 91	$7 96	$12 27
5 % of products on National Formulary which are manufactured or co manufactured locally	negligible	70%	71%	50%	15 20%
6 % of instances where an antibiotic was available from a licensed outlet without a prescription		85%	100%	100%	

Ghana CMS purchases only there were also substantial direct purchases by regional stores and health facilities including diagnostics

*Jamaica health facilities have individual VEN lists which are functionally equivalent to sub-set Essential Drugs Lists

Grey shading indicates information was not collected in the survey

N/A indicates that information was not available

Public Sector Budget and Finance

In 1992, Mozambique spent US$0 62 per capita on pharmaceuticals, lower than Guatemala (US$3 93) and Jamaica (US$1 98) Internationally recommended expenditures range from US$1 00-$3 00 It should be noted that drug needs in Mozambique will increase with the return of up to one million civil war refugees, and that funding for drug procurement is heavily dependent on donated funds The current cost recovery program results in revenues equal to approximately 4% of the acquisition cost of drugs

Mozambique spent only 6% of its total budget on health, lower than Ghana, Guatemala and Ecuador, and 2% of its health expenditures on pharmaceuticals, lower than Guatemala and Jamaica When the value of donations are included, 25% of health expenditures are for pharmaceuticals

Public Sector Procurement

Mozambique has a policy to limit public sector procurement to items on the National Formulary A relatively small catalogue of non-formulary drugs stocked at MEDIMOC indicates that enforcement of the policy has been successful

Mozambique is covered by a centralized system for routine procurement of public sector drugs which also appears to be successful Of the three provincial medical stores surveyed, all reported purchasing 100% of drugs through MEDIMOC Although some purchases outside of MEDIMOC are known to occur, the actual percentage of centralized procurement is probably higher than the 80% reported by Jamaica

Two figures were calculated for the average international price indicator because procurement prices received for two tracer drugs (Tetracycline eye ointment and Lidocaine injection) were artificially high due to donor procurement requirements If these two prices are ignored, Mozambique was more effective than all of the comparison countries in tendering (76% of the average international price)

Competitive tender (usually limited) is used for 91% of purchases, higher than all comparison countries except Jamaica

Public Sector Logistics

The accuracy of MEDIMOC inventory control procedures was assessed For the control cards kept at storage facilities, the average recorded figure was 128 78% higher than the actual count For the cards kept at the administrative offices (from which order quantities are calculated) the recorded inventory was 159 31% of the actual This indicates that significant inventory record keeping problems exist at MEDIMOC compared with comparison countries

Perhaps the most relevant indicator is the availability of tracer drugs at various levels of the distribution cycle In Mozambique, 66 7% of tracer drugs were available at MEDIMOC Maputo, 79 76% were available at surveyed provincial medical stores, and 58 63% at health facilities The only comparison data available is for Ghana Availability was less in Mozambique at all levels

Policy, Legislation and Regulation

Mozambique does not have a formal National Drug Policy Laws exist concerning the National Formulary, prescribing and dispensing of drugs, and the importation and export of drugs, thus it can be said that components of drug legislation exist

There is no formal drug registration system in Mozambique While the Government of Mozambique (GoM) is currently working with the WHO on implementation of a computerized registration system, it was pointed out during the assessment that the state monopoly on drug importation held by MEDIMOC helps to limit the number of drugs entering the country All other comparison countries have either a manual or computerized registration system

Formulary/Essential Drugs List and Drug Information

There are 323 drugs on the Mozambique National Formulary- a greater number than Ghana (222), but less than Guatemala (428), and Ecuador (438), and significantly less than Jamaica (1010) Unlike the comparison countries, the National Formulary of Mozambique applies to both the private and public sectors, and is enforced through the state monopoly on drug procurement

The EDP Kit lists are considered by the MoH to be sub-set Essential Drug Lists (EDL) Kit A contains 32 drug items, Kit B contains 14, and Kit C contains 8 In Guatemala there are 428 drugs on the National Formulary and 50 drugs on the Essential Drug List In Ecuador, the National Formulary has 438 drugs while the EDL has 237

The relatively small numbers of drugs utilized in Mozambique has partially been attributed to the existence of the National Formulary However, the formulary has not been reviewed and approved within the last 5 years, the current edition was approved in 1984 The assessment team was informed that a new edition of the formulary is in the final stages of development

Copies of the National Formulary were available at 100% of the facilities visited in the provincial survey, higher than Ghana (45%), Guatemala (30%) and Ecuador (25%) and equal to Jamaica The National Formulary, which contains only basic prescribing guidelines was mentioned as the principle drug reference book in most health facilities visited during the assessment

Drug Utilization

Mozambique has 13,798 patients per health facility, more than Guatemala, Ecuador and Jamaica Patients in Mozambique are prescribed 2 4 drugs per encounter, slightly more than the INRUD average There is very high (98 91%) compliance with generic prescribing requirements in Mozambique, compared with the INRUD average of 66 7% In Mozambique, 20 39% of patients receive injections compared to the INRUD average of 24 7% A higher percentage (52 30%) of patients receive antibiotics than in INRUD countries (43 2%) The percentages of drugs prescribed which are actually dispensed are similar in Mozambique and INRUD countries The average dispensing time was much less in Mozambique (13 seconds) than the INRUD average of 58 8 seconds, indicating that little counseling is done Drugs dispensed in Mozambique are adequately labeled (96 31%) compared to 12% in Ghana (the only available comparison) Patient knowledge of correct use of dispensed drugs was 53 33% in Mozambique, compared to 64% in INRUD countries

A MOH study, conducted after this assessment, in Maputo City and Province at 15 urban and 11 rural health facilities produced somewhat different results in several categories

% of patients receiving antibiotics (42%)
% of patients receiving injections (18%)
% of prescribed drugs which are actually dispensed (86%)
Patient knowledge of correct use of dispensed drugs (82%)
Availability in facilities of a set of tracer drugs (85%)

For the Drug Utilization indicators, these results indicate a higher degree of rational drug use than the INRUD average and the assessment survey

Product Quality Assurance

Mozambique does not participate in the WHO Certification Scheme, although it has member status and is eligible to participate There is one quality control laboratory in Maputo which reportedly tests all drugs used in Mozambique No system exists for reporting product quality complaints While none of the comparison countries has a drug problem reporting system, all participate to some degree in the WHO Certification Scheme

Private Sector Pharmaceutical Activity

Mozambique has 285,156 people per licensed private sector drug outlet, significantly higher than any of the comparison countries There are estimated to be 20 private and 40 FARMAC pharmacies, thus for a population of 16 million people, access to private sector pharmacies is very low

The pharmacy inspection system has not been fully developed due to a lack of trained inspectors (only 2 for the entire country) Nevertheless, the ratio of drug outlets per government drug inspector is significantly lower than Ghana, Guatemala, and Jamaica due to a relatively small number of private pharmacies in Mozambique

The value of private sector drug sales per capita, and the total value of the public and private drug market per capita are significantly less than the other survey countries

With the exception of Oral Rehydration Salts, no drugs manufactured in Mozambique are utilized locally MEDIMOC does not purchase drugs produced by the local manufacturer SWAMO, in part due to donor requirements to purchase internationally, and in part due to concerns by the GoM about product quality Local production of drugs contained in the National Formulary is substantially below that of all of the comparison countries, although an exact percentage was not calculated

The following table presents additional general health and development indicators for the same five countries taken from the World Bank 1993 World Development Report

WORLD BANK DEVELOPMENT INDICATORS

W.B. DEVELOPMENT INDICATOR-1993	MOZAMBIQUE	GHANA	GUATEMALA	ECUADOR	JAMAICA
1993 Population (millions)	16 1	15 3	9 5	10 8	2 4
1991 Ranking (GNP per capita) 127 countries	1	26	47	49	60
GNP per capita, 1991 (US$)	80	400	930	1000	1380
Average GNP annual growth, 1980-1991	-1 1%	-0 3%	-1 8%	-0 6%	0%
Average annual inflation, 1980-91	37 6%	40%	15 9%	38%	19 6%
Life expectancy at birth (years), 1991	47	55	64	66	73
Total adult illiteracy, 1990	67%	40%	45%	14%	2%
Female illiteracy	79%	49%	53%	16%	1%
Per capita development assistance (US$), 1991	$57 0	$47 2	$20 8	$20 4	$69 7
Total external debt, 1991 (millions US$)	$4,700	$4,209	$2,704	$12,469	$4,456
Average annual growth in population, 1980-91	2 6%	3 2%	2 9%	2 1%	0 5%
Population/physician, 1990	No data	22,970	No data	980	No data
Population/nurse, 1990	No data	1,670	No data	620	No data
Attended births, 1985	28%	73%	19%	27%	89%
Babies with low birth weight, 1985	15%	17%	10%	10%	8%
Infant mortality rate, per 1000 live births, 1991	149	83	60	47	15
Years of life lost per 1000 population, 1990	141	55	41	21	No data
Prevalence of malnutrition under 5, 1990	No data	36%	34%	38%	8%

II USAID MOZAMBIQUE HEALTH ACTIVITIES AND CONCERNS

The UNICEF Essential Drugs Program represents the primary focus of USAID in the health sector The Mission has several concerns about the functioning of kit program, particularly at the health facility level Some of the concerns are

- UNICEF has provided data on arrival dates at the port of entry, transfer to MEDIMOC warehouses, and distribution to the Provincial Stores level, however, information is not readily available on kit distribution and stock levels at the health facility level A system of local level monitoring is lacking

- The system does not appear to respond quickly to problems encountered

- The expected relocation of large numbers of refugees throughout Mozambique may significantly change drug requirements in the next year Reliable information does not exist on settlement patterns, and there is concern that the planned destinations of kits may need to change in the next year In Gaza, 40% of the population left the province during the war years As many as 30% may return

- According to the most recent progress report, buffer stocks of kits in provincial warehouses have not been achieved

- Information on level of support for pharmaceutical procurement from other donors is not readily available The EDP is currently providing a substantial portion of the pharmaceutical budget, and is providing the rural population with almost 100% of drugs received

Other USAID-funded programs in the health sector include a three year Primary Health Care Program which should begin in January 1994 Support will be provided in management, decentralization, and needs assessment

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III MINISTRY OF HEALTH CONCERNS RELATED TO PHARMACEUTICAL MANAGEMENT

Dr Noormohamed Abdul, Director of Health Services, reported that the provision of pharmaceuticals to public health facilities is the top priority of the Ministry of Health His assessment of the current situation in the pharmaceutical sector follows

During routine visits by MoH officials to health facilities throughout Mozambique, the most frequent complaint by staff is the lack of pharmaceuticals The presence or lack of drugs in health facilities is considered to be an important determinant of public confidence in the public health service This level of confidence is believed to have improved after implementation of the EDP Kit Program, and is considered to be more related to improved availability of drugs than to pubic education programs

The greatest constraint to improving the drug supply situation is the critical financial situation in Mozambique Presently, approximately 98% of pharmaceutical purchases are financed by donors In 1991, 65% of the total MoH recurrent budget was financed through donations It has recently been proposed that the MoH budget should be increased by 4 5%, excluding salaries

A 1991-92 policy framework paper concluded that MoH operating costs will continue to rise yearly A contributing factor may be the return of large numbers of refugees to Mozambique Despite the anticipated budgetary gaps, a goal of spending US$1 00 per capita for pharmaceuticals has been set for 1993-1994 The high percentage of the drug budget spent on antibiotics to treat Sexually Transmitted Diseases (STD) has convinced the MoH of the need for public education to prevent these diseases

Dr Noormohamed feels that some notable progress has been made in the pharmaceutical sector The implementation and enforcement of a National Formulary system has reduced the number of imported non-formulary drugs A policy requiring generic prescribing has resulted in virtual elimination of brand-name prescribing

There has been great progress in recent years in stream-lining a cumbersome health information system through forms revision and adjusting the flow of information It is hoped that the improved Management Information System (MIS) will enable managers at all levels to make decisions more quickly and efficiently

Dr Domingos Tuto, National Inspector for the Pharmaceutical Sector was also interviewed and identified the following areas of concern in the pharmaceutical sector

- The National Formulary has not been updated since 1984
- Lack of pharmaceutical legislation and a National Drug Policy
- Lack of a formal drug registration system
- Insufficient activity in priority areas of the Pharmaceutical Department, including improving drug supply, distribution and manufacturing due to lack of educated key personnel

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Steps are being taken to correct several of the problems identified above Approval of a revised National Formulary is expected within months The MoH is currently working with WHO on the implementation of a computerized drug registration system

There is particular interest in the formalization of Pharmaceutical Legislation and the National Drug Policy Dr Tuto feels that without formal controls, problems will increase in the following areas

- A proliferation of unlicensed drug dealers
- Increase in the number of entry points of drugs into Mozambique
- Increase in self medication
- Increase in drug prices
- Increased use of non-essential drugs

IV ASSESSMENT OF RPM OPPORTUNITIES

A Strengthening and Automating Drug Registration Procedures

Current Situation

Although none currently exists, steps have been taken toward establishment of a formal, computerized drug registration system Registration has not been a government priority in the past, at least partially due to the fact that the MEDIMOC monopoly on drug importation has been effective in minimizing the number of products entering the country With the end of the civil war, and relations improving with South Africa, the Ministry of Health feels that the potential has increased for large increases in the number of drug products entering the country Legislation does exist that requires that all drugs utilized in Mozambique be registered, but the law dates from the colonial period It is felt, however, that the existence of this law will aid the process of establishing a system

Government Action Needed

The Ministry of Health is supportive of the establishment of a formal registration system As stated in the previous section, the National Inspector for the Pharmaceutical Sector cited the lack of a registration system as one of the major problems facing the pharmaceutical sector

Other Donor Support/Activities

WHO has supported the implementation of a formal, computerized system for drug registration through the following actions

- Three Mozambicans attended a training course on WHO registration software in Harare, Zimbabwe, and
- WHO will provide the GoM with registration software

USAID Concurrence and Local Support

USAID has not been involved in the planning or implementation of a drug registration system

The proposed registration system would be set up as a unit within the Pharmaceutical Department, which will be involved in implementing and running the program The Director of the Pharmaceutical Department has indicated that she is interested in RPM support for drug registration

Recommended RPM Activities

RPM activities in this area would necessarily be done in collaboration with WHO Potential areas of collaboration are

- Additional training of MoH personnel that will be involved in the program This has already been identified by the MoH as a need because of the time gap that has occurred between the initial training and implementation

- Modification of existing WHO software to meet particular needs in Mozambique

- Provision of drug information to be used in making registration decisions This information could be provided in the form of the United States Pharmacopeia Drug Information database in CD-ROM format

- Additional training and support in

  * establishing a registration committee

  * establishing criteria for making registration decisions

  * analysis of drug information

B Rationalizing Drug Procurement and Inventory Management

Current Situation

Drug procurement is almost completely dependent upon donor funding Procurement of Essential Drug Program (EDP) kits, which provide most of the drugs used by the rural population, is completely funded by USAID A limited cost recovery program results in revenues of approximately 4% of the purchase price of the drugs MEDIMOC has done a reasonable job in conducting tenders despite the fact that sporadic funding prevents establishment of a "procurement cycle " The lack of drugs in health facilities can be attributed primarily to lack of funds, and secondarily to a host of problems in the distribution cycle including

- lack of a well managed system of internal transportation, including management of MEDIMOC trucks, seas shipments, and provincial health authority vehicles Transportation was frequently mentioned in the provincial survey as a major problem in the distribution cycle

- lack of monitoring and supervision of drug ordering, storage and distribution by warehouses and health facilities at the provincial and district levels

- long lead times both from suppliers to MEDIMOC, and from MEDIMOC to the provincial level

- lack of information at provincial medical stores concerning MEDIMOC stock levels

- lack of training in estimation of drug needs at the warehouse and health facility levels Of the surveyed health facilities 11 of 15 did not use a formula for calculating quantities of drugs to order Two of the three provincial medical stores did not use a formula

- Within the EDP, data generated in the EDP reporting system is not fully utilized for planning purposes

Government Action Needed

The Ministry of Health is supportive of strengthening the procurement and inventory management components in the pharmaceutical sector Sustainability is dependent upon establishment of reliable funding sources for procurement of pharmaceuticals This may necessitate substantial improvement in the current cost recovery program and would require political commitment on the part of the government

Other Donor Support/Activities

In addition to the procurement component, the UNICEF EDP Project contains program development activities including training and supervision of Mozambican staff, and improvement in drug storage and distribution UNICEF efforts to date have concentrated on procurement and storage components Problems in the distribution system could usefully be addressed through increased level of effort in the training and supervision of warehouse and health facility staff

The World Bank is involved in improvement of drug storage conditions through its plans to build or rehabilitate 16 facilities in the country A stock control system for use at various levels is also planned

NORAD has provided substantial assistance in the area of procurement/inventory management by funding the position of Senior Pharmacist at MEDIMOC The position is currently held by an expatriate Norwegian pharmacist

The Swiss government has supported procurement indirectly by providing financial support for the quality control laboratory and for development of the new National Formulary

AID Concurrence and Local Support

USAID strongly supports efforts to strengthen the drug distribution and inventory management components of the drug supply system The procurement of EDP kits alone does not ensure that drugs are being provided where and when they are needed Effective transportation, storage and distribution of drugs are also required The lack of training, monitoring and supervision in these areas has been recognized not only by USAID, but by the Pharmaceutical Department as well

Recommended RPM Activities

- Assist in the establishment of a procurement committee composed of members of MEDIMOC, the Pharmaceutical Department, the Technical Commission for Drugs and Medical Articles (CTTF), and the Ministry of Finance

- Assist in the development of the newly rehabilitated Matola facility, located near Maputo, into a model warehouse and training site

- Provide training in warehouse management and inventory control for MEDIMOC, provincial warehouse and health facility personnel This training would ideally be conducted at the Matola facility as part of a model warehouse management program

- Assist MEDIMOC in the establishment of a supplier monitoring and evaluation program

- Improve inventory management at MEDIMOC or at the provincial warehouse level through installation of inventory control software Use of the INVEC Tender Management Module by MEDIMOC would also strengthen tendering capabilities UNICEF has recently proposed providing funds for installation of a computerized inventory control system for stock management at the Matola facility

- Assist in the development of a monitoring and evaluation program for provincial medical stores, district pharmacies, and health facilities This would involve development of appropriate monitoring indicators/criteria, forms and monitoring schedules

- Assist the Statistical Unit of the Provincial Health Directorate in use of the data generated by the EDP reporting systems in planning kit requirements and distribution schedules

C Promoting Rational Drug Use/Strengthening Drug Information

Current Situation

Inappropriate use of drugs may contribute to unnecessary stock-outs and accumulation of drugs in health facilities, a situation that health facility staff try to remedy by ordering extra stocks via the traditional drug distribution system There are few, but sufficient studies to document poor drug utilization in Mozambique That situation may be improving in Maputo province, however, as evidenced by the survey conducted by the MoH after this assessment Results for Maputo City and province indicate rational drug use in several areas, as summarized in the Pharmaceutical and Development Indicators section The study also showed that Standard Treatment Guidelines for six key conditions were followed in 82% of cases reviewed The MoH concludes that, while provision of drug information must be strengthened, drug policy helps prevent overprescribing and guarantees a certain availability of essential drugs in all sectors when funds for drug procurement are available

Many of the country's prescribers have not received adequate prescribing training The medical faculty of the national university in Mozambique are minimally involved in the activities of the EDP Supervision visits are rare, and when they occur they appear to be more inspection exercises than educational ones

Prescribers do not receive adequate drug information on essential drugs (National Formulary), or prescribing (Standard Treatment Guidelines or medical journals) The National Formulary, last published in 1984, is the primary source of drug information at the health facility level The formulary provides very brief information on indications, contraindications, dosages and side effects None of the facilities had spent funds on drug information in the past year A number of standard treatment guidelines have been developed and are in use, many through vertical programs, but a comprehensive, pocket-sized and easy-to-use manual does not exist

Drug utilization has received very little attention from the EDP until recently when a drug use indicator study began Much more attention has been given the various aspects of logistics of essential drugs

UNICEF and the EDP have acknowledged the seriousness of the problem of inappropriate drug use Senior MoH staff members have been trained in regional or overseas courses on rational drug use, and recently UNICEF provided funds for a study of drug utilization in health facilities in the Maputo region, using INRUD/WHO methodology UNICEF has also proposed providing funds for five participants from Mozambique to attend an INRUD course to be held in 1994

As mentioned in the section above on drug registration, the Pharmaceutical Department does not currently have a source of reliable drug information to carry out planned registration activities

Government Action Needed

Rational drug utilization should become a top priority for the EDP in the future It should **not** be addressed by a limited number of isolated activities, but by developing a comprehensive plan of action incorporating vital activities such as training, supervision, monitoring drug utilization, information provision to health facilities, and public education efforts

Drug information provided to prescribers should be improved as soon as possible Approval of a new edition of the National Formulary seems likely and should be a top priority of the Ministry of Health Beyond publication, distribution of the formulary to health facilities and training in the use of it should be ensured Quality standard treatment guidelines should be prepared as soon as possible, as they are indispensable for prescribing and training activities Other ways of providing continuous information to prescribers should be considered, such as distribution of drug bulletins and journals

Other Donor Support/Activities

NGO activity in the areas of rational drug use and drug information in recent years have been minimal due to the more immediate need for drug supply UNICEF is currently supporting the development of a pocket-sized manual of approved standard treatments, and the preparation of the new National Formulary was done with support from the Swiss government The Swiss government is also funding an indicator study based on the INRUD methodology, to be conducted in Maputo Province

AID Concurrence and Local Support

USAID has recommended the implementation of well coordinated, systematic training of all health care providers, from medical students to rural health attendants, and has suggested that this area may be one which may be considered for future assistance Areas of particular concern are

- The essential drugs concept
- Prescribing practices
- Collection and analysis of health information
- Health education

Ideally, USAID support would be supplemented by other donor funds

Recommended RPM Activities

Rational Drug Use

- A rational drug use task force should be created to prepare an integrated plan of action to improve rational use of drugs Members should include representatives from the Pharmaceutical Department, MoH, Eduardo Mondlane University, and other professional organizations Realistic goals should be set on the basis of drug use indicator values Low cost approaches to training should be pursued The implementation of the plan should not be the primary responsibility of the task force
- A quantification exercise has not been conducted since the beginning of the EDP Kit program in 1986 Drug needs in health facilities and optimal kit contents should be reassessed through a quantification exercise, using standard WHO methodology (Estimating Drug Requirements WHO/DAP 88 1), and software (QUANTED) UNICEF has reportedly planned this activity for the near future
- A rapid survey on determinants of prescribing behavior should be carried out, in order to prepare a curriculum for future prescribing training courses
- A curriculum for a two or three day course on rational drug use for the different categories of health workers in the country should be designed
- A core group of course facilitators for future training and continuing education programs should be trained

- Knowledge on rational drug use should be increased through a nation wide program of two or three day courses for the various levels of health workers

  * Medical doctors
  * Health Technicians
  * Health Agents
  * Basic Nurses
  * Elementary Nurses
  * Maternal Child Health Nurses
  * Community Health Workers

  Identification and prioritization of prescribers with the highest work volume and poorest prescribing practices should be part of the development of the training plan

- Ideally, the new National Formulary and Standard Treatment Guidelines would be distributed at these courses and participants trained in their use

- Collaboration with the Eduardo Mondlane University should be intensified to ensure education in rational use of drugs in the medical curriculum and utilize the opinion leading role of medical doctors

- Assistance should be provided in the development of a monitoring and evaluation program for drug utilization in health facilities This would involve development of appropriate monitoring indicators/criteria, forms and monitoring schedules

- A plan for improved supervision at all levels of the health care system should be developed, to ensure continuing education to health workers in rational use of drugs

Drug Information

- Production and distribution of the National Formulary should be facilitated, distribution should be accomplished in conjunction with training programs described above

- Production and distribution of a standard treatment guidelines manual should be facilitated As above, distribution should be done at training programs in rational drug use

- A Portuguese language drug bulletin should be prepared and published, possibly in collaboration with the editing staff of the "Zimbabwe Pharma News "

- A program for public education on rational drug use should be developed This may include a poster program as well as utilization of radio messages

- Drug information for making registration decisions should be provided This could be done in the form of the United States Pharmacopeia Drug Information database in CD-ROM format

SECTION TWO
FINDINGS OF THE RPM MOZAMBIQUE ASSESSMENT

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V PUBLIC SECTOR DRUG SUPPLY SYSTEM

A History

After Mozambique's independence from Portugal in 1975, health services were nationalized, and a new health policy was created in which the scarce resources of the country would be made available for the majority of the poor population Policies regarding pharmaceuticals were felt to be essential in this policy

Drugs were provided free of charge for in-patients, and out-patients would only pay a token fee, based on income The state subsidized the remainder of the price of drugs Drugs for treatment of certain diseases such as tuberculosis and leprosy were free

A Technical Commission for Therapeutics and Pharmacy (CTTF) was set up to

- advise on the importation and distribution of drugs
- produce the first National Formulary for the country
- prepare standard treatment guidelines for the prescription of drugs
- give technical support in drafting legislation that would form the pharmaceutical policy

The Central Agency for Drugs and Medical Articles (CMAM) was created to procure, store, and distribute drugs and medical equipment

In 1977, the state enterprises FARMAC and MEDIMOC were created from abandoned pharmacies and drug import companies, respectively MEDIMOC, formed from some of the 31 companies that had been involved in drug importation, received the exclusive rights in 1979 to import all medicines and medical preparations for the entire country At that time, there were about 26,000 products registered, with 13,000 in circulation CMAM's responsibilities have been largely taken over through time by MEDIMOC, which is now responsible for delivery of drugs and medical supplies to provincial medical stores Distribution from provincial stores to district pharmacies and then to health facilities is the responsibility of the Ministry of Health In 1983, the company EMOFAR was created as a parastatal to produce oral rehydration salts (ORS) for the country Distribution of ORS is done through MEDIMOC

At the present time, the only drug exports reported include a small amount of herbal products, which are not addressed in this report Exportation is also the responsibility of MEDIMOC

Since 1982, expenditures in the pharmaceutical sector have decreased The per capita expenditure in 1989 was only 60% of the 1981 level Until 1981, the major source of financing for drug purchases was foreign exchange from the Ministry of Health budget, purchased from the Bank of Mozambique During the 1980s, a steady decrease in availability of foreign currency resulted in increasing dependence on external donor financing for importation of drugs In 1992, 98% of MEDIMOC's imports were donor financed, up from 13% in 1983 One of the most difficult challenges facing MEDIMOC today is the unpredictable availability of funds for procurement of drugs

B Drug Procurement Through MEDIMOC

The following table is a summary of purchases by MEDIMOC during the period January 1-December 31 for the past three years

DRUG PROCUREMENT THROUGH MEDIMOC
1 January to 31 December

Total International Purchases	$12,312,363 94	$15,733,845 03	$25 628 508 21	
Total Purchases by Direct ICB	$11,769,024 00	$12,855,574 06	$23,358,517 00	
Total Int'l Purchases by Direct Purchase	$543,339 94	$2,878,270 97	$2,269,991 21	
Local Purchases (MEDIMOC not involved)			$155,172 00	
Annual Product Donations		$18,139,969 00	$23,056,282 00	
Requested Drug Budget				$26,000,000 00*
Approved Drug Budget				$16,000,000 00
MEDIMOC Inventory Figures		$2 706 776 00	$13 799 247 00**	
MEDIMOC Expenditures			$43 000 00	(fuel for drug transport)
			$45,000 00	(vehicle maintenance)
			$386,750 00	(administration)
			$193,600 00	(other expendables)

*for drugs and materials, $16,000,000 for drugs alone
**a large consignment of drugs arrived shortly before the end-of-year inventory

MEDIMOC drug procurement depends primarily on periodic donations For this reason, it has not been possible to establish a routine procurement cycle in the past several years In the last calendar year, four major donations of funds were received, resulting in an equal number of procurements

Officially, MEDIMOC is the sole importer of drugs entering Mozambique Although specific examples were not offered, it was implied by the Ministry of Health that some private facilities, and one of the larger government facilities, engage in the direct importation of drugs from Swaziland A limited inspection process to detect illegally imported drugs exists, however, lack of staff (two inspectors for the entire country) has prevented formation of a fully functioning program In the last "round" of inspections, products were confiscated at 10 facilities throughout the country The size of the illegal market is unknown

Recently, UNICEF has proposed providing funds to MSH for development and implementation of a modular training course for Pharmaceutical Inspection

The usual steps for drug procurement and time range in weeks for each step, as calculated by MEDIMOC are as follows

	WEEKS
Need to order/Preparation of tender	4
Call for offers	2-6
Evaluation-Comparative schedule preparation	1
Decision-Tender Board authorization	2-4
Contracts awarded/Suppliers proforma invoice	3
Letter of credit from Ministry of Commerce	2
Foreign exchange available (Bank of Mozambique)	2-10
Preparation of Shipment-Goods received in port	8-12
Transport-Goods received in port	2-6
Customs clearing of goods	2
Goods received and ready at warehouse	2
	30-52 weeks

As the above estimates show, 17-39 weeks (60-75%) of the procurement cycle takes place in Mozambique It should also be noted that MEDIMOC does not have complete control over the procurement process The MoH has estimated that there would be a 20% reduction in lead time with improved performance from the Bank of Mozambique and the Ministry of Finance

C Drug Budget and Access to Funds

Beyond the initial purchase by MEDIMOC from suppliers, facilities lower in the distribution cycle (provincial warehouses, district pharmacies, and health facilities) do not pay for drugs, although "invoices" are prepared at each step in the distribution chain so that facilities can calculate the value of drugs received

A formal committee responsible for development and approval of drug budgets does not exist at the central level The decision process consists of determination of when and how to spend donated funds Main responsibilities for this at MEDIMOC lie with the General Director and the Import/Export Director Members of the Financial Department of the Ministry of Health, the Ministry of Commerce and the Ministry of Finance also participate

MEDIMOC access to funds provided by donors for drugs typically occurs as follows

1 A donor government or organization informs MEDIMOC that funds will be available for the purchase of drugs

2 MEDIMOC conducts a tender and submits a proposal of adjudication to the Ministry of Commerce

3 A request is made to the Bank of Mozambique to open letters of credit to the suppliers

4 Funds are transferred from the bank of the donor to the banks of the suppliers

As demonstrated above, the usual time from donor notification of available funds to receipts of drugs in warehouses is 30 to 52 weeks

Despite the fact that returning refugees will increase drugs needs, expansion of services cannot be considered with the current funding mechanism A "rough estimate," based on three million returning refugees and US$1 00/capita/year for drugs, indicates that an additional US$3,000,000 per year will be needed for drugs for refugees

D Direct Donation of Drugs to MEDIMOC

An established process does not exist for acceptance of donated products, with the exception of the UNICEF EDP kit program for which there are well established procedures

Problems have been encountered recently with donated products, including

- receipt of products not on the National Formulary
- donations which are sent directly to health facilities, bypassing MEDIMOC
- receipt of expired drugs
- receipt of unfamiliar strengths of drugs

These comments do not refer to the EDP program

MEDIMOC has had little success in controlling the content of shipments of donations, particularly because they tend to be carried out by NGOs that run major health care programs in various regions of the country

E Purchasing

As with budgeting, a formal purchasing committee does not exist The decision making process typically involves the MEDIMOC General Director, Import/Export Director, Internal Distribution Director, and the Senior Pharmacist Recently, the CTTF has also been involved in the decision making process by reviewing MEDIMOC recommendations of drugs and quantities to purchase

When availability of funding is announced, the group makes decisions regarding what drugs and quantities to purchase, and the best method of shipment from the supplier Generally, sea shipment is chosen, with the exception of vaccines, insulin, or shipments containing drugs in extremely short supply, which are air-lifted Trucks are used by South African suppliers

Order quantities are calculated primarily from the current stock position, as recorded on the Kardex system maintained at the MEDIMOC central office Formulas incorporating lead times and buffer stock are not utilized, nor are stock-out periods and morbidity data considered A MEDIMOC study of bin cards in Beira and Maputo indicated that actual order quantities would be 30% greater if stock out and quantity requested (as opposed to quantity supplied) data were utilized A review of actual stock count versus that recorded on the Kardex system for the set of tracer drugs revealed that the recorded figures were on average 159 31% of the actual stock count This record keeping system is used to make procurement decisions and thus a situation of under-ordering is likely to occur

The Senior Pharmacist has prepared a VEN (Vital, Essential, Non-essential) classification, based on 1991-92 MEDIMOC drug imports, in order to better allocate scarce funds The VEN list has been incorporated into an ABC analysis document (A=20%, B=20%, C=60%) The VEN list contains 127 Vital, 210 Essential and 330 Non-essential drugs The Senior Pharmacist estimates that 20% of the current drug budget could be saved through purchasing decisions made using VEN/ABC analysis It has been proposed that the CTTF could participate in the maintenance of the VEN list

Other issues discussed by the purchasing group include distribution of excess stocks and distribution of drugs with short expiry dates

When purchases are to be made, the MEDIMOC Import/Export Director prepares a proposal based on the discussions described above A LOTUS 1-2-3 based spreadsheet program is used to compile information on proposed order quantities The final decision on quantities to be purchased and their sources are made by the General Director of MEDIMOC

Normally, purchases are restricted to items on the National Formulary Some drug dosage forms which are not included in the formulary are permitted to be imported because it is accepted by MEDIMOC and the MoH that their omission was an oversight These items include antibiotic and vitamin syrups for use with children

An informal procedure is followed when practitioners have special requests for specific patients The requesting practitioner submits a prescription or written request to the Pharmaceutical Department, followed up by a verbal or written request to MEDIMOC by the Pharmaceutical Department MEDIMOC then places an order for the drug

Vender Selection

MEDIMOC makes purchases through both International Competitive Bidding and Limited Competitive Bidding processes The latter is the locally preferred method

In limited competitive bidding, pre-qualification of vendors is based on past performance The General Director and the Import/Export Director are responsible for determining companies that will be invited to tender

Items on the tender document are listed by generic name and are arranged according to the code established for the National Formulary as follows

A Diagnostic agents
B Antidotes
C Antihistamines
D Antirheumatics
E Antiseptics
F Cardiovascular
G Gastrointestinal
H Gynecologic
I Respiratory
J Cytostatics
L Dermatologics
M Diuretics
N Electrolytes/Acid and base modifiers
O Antiinfectives and antiparasitics
P Hormones and hormonal antagonists
Q Vaccines and immunoglobulins
R Dressings
S Nutrition agents/Vitamins
T Ophthalmics
U Otics
V Blood and blood forming agents
X Autonomic CNS drugs
Z Somatic CNS drugs

Acceptable pharmacopeial standards listed on the tender document are the British Pharmacopeia, European Pharmacopeia, and the United States Pharmacopeia

Samples are required from all vendors and for all drugs on the tender Four samples of all lots quoted in bids must reach MEDIMOC within one week of the tender closing date

Other requirements in the tender document specify

- drugs must be packaged in such a way that they are waterproof and protected from all damage during transport
- labels must carry the imprint "IMPORTED BY EE MEDIMOC, MOZAMBIQUE "
- required delivery time is 60 days from opening of letter of credit
- material should not be more than three months old from date of manufacture

Suppliers are required to submit the following documents to the donor bank as a condition for payment

- Commercial invoice and bill of lading
- Detailed packing lists
- Certification of country of origin
- Certificate of Quality (type unknown)
- Clean report of finding from the Societe Génerale de Surveillance, Geneva
- Insurance certificate for CIF shipments

Fees are not charged for international competitive bids A US$100 00 fee is required for Limited Competitive bids A bid bond of 2% of the bidder's price is required in the form of a Bank Guarantee or Irrevocable Letter of Credit Performance bonds are required in the amount of 10% of the contract price It is unknown if bond requirements discourage potential suppliers

Standard tender contracts are maintained on a MEDIMOC computer It takes an average of three days to prepare documents once order quantities have been established Tentative adjudications are made by the Import/Export Director and the General Director, and are submitted to the Ministry of Commerce for final approval Adjudication is based primarily on the lowest bid price Past performance and the results of Quality Control testing are also considered

Split tender awards are routinely made for order quantities greater than 500,000 order units Secondary supplier awards are not made as a safeguard against non-performance by the selected supplier

Vendors that do not meet conditions of tenders are not invited to participate in future tenders In one recent case, a vendor was not invited to bid for a period of two years when a shipment of aspirin that failed dissolution testing was not replaced The company eventually shipped replacements and has been including in subsequent tenders

In 1992, an estimated 15 non-routine purchases were made in cases of stock-out of "vital" drugs, and for specific requests by physicians Vendors for non-routine purchases are chosen based on a list of vendors that successfully provided the product in the past The Import/Export Director and the General Director are responsible for non-routine purchases

MEDIMOC utilizes a computer spreadsheet program, developed by an expatriate consultant, for tracking shipments of drugs Information entered in the program includes

Funding Source
Bank of Mozambique Reference Number
Contract Number
Vendor Name
Type of Goods
Import License Number and Date
Letter of Credit Request and Approval Dates and Numbers
Currency of Payment
Value of the Order
Validity of Shipment
Validity of Negotiation (validity date for letter of credit)
Name of Vessel
Promised Date of Arrival
Port of Departure
Port of Destination
Date of Arrival in Port
Date of Departure from Port
Date of Customs Clearance
FOB Cost
Freight Cost
Insurance Cost

Ordering from Tendering Sources

MEDIMOC reports that it takes an average of one week to have tendered orders approved by the Ministry of Commerce Drugs are usually received 16-32 weeks after opening of the letter of credit Funds are transferred to the bank of the supplier when the shipment leaves the port of the supplier

For tender orders, the average time to clear port in Maputo is 14 days

There were 104 tendered drug orders placed in 1992 in four major tenders Donations were made by international organizations that included the Norwegian Development Agency (NORAD), SIDA, and DGIS (Directorate General International Cooperation, the Dutch development agency)

If suppliers are unable to ship drugs as agreed, unused funds remain in the bank of the donor and are not available for future procurements, although such occurrences are rare

Problems cited by MEDIMOC in obtaining tendered drugs include

- the sporadic nature of funding through donations
- lack of a well defined program for evaluation of supplier performance
- underutilization of reliable suppliers in neighboring countries, such as South Africa, in spite of political changes which would make this feasible
- long lead times for financial approvals within Mozambique

Ordering from Non-tender Sources

MEDIMOC occasionally (15 orders in 1992) places orders from non-tender sources It reportedly takes only one day for Ministry of Commerce approval of non-tender orders Non-tender orders, which usually are air-shipped, take an average of 20 days from approval by the Ministry of Commerce to receipt of drugs

The difference between non-tender and tender prices for drugs has never been calculated Payment for non-tender orders is made either by bank transfer, or by "Cash Against Document "

Non-tender purchases are made by foreign currency exchange through the Bank of Mozambique Time required to make foreign currency available has been estimated to be two to ten weeks

Areas of Concern

- Drug procurement is almost completely dependent on donor support (98% in 1991 and 1992)
- Establishment of a routine procurement cycle is not possible given the unpredictable receipt of funds
- Stock out periods and quantity requested figures are not used in calculating drug needs
- The lack of a functioning inspection unit inhibits the prevention of illegal importation of drugs
- Lead times of up to one year have occurred in procurement of drugs
- There appears to be little input from the CTTF or the Pharmaceutical Department in buying decisions, including tender adjudications
- Donor financing of procurements in Mozambique places restrictions on procurement and inhibits the development of a local drug manufacturing industry
- Lack of established procedures for receiving donated products has resulted in problems such as receipt of non-formulary and expired drugs

- Purchasing decisions are made based on consumption information taken from the manual, centralized Kardex System, which was found to be inaccurate Order formulas are not utilized

- A formal program of supplier evaluation does not exist

Recommendations

- Include members of the Pharmaceutical Department and the CTTF in drug procurement decision making Such involvement will bring greater expertise and experience to the process, including

  * clinical experience with drug entities or specific drug products

  * knowledge of morbidity patterns

  * MoH plans for upcoming program activities that could affect the drug supply process

  * meetings could also be a forum for discussions of other problems in the drug supply process, such as long lead times

- Establish a formal supplier monitoring and evaluation program Such a program would routinely address performance in areas such as

  * delivery time
  * response to inquiries
  * adherence to delivery instructions
  * provision of documents
  * packaging and labeling
  * adherence to dating requirements

- Improve the process of determining order quantities through

  * access to accurate consumption data

  * use of formulas in which lead time and buffer stock figures are utilized

  * use of morbidity information, if available

  * ABC analysis and VEN classification

These recommended improvements could be accomplished through either manual or computer programs

- The inspection process for the pharmaceutical sector, which will help to detect illegally imported products, should be improved by

  * increasing the number of inspectors from the current level of two The exact number of inspectors needed would be established after definition of all activities involved in the process

* establishing a criteria-based inspection process for various levels of the pharmaceutical sector (port, warehouses, health facilities, retail pharmacies, manufacturing sites)

* identifying new funding sources for staff salaries and travel expenses

* training current and new inspectors in a program such as the one proposed by UNICEF

VI COST RECOVERY PROGRAM

There is a limited cost recovery program for pharmaceuticals in Mozambique administered by the Central Medical Supplies section of the Pharmaceutical Department Revenues generated in 1992 are estimated to equal approximately 4% of the total cost of the drugs purchased for that year The figure for 1993 is estimated at 1%

Revenue generated through the program is utilized by the Pharmaceutical Department for local, sole source purchases of the following

- medical gasses from the firm Mogas
- alcohol from the firm Buzi
- cotton products from the firm Texafrica
- ORS from EMOFAR

Additionally, cost recovery funds are used for the yearly transportation budget of MEDIMOC, which represents MEDIMOC's only involvement in the cost recovery program

The revenue generated from cost recovery does not fully cover the costs of the products and services listed above In 1992, local purchases of these items totaled

LOCAL PURCHASES	450,000,000 Meticais (US$300,000)
REVENUE FROM COST RECOVERY	360,612,994 Meticais (US$240,409) (80%)
DEFICIT	89,387,006 Meticais (US$59,591) (20%)

After cost recovery funds are exhausted, outstanding invoices for local purchases are forwarded to the Ministry of Finance for payment

Patient drug prices are listed in the "*Preçario de Medicamentos,*" the official government price list, and stamped on each drug package It was the original intention of the Ministry of Health that the official price equal the acquisition cost of the drug, and that the list be revised every six months to reflect price increases Revisions have actually been rare, the last two being in 1985 and 1992 The 1992 price list was based on an exchange rate of US$1 00 = 1,500 meticais The current *mercado secundario* rate is approximately US$1 00 = 5,000 meticais Thus, rising drug prices and devaluation of the metical have drastically diminished the effectiveness of the program In October 1993, the official U S dollar exchange rate was 4,000 meticais, the *mercado secundario* exchange rate was 5,000 meticais At the same time, the parallel market rate (street value) was 5,400 meticais

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The 1992 price list reportedly took two years to be approved Increased revenues are expected in 1993 with the publication of the 1992 list Some price comparisons from the 1992 list and the actual prices paid by MEDIMOC for the last purchase of the drugs are presented below MEDIMOC has noted that there can be great price variation in their purchase prices due to market fluctuation and donor requirements

DRUG	1992 PREÇARIO DE MEDICAMENTOS	MEDIMOC
Ergometrine 0 2mg inj	$0 1326	$0 0043
Nalidixic Acid 500 mg tab	$0 0974	$0 0459
Cotrimoxazol 400/80 tab	$0 0467	$0 0119
Kanamycin 1 Gm inj	$1 0118	$0 2759
Metronidazole 250 mg tab	$0 0245	$0 0073
Multiple Vitamin tab	$0 0360	$0 0127
Tetracycline Ophth oint	$0 5418	$0 60
Adrenalin 1 mg inj	$0 1261	$0 0565
Paracetamol 500 mg tab	$0 0020	$0 0041
Penicillin 3 MU inj	$0 1321	$0 4313

For the drugs listed above, the average difference between the official price list and the last MEDIMOC price is US$0 14201 In general, the MEDIMOC prices are lower

Official prices are charged to outpatients at urban hospitals, health centers and health posts However, there are several subsidy schedules in which patients pay a percentage of the official drug price or receive drugs free of charge as follows

	% of Official Price Paid
Chronic conditions	80%
Working disabled	50%
Retired persons	40%

Patients at rural health centers and posts pay 100 meticais per visit for drugs, or about US$0 02 at the present exchange rate of US$1 = 5,000 meticais

Drug are received free of charge by the following groups

Prisoners
Students
Blood Donors
Unemployed
Hospital inpatients

Drugs supplied through vertical programs are provided free of charge, with the exception of anti-malarials for which patient charges were initiated in an effort to curb overprescribing The financial impact of exemptions is not known

In 1990, the Social Fund for Drugs and Infant Formula was started with the assistance of the Swedish government The starting balance of the fund was approximately 1 2 billion meticais, with SIDA and the GoM contributing equal amounts This fund was intended to help fill the revenue gap created by subsidized prices listed above

Cost recovery funds are forwarded from health facilities to district pharmacies on a monthly basis, along with a report of the value of drugs received (according to the price list) during the month and the total revenue collected The district pharmacy aggregates the reports from facilities and forwards a summary report, and the collected funds, to the provincial health administration Funds are deposited in a bank at the provincial level, and payment is made to the Central Medical Supplies Department by check

Drug issues and revenues are reconciled twice yearly The purpose of the exercise is to determine the extent of government subsidy of drug prices Government audits are not performed regularly, and are usually done in response to detected problems A central audit is performed yearly

Areas of Concern

- The cost recovery program covers only 1% of the purchase price of drugs
- The 1992 price list does not reflect the actual purchase price of drugs
- The pharmaceutical system cannot become self-sustaining because cost recovery funds are not used for procurement of pharmaceuticals, in part due to the lack of local suppliers from whom meticais purchases could be made
- Planned updates of the government price list have not occurred, despite rising drug prices and devaluation of the metical Since 1985, only two updates have been made
- Extensive subsidy schedules and complete exemptions make the possibility of recovering even the purchase price of drugs unlikely
- Regular audits of the cost recovery program at the provider level are not done

Recommendations

- More timely publication and distribution of the "*Preçario de Medicamentos*" is required
- Increased cooperation between the Pharmaceutical Committee and MEDIMOC should result in more accurate pricing
- A thorough study of the cost recovery program is needed, including a determination of the ability of patients to pay prices which would cover replacement costs

VII THE DRUG DISTRIBUTION SYSTEM

A MEDIMOC Staffing

The MEDIMOC core administrative staff consists of the following members

Mr Renato Ronda, Pharmacist
General Director

Mr Estevao Macuaca, Economist
Finance and Administrative Director

Mr Domingos Gomes
Import and Export Director

Mr Velemo Machanguana
Internal Distribution Director

Ms Noelma Lopes
Assessor of Internal Distribution

Mr Guttorm Folkedal, Pharmacist
Senior Pharmacist

General staffing levels for MEDIMOC are as follows

	MAPUTO	BEIRA	NAMPULA	TOTAL
Pharmacists/Technicians*	7	3	1	11
Supply Officer	37	4	0	41
Store Keeper	24	8	0	32
Clerk/Secretaries	51	14	3	68
Handymen	0	0	0	0
Drivers	7	4	1	12
Security (day)	10	7	1	18
Security (night)	10	7	1	18
TOTALS	146	47	7	200

* MEDIMOC currently employees two pharmacists and nine technicians

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B Infrastructure and Equipment

MEDIMOC storage and administrative facilities are located throughout Maputo There are also MEDIMOC warehouses in Beira and Nampula, but they are not addressed in detail in this report This fragmentation can be considered to be one of the greatest impediments to improvement of the distribution of pharmaceuticals in the National Health Service

In Maputo, there are 12 separate storage facilities and two administrative offices For purposes of this assessment, it was decided that four storage areas would be visited, including the recently renovated site selected for future local kit packing This is also the site where EDP kits are stored The Senior Pharmacist felt that the selected sites were a representative sample for purposes of addressing equipment and storage conditions Data on tracer drugs and the EDP kits were collected at these sites Storage facilities are referenced by number The team visited MEDIMOC #1, #7 (kit storage), #8, and #9

Each province in Mozambique has a medical store located in the provincial capital During the assessment, medical stores in Gaza, Nampula and Niassa were visited

Structural Conditions No major structural problems were detected in the MEDIMOC facilities Two of the sites (#1 and #8) probably experience some water leakage through the roof during heavy rains The site used for kit storage (#7) was recently renovated and is very sound structurally Windows at all sites were equipped with bars

The provincial stores in Gaza will require rehabilitation while those in Nampula and Niassa are structurally sound The MoH is considering building a facility in Nacala that will serve as both a MEDIMOC and provincial warehouse The same model is being considered for Beria/Sofala and Maputo It is hoped that decreasing the number of steps in the distribution cycle will shorten lead times

Temperature control Only one of the 12 MEDIMOC sites (# 9) is equipped with air-conditioners While the air temperature in the visited storerooms was not excessive, some heat degradation would be possible during summer months None of the facilities are equipped with ceiling or roof fans and temperatures are not routinely monitored Results of quality control lab tests on anti-tubercular drugs have revealed sub-potency while products were still in date, these problems may or may not be due to storage conditions

The provincial stores in Nampula had an air conditioning unit but it was in need of repair during the survey None of the facilities monitor room temperatures

The MEDIMOC warehouse in Beira has a large air conditioned area

Storage space MEDIMOC estimates that the total storage space provided from all 12 MEDIMOC sites in Maputo is 4,000 square meters The World Bank is funding the construction of an 8,000 square meter warehouse a short distance from Maputo which will be used for all drug/medical supply storage and administrative offices Most of the current MEDIMOC storage facilities would be closed if this facility is constructed, with the possible exception of the site serving FARMAC stores

Two of the three provincial stores visited (Nampula and Niassa) reported that additional storage space was needed

Security Armed guards are utilized at all MEDIMOC sites, and are present around the clock All windows are barred but none of the facilities have alarm systems While recent break-ins have not occurred, there have been problems with internal theft for which employees have been discharged Preventative measures include locked storage for antibiotics, dangerous drugs, and alcohol Receiving and dispatching procedures involve double checks to deter theft A manual exists which outlines these procedures

At the provincial level, all facilities reported adequate security with the exception of Nampula, where it was reported that security in the storeroom was inadequate

Pest control All MEDIMOC offices and storage sites are sprayed twice yearly for insects, and rat poison is provided four times a year Three of the four sites reported some problems with rats and the assessment team noted several instances of this

None of the provincial stores have pest control procedures, although no problems were noted

Cold Chain Refrigerated storage is provided at only one Maputo MEDIMOC storage site (#9) and is comprised of one kitchen-type refrigerator, a freezer in which diagnostic products are stored, and a cold room of approximately 225 square feet At the time of the assessment, the cold room was filled to capacity and the staff confirmed that available space is inadequate The cold room had a thermometer and the temperature was within acceptable limits, but temperatures are not monitored or recorded The refrigerator and freezer did not have thermometers

MEDIMOC in Beira has an adequate cold storage area

Electrical supply All MEDIMOC sites are serviced by the national supply system The facility with refrigerated storage is serviced by the generator for the adjacent hospital With the current peace-time situation, power outages are reportedly not a problem

All of the surveyed provincial stores have electric service, but none have a back-up generator

Storage systems At MEDIMOC facilities, products were not routinely stored directly on floors A variety of storage systems are utilized, including shelves, cabinets and pallets The major constraint to proper storage is lack of adequate square footage While it was not possible to quantify the amount of floor space needed for MEDIMOC during the assessment, it is felt by MEDIMOC that the planned 8,000 square meter warehouse will provide adequate storage space At site #1, the team saw the results of the collapse of a large stack of chlorhexidine gluconate bottles, resulting in damage to most of the product Similar inappropriate stacking of palletized products was seen at other sites

MEDIMOC storerooms were found in various states of organization, ranging from neat organization based on the national formulary coding system (#9) to apparently random storage in those facilities relying primarily on pallet storage Is doubtful that disorganized storage conditions have a significant negative impact due to the relatively small number of products kept at each facility

On questioning, employees stated that stock is distributed by the FEFO method (first to expire, first out) Expired products were not found in any of the warehouses

At the provincial level, shelves and cabinets are used for storage and products are arranged alphabetically and by dosage form Organization ranged from neatly organized to generally disorganized No expired products were found

Fire control All MEDIMOC sites visited had several fire extinguishers and we were told that the allocation was based on square footage of the facility Extinguishers did not carry inspection tags, but all appeared new

Fire extinguishers were present in the stores in Gaza and Niassa, but not Nampula

Compounding MEDIMOC is not involved in local compounding or packaging

Use of computers MEDIMOC currently has six computers, all located in the administrative offices in Maputo A local area network is not utilized The distribution of hardware is as follows

Staffing (1)
Accounting (1)
Purchasing and Import (2)
Office of the General Director (1)
Office of the Senior Pharmacist (1)

Programs were developed for MEDIMOC by the local firm Soft Limited An expatriate consultant developed the software program utilized for tracking of purchase orders Only this program was demonstrated during the assessment

All computers are made by IBM or Olivetti Computec, another local firm, provides hardware support through a maintenance contract

Six printers, and Uninterrupted Power Supply (UPS) equipment were purchased from International Computers Limited, a local company

MEDIMOC is trying to raise the general computer skills of its staff through training courses conducted during business hours in DOS, WordPerfect, LOTUS 1-2-3, and dBase

None of the surveyed provincial stores had computers

Kit packing facility MEDIMOC # 7 has recently been renovated with UNICEF funds for the purpose of starting a local kit packing operation Pallet racking is present to hold drug kits A conveyer belt system is in place for a kit production line Other equipment includes work-benches, a strapping machine for sealing kits, a stenciling machine, and one electric and two hand operated fork-lifts The facility is approximately 625 square meters, including offices It is currently used for storage of "A," "B" and "C" kits

The exact role of the facility has yet to be determined It has been suggested that an initial function could be a program for opening and adding drugs to kits as they arrive from Copenhagen, although the "Final Report Matola Set-Packing Report" does not address this activity This report suggests that by the end of 1994, the facility could fill 25% of the national kit demand The kit packing facility is discussed in more detail in the UNICEF EDP Kit Program section of the report

Transportation In the National Health Service, MEDIMOC is responsible for the transportation of drugs from ports of entry to the provincial warehouse level In the current fiscal year, the Ministry of Health has provided MEDIMOC a budget of 135,000,000 meticais for "logistics," including customs fees, transportation and storage fees As stated in the section on cost recovery, these funds are provided by the Cost Recovery Program within the Pharmaceutical Department Additionally, UNICEF provides support to MEDIMOC for the kit program in the form of vehicles, fuel, spare parts and cash contribution to pay for airfreight or special land-transport MEDIMOC may use UNICEF vehicles for non-kit distribution providing that the kit program is not adversely affected

The MEDIMOC fleet in Maputo consists of 12 vehicles Beira has six vehicles and Nampula has two Since 1985, UNICEF has provided five vehicles for Maputo, two for Beira, and one for Nampula

The Maputo fleet is utilized for transport of drugs and medical supplies to the provincial stores of Maputo, Gaza, and Inhambane

None of the trucks used for transportation of drugs has a built-in fork-lift, which creates problems when laborers or fork-lifts are not available for loading and unloading

One mechanic and three assistants are utilized for minor repairs of vehicles, but are not regular employees The trucks now in service, made by SCANIA, are considered to be very reliable, and service is available in Maputo

Sea shipments are used by MEDIMOC to forward drugs and supplies from Maputo to Pemba, Nacala, Beira and Quelimane Although a UNICEF-funded study concluded that in the long term, and for long distances, sea transportation is financially the optimal mode, there is a preference for ground transportation Significant time savings are realized with land transportation, particularly because of port clearing procedures In the peace-time situation, the desire to use ground transportation has increased

There is fairly frequent, but not official, shared transport with other health programs that have vehicles

MEDIMOC does not currently use rail transport for the shipment of drugs The UNICEF study did not address this option in detail Air shipments are used occasionally in times of severe shortages, such as Phase I of the USAID kit procurement, but are considered to be too expensive for routine use

At the provincial level, of the three stores surveyed, two had two vehicles and one had one vehicle Only one of the vehicles was reported to need repairs Two of the stores reported transportation problems, including inadequate numbers of vehicles, and inappropriate management of the vehicles

Twelve of the 15 health facilities surveyed reported that transportation was one of the main problems in getting drugs from the provincial stores The main problem cited was an insufficient number of vehicles

Port Clearing Procedures In Maputo, port clearing procedures are estimated by MEDIMOC to take approximately 14 days However, for ten Maputo sea shipments chosen randomly from the MEDIMOC tracking document, the mean clearance time was 1 2 days For six shipments arriving in Beira, the mean clearing time was 61 days Delays are reported to arise primarily from the processing of the document required for bank-to-bank transfer of funds Briefly, port clearing procedures are as follows

1 A bill of lading is sent by the supplier to the Bank of Mozambique, then forwarded to MEDIMOC In the case of donations, the bill of lading is sent directly to MEDIMOC

2 MEDIMOC takes the bill of lading to Manica, the company that serves as the local representative of various shippers A Delivery Order is prepared by Manica

3 MEDIMOC prepares the *Despacho de Importaçao*, a set of documents required by Customs Office

4 MEDIMOC pays customs fees Three major fees representing 17 5% of the value of the shipment, are waived The remaining fees are financially insignificant

5 After the *Despacho de Importaçao* has been processed, MEDIMOC collects the drugs from the port

This procedure is not felt to cause unusually long delays Most delays are caused by the processing of the *"Titulo"* document, which is part of a complex process of fund transfers involving the banks of the donor and supplier, and the Bank of Mozambique

The delays described above result in the imposition of storage fees at the port of entry The fee schedule is US$12 00/day for 20 foot sea-containers, and US$24 00 per day for 40 foot containers

In the provincial survey, Nacala and Quelimenane reported that the greatest constraint in port clearance was lack of transportation to take drugs from the ports Quelimane also reported that lack of fork-lifts and cranes is a problem

Receiving For Maputo shipments, following port clearance, MEDIMOC trucks carry drugs from the Port of Maputo to the appropriate storage facility A MEDIMOC official physically accompanies shipments At the storage site, the officer in charge checks the shipment for damage and compares the actual piece count to the packing list and MEDIMOC order Incorrect receipt quantities rarely occur Quantities received are added to the Kardex system, which is maintained in the stores office A copy of the invoice is sent to the MEDIMOC administrative offices where the parallel Kardex system is maintained

In the last year, the following problems have been reported with receipt of products

- products received that were not ordered
- damaged products
- expiry dates earlier than those stipulated in the tender document
- failure to pass quality assurance testing

The corrective action preferred by MEDIMOC is for replacement shipments to be sent, which is usually done without undo difficulty

A drug problem reporting system has been developed by the Senior Pharmacist for documentation of problems such as those listed above, but has not been implemented Such systems are valuable for gauging supplier performance

The MEDIMOC General Director and Internal Distribution Director have authority to return products The Quality Control Laboratory has authority to reject drugs that do not pass testing on receipt

Provincial stores reported receiving non-requested drugs from both MEDIMOC and NGOs, for example, Medecins Sans Frontieres One of the stores returned non-requested products to MEDIMOC No drug quality problems were reported by the provincial stores

Inventory Control The MEDIMOC catalog contains 600 drugs and 60 medical supply products There are presently 493 drug products and supplies in stock in Maputo facilities, including 20-25 not on the National Formulary The Senior Pharmacist estimates that there are approximately 126 products in Maputo facilities with low inventory levels

Each storage site in the system maintains a Kardex system for all products normally stored at that facility Stock addition and distribution quantities are recorded along with the date of transactions and supplier and client names The accuracy of this record keeping system was assessed by taking an inventory of 20 tracer drugs and three kit types At the time tracer drugs were checked, entries were approximately 4 days behind actual distribution The results show that on average, recorded stock levels are 123 78% of the actual level

A physical stock count is done quarterly by the MEDIMOC Stock Control Unit, and checked against the Kardex system Discrepancies are reported to the General Director but it is unclear what actions are taken in these cases

A parallel Kardex system is maintained at the MEDIMOC administrative offices, using records forwarded from the storage sites The results of the tracer drug audit of this system revealed that on average, recorded stock levels are 159 31% of actual levels This discrepancy can be attributed to the fact that because of the fragmented structure of the MEDIMOC warehouse system, the administrative system is updated only every three months There are plans implement daily updates of the system

MEDIMOC administrative officers are interested in the implementation of computerized inventory control Soft Limited, a local software firm has demonstrated a program which is designed for general commodities and does not allow for entry of expiration dates MEDIMOC considers this to be a significant shortcoming in the system Another program, SCALA, demonstrated by the firm Frexpo in Maputo, permits monitoring and allocation by expiration dates Given the planned consolidation of storage sites, MEDIMOC may choose not to implement a computerized program until 1995 or 1996, when the move is made to the new facility INVEC was demonstrated to two senior MEDIMOC officials during the assessment Both were favorably impressed with the ability INVEC gives managers to monitor expiration dates and distribute stock according to earliest expiration They were also impressed with the reporting capabilities of the program Their major concern was in the potential lack of software support UNICEF has suggested to MSH that it may provide funding for installation of a computerized inventory control package at the Matola facility

At the health facility level 73% (11 of 15) used either a bin card or Kardex system for inventory control One facility used no system, and one relied on the experience of the staff Tally cards are used at the provincial medical stores level

Distribution to Provincial Facilities MEDIMOC distributes drugs and medical supplies directly to the following clients

- ten Provincial Medical Stores
- Maputo City Medical Stores, which is generally thought of as another "province"
- approximately 60 retail pharmacies, including 40 FARMAC stores and 20 private pharmacies
- approximately 30 other clients including
    - the armed forces
    - the Clinica Cruz Azul (private)
    - the prison system
    - The Maputo Central Hospital
    - The Central Hospital of Beira

The closest facility to which MEDIMOC delivers product is the Maputo Central Hospital (2 2 Km) The farthest facility serviced by MEDIMOC Maputo trucks is the Inhambane Provincial Medical Stores (500 Km) FARMAC stores in Maputo use their own trucks to pick up drugs at the appropriate storage site The northern provinces of Cabo Delgado, Zambezia and Nampula are served from Maputo by ship The southern provinces of Maputo, Gaza and Inhambane are served from Maputo by truck The provinces of Sofala, Manica, Tete and Niassa are served by the MEDIMOC warehouse in Beira by truck

Provincial stores place drug orders from MEDIMOC every three months Emergency orders are permitted before the next scheduled order time Of the three surveyed provincial stores, an average of 6 3 orders were filled by MEDIMOC in 1992 Current stock balance and quantity requested are entered on the order form All stores reported never receiving a MEDIMOC stock list The average time between MEDIMOC receipt of a requisition and provision of the drugs to the facility is reported to be seven days for orders delivered by MEDIMOC trucks Sea shipments take approximately one month for delivery MEDIMOC has three employees located at the Port of Maputo for processing shipments to northern provinces in sea containers

There is no formal program of therapeutic substitution when ordered drugs are out of stock Substitution is practiced occasionally, following approval by the Pharmaceutical Department Recently, Chlorhexidine solution was approved to be distributed in place of Savlon

When items are approaching stock-out at MEDIMOC, a small quantity is routinely reserved for emergency situations Distribution of this emergency stock is done only with the approval of the General Director A proposal has been submitted by the Senior Pharmacist suggesting that **all** remaining stock be distributed to requesting facilities based on past consumption, and that health facilities be informed about stock-out situations

The main problems reported by the provincial stores in getting drugs from MEDIMOC are

- inadequate transportation
- inadequate quantities supplied
- lack of information on MEDIMOC stock levels
- not receiving invoices promptly

Distribution to Health Facilities from Provincial Stores At the health facility level, the following methods were reported to be used to order drugs

Past consumption (73%)
Review of past and current disease patterns (53%)
General experience of staff (33%)
Comparison of consumption with disease patterns (7%)

Only four of the 15 facilities (27%) use a formula to calculate order quantities Only 53% of facilities reported to receive stock lists from provincial medical stores and 60% reported inadequate supplies of drug received from the provincial stores At the 15 surveyed facilities, 58 63% of tracer drugs were in stock

As stated above, the main problem reported in getting drugs from the provincial stores was lack of transportation

Areas of Concern

- The existence of 12 storage facilities and two administrative offices in Maputo makes management of distribution difficult
- Observation of crowded storage conditions in several facilities indicates that more storage space is needed
- Additional refrigerated storage space is needed, as well as routine monitoring refrigerator and freezer temperatures
- Although not quantified, product loss due to pests (rats) is probably substantial
- The storage facility at Matola is under-utilized This recently rehabilitated site offers large storage capacity, heavy duty shelving and equipment for moving products It is currently used only for temporary storage of drug kits
- A thorough evaluation of the transportation system (MEDIMOC and the provincial systems) has not been undertaken Several of the health facilities surveyed during the provincial survey cited transportation as being a major problem in getting drugs
- Port clearing time, particularly in Beira, is long and results in imposition of storage fees
- Problems have been identified with receipt of damaged or otherwise unacceptable products As mentioned in the previous section, a formal program of supplier monitoring and evaluation does not exist
- The manual inventory control system (Kardex) was found to be inaccurate at all levels (administrative offices, storage facilities, and health facilities)
- The computer software under consideration by MEDIMOC for use in Maputo does not have a feature that permits monitoring of expiration dates and allocation of products by expiration date
- Formulas incorporating lead times and buffer stocks are not used routinely by MEDIMOC, provincial stores or health facilities to determine order quantities

Recommendations

- Greater use should be made of the Matola facility, as it seems unlikely that local kit packing will begin in the next few years One possible role for the facility that warrants serious consideration is to move the Maputo Provincial Medical Stores to Matola, for use as a model warehouse and training site for drug management courses The current head of the facility, Dr K Sharad, appears to be very motivated and qualified to manage such a demonstration project Additionally, Dr Sharad is responsible for training activities in the EDP

- Increase expenditures for pest control, particularly rat poison Based on observations and anecdotal information, financial savings would be realized through decreases in destroyed products

- As detailed in the procurement section, problems with damaged products may be prevented through an development and implementation of an effective supplier monitoring program

- Improvements should be made at all levels in the inventory control and ordering procedures This may involve training of staff on the current system, or installation of a computerized system at one or more facilities If computerization of MEDIMOC operations is desired prior to the move to the new facility, it is recommended to begin with MEDIMOC # 9, where most of the drugs for public health facilities are stored This facility has reliable electric supply, and is served by an emergency generator

Many of the concerns identified above, particularly those related to storage, will be corrected with the move to the new MEDIMOC facility in Maputo All indications are that this facility will be built and therefore, further rehabilitation of existing facilities would not be advisable

VIII DRUG CONTROL LEGISLATION

Although the expression "drug policy" is used throughout the documents reviewed, Mozambique does not have a drug policy in the strict sense of the words What is referred to as the "drug policy" is a set of laws and regulations, implemented during the post-independence years Comprehensive pharmaceutical legislation has not been designed, and most of the regulations are superimposed on regulations from the colonial period as is seen below

The post-independence legislation stipulated the following

- a National Formulary to be prepared by the Technical Committee for Pharmaceutic Therapy (CTTF), including a limited selection of generic drug products, diagnostic agents, and dressing materials
- prescribing allowed only for items from the National Formulary
- authorization of a specific set of drugs for each level of care, and for each level of prescriber
- import and export of drugs centralized at the state enterprise MEDIMOC
- dispensing of drugs was authorized only with presentation of a medical prescription

Existing national drug regulations do not specifically address monitoring adverse drug reactions, rational use of drugs, or monitoring drug utilization However, with the publication of the National Formulary in 1984, the use of standard treatment protocols obtained legal status Promotion of treatment in discordance with the National Formulary or standard treatment protocols became punishable at that time

WHO has recently recommended that the Government of Mozambique update the national drug policy, and prepare accompanying legislation

Drug Registration

There is no system of drug registration in Mozambique, but Ministry of Health officials emphasized that through its monopoly on the importation of drugs, MEDIMOC in fact fills this vacuum In 1992, MEDIMOC imported 660 different items

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There are currently plans to implement a computerized drug registration system in Mozambique, with support from WHO Three MoH staff have attended a WHO-sponsored training session in Zimbabwe in which they were introduced to the WHO/PAHO computer program The MoH is awaiting installation of the software on a computer in the Pharmaceutical Department Some MoH concerns regarding the program remain

- The actual implementation date for the program remains unclear
- Additional training on the WHO software is needed Retraining of the three technicians may be necessary due to the time lag between training and implementation
- Additional training and support is desired in analysis of drug information required to make registration decisions

Consideration is also being given to requesting registration assistance from the government of Norway because of the similarities between the importation policies of the two countries

It is not felt that there will be serious legislative constraints to implementing the registration system because current legislation, written during the colonial period, requires that all drugs utilized in Mozambique be registered Nor was it felt that there would be significant resistance from drug industry representatives active in Mozambique

Procurement, distribution and storage

As discussed earlier, the state enterprise MEDIMOC has a monopoly in the importation and exportation of all drugs in the country Special permissions for importation of drugs by others can be provided Some 5 3% of the goods purchased by MEDIMOC in 1990 were believed to be non-Formulary items (excluding in-kind donations) Data on utilization of funds by MEDIMOC in 1991 show that 9 4% of the purchased goods were non-formulary items The three large provincial hospitals were reported to be permitted to import drugs not listed in the National Formulary Illegal imports by merchants have also been reported

The state enterprise FARMAC was created from pharmacies abandoned after independence However, to facilitate the distribution of drugs, 423 cooperative and commercial drug outlets are authorized to sell a restricted number of drugs and dressing materials without prescription These are the so-called List C drugs, seen on the next page The Ministry of Health has acknowledged that the list contains several non-essential drugs and requires review and revision Retail prices in the public sector, including FARMAC pharmacies, are decided by the state

Local production of pharmaceuticals

Local production is estimated to comprise only 3-4% of the national market The two local drug manufacturers are SWAMO (producing a small range of oral drug formulations), and EMOFAR (producing oral rehydration salts) SWAMO also exports to other African countries

MEDIMOC has not purchased from SWAMO for two reasons donor stipulations and concern about product quality

LIST OF DRUGS AUTHORIZED FOR SALE IN SHOPS, COOPERATIONS, AND COMMERCIAL ESTABLISHMENTS (LIST "C")
Portaria 105/77, Diploma Ministerial 94/81

Nat. Form. Code	Drug	Form	Strength
D-7	Mentol/mentol salicylate	ointment	
E-1	Hydrogen peroxide		500 ml
E-5	Cetrimide/chlorhexidine	sol	
E-10	Iodine solution (alcoholic)	sol	1 gr/100ml
E-11	Potassium permanganate	tab	500 mg
G-2	Anti-hemorroid cream	cream	
G-3	Anti-hemorroid sup	sup	
G-6	Aluminium Hydroxide	tab	233 mg
G-9	Bisacodil	tab	5 mg
G-12	Glicerin	sup	
G-13	Glicerin (pediatric)	sup	
G-16	Liquid parafin		100 gr
I-1	Aminophyllin	tab	100 mg
I-9	Sodium Benzoate	syrup	100 gr
L-13	Eosin solution (alcoholic)		
L-16	Hexachlor benzene lotion	lot	600gr/60ml
L-17	Iodine/salicylic acid solution (alcoholic)		
M-21	Glicosed polyelectrolyte powder		
O 35	Chloroquin	tab	250 mg
O-38	Mebendazole	tab	100 mg
R-1	Adhesive plaster		2 5cmx5m
R-2	Adhesive plaster		5cmx5m
R-3	Elastic adhesive plaster		5cmx2 5m
R-4	Elastic adhesive plaster		10cmx2 5m
R-6	Cotton wool absorbent		
R-13	Gauze absorbent		
R-15	Bandage		5cmx5m
R-16	Bandage		10cmx5m
R-17	Bandage		10cmx10m
R-18	Bandage gauze (adhesive)		5cmx5m
R-19	Bandage gauze (adhesive)		10cmx5m
R-20	Bandage gauze (adhesive)		10cmx10m
R-21	Elastic bandage		8cmx3m
R-26	Talc powder		100 gr
R-27	Sterilized vaseline		20 gr
S-5	Sacharine	tab	20 mg
S-8	Hydrolized protein compound		
S-11	Vitamine C	tab	
S-19	Multivitamin	tab	
T-19	Tetracycline eye ointment	ointment	
U-3	Eucaliptus tincture		
U-5	Fenazone/procain drops		
U-6	Fenylephrine nose drops		
U-7	Fenylephrine pediatric nose drops		
V-3	Ferrous salts	tab	200 mg
Z-2	Acetylsalicylic acid	tab	500 mg
Z-3	Paracetamol pediatric sups	sup	250 mg

Customs

A duty schedule exists for the importation of drugs, but they are generally waived

The normal duties imposed are

Duty	5%
Consumer Tax	5%
General Customs	7 5%

Policies on medical and pharmaceutical profession

A Medical Practice Act is not in force in the country There is also no existing licensing scheme for medical doctors Prescribing of drugs is restricted to medical doctors, health technicians, health agents, nurses, and to community health workers (APEs), each group having its own set of authorized drugs The National Formulary defines the levels of authorized prescribers for each drug In theory, these rules apply to the private health professionals as well, however, there are few private practitioners in the country

Pharmaceutical services are governed by an act from the colonial days, decree 229/70, and post-colonial regulations The 1970 decree addresses licensing of pharmacists, premises for pharmacy business, retail and wholesale, price control, and disciplinary action in case of infringements Generic substitution is not addressed Pharmacists and pharmacy technicians are licensed to dispense drugs At present, there are eight graduate pharmacists (three of them expatriates), 79 pharmacy technicians, and 323 pharmacy agents in the country According to the law, pharmacies are required to have a pharmacist on the premises, but due to the limited number of graduate pharmacists in the country, this legislation is not enforced Pharmacy technicians are primarily responsible for the dispensing of medicines In health facilities where pharmacy technicians are not available, any available staff can dispense drugs, such as nurses, community health workers or midwives

Pharmacists or pharmacy technicians are not permitted to work simultaneously in the public and private sector However, it has recently become possible for pharmacy technicians to apply for a license to open a private pharmacy, after a given period of employment in the public sector

Rational use of drugs

The regulations governing the pharmaceutical sector in Mozambique are seen as the key to achieving rational use of drugs Poor prescribing patterns are seen as the result of insufficient knowledge and MoH officials feel that this issue should be addressed through training in correct prescribing practices, and increasing the number of drug inspectors in the country

Drug inspection

Pharmaceutical services are inspected by the Inspection Service of the Department of Pharmaceuticals of the Ministry of Health There are two official inspectors in the country This illustrates the limited capacity for inspection of pharmaceutical practices in Mozambique Inspection of pharmaceutical services is expected to be carried out by each level of care on its lower levels, although MoH staff could not provide information on the extent to which this is actually being done

Private pharmacies are required to keep records of all prescriptions dispensed and prescriptions must be retained on file The enforcement of this requirement is dependent on the limited inspection capacity of the Ministry of Health

At present there is only one private hospital in Maputo, and, theoretically, record keeping would fall under the regulations of the Ministry of Health Several NGOs are working throughout the country Information on their record keeping practices was not readily available from the MoH It is known that several NGOs import drugs, including items not listed in the National Formulary Inspection probably does not affect their activities

Areas of Concern

- There is no national drug policy or a comprehensive drug legislation to guide decisions in the pharmaceutical sector The policy should be developed by a team of Mozambican professionals Rational drug use should be an integral part of the new drug policy

- There is no drug registration system in the country Importation of drugs, both legally and illegally, can be expected to increase in the future

- The Pharmaceutical Committee does not have an adequate drug information database for use in making registration decisions Personnel have not been trained in analysis of drug information

Recommendations

- The MoH should proceed with the preparation of a new drug policy and drug legislation, in collaboration with WHO, which has offered support The new legislation should include a policy permitting generic substitution

- The current plan to implement a computerized drug registration system should proceed Additional training of personnel will be necessary due to the time lag between the initial training and implementation This should include training on the WHO software, and specialized training in analysis of drug information

- Drug information, such as the United States Pharmacopeia Drug Information database, should be obtained and utilized in the registration decision making process As stated above, training in analysis of drug information will be required

IX NATIONAL FORMULARY

Mozambique has had a National Formulary since late 1976, the *Formulario Nacional de Medicamentos* The third and most recent edition was published in 1984 It contains 455 items 383 drug items, 22 diagnostic agents, 28 dressing materials, 16 vaccines, five food supplements, and one Intra-Uterine Device The drugs listed in the National Formulary are considered to be the Essential Drugs List in the country

Of the drug items included, 29 are antibiotics and 26 are other anti-microbial products Fourteen percent of the drug items in the National Formulary are intended to treat infectious conditions

The National Formulary was developed and twice updated by the Technical Committee for Therapeutic Therapy (CTTF), established after independence in 1975 The Committee had been inactive from the publication of the 1984 edition until it began to work on the soon-to-be released version One of the reasons for the long period of inactivity was the political problems in the country, which severely affected pharmaceutical supplies

Recently, the CTTF became active again, although there is no regular schedule of meetings The CTTF membership is as follows

3 internists, including the president of the Committee
1 pharmacist
1 anesthesiologist
1 cardiologist
1 pediatrician
1 rapporteur (pharmacy technician from the Pharmaceutical Department of the MoH)

None of the members are public health specialists

A new edition of the National Formulary is now in its final stages and it is hoped to be published in the months to come It is expected that the number of items in the new formulary will be approximately the same, with approximately 20 drug items deleted, and the same number added The new formulary will contain broader information on drugs than the 1984 edition

Reportedly, an effort was made to broaden the ownership of the new Formulary, by requesting professionals outside of the Committee to draft chapters for individual products or product groups, and by discussing drafts at regional seminars

The Swiss government is actively supporting work on the preparation of the National Formulary by providing reimbursements for per diem/out of station costs

While it is not uncommon for regions within a country or health facilities themselves to further limit drug procurement and utilization, none of the provinces surveyed during the assessment utilized a priority stock list which is a sub-set of the National Formulary

Areas of Concern

- An updated National Formulary is a precondition to improving drug use practices in the country The unavailability may hinder attempts to improve drug use

Recommendations

- The preparation of the National Formulary should proceed as quickly as possible Health professionals in the country should participate in the final stages of preparation to secure a feeling of ownership by the users

Standard Treatment Protocols or Guidelines

There are several manuals that include recommendations on treatment of diseases, and/or the use of drugs Amongst the ones best known (and used by the EDP) are

- *Republica Popular de Moçambique Ministerio da Saude Formulario Nacional de Medicamentos, 1984*
- *Republica Popular de Moçambique Ministerio da Saude Programa de Medicamentos Essenciais Manual de Medicamentos Essenciais, Para Cuidados de Saude Primarios 2ª edição, mayo 1987*
- *Republica Popular de Moçambique Ministerio da Saude Programa de Medicamentos Essenciais Manual para Cuidados Primarios de Saude, Racionalização do Uso de Medicamento Undated*
- Tigretti, T *Os 40 medicamentos do distrito, Manual dos prescritores Instituto Universitario de Estudos do Desenvolvimento, Geneve 1988*

Vertical programs in the Ministry of Health have issued standard treatment guidelines for their respective programs (Maternal Child Health, Malaria, Tuberculosis, Diarrheal Diseases, Cholera, Sexually Transmitted Diseases, etc) These guidelines were written by specialists in the Ministry of Health, and departments of the Central Hospital of Maputo None of the surveyed provinces have developed their own treatment protocols or treatment guidelines

A pocket-size, concise standard treatment protocols book does not exist in Mozambique

The two manuals of the EDP require revision Whereas they cover most issues related to essential drugs and prescribing, the recommendations are not always in line with most recent MoH/WHO recommendations (specifically for diarrheal diseases and respiratory infections) Complicated flow-charts are used to "guide" health workers through the process of diagnosing diseases

UNICEF has provided funding for the production of desk-top and pocket versions of a standard treatment guidelines manual The planned program involves an initial three month consultancy, scheduled to begin in November 1993, in which an expatriate and two Mozambican physicians will create a "library" of all manuals currently in use This team will compile a proposed set of guidelines and produce the desk-top and pocket manuals In the second phase of the project, the manuals will be edited and field tested If accepted and utilized by prescribers, this project could have a significant positive effect on the utilization of drugs in rural areas The degree of participation by health professionals in addition to those mentioned above is unclear, and acceptance and ultimate impact may depend on the perception of ownership by prescribers

Areas of Concern

- Updated and easy-to-use Standard Treatment Guidelines are a precondition to improving drug use practices in the country Their unavailability may hinder attempts to improve drug use

Recommendations

- The preparation of Standard Treatment Guidelines should proceed Health professionals should participate in the later stages of the preparation to ensure perception of ownership by users

X DISEASE PATTERNS IN THE COUNTRY

The Epidemiology Department of the Ministry of Health has collected data from health facilities in the country for the past ten years The most recent (published) data on out-patient encounters are from 1991, and were collected by the EDP

In 1991, health posts in the country were visited by five million patients, health centers had 492,203 out-patient encounters, and hospitals saw 640,240 patients in their outpatient departments On average, Mozambicans went for 0 38 outpatient consultations per person per year However, this figure varied considerably in the country Maputo City inhabitants had on average 1 73 consultations per person per year, while the population of Zambezia had 0 20 consultations per person per year

An impression of the most frequent diseases encountered in outpatient departments can be achieved from a survey conducted by MSF Belgium in the northern part of Inhambane province in 1989 The results are for patients of all ages, and are presented in the following table

Frequencies of Out-patient Diagnoses in Health Facilities in Northern Inhambane

DIAGNOSIS	PERCENTAGE
Malaria	14 8%
Trauma	6 9%
Gonorrhea	6 0%
Intestinal parasitosis	4 2%
Bronchitis	3 6%
Other intestinal diseases	3 1%
Diarrhea	3 0%
Skin diseases	3 0%
Constipation	2 9%
Others	52 5%

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The Department of Epidemiology provided the following data on inpatient morbidity in rural hospitals in 1992

Frequencies of In-patient Diagnoses in Rural Hospitals in Mozambique

Diagnosis	Pediatrics	Pediatrics and Internal Medicine
Malaria	21 5%	18 3%
Malnutrition	15 0%	9 7%
Pneumonia	11 7%	8 9%
Diarrhea	9 7%	8 5%
Anemia	8 0%	7 2%
Measles	2 7%	1 8%
Tuberculosis	1 4%	3 1%
Others	30 0%	42 6%

XI QUALITY CONTROL

Inspection of pharmaceutical services is one of the responsibilities of the Inspection Service of the Pharmaceutical Department of the Ministry of Health The Inspection Service can request services from the Quality Control Laboratory (QC)

The Quality Control Laboratory, set up in 1985 with Swiss funds, functions as a technical advisory body to the Department of Pharmacy It specializes in technical evaluations of drugs entering and circulating in the country QC staff participate in inspection visits to warehouses, health facilities and pharmacies The QC Laboratory is the national reference laboratory of Mozambique, and the only drug quality controlling institution in Mozambique Almost 100% of the tests are carried out in Mozambique with only occasional testing by the WHO regional QC Laboratory in Harare, Zimbabwe This outside testing is done principally when there is doubt on the validity of results obtained in Mozambique

The laboratory has chemical, and microbiological departments It is staffed by two senior staff members, and 12 analysts, some of whom work part-time Laboratory space and equipment, shared with the Water and Food Control Laboratory, includes a spectrophotometer, gas chromatograph, and a high pressure liquid chromatograph Through support from the Swiss Cooperation, standards and reagents are available in sufficient quantities for the number of tests carried out

Neither the QC Laboratory nor the Pharmaceutical Department has a regular system in place for controlling drug quality in the country In 1992, the Swiss Cooperation funded pharmaceutical inspection visits to all of the provinces In each visit, a three to four person team of the MoH, including QC staff, was sent to the provincial warehouse, district pharmacy, a sample of public health facilities, and public and private pharmacies Storage conditions and stocks were inspected and time was spent on supervision and education of warehouse staff Samples of drugs were collected in all institutions for analysis in Maputo This analysis detected some deteriorated drugs, which were confiscated Non-formulary drugs found in private pharmacies were also confiscated if the shop-owner was unable to provide the required license issued by MEDIMOC In 1993, with fewer resources available, inspection visits concentrated on the provinces with harsh climatic conditions Tete, Sofala, Gaza, Nampula, and Niassa

The Swiss Cooperation is currently evaluating a proposal by the Pharmaceutical Department to fund the installation of a decentralized network of quality control laboratories in the country, a one million Swiss franc project

One of the problems facing the Quality Control Laboratory is the lack of a formal set of operating procedures and a procedures manual

Mozambique signed in as a member of the WHO Certification Scheme, but does not actively participate With the exception of kit drugs, all drugs entering the country are checked for quality during the tendering process as well as after importation Reported time needed for testing ranges from one day to two weeks, depending on the drug Administrative procedures may take one additional week Test results are informally reported to MEDIMOC as soon as they are known

Quality Control Laboratory reports are routed to MEDIMOC, the Pharmaceutical Department, the Pharmaceutical Inspection Service, and the visited warehouse, health facility, or pharmacy

The head of the QC Laboratory estimates the maximum testing capacity of the laboratory to be 680 samples per year, although other sources mention a capacity of 300-400 samples per year Last year the maximum capacity was utilized However, it was emphasized that due to limited space, the department was forced to keep activities at a lower level than desired It is not clear how many tests were actually done in the past year or how many were turned away

The QC Laboratory utilizes internationally accepted schemes for sampling drugs from warehouses However, limited testing capacities dictate that a smaller sample be taken than required by the sampling procedures Generally, one closed unit (box, container, or tin can) is taken to the laboratory for testing Identity and potency testing are always carried out Stability, in vitro dissolution and pyrogen testing are conducted where applicable Sampling of drugs already in the distribution system concentrates on a list of sensitive drugs, compiled by WHO Recently the QC Laboratory requested that pre-shipment testing of EDP kits drugs be conducted, based on the fact that the majority of Kit A drugs are on the WHO list of sensitive drugs, and that therefore they should be submitted to the same procedures as drugs purchased through regular tendering

Detected problems in the quality of drugs have been attributed to

- climatic conditions in several provinces
- transport and storage of drugs under sub-optimal conditions
- poor practices in inventory management in warehouses

Deteriorated drugs found most frequently during inspections included methylergometrine, acetylsalicylic acid, and aminophylline Currently, no system exists for prescribers and/or dispensers to report drug quality problems Problems are detected through top-down inspection activities

QC Laboratory staff declined to talk about quality of drugs produced by the local drug manufacturer SWAMO The quality of EMOFAR oral rehydration salts has been criticized several times for not meeting GMP standards

Counterfeit products have been found only rarely in Mozambique The low rate is attributed to the limited volume of sales in the country, and to the centralization of all imports through MEDIMOC

As mentioned in the section on drug procurement, a program for reporting drug problems has been developed but has not been implemented

Areas of Concern

- There is no regular system of inspection of health facilities Inspections are carried out on an ad-hoc basis, and probably add little to improvement of the pharmaceutical sector
- The educational component of inspection visits is probably small
- There is no system for reporting drug product quality problems
- The QC Laboratory does not have an operating manual and does not function according to such a manual
- Despite having member status, Mozambique does not participate in the WHO Certification Scheme and proposes testing all drugs entering the country regardless of the supplier
- If implemented, pre-shipment testing of EDP kit drugs will increase already long lead times

Recommendations

- QC in Mozambique should shift its focus from inspection "raids" to education of pharmacy staff on how to maintain drug quality and how to recognize deteriorated drugs
- A plan of action for quality control of drugs in health facilities should be prepared, incorporating inspection and education in equal measures
- Training in drug quality maintenance should become part of regular in-service training of pharmacy staff
- Training of drug inspectors should emphasize the educational component of inspection visits
- The proposed decentralized system of quality control should be reconsidered and the resources made available may be used for other activities to improve drug quality in Mozambique
- The pre-shipment testing of drugs in kits should not be implemented

XII PRIVATE SECTOR PHARMACEUTICAL ACTIVITY

The private sector in Mozambique is still relatively small There is one licensed drug outlet for every 285,156 people Ministry of Health sources estimate the number of private pharmacies at 20 They are all staffed by licensed pharmacy technicians The state enterprise, FARMAC, has 40 pharmacies in the country Recent discussions have been held concerning possible privatization of FARMAC

Private pharmacies and the ones owned by FARMAC sell about 10% of all pharmaceuticals imported by MEDIMOC

Private health facilities (hospitals or clinics) are almost non-existent in Mozambique The one known private clinic, the Cruz Azul, opened recently in Maputo

There are two local drug manufacturers in the country SWAMO produces a limited number of oral drug formulations (aluminum hydroxide, paracetamol, cotrimoxazole, aminophylline, indomethacin, and some non-National Formulary products, such as piperazine) The other manufacturer, EMOFAR, produces oral rehydration salts

Except for oral rehydration salts, MEDIMOC has procured a very limited amount of drugs from local manufacturers This is reportedly due to questions concerning product quality, and to donor restrictions that require international procurement

The official government view is that local manufacturing of drugs is being encouraged, particularly through a new Law on Foreign Investments The government is willing to participate in joint ventures Lack of know-how and lack of investments were reported to be the major factors hindering the development of local industry

Access to foreign exchange to procure drugs is controlled, and authorization to use hard currency and must be obtained separately from each of the ministries of finance, commerce and industry Normally, this process will take between one and three months

Import duty is generally waived for all drug imports by MEDIMOC, and therefore also for imports for the private sector

Drug prices in the public sector are subsidized and determined by the government (see Cost Recovery section above) Prices are stamped on each drug container and represent the authorized sales price to patients Pharmacies of the FARMAC network must sell at these prices as well, but 15% of the price is paid to FARMAC as a profit margin Prices in private pharmacies are set in relation to the real cost

There are very few drug representatives in Mozambique, at present only three companies (Bayer, Ciba-Geigy and Hoechst) have some form of representation in the country Recently, a South African drug manufacturer requested and was given authorization to sponsor a seminar on hypertension treatment in the medical school Senior South African university lecturers participated The authorization process took about one year and, thus far, no requests for additional seminars have been made by health professionals in Mozambique

NGOs, working in health projects in the country, import drugs The volume of these imports is not known *Médecins sans Frontieres*, in particular the Belgian division, assists in distribution of kits and *"via clássica"* drugs from MEDIMOC Additionally, MSF Belgium distributes drugs and foods considered necessary for optimal functioning of the health facilities in the region where they work (northern Inhambane) Three other MSF divisions run health projects in the country and supply unknown quantities of drugs

Recommendations

- The private sector should be permitted to develop as any other industrial sector in the country The MoH should encourage local companies by purchasing the goods produced, provided that quality meets international standards The Quality Control department of the Ministry of Health should play an important role in monitoring product quality of locally produced drugs and non-drug items, and offer assistance where needed

- The local production of non-formulary items, in particular non-essential drugs such as antidiarrheal preparations, should not be allowed by the government

SECTION THREE
ESSENTIAL DRUGS PROGRAM AND KIT DISTRIBUTION PROGRAM

XIII ESSENTIAL DRUGS PROGRAM BACKGROUND

The Mozambique EDP was launched in May 1985 with support from the Government of Italy The main objective of the program is to "promote health through the provision of cost-effective treatment for the most common diseases " Additionally, the program should include health worker training and public education in drug use, effective procurement, storage and distribution of drugs and associated supplies, and the development of policy and management systems to support rational, cost effective and consistent drug distribution, funding and use

Support for the EDP has been provided by UNICEF since its inception, with funding from the governments of Sweden, Italy, and the United States

The procurement of drugs through the kit program was once the weakest component of the EDP due to a lack of funding USAID funding has enabled the program to purchase kits which should ensure that drugs are available through 1994 While the goal of buffer stocks of kit drugs in provincial warehouses has not been achieved, stock levels have improved in 1993 The repatriation of refugee populations from neighboring countries in the next year will inevitably increase the need for drugs, necessitate close monitoring of consumption patterns, and increase the need for continued funding of the procurement component

The storage and distribution component of the EDP, funded by the Government of Italy, has resulted in the construction or rehabilitation of drug warehouses in Xai Xai, Tete, Nampula and Matola The Matola facility has been equipped for a local kit-packing operation which could eventually eliminate the need for procurement of finished kits

UNICEF has made substantial contributions toward the purchase of vehicles for use by MEDIMOC and provincial medical stores, although management of the transportation network remains weak

While some training activities have occurred, the civil war, and lack of funds and staff have prevented adequate training of health workers in drug use, procurement, storage, distribution and development of policy and management systems that will support and improve the EDP

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UNICEF EDP KIT PROGRAM
1993 VS 1994 DISTRIBUTION PLAN

	1993 KIT A	1994 KIT A	CHANGE		1993 KIT B	1994 KIT B	CHANGE		1993 KIT C	1994 KIT C	CHANGE
MAPUTO CITY	19 90%	13 77%	-6 12%		12 88%	12 82%	-0 05%		0 00%	0 00%	0 00%
MAPUTO PROVINCE	3 32%	2 54%	-0 78%		5 23%	5 16%	-0 07%		4 57%	4 49%	-0 08%
GAZA	8 31%	6 57%	-1 74%		15 32%	15 33%	0 01%		8 83%	8 73%	-0 10%
INHAMBANE	7 75%	6 36%	-1 39%		5 23%	5 30%	0 07%		3 36%	3 28%	-0 08%
SOFALA	8 85%	11 23%	2 38%		9 09%	9 53%	0 44%		3 64%	4 24%	0 59%
MANICA	6 08%	6 99%	0 91%		4 54%	3 80%	-0 75%		2 76%	2 12%	-0 64%
TETE	6 08%	6 78%	0 69%		5 55%	6 02%	0 46%		0 31%	0 30%	-0 01%
NIASSA	4 10%	4 87%	0 77%		2 42%	2 44%	0 01%		4 26%	4 29%	0 03%
ZAMBEZIA	15 75%	18 01%	2 26%		20 20%	20 13%	-0 07%		28 37%	27 90%	-0 47%
NAMPULA	14 61%	16 53%	1 91%		11 87%	11 89%	0 03%		24 95%	25 48%	0 53%
CABO DELGADO	5 24%	6 36%	1 11%		7 67%	7 59%	-0 08%		18 90%	19 17%	0 27%
	100 00%	100 00%			100 00%	100 00%			99 96%	100 00%	

Source USAID PROGRESS REPORT AND PHASE III DISTRIBUTION GUIDE

XIV KIT PLANNING

A Numbers of Facilities to be Served

The EDP Office provided the following figures for Health Centers and Health Post served by kits

Health Centers and Health Posts Served by the EDP

Region	Health Centers (Kit A)	Health Posts (Kit B)	Health Posts (Kit C)
South	43	89	43
Center	58	81	45
Zambezia	31	54	130
North	99	205	51

While there is a system in place for informing the EDP of newly opened health facilities, it is known that this system has failed in a few cases in the past, and health facilities have not been placed on the kit distribution schedule in a timely fashion

In addition to Health Centers and Health Posts, 27 District Hospitals receive kits The four hospitals in Maputo that receive kits also serve as local depots for further distribution to Health Centers and Health Posts All of the hospitals have out-patient departments to which kits are delivered EDP Kit drugs are not intended to be used for hospitalized patients UNICEF staff does not feel that kit drugs are used excessively for inpatient care, although an effective system of supervision does not exist

Distribution of "A" kits to out-patient pharmacies in hospitals, as compared to total kit distribution, is as follows

Maputo City	31%
Maputo	6 7%
Gaza	Insufficient Data
Inhambane	5 4%
Sofala	32%
Tete	18 4%
Zambezia	3 4%
Nampula	9 8%
Cabo Delgado	6%

Allocations of kits to hospitals are made in the same way as out-patient facilities, on the basis of reported out-patient consultations In the case of Sofala, UNICEF reports that the rural health-care network is almost non-existent, and that 32% distribution to hospitals is necessary

B Numbers of Out-patient Encounters

Health facilities report to the EDP office in Maputo through an extensive reporting system, using three reporting forms (see Monitoring section) Among the data provided are the number of consultations for the reporting month (defined as all registered visits to the out-patient department of the facility, with the exception of vaccination visits and mother/child visits) Data on numbers of kits received and information on stocks of individual drug items are also included

C Assessment of Kit Requirements

Health facilities forward reporting forms to the provincial level The actual forms remain at the provincial level A three month average on patient encounters is calculated and forwarded to the central EDP office, where it is entered into a dBase computer program from which future distribution plans are generated See sample form in Annex 4 Information on numbers of kits distributed from the provincial medical stores level is also forwarded to the EDP office and entered into a computer program which generates a year-to-date report of kits distributed See sample report in Annex 5

The table on the following page illustrates how, on the basis of out-patient consultation data, the kit distribution plan has been changed for Phase III

D Ordering Kits

The procedure for ordering kits from UNIPAC in Copenhagen is as follows

1 Needs assessment, conducted by UNICEF, EDP and staff members of the MoH

2 Determination of the ports of entry

3 Determination of changes in kit content, if any

4 Once kit content is decided, desired drugs and quantities are entered into a computer program at UNICEF Maputo This program allows the generation of a "supply list" which includes the drugs and quantities which make up each kit type, the number of kits requested, and the desired distribution by port of entry

5 Local confirmation of available funds is obtained from donor (currently USAID)

6 A supply request is submitted to UNICEF Maputo (Supply Section), for forwarding to UNIPAC Copenhagen

7 UNIPAC Copenhagen sends a feedback report to UNICEF Maputo, informing of price changes, lead time, shipping charges to various ports (air shipments average 30-35% above cost of kit, sea shipments average 15% above)

8 UNICEF Maputo finalizes request, based primarily on information concerning price changes and how they affect the number of kits that can be purchased

9 A "Supply List" (SL) and "Supply Call Forward" (SCF) are issued by UNICEF Maputo, and a file is opened for each Supply List started

10 SL and SCFs are forwarded to UNIPAC Copenhagen

11 Upon confirmation from UNICEF New York that funding is confirmed with the donor, UNIPAC issues an Issue Order and Purchase Order to UNICEF Maputo, indicating that processing of the order has begun

12 UNIPAC sends a Shipping Document to UNICEF Maputo indicating the status of the order as the shipping date approaches

13 UNIPAC notifies UNICEF by telex when the exact Expected Time of Arrival (ETA) is known

14 MEDIMOC is notified several weeks in advance of upcoming ETA, so that warehouse space and internal transportation can be arranged

It was decided to deliver the 1992-1993 orders for kits in three phases, all funded by USAID The first phase was airlifted to Mozambique on eight flights, to satisfy urgent needs in the country, while the two remaining deliveries would take place through sea shipments An evaluation of the times from SCF to arrival is summarized below

Phase I Kit Distribution Lead Times

Kit B SCF date 4/29/92		Kit C SCF date 4/29 92	
Arrival dates	Lead time (days)	Arrival dates	Lead time (days)
6/16	48	6/21	53
6/23	55	6/28	60
7/1	64	7/5	67
7/8	71	7/12	74
Average time from order to arrival in port 59 5 days		Average time from order to arrival in port 63 5 days	

Phase II Kit Distribution Lead Times

	Kits	SCF date	Arrival Date	Lead time (days)
Maputo	A/B	4/29/92	2/2/93	279
Beira	C	4/29/92	1/24/93	270
Beira	A/B	4/29/92	2/6/93	283
Quelimane	A/B/C	4/29/92	3/9/93	314
Nacala	B/C	4/29/92	1/19/93	265
Nacala	A	4/29/92	2/5/93	282
		Average time from order to arrival in port 282 days		

The Estimated Time of Arrival was determined while the assessment was in process The anticipated lead time for Phase III is as follows

Expected Phase III Kit Distribution Lead Times

	Kits	SCF date	ETA	Lead time (days)
Maputo	A/B/C	2/10/93	11/4/93	267
Beira	A/B/C	2/10/93	11/8/93	271
Quelimane	A/B/C	2/10/93	11/18/93	281
Nacala	A/B/C	2/10/93	11/15/93	278
		Expected average time from order to arrival in port 274 days		

The average times from order to arrival (by sea) are comparable to estimates compiled by MEDIMOC, in which the time from awarding of contracts to arrival in port was found to be between 119 and 231 days

Accomplishments

- As reported by UNICEF, the EDP kit program is now serving 249 Health Centers, and 719 Health Posts in all ten provinces
- A computerized system is in place in which kit needs are determined on the basis of out-patient encounters in health facilities
- In the past, kit contents have been changed a number of times on the basis of changing needs in the country
- The EDP has been receptive to pharmaceutical needs of vertical programs in the MoH
- Requests to UNIPAC for changes in kit content do not add to delivery times unless the addition requires a special tender
- The procedure for ordering kits from UNIPAC is well established
- The planning of the 1992 deliveries of kits, combining air-lifting for satisfying immediate needs and sea-shipment for long term needs, was appropriate

Areas of concern

- The provincial level is minimally involved in the planning process Much data produced in health facilities is not processed at the central level (because it is not received) or at the provincial level, where the task has reportedly been delegated, but is not being undertaken properly

- The use of data as a planning tool is not sufficiently emphasized Problems in submission of out-patient encounter reports by provincial medical stores have been reported by EDP staff, and recently the Assistant Coordinator has started sending reminders by mail to correct the problem Moreover, there is a significant lag time in reporting and processing patient encounter data At the time of this assessment, data from the first three months of 1993 was being utilized for planning kit needs for the third phase

- Whereas health facilities do produce data which could be used to monitor stock levels, stock outs, and accumulation, the provincial level does not summarize this data for use in the planning process

- The UNIPAC mandate to prioritize supply based on world-wide emergencies has severely affected planning of distribution of kits These delays caused lead times for Phase II to exceed those experienced by MEDIMOC in the past

Recommendations

- More emphasis should be placed on timely return of data from the field, in particular reporting forms from health facilities and patient encounter summaries from the provincial level A system should be considered in which health facilities and higher levels are made accountable for returning reports and summary forms In some countries better results have been obtained with tying kit distribution to submission of required forms

- Information contained in health facility reporting forms related to stock outs, accumulation and kit opening dates should be used in the process of planning kit needs and distribution It would be appropriate for this function to be carried out at the provincial health administration level UNICEF has suggested that the appropriate department would be the Statistical Unit of the Provincial Health Directorate This will require further training in each province

XV KIT ARRIVAL AND DISTRIBUTION

A Port Clearance

An important aspect of the kit distribution process is the efficiency with which shipments are cleared from the port, allowing the internal distribution process to begin In the Phase I emergency airlift, all kits arrived by air to Maputo, which was used as a central distribution point for the rest of the country Kits arrived on eight flights, with an average clearance time of five to seven days Because of the critical shortage of drugs at the time, internal distribution was done by air, utilizing LAM airline

Phase II utilized sea shipments to the ports of Maputo, Quelimane, Beira and Nacala Clearance dates were available for four of the ten arrivals Based on the available data, the overall average port clearance time for Phase II was 22 days (ranging from 24 5 days for Maputo and 20 days for Quelimane) The average number of days from arrival in port to departure for the first warehousing point was 33 63 days, and indicated the efficiency with which freight forwarding was planned and carried out by MEDIMOC (Maputo and Beira), the Provincial Health Administration (Quelimane), and privately contracted vehicles (Nacala) A summary of port clearance and departure from port data is found on the following page

In comparison, MEDIMOC has calculated the average time for port clearance in routine procurement to be 14 days Longer port clearing times are experienced in all cases of donated products according to MEDIMOC, although the exact reasons are unclear

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UNICEF EDP KIT PROGRAM- PORT CLEARANCE

PHASE I USAID PROCUREMENT OF EDP KITS

ARRIVAL AT MAPUTO

TYPE	DATE OF ARRIVAL	DATE CLEARED	DAYS TO CLEAR
B	16 JUN 92	20 JUN 92	4
C	21JUN 92	1 JUL 92	10
B	23 JUN 92	24,26 JUN 92	1 TO 3
C	28 JUN 92	6 JUL 92	8
B	1 JUL 92	3 JUL 92	2
C	5 JUL 92	7 JUL 92	2
B	8 JUL 92	13 JUL 92	11
C	12 JUL 92	13,26 JUL 92	1 TO 14

PHASE II USAID PROCUREMENT OF EDP KITS

	TYPE	DATE OF ARRIVAL	DATE CLEARED	DAYS TO CLEAR	DAYS TO DEPARTURE	DAYS FROM CLEARANCE TO DEPARTURE
MAPUTO	A	2 FEB 93	3 MAR 93	29	35	6
	B	2 FEB 93	22 FEB 93	20		DAY TO CLEAR<DAYS TO DEPARTURE
	C	NO DATE				
BEIRA	C	24 JAN 93			87	
	A	6 FEB 93			40	
	B	6 FEB 93			6	
QUELIMANE	A/B	9 MAR 93	29 MAR 93	20	20	0
	C	9 MAR 93	29 MAR 93	20	23	3
NACALA	B/C	19 JAN 93			10	
	A	5 FEB 93			48	

AVERAGES 22 25 33 63

B Storage

The assessment team visited the port of Maputo and was shown the areas in which EDP kits are stored Kits are kept in a short-term storage area for the first 25 days, and then moved to a different port warehouse if longer-term storage is necessary The short-term storage facility has a large section of roof missing resulting from a crane accident It was not possible to determine if EDP kits were stored properly as there were none present at the time The long-term facilities visited are adequate for storage of kits Storage pallets were available

None of the facilities used for storage of kits had air-conditioners or fans Full-time guard service is employed for all warehouses, but there have been reports of theft, none of them involved EDP kits

Central storage is not a component of the distribution plan However, to accommodate limits in transportation capacity (specifically after arrival of large shipments of kits) the recently rehabilitated Matola facility is used for short term storage

C Transportation and Distribution

The efficiency of transportation of kits to provincial stores, and thereafter to district stores, was high, particularly in Phase I due to the use of air transportation Actual distribution from provincial stores to district pharmacies can be seen in the graph on the following page Sharp increases in output of kits can be seen during the months of June 1992 and February 1993, following arrival of kits in the ports

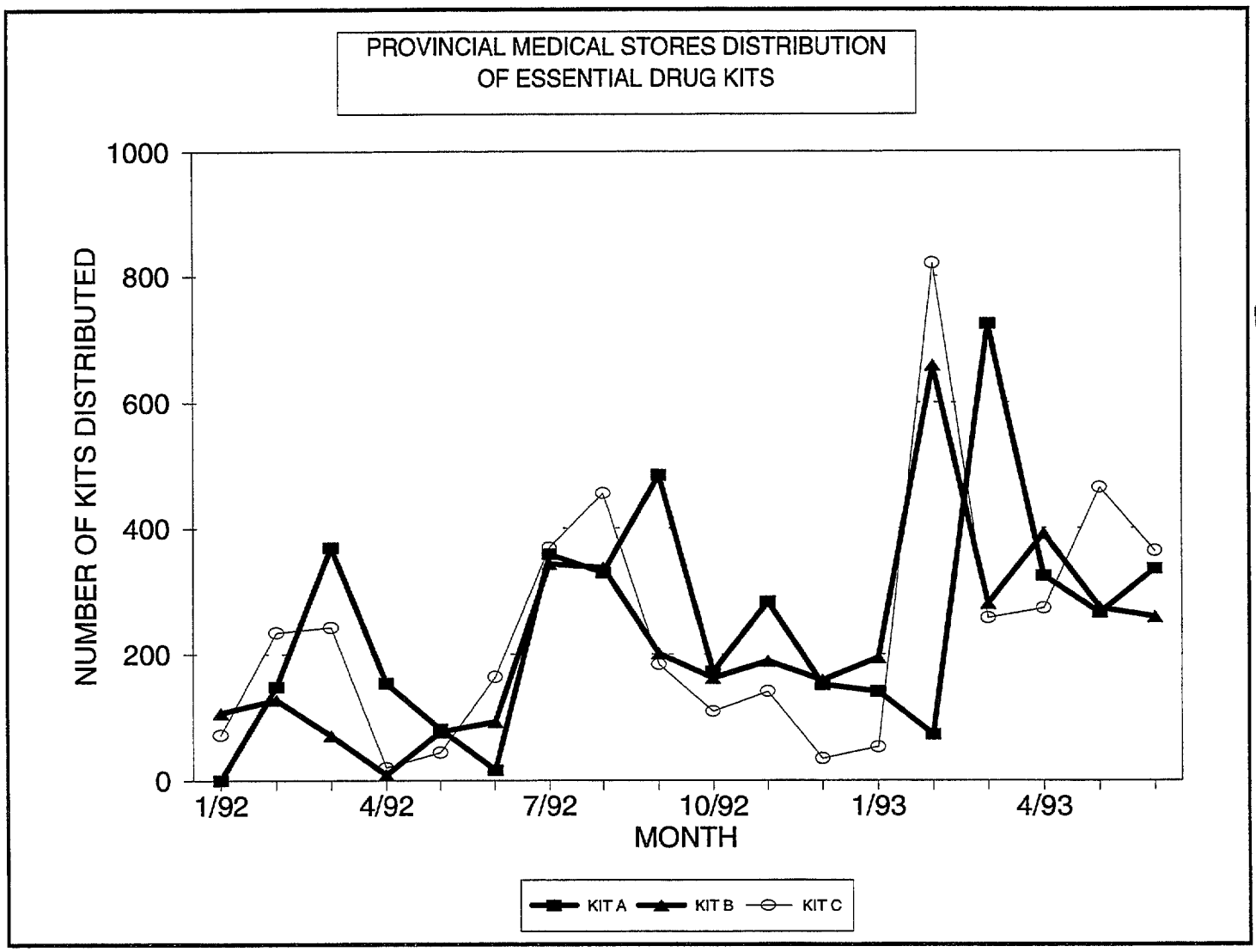
D Warehouse Capacities and Warehouse Rehabilitation

Provincial warehouse construction or rehabilitation has been completed in Xai Xai, Tete, Nampula, and Matola The last facility has recently been rehabilitated and was visited by the assessment team and found to provide excellent storage conditions (see discussion of the Matola facility below)

UNICEF has also supported planning activities for the rehabilitation of warehouses in Cabo Delgado, Gaza, Niassa, and Zambezia

Accomplishments

- Whereas port clearance has been a known problem in the past, this problem has been effectively dealt with by the EDP and MEDIMOC and clearance times for Phases I and II have been within acceptable limits
- Physical conditions and security in the new Matola warehouse, currently used for kit storage after arrival in the port of Maputo, are excellent
- Internal distribution of kits has been carried out in an efficient way, shown by sharp rises in output from provincial warehouses, shortly after arrival of kits in ports


PROVINCIAL MEDICAL STORES DISTRIBUTION
OF ESSENTIAL DRUG KITS
NUMBER OF KITS DISTRIBUTED
1000
800
600
400
200
0
1/92
4/92
7/92
10/92
1/93
4/93
MONTH
KIT A
KIT B
KIT C

XVI MONITORING

A Stock Levels

The process of monitoring the kit distribution system is reported by UNICEF to be as follows

1 MEDIMOC clears kits from the port of entry, and distributes to the regional warehouses MEDIMOC reports to the EDP using form SIS-CO7 (see Annex 6 for sample)

2 The provincial warehouses report monthly to the EDP on stock levels, distribution to district warehouses, and on distribution to health facilities within the provincial capital Form SIS-CO7 is also used for this purpose

3 The district warehouses report on a monthly basis to the provincial warehouses on stock levels, dates of arrival of kits, and distribution of kits to the health facilities Form SIS-CO7 is used here as well and retained at the provincial level

4 Health centers and health posts report to the provincial warehouse and to the EDP, using forms SIS-CO4 and SIS-CO5 (see Annex 6 for samples) Information includes a) date of opening of the kit, b) number of kits allocated per month, c) categories of prescribers present, d) number of outpatient encounters per month, e) information on stock movements for each drug included in the kit Outpatient encounter data is used to prepare provincial distribution plans

5 Information on stock movements is sampled once a year by the central team to determine corrections needed in contents of drugs in kits

6 Informal monitoring of kit distribution is carried out in the following ways

* Area based program staff of UNICEF and MoH staff monitor kit distribution in 6 districts of 3 provinces

* Any UNICEF or EDP staff member that is travelling out of Maputo will monitor kit distribution

* During provincial seminars with district staff, the kit program is a specific topic for discussion

As shown above, monitoring tends to center around the logistics issues of kit distribution and on stock accounting

In the provinces surveyed, Sofala, Zambezia, and Gaza reported that pharmaceutical monitoring teams exist In Sofala, no visits had been performed in the past year Zambezia and Gaza each reported one monitoring visit, but no specific details were provided Gaza reported that it prepares reports related to drug use, morbidity, finances, and staffing

B Security Stocks

An optimally functioning EDP should achieve stock levels at Provincial Medical Stores slightly above calculated needs This buffer stock allows some flexibility for provincial managers to accommodate fluctuating needs in districts, and more importantly to respond quickly to population shifts that are anticipated with repatriation of refugee populations The program description quotes targets of 20% security stock for 1992, and 10% for 1993 UNICEF calculations are based on 15% security stocks for both years A summary of actual versus planned distribution is presented on the following page In 1992, actual distribution was below calculated needs, and security stocks were not achieved Distribution in 1992 represents kits financed by the Swedish government, and the Phase I air-lift of B and C kits financed by USAID The efficiency of the Phase I airlift is discussed in the port clearance and distribution sections of this report

UNICEF SUMMARY OF EDP KIT PROGRAM
1992 PLANNED VS ACTUAL DISTRIBUTION WITH 15% BUFFER STOCK

	A KITS			B KITS			C KITS		
PROVINCE	PLANNED	ACTUAL	% DISTRIBUTED	PLANNED	ACTUAL	% DISTRIBUTED	PLANNED	ACTUAL	% DISTRIBUTED
MAPUTO CITY	994	570	57 34%	510	153	30 00%	0	0	
MAPUTO	166	88	53 01%	207	124	59 90%	207	76	36 71%
GAZA	415	196	47 23%	607	295	48 60%	400	171	42 75%
INHAMBANE	387	271	70 03%	207	106	51 21%	152	87	57 24%
SOFALA	442	312	70 59%	360	101	28 06%	165	124	75 15%
MANICA	304	196	64 47%	180	237	131 67%	125	94	75 20%
TETE	304	183	60 20%	220	65	29 55%	14	90	642 86%
ZAMBEZIA	787	465	59 09%	800	459	57 38%	1285	741	57 67%
NAMPULA	730	324	44 38%	470	204	43 40%	1130	362	32 04%
CABO DELGADO	262	126	48 09%	304	140	46 05%	856	285	33 29%
NIASSA	205	42	20 49%	96	104	108 33%	193	78	40 41%
TOTALS	4996	2773	**55 50%**	3961	1988	**50 19%**	4527	2108	**46 57%**

UNICEF SUMMARY OF EDP KIT PROGRAM
1993 JANUARY-JUNE PLANNED VS ACTUAL DISTRIBUTION WITH 15% BUFFER STOCK

	A KITS			B KITS			C KITS		
PROVINCE	PLANNED	ACTUAL	% DISTRIBUTED	PLANNED	ACTUAL	% DISTRIBUTED	PLANNED	ACTUAL	% DISTRIBUTED
MAPUTO CITY	496 8	438	88 16%	255 3	198	77 56%	0	0	
MAPUTO	82 8	41	49 52%	103 5	90	86 96%	103 5	38	36 71%
GAZA	207	145	70 05%	303 6	269	88 60%	200 1	115	57 47%
INHAMBANE	193 2	232	120 08%	103 5	105	101 45%	75 9	172	226 61%
SOFALA	227 7	238	104 52%	179 4	165	91 97%	96 6	21	21 74%
MANICA	138	113	81 88%	69	81	117 39%	48 3	45	93 17%
TETE	138	146	105 80%	110 4	78	70 65%	6 9	5	72 46%
ZAMBEZIA	393 3	183	46 53%	386 4	232	60 04%	586 5	379	64 62%
NAMPULA	365 7	163	44 57%	234 6	147	62 66%	565 8	365	64 51%
CABO DELGADO	131 1	83	63 31%	151 8	134	88 27%	427 8	355	82 98%
NIASSA	103 5	104	100 48%	48 3	56	115 94%	96 6	90	93 17%
TOTALS	2477 1	1886	**76 14%**	1945 8	1555	**79 92%**	2208	1585	**71 78%**

TAKEN FROM SUMMARY SPREADSHEET
15% ADDED TO ANNUAL NEED FOR 1993

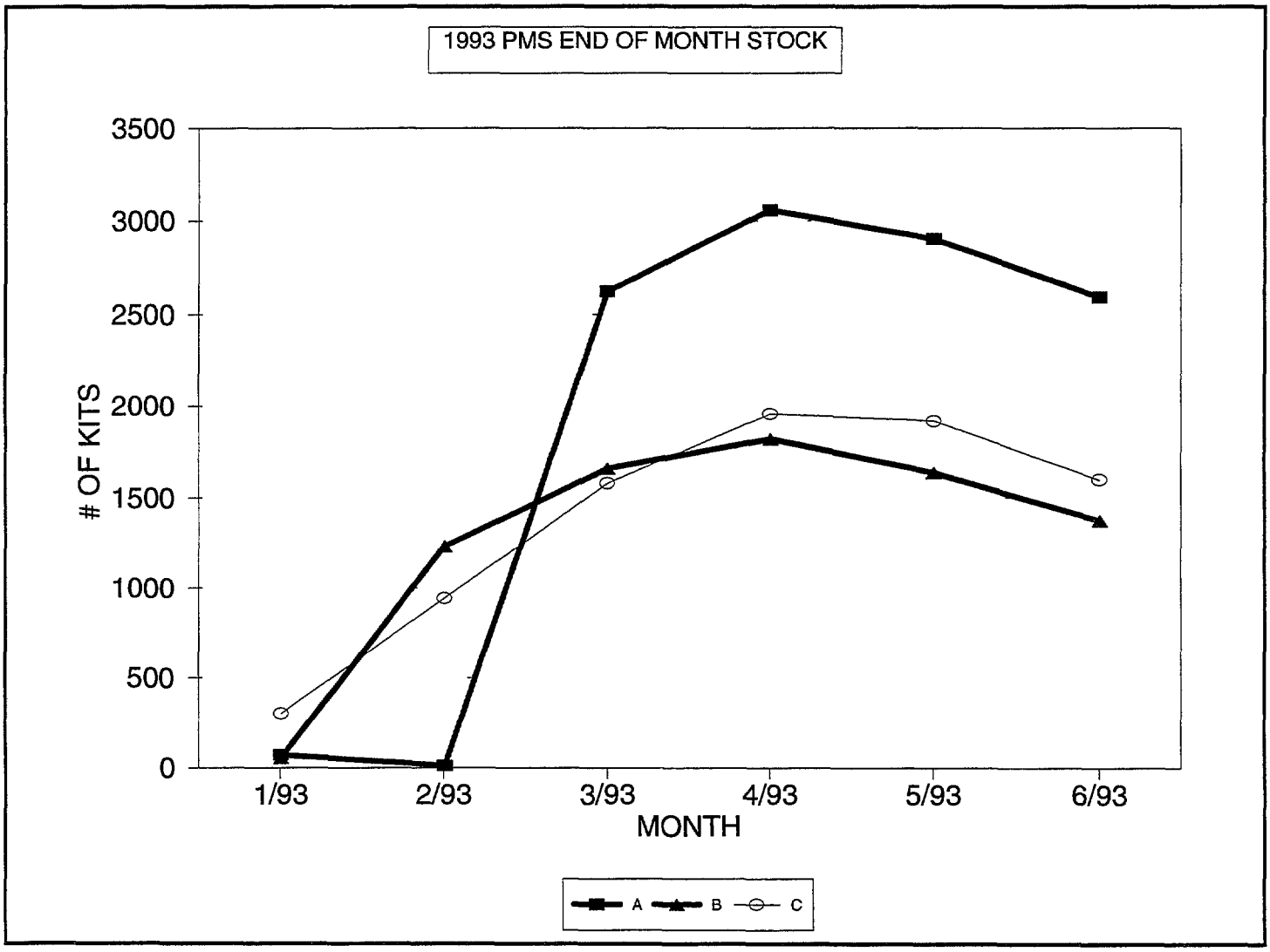
In 1992, the following distribution results were achieved

KIT	% OF DISTRIBUTION ACHIEVED (including buffer stock)
A	55 50%
B	50 19%
C	46 57%

Stock levels achieved in 1993 represent an improvement, as can be seen in the graph presented on the following page As of June 1993, the following results were achieved

KIT TYPE	% OF DISTRIBUTION ACHIEVED* (including buffer stock)
A	76 14%
B	79 92%
C	71 78%

* These figures are modified from figures presented by the EDP and were corrected to include buffer stocks


1993 PMS END OF MONTH STOCK
3500
3000
2500
2000
1500
1000
500
0
OF KITS
1/93
2/93
3/93
4/93
5/93
6/93
MONTH
A
B
C

The presented percentages should be interpreted with caution since 1993 Security Stock figures originated from needs assessments calculated early in 1992 During the first three months of 1993, reported numbers of out-patient encounters in health facilities increased, and thereby kit needs increased as well (see following page) Nationally, increases in kit needs between the 1992 and 1993 needs assessments are

KIT A	27 18%
KIT B	45 11%
KIT C	21 14%

For example, in Sofala annual needs for "A" kits increased from 442 to 881 Annual needs for "B" kits increased from 360 to 1104 and needs for Kit C increased from 84 to 390 In other words, taking into account the corrected figures for kit needs, the percentage of achieved distribution is lower than reported For example, the percentage of achieved distribution for Kit A in Sofala would be 31 9% instead of 120 2% For Kit B, 17 6% instead of 105 77%, and for Kit C, 6 3% instead of 25%

UNICEF EDP KIT PROGRAM- MONTHLY NEEDS

CHANGE IN MONTHLY NEEDS BASED ON TWO MOST RECENT ASSESSMENTS

PROVINCE	KIT A			KIT B			KIT C		
	1992	3/93	% CHANGE	1992	3/93	% CHANGE	1992	3/93	% CHANGE
MAPUTO CITY	82 8	85 0	2 62%	42 5	35 5	-16 47%	0 0	0 0	0 00%
MAPUTO PROVINCE	13 8	45 0	225 30%	17 3	28 0	62 32%	17 3	29 0	68 12%
GAZA	34 6	NO DATA	NO DATA	50 6	NO DATA	NO DATA	33 3	NO DATA	NO DATA
INHAMBANE	32 3	37 0	14 73%	17 3	24 5	42 03%	12 7	33 5	164 47%
SOFALA	36 8	78 5	113 12%	30 0	104 5	248 33%	13 8	36 5	165 45%
MANICA	25 3	32 5	28 29%	15 0	41 0	173 33%	10 4	29 0	178 40%
TETE	25 3	40 5	59 87%	18 3	50 0	172 73%	1 2	6 0	414 29%
NIASSA	17 1	19 0	11 22%	8 0	19 0	137 50%	16 1	31 5	95 85%
ZAMBEZIA	65 6	72 5	10 55%	66 7	90 0	35 00%	107 1	141 0	31 67%
NAMPULA	60 8	86 5	42 19%	39 2	52 0	32 77%	94 2	88 5	-6 02%
CABO DELGADO	21 8	33 0	51 15%	25 3	34 5	36 18%	71 3	62 0	-13 08%
AVERAGES	416 3	529 5	**27 18%**	330 1	479 0	**45 11%**	377 3	457 0	**21 14%**

3

Taking into account the corrected kit need figures, new estimates can be calculated for the number of months of supply to be covered by Phase III supply The results for each province (except Gaza, for which recent out-patient encounter data are not available) are presented on the following page The average months supply for each kit type are

Kit A 1 13 months
Kit B 3 82 months
Kit C 4 62 months

The EDP has acknowledged the problem outlined above, and is preparing to update kit need estimates, using the most recent out-patient consultation data (second quarter 1993)

UNICEF EDP KIT PROGRAM-PHASE III
MONTHS' SUPPLY BASED ON MOST RECENT PATIENT ENCOUNTER DATA

PROVINCE	KIT A	ANNUAL NEEDS	MONTHS' SUPPLY		KIT B	ANNUAL NEEDS	MONTHS' SUPPLY		KIT C	ANNUAL NEEDS	MONTHS' SUPPLY
MAPUTO CITY	65	821 1	0 95		179	314 5	6 83		0	0 0	
MAPUTO PROVINCE	12	435 2	0 33		72	241 0	3 59		89	241 0	4 43
INHAMBANE	30	325 6	1 11		74	188 7	4 71		65	261 0	2 99
SOFALA	53	748 9	0 85		133	938 4	1 70		84	331 5	3 04
MANICA	33	287 3	1 38		53	307 3	2 07		42	210 8	2 39
TETE	32	359 1	1 07		84	404 2	2 49		6	51 9	1 39
ZAMBEZIA	85	670 2	1 52		281	788 0	4 28		553	1189 2	5 58
NAMPULA	78	775 2	1 21		166	396 5	5 02		505	720 8	8 41
CABO DELGADO	30	280 1	1 29		106	263 5	4 83		380	565 7	8 06
NIASSA	23	175 5	1 57		34	153 4	2 66		85	193 4	5 27

1 13	3 82	4 62
KIT A AVERAGE	KIT B AVERAGE	KIT C AVERAGE

C Quality Control of Drugs in Kits

In recent site visits to provinces, the Quality Control Laboratory staff inspectors found deteriorated drugs delivered through kits, particularly methylergometrine The laboratory considers practically all drugs contained in kits as "sensitive" drugs, citing a list compiled by WHO It has therefore called for pre-shipment testing of all drugs contained in kits If UNIPAC is assuring quality of kit contents, testing of every batch should not be necessary, and it would definitely increase delivery times

D Quarterly Reporting by UNICEF

As stipulated in the USAID program description, quarterly meetings between UNICEF and USAID were intended to cover the issues of program progress, program implementation, storage and distribution, warehouse rehabilitation, local kit packing, training and supervision, and cost issues

Since August 1992, four such meetings have taken place, minutes were reviewed by the assessment team

Topics that have been discussed in quarterly meetings included

- Internal distribution plan
- Changes in kit contents
- Labelling kits
- Matola kit packing facility
- Port clearing
- Budget status
- Changes in kit demands
- Extension of kit program to hospitals

Accomplishments

- There is a system in place for monitoring the process of kit distribution at various levels of warehousing and health care facilities

- The three monitoring forms are well designed and provide useful information for an effective monitoring system

- With Phase II completed, the program started moving toward building up stocks at the provincial stores level

Areas of concern

- Monitoring forms for Kits A and B (SIS-CO4 and 5) are in use However, summaries of the data provided by these forms, in particular on stock positions of individual drugs, are not forwarded to the central level of the EDP, and consequently not used for monitoring purposes

- Summary forms on distribution of kits (SIS-CO7) are not always returned promptly by provinces, hampering effective monitoring of kit distribution For example, at the time of the assessment, Sofala and Zambezia had not submitted data since June 1993

- In reviewing the quarterly UNICEF/USAID meeting minutes, it appears as if a routine, planned agenda is not used

- Effective security stocks in provincial medical stores have not been achieved at the time of the assessment

- A compromise between testing of every drug in each batch and total reliance on UNIPAC quality assurance mechanisms is desirable

Recommendations

- The regional level should provide summary data that allows the central level to monitor distribution and stock levels to the **health facility** level

- In order to plan for effective buffer stocks in provincial medical stores, UNICEF should conduct a pipeline analysis, allowing for careful estimates of kits to be procured in Phase IV Data to be taken into consideration include the most recent out-patient encounter data, estimates of the effects of imminent repatriation of refugees, lead time analysis, and most recent cost information from UNIPAC

- A standardized agenda should be established for the quarterly progress meeting, in which all required elements are addressed in every meeting Level of detail required for the various topics can be discussed between USAID and UNICEF

- A sampling system should be established to periodically test the quality of drugs provided in kits Samples should be obtained from newly received kits, and from drugs which have been in stock at the facility level

XVII SUPERVISION

A Supervision at the Regional Level

Within the MoH, the EDP is managed by a full time national coordinator who is assisted by an expatriate pharmacist MEDIMOC staff also plays an active role in port clearance and freight forwarding of kits

Three individuals were employed by the EDP to be responsible for assistance in program management and monitoring in the northern, central and southern regions The individuals were to be stationed at the regional level However, staff shortages and transfers prevented this plan from being implemented One individual is currently filling the post of national EDP coordinator, and another is assistant coordinator The third individual is managing the provincial medical store in Maputo, and coordinates EDP training All are based in Maputo and at present there are no EDP management staff stationed outside of Maputo

B Supervision at the Health Facility Level

Reportedly, health facilities have been supervised on an ad-hoc basis but no quantifiable information or reports were available to determine the numbers and results of these supervisory visits For supervision of health facilities, the EDP has prepared a guide, which includes appropriate checklists

One of the problems cited as significantly hampering supervision has been the civil war, which impeded travel in large parts of the country

Accomplishments

- The existence of a guide for supervision of health facilities, including checklists, is one of the pre-conditions for effective supervision of staff in health facilities
- The presence of active EDP staff in Maputo is reported to have resulted in supervisory activities in this geographic area

Areas of concern

- The lack of regional supervisors has contributed to insufficient monitoring and supervision of EDP activities at the provincial level
- Supervisory and monitoring visits to health facilities appear to have been carried out ad hoc, and there does not seem to be a systematic approach to sites selection and/or sampling
- Checklists do not exist for supervision of district pharmacies and provincial medical stores

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Recommendations

- UNICEF/EDP should design an effective system of supervision at all levels of kit distribution and prescribing This system should be part of an overall plan of action to improve rational use of drugs in the country Extensive discussions about responsibilities and staff allocation for supervision will be required Availability of funding for travel and per diem expenses is a pre-requisite to implementation In light of the apparent staff shortage, a recommended strategy might be a system as follows

  * Core EDP staff are responsible for supervisory visits to provincial medical stores If funding permits expansion of EDP staff, three regional supervisors should be placed in the field to cover the northern, central, and southern provinces See section on EDP staffing below

  * Senior staff of the provincial medical stores are responsible for supervision of district pharmacies

  * District medical stores supervisors should supervise health facility drug storage

  * Prescribers in health facilities should receive supervision from district medical staff

- The EDP will need to collaborate with provincial and district health administration in setting up an effective supervisory structure

- Checklists must be prepared for supervising district pharmacies and provincial medical stores

XVIII TRAINING

Training related to Essential Drugs can be divided in a number of distinct activities

- Pre-service training of medical and pharmaceutical personnel
- Training activities by the Essential Drugs Program
- Training in regional and overseas courses

A Pre-service Training of Medical and Pharmacy Personnel

The EDP has prepared an "*Essential Drugs Manual*," a "*Manual for Primary Health Care*," and a "*Module of the Essential Drugs Program*," to be used in the pre-service training of health workers and pharmacy personnel It is not clear how many hours are presently spent on teaching the essential drugs concept in the respective pre-service training of each of the categories

Medical students should be taught the essential drugs concept in their basic training It is not clear what essential drugs curriculum, if any, is included in medical training This category of health workers may not have received sufficient attention from the Essential Drugs Program possibly due to the relatively small size of the group (the output of the medical faculty of the University of Mozambique is approximately 25 physicians per year) However, these health workers tend to be opinion leaders for the medical profession in the country

In the past, the curricula of pre-service training of pharmacy personnel focussed on preparation of drugs, storage, distribution, quality control, patient information, and supervision of other personnel Drug use was not addressed formally Due to a severe lack of funds, training was halted in 1986 Because of a lack of personnel, 34 pharmacy agents were upgraded to pharmacy technicians, and pharmacy aides were upgraded to pharmacy agents with a short course in 1990

At present, there is a severe lack of trained pharmacy staff in the country Eight graduated pharmacists (of whom three are expatriates) and 79 pharmacy technicians are the only higher trained pharmacy staff in the country Other pharmacy staff include 323 pharmacy agents and 134 pharmacy aids A three and a half year course to train 38 new pharmacy technicians started in September 1993

The pre-service curricula of pharmacy staff (pharmacy technicians, pharmacy agents and pharmacy aids) are now being revised under the direction of a UNICEF paid staff member of the EDP

B Training Activities by the Essential Drugs Program

Funding from the government of Italy has supported the training of 95 pharmacy staff in four provinces in management, planning and administrative activities Four five-day seminars were conducted between May and August 1993 in Inhambane, Manica, Cabo Delgado, and Niassa EDP kit distribution issues were components of the seminar Other topics included rational drug use, narcotic use, cost recovery, staffing patterns and health unit statistical information

The same course was also conducted in 1993 for 186 participants in seven seminars in Maputo City, Maputo Province, Gaza, Sofala, Nampula, Zambezia, and Tete The Swiss government funded these activities

UNICEF reports mention three seminars in 1992 in the provinces of Gaza, Manica, and Zambezia, focussing on management, planning and administration Among the objectives was the improvement of collaboration between provincial and district warehouses Training in warehouse management and stock control has not yet been provided, although funds are available for such training for 1994 UNICEF is interested in a providing a two to three week training program for 20-25 participants from the 11 provincial medical stores and three hospitals

In the provincial survey, only Gaza reported training in the last year in rational drug use for District Medical Officers and Medical Assistants Only Nampula reported training in rational drug use for nurses All provinces except Gaza reported training in drug supply, rational drug use and general management for pharmacy personnel

C Training in Regional and Overseas Courses

In recent years, UNICEF has financed the training of one senior clinician in a MSH Rational Drug Use course in Nepal USAID financed sending four senior pharmacy officials to the same course in Harare

As a result of these international activities, a drug use indicators survey is now planned in the Maputo province, for which a manual has been translated into Portuguese

Four pharmacy technicians attended a ten day training course in kit packing management at the UNIPAC facility in Copenhagen, although the course may have been of limited relevance since it was based upon the automated procedures followed at the high-tech Copenhagen facility

D Public Education

A UNICEF-funded public education program regarding self-medication is being planned, and contacts have been made with a local marketing company to conduct a baseline survey in November 1993 Consumer perceptions on use of modern medicines will be investigated in the province of Maputo, and materials will be prepared

Accomplishments

- The recent appointment of a coordinator of training in the Pharmaceutical Department of the MoH is a positive step toward enhancing training activities
- The EDP has made a serious effort to improve professional skills in the country by producing training materials, re-starting the training of pharmacy technicians, initiating the revision of pre-service training of pharmacy technicians
- Courses, focussing on several aspects of the Essential Drugs Program and financed by both the Swiss and the Italian governments, were conducted in 1992
- Ministry of Health staff were sent to regional and overseas courses to be trained in rational use of drugs

Areas of concern

- Since the manuals prepared by the EDP were written a number of years ago, they do not contain the most recent recommendations of programs of the MoH/WHO Moreover, the flow charts presented in the "*Essential Drugs Manual*" are complicated and do not provide optimal assistance in diagnosing and managing diseases
- There is little indication of close contact between the Essential Drugs Program and the medical faculty This could imply that medical doctors receive too little training in the essential drugs concept, which is particularly worrisome in light of the opinion leading role of medical doctors in prescribing
- Within the Pharmaceutical Department concern was expressed that, specifically, the lower level prescribers (health technicians, health agents, basic nurses, elementary nurses, MCH nurses, and community health workers) are performing sub-optimally when prescribing This group is said to be responsible for a high amount of prescribing at the primary care level and thereby for a large part of inappropriate drug use It is unclear whether training priorities reflect the importance of this group
- Although the pre-service training curricula of pharmacy technicians is now being revised, it is not clear to what degree the essential drugs concept is taught to the lower levels of pharmacy personnel
- The training of 281 participants in 1993 is encouraging, but given an estimated 5000 prescribers and 600 pharmacy staff in the country, this number does not give the impression of being part of a systematic approach to training all health staff in the country

Recommendations

- In-service training of prescribers should become a top priority for the Essential Drugs Program A detailed plan of action should be developed, beginning with identification and prioritization of high volume/low performance health personnel Training efforts should be part of a comprehensive plan to improve drug utilization in Mozambique (see section on Rational Use of Drugs)

- Given the substantial needs for training of various categories of personnel working with essential drugs, the EDP should consider increasing the level of effort in the training component of the program Securing financial resources for this purpose will be a necessary step in the process and it is understood that UNICEF will provide support

- In view of the opinion leading role of physicians, the EDP training coordinator should assess the adequacy of education of medical students in the essential drugs concept The EDP should collaborate closely with the medical faculty in the preparation or modification of a module on the essential drugs concept and rational prescribing

- Given the availability of funding for training in warehousing and stock control, UNICEF should proceed with planning this activity in 1994

XIX RATIONAL USE OF DRUGS/DRUG INFORMATION

The rational use of drugs provided by kits has a direct impact on the occurrence of shortages and accumulation of drugs Where antibiotics are severely overused or used for the wrong indications, supplies will not last until the end of the month and, consequently, a new kit will have to be opened In other cases, health facility staff will try to obtain more drugs through the "*via classica*" (the standard drug distribution system) Conversely, if drugs are underprescribed, stock accumulation will occur

Problems in rational prescribing are repeatedly mentioned in documents reviewed Evidence of problems in prescribing practices dates from as early as 1987 when an evaluation of the first six months' kit drug distribution was carried out Some 4000 prescriptions were analyzed Among the conclusions reached were that prescribing problems were present in treatment of diarrhea, acute respiratory infection, and sexually transmitted diseases In one province it was estimated that 50% of the antibiotics and 55% of acetylsalicylic acid tablets were used in cases where they provided no therapeutic benefit for the patient

Médecins sans Frontieres Belgium documented prescribing practices in 1989 in a survey of health facilities in the northern part of Inhambane province Prescribing errors were frequent in common disease conditions such as malaria, gonorrhea and diarrhea The number of antibiotics per prescription varied greatly among prescribers (between 7% and 42%, the average being 24 2%) One finding was that laboratory facilities were under-utilized

Injection usage received recent attention from the medical faculty of the Eduardo Mondlane University in Maputo Prescriptions from four health centers in the city of Quelimane were examined for injection use during three months There was a wide variety of injection use, with two of the facilities using injections in 4% and 13% of the encounters, but another prescribing injections in 48% of the encounters Procaine Penicillin was the most frequently used, and mis-used injectable drug (e g for dental caries and rheumatic pains) The use of procaine penicillin for acute respiratory infections was found to be very high The high rate of injection was attributed to their popularity with patients, but also to the high availability, the investigators found more injectables than oral drugs in the health facilities being studied It was also suspected that treatment protocols for acute respiratory infections were little known, particularly by the health agents

A consultant for an Italian NGO conducted a recent survey in health facilities in rural Zambezia In some health facilities 100% of ARI cases were treated with antibiotics, which were among the drugs most frequently out of stock Lack of supervision was one of the main reasons offered for poor prescribing practices The report concluded that, in its present form, the EDP was only a program of supplies, without any effective component of supervision or continuing education

UNICEF reports acknowledge the lack of progress in promoting rational drug use UNICEF addressed this problem by supporting training of senior MoH staff members (all from the central level in Maputo) in regional or overseas courses on rational drug use Additionally, a portuguese language version of a drug information bulletin, *The Prescriber* is being distributed with EDP Kits

Recently, UNICEF committed funds for a study of drug utilization in health facilities in the Maputo region, using INRUD/WHO methodology Data obtained in a baseline study will be used to design an intervention trial A follow-up study will be carried out to provide information on impact Training of data collectors for the baseline study was conducted while our assessment was taking place

The MoH reported that their primary sources of drug information are the Medline database on CD-Rom, and recent (year unknown) editions of *Martindale The Extra Pharmacopoeia*, and *Goodman and Gilman's The Pharmacological Basis of Therapeutics* Concern was expressed that the CTTF does not utilize this information in its activities

Accomplishments

- There is a remarkably high compliance in prescribing generic drugs, further leading to patient and prescriber acceptance of generic drugs contained in kits
- UNICEF has acknowledged the problem of lack of information on drug utilization patterns in the country and has recently funded training of senior MoH staff in a regional rational use of drugs course A survey of prescribing practices is to be carried out soon UNICEF has proposed sending five participants from Mozambique to an upcoming INRUD course
- A portuguese language version of *The Prescriber* is being distributed with EDP Kits

Areas of Concern

- Rational use of drugs is not guaranteed by the presence of a policy of generic prescribing and limiting drug allocation to defined levels of prescribers only The few available surveys suggest inappropriate drug utilization practices of kit drugs, as well as those distributed through the routine distribution system These practices negatively influence stock levels of drugs
- Due to the emergency situation of recent years, attention has focussed on securing drug supplies and drug utilization has received insufficient attention
- It is unclear to what degree drug supply reflects actual needs on the basis of disease patterns
- Data from surveys suggest serious problems in the use of antibiotics and injectable drugs, lack of use of standard treatment protocols, and a lack of supervision of health facility staff Large variations of prescribing behavior amongst prescribers have been identified in two surveys
- Knowledge on appropriate drug utilization appears to be severely inadequate among prescribers at all levels (including medical doctors)
- Drug utilization practices are not monitored and it is unclear whether reported stock-outs reflect inadequate supply or improper use
- Technical information for use in drug prescribing is not readily available in the country
- The general public has not been exposed to educational efforts to improve rational drug use at home and to diminish unrealistic drug demands from health facilities

- While it remains to be seen that there is a serious problem of overprescribing, the situation can and should be improved through clinical supervision and MoH follow up

Recommendations

- An integrated plan of action to improve drug utilization should be prepared by a rational drug use task force, consisting of the key professionals in the country

- Knowledge of prescribers should be rapidly increased by a the development and implementation of a nationwide rapid training program This training program would consist of short training sessions (two or three days), concentrating on the most frequent disease conditions in health facilities Standard treatment guidelines and a newly prepared National Formulary should be distributed through these training courses Information on determinants of prescribing behavior should be rapidly investigated and used for the preparation of the curriculum of the course Prescribers with high work volume and poor prescribing practices should be prioritized in the development of the training plan

- Rational use of drugs should become an important part of the training of medical doctors

- Drug utilization in health facilities should be regularly monitored and evaluated and the outcomes used for adjustment of the plan of action to improve rational drug use To do so, appropriate monitoring indicators, forms and monitoring schedules would have to be developed

- Supervision visits should emphasize continuing education at all levels of the health care system

- The National Formulary and a pocket-size set of standard treatment guidelines should be made available in the country and prescribers should be trained in their use

- A Portuguese language drug bulletin, with up-to-date information on prescribing and drug management should be made available for prescribers and pharmacy staff in the country Collaboration with organizations or individuals involved in similar efforts in neighboring countries may be considered

- The general public should be educated on more rational use of medicines

- Drug information, such as the United States Pharmacopeia Drug Information database in CD-ROM format, should be made available to guide registration decisions in the future

- The distribution of drug information such as *The Prescriber* should continue and be reinforced with training during MoH visits If possible, impact analysis should be conducted

XX PRICES OF KIT DRUGS

A Present Cost of Kits

One of the goals of a drug kit program is to simplify procedures for drug storage, inventory control and distribution MEDIMOC concurs that the UNICEF program has succeeded in those respects An important consideration is the cost of these simplified procedures Management Sciences for Health produces a guide to drug prices titled the "International Drug Price Indicator Guide " It is updated yearly (current edition is for 1992-1993) to allow institutions involved in international procurement of drugs to compare generic drug prices in the international market The table, "UNICEF EDP Kit Program- Comparison of UNICEF Kit Drug Prices With Average International Price and Lowest Listed Price," on the following page provides two price comparisons for all kit drugs (with the exception of Kanamycin, for which comparison information was not available)

- the actual UNIPAC unit cost to EDP for Phase II procurements (tablet, vial, etc) versus the *average* price charged by the companies and buying groups included in the guide
- the actual UNIPAC unit cost per unit versus the *lowest* price listed in the indicator guide

As shown in the above mentioned table, the unit cost of all drugs contained in the EDP kits (except for Kanamycin) was 104 92% of the average international price, and 190 94% of the lowest available price

UNICEF EDP KIT PROGRAM

COMPARISON OF UNICEF KIT DRUG PRICES* WITH AVERAGE INTERNATIONAL PRICE AND LOWEST LISTED PRICE (ALL PRICES ARE US$)

KIT DRUG	KIT PRICE**	AVG. INTERNATIONAL PRICE	LOWEST PRICE
Acetylsalicylic Acid 500 mg/tab	$0 0100	$0 0080	$0 0031
Paracetamol 500 mg/tab	$0 0125	$0 0101	$0 0039
Procaine Penicillin 3 MU/vial	$0 3962	$0 3724	$0 2550
Ferrous Sulfate/Folic Acid/tab	$0 0017	$0 0022	$0 0017
Benzoic Acid/Salyicylic Acid Oint/gram	$0 0057	$0 0080	$0 0043
Mebendizole 100 mg/tab	$0 0133	$0 0096	$0 0071
ORS Sachet/Sachet	$0 0683	$0 0985	$0 0650
Chloroquine 150 mg/tab	$0 0101	$0 0103	$0 0082
Chloroquine 250 mg/5 ml (per ml)	$0 0342	$0 0227	$0 0103
Lidocaine/epin 2%/1 100,000/vial	$0 5200	$0 0207	$0 0094
Phenoxymethyl Penicillin 250 mg/tab	$0 0151	$0 0171	$0 0138
Methylergotemine 0 2 mg/amp	$0 1000	$0 1410	$0 0694
Metronidazole 250 mg/tab	$0 0061	$0 0108	$0 0072
Cotrimoxazole 400/80/tab	$0 0128	$0 0192	$0 0201
Benzyl Benzoate Lotion/ml	$0 0067	$0 0034	$0 0025
Povidone Iodine 10% soln/ml	$0 0062	$0 0051	$0 0001
Gentian Violet Powder/gm	$0 0460	$0 0720	$0 0460
Epinephrine 1 mg/1ml	$0 0900	$0 1108	$0 0600
Diazepam 5 mg/1ml	$0 0530	$0 2875	$0 0292
Chlorpromazine 25 mg/1 ml	$0 0460	$0 1129	$0 0273
Penicillin Benzathine Benzyl 2 4 MU/vial	$0 4152	$0 3553	$0 2722
Water for Injection 10 ml/ml	$0 0037	$0 0098	$0 0033
Amoxicillin 250 mg/5ml per ml	$0 0154	$0 0136	$0 0133
Nystatin Pessary 100,000 IU/pessary	$0 0500	$0 0612	$0 0247
Tetracycline Eye Oint /gm	$0 0420	$0 0604	$0 0180
Praziquantel 600 mg/tab	$0 4010	$0 4215	$0 2658
Sodium Lactate Cmpd Soln/ml	$0 0029	$0 0023	$0 0009
Aluminum Hydroxide 500 mg/tab	$0 0086	$0 0083	$0 0051
Salbutamol 4 mg/tab	$0 0068	$0 0084	$0 0039
Chlorpheniramine 4 mg/tab	$0 0039	$0 0029	$0 0014
Retinol 60 mg/cap	$0 0202	$0 0239	$0 0171
TOTALS	$2 4236	$2 3099	$1 2693

104 92% = % OF AVERAGE INTERNATIONAL PRICE PAID BY UNICEF

190 94% = % OF LOWEST INTERNATIONAL PRICE IN INDICATOR GUIDE

*Comparision information was not available for Kanamycin injection
**US$, FOB price as reported in UNICEF Progress Report of 5/93

The table entitled, "UNICEF EDP Kit Program- Comparison of UNICEF Kit Drug Prices With the Last Price Paid by MEDIMOC for Selected Drugs," found on page 114, shows price comparisons for 11 kit drugs for which comparison information was available between the UNIPAC prices and the last price paid by MEDIMOC UNICEF kit prices were found to be 38 89% higher on average than the last price paid by MEDIMOC

However, it should be pointed out that this comparison has limited value, since it only takes into account the unit price of drugs, and not the quantities actually procured However, the data do provide an indication of the international tendering capabilities of MEDIMOC

UNICEF EDP KIT PROGRAM

COMPARISON OF UNICEF KIT DRUG PRICES WITH THE LAST PRICE PAID BY MEDIMOC FOR SELECTED DRUGS (ALL PRICES US$)

KIT DRUG	FOB KIT PRICE	CIF KIT PRICE	CIF MEDIMOC PRICE	PRICE DIFFERENCE
Acetylsalicylic Acid 500 mg/tab	$0 0100	$0 0115	$0 0033	$0 0082
Paracetamol 500 mg/tab	$0 0125	$0 0144	$0 0041	$0 0103
Procaine Penicillin 3 MU/vial	$0 3962	$0 4556	$0 4313	$0 0243
Ferrous Sulfate/Folic Acid/tab	$0 0017	$0 0020	$0 0040	-$0 0020
Benzoic Acid/Salicylic Acid Oint /gram	$0 0057	$0 0066	$0 0055	$0 0011
Mebendizole 100 mg/tab	$0 0133	$0 0153	$0 0075	$0 0078
Chloroquine 150 mg/tab	$0 0101	$0 0116	$0 0093	$0 0023
Lidocaine/epin 2%/1 100,000/vial	$0 5200	$0 5980	$0 3522	$0 2458
Metronidazole 250 mg/tab	$0 0061	$0 0070	$0 0073	-$0 0003
Cotrimoxazole 400/80/tab	$0 0128	$0 0147	$0 0119	$0 0028
Epinephrine 1 mg/1ml	$0 0900	$0 1035	$0 0565	$0 0470
TOTALS		$1 2402	$0 8929	

38 89%

PERCENT DIFFERENCE

Taking into account the price differences between UNIPAC and MEDIMOC, and the actual quantities of drugs to be procured for Phase III, the potential cost differences can be calculated The results are presented in the table, "UNICEF EDP Kit Program- Illustration of Cost Savings Possible Through MEDIMOC Purchases in Phase III," found on page 116 and demonstrate that for the 11 selected drugs, tendering and procurement through MEDIMOC could result in savings of US$40,594 54 Obviously, for the entire shipment of Phase III kits, the savings might be higher

However, if the current kit program was replaced by local kit packing at the Matola facility, funds would be required for staffing the local kit packing facility, providing materials for kit packing and transporting kits from Maputo Quality control mechanisms of UNIPAC would have to be matched by local quality control activities

The Program Description suggests that UNICEF contract for an assessment of comparative tendering practices, price differentials, drug quality control mechanisms, and capacity to guarantee timely arrivals of shipments This assessment, which has not been conducted to date, will provide a more realistic estimate of savings which could be realized through local procurement

UNICEF EDP KIT PROGRAM

ILLUSTRATION OF COST SAVINGS POSSIBLE THROUGH MEDIMOC PURCHASES IN PHASE III (US$)

KIT DRUG	FOB KIT PRICE (US$)	UNITS PURCHASED IN PHASE III	CIF KIT PRICE (US$)	TOTAL KIT PURCHASES (US$)	CIF MEDIMOC PRICE (US$)	TOTAL MEDIMOC PRICE (US$)
Acetylsalicylic Acid 500 mg/tab	$0 0100	1,703,000	$0 011500	$19,584 50	$0 0033	$5,619 90
Paracetamol 500 mg/tab	$0 0125	560,600	$0 014375	$8,058 62	$0 0041	$2,298 46
Procaine Penicillin 3 MU/vial	$0 3962	186,500	$0 455630	$84,975 00	$0 4313	$80,437 45
Ferrous Sulfate/Folic Acid/tab	$0 0017	4,668,000	$0 001955	$9,125 94	$0 0040	$18,672 00
Benzoic Acid/Salyicylic Acid Oint/gram	$0 0057	1,923,500	$0 006555	$12,608 54	$0 0055	$10,579 25
Mebendizole 100 mg/tab	$0 0133	1,271,400	$0 015295	$19,446 06	$0 0075	$9,535 50
Chloroquine 150 mg/tab	$0 0101	3,090,500	$0 011615	$35,896 16	$0 0093	$28,741 65
Lidocaine/epi 2%/1 100,000/vial	$0 5200	469	$0 598000	$280 46	$0 3522	$165 18
Metronidazole 250 mg/tab	$0 0061	469,000	$0 007015	$3,290 04	$0 0073	$3,423 70
Cotrimoxazole 400/80/tab	$0 0128	2,334,000	$0 014720	$34,356 48	$0 0119	$27,774 60
Epinephrine 1 mg/1ml	$0 0900	4,690	$0 103500	$485 42	$0 0565	$264 99
TOTALS				$228,107 21		$187,512 68

$40,594 54 COST SAVINGS US$

B Cost Implications of Changes in Kit Content

An evaluation of kit programs in ten countries, carried out by WHO in 1989, found that the median number of drugs included in health center kits to be 28 5 (Drug Supply by Ration Kits Report of an Evaluation) The Mozambican health center kit included 28 at that time, four of them being antibiotics

In 1989, prices for health center kits in the ten countries ranged from US$95 to US$407 The median cost was US$142 The Mozambican health center kit was valued at US$174 in 1989, all prices were based on UNIPAC prices, and non-drug items were not included

During the evaluation, the relative cost of the six drugs with the highest average financial volume (Chloroquine tabs, Procaine Penicillin injection, Phenoxymethyl penicillin tabs, Cotrimoxazole tabs, Tetracycline eye ointment, and Oral Rehydration Salts) was determined On average, 60 2% of the cost of the health center kits was spent on these six drugs in the ten country programs

The cost of the 1993 Mozambique Kit A was quoted as US$453 07 Counting only drug items, the cost comes to US$399 58

At present, 34 drug items are included in the Mozambican Kit A, seven are antibiotics The table on the following page provides an overview of the drug content changes of health center kits between 1989 and 1993 Six new drug items were added, and the quantities of 14 were changed Of the six new drugs, three are antibiotics

Based on 1993 prices, the changes represented an added cost of US$157 33 to the cost of the kit Adding this difference (US$157 33) to the cost of the 1989 kit (US$174) and comparing it with the actual price of the kit at present (US$399 58) results in a difference of US$68 25 This difference may be due to price increases of essential drugs between 1989 and 1993

Systemic antibiotics showed a cost increase of US$130 80, or 83% of the total cost change of the kit between 1989 and 1993 A large share of these added costs come from Kanamycin injections and Amoxycillin suspension which together cost US$97 02

A look at the fraction of the cost to Mozambique of the six drugs cited above shows that in 1993, US$132 03, or 33%, was spent on these drugs, which is considerably less than the average value of 60 2% found in 1989 in the ten country study

CHANGES IN KIT A CONTENTS 1989-1993

(Drug items only)

Drug	Units	Contents 1989	Contents 1993	% Change	Cost change at 1993 UNIPAC prices (US$)
Epinephrine inj 1 mg	amps	5	10	100 0	$0 45
Methylergometrine inj 0 2 mg	amps	50	40	-20 0	-$1 00
Chlorpromazine inj 50 mg	amps	5	10	100 0	$0 46
Procaine Benzyl Penicillin 3 MU	vials	150	100	-33 3	-$19 81
Kanamycin inj 2 gm	vials	0	75	NEW	$69 30
Amoxycillin Susp 3 gm	bott	0	30	NEW	$27 72
Phenoxymethyl Pen 250 mg	caps	0	500	NEW	$7 55
Cotrimoxazole 400/80 mg	tabs	1500	2000	33 3	$6 42
Metronidazole 250 mg	tabs	1250	1000	-20 0	-$1 53
Nystatin 100,000 IU	pess	0	75	NEW	$3 75
Tetracycline Eye Ointment 5 gm	tube	100	75	-25 0	-$4 25
Mebendazole 100 mg	tabs	500	800	60 0	$6 65
Metrifonate 100 mg	tabs	100	0	-100 0	-$4 21 **
Praziquantel 600 mg	tabs	0	100	*	$40 10
Oral Rehydration Salts Powder 1 ltr	pack	0	300	NEW	$20 49
Aluminum Hydroxide 500 mg	tabs	300	400	33 3	$0 86
Salbutamol 4 mg	tabs	500	600	20 0	$0 68
Paracetamol 500 mg	tabs	1000	600	-40 0	-$5 00
Benzyl Benzoate Sol 1 ltr	bott	1	2	100 0	$6 68
Retinol 200,000 IU	caps	0	100	NEW	$2 02
			Total		**$157 33**

Share of systemic antibiotics **$130 80 = 83 1 %**

* Because of reported unavailability, Praziquantel was temporarily included, replacing the cheaper Metrifonate

** For Metrifonate, the 1992 WHO price was used

Recommendations

- Although procurement through MEDIMOC could potentially result in lower unit costs of drugs, it is unknown whether local kit packing is feasible and how the overall cost of kits would be affected if bulk procurement and local kit packing were implemented A study to evaluate feasibility and cost implications of bulk procurement and local kit packing is recommended

- The cost of Kit A has more than doubled over the past four years, whereas its capacity (1000 out-patient encounters) has remained the same Systemic antibiotics are responsible for almost all of the added cost This suggests that thought should be given to the appropriateness of the use of those antibiotics, and prescriber training provided if required

XXI KIT CONTENTS

The Mozambican kit program is distributing three types of kits "A," "B" and "C " The present contents of each of these kits are listed in Annex 7

The type of kit to be distributed to health facilities is dependent on the category of health worker present in that facility Kit A is distributed to health facilities with, at minimum, a doctor, health technician, health agent, or a basic nurse Kit A is therefore not restricted to health centers, health posts that meet the personnel requirements can also receive Kit A Health centers located in hospitals would also be supplied with "A" kits although these medicines are not meant to be used for inpatient care Outpatient departments of hospitals are supplied with "A" kits as well

Kit B is distributed to health facilities staffed by an elementary nurse, or a Maternal Child Health nurse Kit C is provided to facilities with either a community health worker (*Agente Polivalente Elementar*), or "*servente*" (a health worker with basic education and a few months of basic health training)

The rules for assignment of the three kit types are not rigid, and are modified at the discretion of the district health director

Kit A was designed to provide drugs for 1000 outpatient encounters, Kit B for 500 outpatient encounters, and Kit C for 250 outpatient encounters Depending on the staffing and work-load of each health facility, it receives the number of kits needed (for example, a health center staffed by a basic nurse with 2000 outpatient encounters would receive two Kits A per month)

The contents of the 1993 three kit types are presented in the following table

Contents of Kits EDP Mozambique

	Total number of items included	Antibiotics	Injections	Non-drug items
Kit A	40	7	10	8
Kit B	21	3	1	7
Kit C	15	1	0	7

The contents of kits have been subject to change during the period of operation of the kit program In 1992, Kit A contents were changed Metrifonate was included for schistosomiasis treatment in Kit A In 1993, Metrifonate was reported to be unavailable, and (temporarily) replaced by the more expensive Praziquantel

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Changing the Kit Contents

Discussions are held between UNICEF staff, EDP Program staff, and the Pharmaceutical Department to determine changes in kit content For the most recent changes, stock-outs and accumulation were addressed through random sampling of reporting forms An ongoing, systematic approach based on statistical information from health facilities on stock-outs, accumulation and epidemiological considerations was attempted in the past, but was discontinued because of uncertainty of the reliability of data, and the excessive time involved Decisions are based mainly on perceived needs, information gathered ad-hoc in the field, and through input from vertical programs

The actual process for requesting changes from UNIPAC is not time consuming, and is only problematic if the requested drug(s) require special tendering This procedure is outlined below A summary of changes made to date is included in the section on Kit Contents

An overview of changes in the kit contents in the 1992/1993 period is presented below

Changes in Kit Contents in the 1992/1993 Period

	Kit A	Kit B	Kit C
1992	**NEW** Povidone Iodine sol Phenoxymethyl Pen tabs Nystatin Pessary Vitamin A caps Kanamycin inj **QUANTITY CHANGE** Cotton wool ↓ Washing soap ↑ Silk sutures ↓ Methylergometrine inj ↓ Proc Benz Penicill inj ↓ Cotrimoxazole tabs ↑ Tetracycline eye oint ↓ Mebendazole tabs ↑ Metrifonate tabs ↑ Aluminium Hydroxide tabs ↑ Salbutamol tabs ↑ Paracetamol tabs ↓ Benzyl Benzoate sol ↑ Kanamycin inj ↑	**NEW** None **QUANTITY CHANGE** Tetracycline eye ointm ↓ Paracetamol tabs ↓	**NEW** None **QUANTITY CHANGE** None
1993	Due to temporary unavailability, Praziquantel was included, to replace the cheaper Metrifonate		

At present, two antibiotics (Kanamycin injection and Procaine Penicillin injection) account for almost 25% of the financial value of Kit A

Areas of Concern

- Present kit contents have their basis in determinations made eight years ago, with subsequent changes in the years thereafter These changes have often been made more on qualitative arguments than on quantified needs assessments At present, it is not clear if kit contents correspond to actual needs

Recommendations

- Perform a quantification study to determine drug needs at the health facility level and change contents of kits as needed

XXII EDP STAFFING LEVELS

As stipulated in the grant agreement, USAID-supported staffing for the EDP includes

- Internationally recruited project officer
- Mozambican project assistant
- Secretary
- Driver

These positions are currently filled, and are all based at the UNICEF Maputo office

The EDP staff also includes a Program Coordinator, Assistant Coordinator and a Training Coordinator Of these, the Program Coordinator is funded by the MoH The Assistant Coordinator and the Training Coordinator are funded by the Italian Government

Areas of Concern

- During the assessment visit, it was mentioned that the internationally recruited project officer position may be eliminated as of January 1994 A number of recommendations related to program development made in this report will require a substantial level of effort, particularly in the areas of training, monitoring and supervision Successful implementation of recommended activities will not be possible with a decreased staff level Given the fact that the EDP is responsible for a large percentage of drugs utilized by the rural population, adequate staffing is imperative

Recommendations

- Maintain or increase staffing levels Greater responsibility for EDP kit logistics can be assumed by the Program Coordinator and the UNICEF-funded Assistant Coordinator working within the Ministry of Health The Project Officer should assume greater responsibility for program development activities, particularly in the areas of monitoring, supervision and training Additional staff may be required for these activities Optimally, the current staff would remain in their positions and three additional staff hired and placed in regional positions to implement monitoring and supervision and training activities at provincial medical stores, district pharmacies and health facilities Proposed staffing, not including support personnel, would result in the following EDP staff, three of them located outside of Maputo

  1 UNICEF Project Officer
  1 Program Coordinator
  1 Assistant Coordinator
  1 Training Coordinator
  1 Supervisor, Northern Provinces
  1 Supervisor, Central Provinces
  1 Supervisor, Southern Provinces

- USAID, UNICEF and the MoH should discuss whether the Project Officer should be out-posted to the Ministry of Health or remain based at the UNICEF office Increased activities in program development areas may justify out-posting

XXIII FUNDING OF THE ESSENTIAL DRUGS PROGRAM

An overview of all aid given to the health sector in Mozambique is provided in the table on the following page As shown, a variety of donors provides support to the pharmaceutical sector

The organizations strongly supporting the Essential Drugs Program are USAID and UNICEF, which in Mozambique is supported by funds provided by the Government of Italy since 1985

COOPERATION IN THE HEALTH SECTOR OF MOZAMBIQUE

Donor	Funding Activities		
	Financial Aid Procurement Pharmaceuticals	Project Aid in Pharmaceutical Sector	Other Aid in Health Sector
International Agencies			
UNDP			*
UNICEF		*	
USAID	*	*	
World Bank		*	
World Health Organization		*	
Bilateral Agencies			
Switzerland	*	*	
Denmark (DANIDA)	*	*	*
The Netherlands	*		*
Spain			*
Germany			*
Italy		Through UNICEF	*
Finland (FINNIDA)			*
Norway (NORAD)	*	*	*
Sweden (SIDA)	*		*
United Kingdom	*		*
Canada (CIDA)	*		
France			*
Zimbabwe			*
European Community	*		
Non-Governmental Organizations			
MSF Belgium-Holland		*	
MSF France		*	
MSF Spain		*	
MSF Switzerland		*	
Save the Children Fund UK			*
Save the Children Feder USA			*
World Vision			*
World Lutheran Federation			*
ARO			*

USAID

USAID has funded the procurement of essential drugs kits since mid-1992 Its support has enabled the Essential Drugs Programme to become the major source of drugs for large parts of the rural population, with often no single other source of drugs available USAID also provided the funds to send four senior MoH officials to attend a course in Rational Drug Use in Harare

UNICEF

UNICEF has provided continuing support to the Essential Drugs Program in Mozambique through the support of the government of Italy An overview of the different components of this support in 1993 has been presented in the following table

Funding for Mozambique Essential Drugs Program in 1993 by Government of Italy, through UNICEF

PROJECT ACTIVITY	TIME FRAME	STATUS	PLANNED BUDGET (US$)
District staff training seminars	July-December	4 seminars done	10,000
National Pharmacy Seminar	November	not done	10,000
Rational drug use seminars for clinicians	April-September	planned	5,000
Salary training coordinator	January-December	done	24,000
Salaries external teachers and funds for *Institutos de Ciencias de Saude*		done	30,000
Development of training materials	January-December	planned	10,000
Training senior MoH staff in regional MSH Rational Drug Use course, Zimbabwe	March	done	10,000
Drug use indicator survey	March-June	ongoing	5,000
Support to quality control laboratory in EMOFAR Beira	July-August	done	2,500
Revision posters on drug use	March-June	planned	5,000
Revision EDP standard treatment manual	March-December	planned November 93-January 94	10,000
Baseline study and educational campaign against illicit drug sales	January-December	ongoing	30,000
Salary of pharmacist cooperant in EDP	January-December	done	18,000
Consultancy Matola kit packing facility	January-March	done	30,000
Installation INVEC program at MEDIMOC	May	not done	30,000
Restart ORS production at EMOFAR Beira	January-May	done	70,000
Construction/rehabilitation warehouses	January-December	done	452,000
Vehicles, spare parts, supplies and equipment for provincial warehouses	January-April	done	125,000
Carton boxes for Matola kit packing facility	March-December	not done	20,000

Other donors and agencies are currently involved in support to the pharmaceutical sector in Mozambique This support is not strictly limited to the Essential Drugs Program, but is related to it

WORLD BANK

In 1993, the World Bank defined its Health II project in Mozambique, consisting of three major components a) the Rural Health Services Development project, b) the Institutional Development Project, and c) the Human Resources Development project

Regarding pharmaceuticals, the Rural Health Services Development plans to partially finance importation of essential drugs and medical supplies for rural areas during the first two and a half years of the project

Within the Institutional Development component, the project intends to build four warehouses for pharmaceuticals, ten district warehouses for medical supplies and the building and/or improvement of two regional warehouses Additionally, a stock control system for use at the health unit and provincial level will be developed

NORAD

NORAD is providing technical assistance to the pharmaceutical sector through a full time Norwegian pharmacist While most time is spent at MEDIMOC, the pharmacist is also attached to the Pharmacy Department/MoH At present a proposal is being evaluated by the Norwegian embassy to assist in the funding of three volunteer expatriate pharmacists to work in the provinces of Gaza, Manica, and Cabo Delgado The main objectives would be to safeguard efficient ordering, storage and distribution of drugs to and from provincial warehouses, and to contribute to an improvement in the rational use of drugs in health facilities

SWITZERLAND

One of the most important activities of the Swiss cooperation is the coordination of the donor community regarding aid in the health sector In recent years quality control and drug inspection visits in warehouses and health facilities were supported At present the Technical Committee for Pharmaceutical Therapy (CTTF) is receiving Swiss support for the formulation of the new edition of the National Formulary Other aid includes financial support for training, equipment, and scholarships Technical assistance is not given At present there is a 1 million Swiss franc proposal to install a decentralized network of quality control laboratories

WORLD HEALTH ORGANIZATION

During a recent visit by a WHO/DAP staff member, the following recommendations were made

- Formulation of a plan of action for the pharmaceutical sector in Mozambique, coordinated by the Ministry of Health, covering production, importation, distribution, legislation, registration, quality assurance, financing, training and coordination of national and international aid

- Preparation of a document for the elaboration of new pharmaceutical legislation

- Establishment of a national drug registration system
- Support preparatory activities for a training course for 20 pharmaceutical inspectors

MEDECINS SANS FRONTIERES

MSF divisions of three countries (Belgium, France and Spain) are providing project aid in regional health care provision, including pharmaceutical supply, in different parts of the country The largest project is being carried out by MSF Belgium, working in the northern part of the province of Inhambane The project started in 1989 and covers an area of 206,000 inhabitants with seven health centers, six health posts and the regional hospital In the first three years of operation, the organization had an expatriate pharmacist employed

MSF distributes drug kits and drugs from the "*via classica*" system, arriving via the regular public health drug distribution system MSF imports and distributes a supplementary set of drugs and food items Overall needs of drugs in health facilities are determined on the basis of an initial quantification study, adjusted for actual consumption levels Only drugs from the National Formulary, and the ones now being promoted by vertical programs, are imported and distributed

The organization funded a survey of morbidity and drug prescribing in out-patient encounters in 1989, the results are discussed in the section on "Rational Use of Drugs" in this report

Areas of Concern

- UNICEF has secured funding for a number of EDP activities, including warehouse rehabilitation, transportation, and some training in drug use However, there have been few funded activities related to monitoring and supervision, and drug use training has not reached large numbers of prescribers

Recommendations

- Funding for the following activities should be increased
  - * Monitoring and supervision
  - * Training and education in rational drug use

XXIV OTHER ISSUES

A Matola Kit Packing Facility

The rehabilitation of the MEDIMOC warehouse in Matola took almost two years to complete Pallet racking has been installed to hold drug kits A conveyer belt system is in place for a kit production line Other equipment includes work-benches, a strapping machine for sealing kits, a stenciling machine, and one electric and two hand operated fork-lifts The facility is approximately 625 square meters, including offices Staff for this kit packing facility has been trained in Copenhagen, as outlined in the training section

The facility is currently used for temporary storage of "A," "B" and "C" kits after port clearance in Maputo, and for longer storage of kits to be sent to Maputo City, Gaza and Inhambane In the original plan, kits were to be assembled locally with drugs and supplies purchased in bulk by MEDIMOC, and transported to provinces by truck or sea Local production would decrease the need for imported kits and donor funds could be utilized for bulk procurement of drugs In the report "Final Report Matola Set-Packing Unit," it was suggested that by the end of 1994, 25% of the national need for kits would be filled by the facility

In an October 1993 report to the government of Italy, UNICEF concludes that "Due to the weakness of the pharmaceutical sector, kit-packing will be implemented gradually, beginning with the most simple C kit and reaching full scale according to the system managerial capacity "

Several suggestions have been offered by UNICEF as other possible roles of the facility

- Opening and modification of kits packed in Copenhagen
- Pack only Kit C, and/or a resupply kit for Traditional Birth Attendants
- Move the Maputo Provincial Warehouse to the new facility Matola would be used as a training site for future warehouse management/inventory control programs Additionally, an adjoining warehouse would be used for medical supplies now stored at another facility

Recommendations

- The assessment team recommends that kits not be opened for modification prior to delivery to health facilities The value provided by the current kit program in storage and transportation of essential drugs, simplicity of administrative procedures, and increased security would diminish The Essential Drugs Program and MEDIMOC would have to assume substantially more responsibilities, for which staff might not be available
- Taking into account the demonstrated capabilities of MEDIMOC in tendering and purchasing drugs, the assessment team believes that bulk procurement for local kit packing continues to be an option for the Essential Drugs Program in the future

- An assessment of the transport capacity for local kit packing has recently been conducted However, prior to initiation of local kit packing, transport capacities have to be carefully reassessed, in light of the limited period of time for which such data is valid

- The conditions of the Matola warehouse facility justify potential plans to develop it into a model site for warehouse management It is recommended that the EDP pursue the idea of developing the Matola facility as a training site

B Expansion of the Kit Program to Hospitals

Low stock levels in the approximately 25 rural hospitals in Mozambique supplied through the routine distribution system have prompted discussions about extension of coverage of the EDP to the inpatient level All rural hospitals are currently supplied with Kit A for use in outpatient departments It is generally known by UNICEF and the MoH that there is some use of kit drugs for inpatients The MoH and UNICEF are planning a proposal to extend the coverage of the EDP to the inpatient level of the largest health centers and rural hospitals

The UNICEF Project Director has drafted a kit list designed for district hospitals and large Health Centers with in-patient beds, but the list has not been discussed in detail with the MoH The hospital kit differs from Kit A in that it contains more injectable drugs, anesthetics, diuretics and barbiturates

C Support Provided by UNICEF Staff

Beyond the four EDP staff members described above, additional program support is provided by the Logistics Section of the UNICEF Maputo office in the following areas

- ordering of kits from UNIPAC
- receiving kits in ports of entry and verifying quantities received
- forwarding shipping documents to MEDIMOC counterparts for port clearance

ANNEXES

Annex One List of Acronyms

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List of Acronyms

AID	Agency for International Development
ARI	Acute Respiratory Infection
ASDI	Swedish International Development Agency
CD ROM	Compact Disk Read Only Memory
CIF	Carriage Insurance Freight
CTTF	Technical Commission for Drugs and Medical Articles
CMAM	Central Agency for Drugs and Medical Articles
DAP	Drug Action Programme
DANIDA	Danish Development Agency
DGIS	Directorate General International Cooperation (Dutch)
EDL	Essential Drugs List
EDP	Essential Drugs Program
EMOFAR	Mozambican state company for production of ORS
ETA	Estimated Time of Arrival
FARMAC	*Empresa Estatal de Farmacias* (Mozambican state company of pharmacies)
FEFO	First to Expire First Out
FMN	*Formulario de Medicamentos* (National Medicines Formulary)
GMP	Good Manufacturing Practice
GoM	Government of Mozambique
INRUD	International Network for Rational Use of Drugs
INVEC	MSH-developed inventory control software
LAC/HNS	Latin American Caribbean/Health, Nutrition and Sustainability (USAID contract)
MCH	Maternal and Child Health
MEDIMOC	*Empresa Estatal de Importacao e Exportacao de Medicamentos* (Mozambican state company for importation and exportation of medicines and medical supplies)
MIS	Management Information Systems
MSF	Médecins Sans Frontières
MoH	Ministry of Health
MSH	Management Sciences for Health
NF	National Formulary
NGO	Non-Government Organization
NPR	National Pharmaceutical Requirements
NORAD	Norwegian Development Agency
ORS	Oral Rehydration Salts
PAHO	Pan-American Health Organization
QA	Quality Assurance
QC	Quality Control
R & D HEALTH	Research and Development (AID bureau)
RPM	Rational Pharmaceutical Management Project
PMS	Provincial Medical Stores
SDC	Swiss Development Cooperation
SGQM	*Sisema de Garantia de Qualidade dos Medicamentos* (System for Guaranteeing the Quality of Medicines)
SIDA	Swedish International Development Agency
SL	Supply List

SCF	Supply Call Forward
STD	Sexually Transmitted Disease
UNICEF	United Nations International Childrens' Emergency Fund
UNIPAC	United Nations International Procurement Agency
UPS	Uninterrupted Power Supply
USAID	United States Agency for International Development
USP	United States Pharmacopeial Convention
USP DI	United States Pharmacopeial Convention Drug Information (data base)
VEN	Vital, Essential, Necessary (a method of prioritizing drugs)
WHO	World Health Organization

Annex Two Documents Reviewed

Documents Reviewed

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Annex Three Persons Met

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Persons Met

Mozambique Ministry of Health

Central Ministry of Health

Dr Abdul R Noormohamed, Director of National Health Direction
Mrs Elizabeth A Banqueiro, Chief of the Pharmaceutical Department
Mr Rathod K Bachubhai, Assesor of the Coordinator of the Essential Drugs Program
K Sharad, Cooperant in Training
Mr Zefanias V Muchanga, National Coordinator of the Essential Drugs Program
Dr Domingos Tuto, National Inspector for the Pharmaceutical Sector
Mrs Lourinda D Diogo, Pharmacist, Chief of the National Laboratory for Quality Control
Ms Amina Gairate, Director of Central Medical Supplies Department
Dr Avertino Barreto, Communicable Diseases Department/Division of Epidemiology
Dr Philippe Tabard, Communicable Diseases Department/Division of Epidemiology
Mr Domingos O R Coelho, National Supervisor Nursing Services
Dr Bert Schreuders, Maternal Child Health Department/DANIDA

MEDIMOC

Mr Renato Ronda, General Director
Mr Estevao S Macuaca, Finance and Administration Director
Mr Domingos Gomes, Import and Export Director
Mr Velemo Machanguana, Internal Distribution Director
Ms Noelma Lopes, Assesor of Internal Distribution
Dr Guttorm Folkedal, Senior Pharmacist

FARMAC

Mr Chonguica M Chonguica, Assesor of the General Director

Maputo Ministry of Health

Maria Vicente Pires, Chief Pharmacist, Maputo City Health Administration

Central Hospital of Maputo

Dr Reinaldo da Encarnacao Mabeia, Director of Pharmacy

Maputo Provincial Medical Stores

Mr Jose Albino Tivane, Head of Provincial Store

Other Donors and Agencies

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Ms Isabela Soares, Switzerland Cooperation Agency, Project Officer for Health
Dr Lieve van der Paal, Médecins sans Frontières Belgium

USAID and USAID Consultants

Mr Armand Utshudi, HPN Program Manager
Dr Caseiro Rocha, PHC Project Manager
Mr Roger Carlson, Mission Director
Mr John Miller, Deputy Mission Director
Mr Charles North, Department Program Officer
Mr Modupe Brodereck, Project Development Officer

Other

Mr Antonio Luis Tembe, Maputo Port Facility
Dr Sam Patel, President Technical Committee for Pharmaceutical Therapy (CTTF)

Annex Four Sample Reporting Form

PLANO DE DISTRIBUÇAO DOS KITS - 11/10/93
TRIMESTRE 1/1993
AUMENTO 15%

(SO) PROVINCIA DE SOFALA

CODIGO	UNIDADE SANITARIAS	NO MEDIO DE CONSULTAS MENSAIS DADOS DOS ULTIM 3 MES	CATEGORIA PESSOAL CLINICO	TIPO DE KIT	NUMERO DE KITS (MES / ANO)	
(SO-BE)	DISTRICTO DE BEIRA					
SPSAH	P S MATADOURO	255		B	1 0	7 5
SPSAC	P S BASE NAVAL	769 E		B	2 0	21 5
SPSAD	P DES C F M	859 E		B	2 0	24 0
SPSAE	P S CHAMBA	837		B	2 0	23 5
SCSAA	C S CHINGUSSURA	2526		A	3 0	35 0
SCSAB	C S MANGA	4121		A	5 0	57 0
SCSAC	C S MUNHAVA	4244		A	5 0	59 0
SCSAD	C S PONTA GEA	2867		A	3 5	40 0
SHCAA	H CENTRAL BEIRA•	0		?	0 0	0 0
SPSAA	P S AEROPORTO	774		B	2 0	21 5
SPSAG	P S MACURUNGO	1567		B	4 0	43 5
SPSAI	P S INHAMIZUA	0	ENCERRADO	?	0 0	0 0
SPSAJ	P S INHAMUDIMA	0	ENCERRADO	?	0 0	0 0
SPSAB	P S BAIXA	0	ENCERRADO	?	0 0	0 0
(SO-BU)	DISTRICTO DE BUZI					
SPSBB	P S MATOLA	560 E		B	1 5	15 5
SPSAZ	P S CERAMICA	1305	SERVENTE	C	6 5	72 5
SPSAU	P S RIO BUZI	1224	ENF BASICO	B	3 0	34 0
SPSBD	P S CHIRIMONHO	421	SERVENTE	C	2 0	23 5
SCSAG	C S ESTAQUINHA	478	ENF BASICO	A	1 0	7 0
SPSAX	P S BANDUA	458	AG MEDICINA	B	1 5	13 0
SHRAA	H RURAL BUZI •	2441	MEDICO	A	3 0	34 0
SCSAH	C S NOVA SOFALA	346	ENF ELEMENTAR	A	0 5	5 0
SPSAV	P S BARRADA	496	AG MEDICINA	B	1 5	14 0
(SO-CA)	DISTRICTO DE CAIA					
SCSAL	C S DE CAIA	3174	ENF BASICO	A	4 0	44 0
	C S MURRACA	1005	ENF BASICO	A	1 5	14 0
	P S SENA	1788	ENF BASICO	B	4 5	49 5
(SO-CH)	DISTRICTO DE CHIBABAVA					
SCSAM	C S CHIBABAVA	595	ENF BASICO	A	1 0	8 5
	P S MUXUNGUE	180	ENF BASICO	B	0 5	5 0
	P S GOONDA	695	ENF BASICO	B	2 0	19 5
	P S REVUE	72	SERVENTE	C	0 5	4 0
	P S TRONGA	207 E	SERVENTE	C	1 0	11 5

Annex Five Sample Report

RESUMO DE DISTRIBUÇAO DOS KITS PARA OS DISTRITOS - 31/08/93

PROVINCIA DE TETE (CODIGO DA PROVINCIA: TE)
INFORMAÇAO DO JANEIRO 1993 ATE JUNHO 1993

DISTRITO	KIT A	KIT B	KIT C
* CORRECCAO	0	0	0
ANGONIA	20	3	0
CABORA BASSA	11	7	0
CHANGARA	8	7	0
CHIFUNDE	4	0	0
CHIUTA	4	5	0
MACANGA	5	6	0
MAGOE	11	1	4
MARAVIA	4	0	0
MOATIZE	18	18	0
MUTARARA	5	5	0
TETE	46	13	0
TSANGAMO	4	12	0
ZUMBO	4	1	1
DISTRIBUIÇAO ACTUAL	144	78	5
PLANO DE DISTRIBUIÇAO	152	110	7
INDICE	95	71	71
STOCK NO INCIO (+)	39	0	0
RECEBIDOS (+)	304	153	12
DESTRIBUIDOS (-)	144	78	5
PERDAS (-)	2	0	0
STOCK NO FIM	197	75	7

Annex Six Sample EDP Kit Monitoring Forms

REPUBLICA DE MOÇAMBIQUE
MINISTERIO DA SAUDE
Mod SIS C04

DISTRITO _____
U S _____ _____
MÊS _____ ANO _____

PME - RESUMO MENSAL DE CONSULTAS EXTERNAS E DO STOCK DE MEDICAMENTOS KIT A - CENTRO DE SAÚDE

DATA DE ABERTURA DO KIT _____/_____/19___ Nº DE KIT/MÊS _____

CATEGORIA DO RESPONSÁVEL CLINICO _____

CENTRO DE SAUDE Nº TOTAL DE CONSULTAS _____ **HOSPITAL RURAL** Nº TOTAL DE CONSULTAS _____	**DISTRITO** Nº TOTAL DE CONSULTAS _____

MEDICAMENTOS	SALDO MÊS ANTERIOR	RECEBIDO DURANTE O MÊS	TOTAL DO MÊS	ACABOU EM (DATA)	UTILIZADO	DEVOLVIDO	SALDO NO FIM DO MÊS
A A S comp 500 mg							
Salbutamol comp 4 mg							
A Benzóico/A Salicílico pomada							
Clorfeniramina comp 4 mg							
Cloroquina inj 150 mg base							
Cloroquina comp 150 mg base							
Cotrimoxazol comp 400 mg/80 mg							
Amoxicilina susp oral 125 mg/5 ml							
Hidróxido de aluminio comp 500 mg							
Mebendazol comp 100 mg							
Metrifonato comp 100 mg							
Metronidazol comp 250 mg							
Paracetamol comp 500 mg							
Sal Ferroso e Acido Fólico comp							

REPUBLICA DE MOÇAMBIQUE
MINISTÉRIO DA SAUDE
Mod SIS C05

DISTRITO _____
U S _____
MÊS _____ ANO _____

PME - RESUMO MENSAL DE CONSULTAS EXTERNAS E DO STOCK DE MEDICAMENTOS KIT B - POSTO DE SAÚDE

DATA DE ABERTURA DO KIT _____/_____/19___ Nº DE KIT/MÊS _____

CATEGORIA DO RESPONSAVEL CLINICO _____

Nº TOTAL DE CONSULTAS _____

MEDICAMENTOS	DURANTE O MÊS ACABARAM ALGUNS DOS SEGUINTES MEDICAMENTOS?				
	SIM / DATA	STOCK NO FIM DO MÊS		SIM / DATA	STOCK NO FIM DO MÊ
A A S comp 500 mg			Cetrimida e Clorexidine		
Aminofilina Comp 100 mg			Tetraciclina Pomada Oft		
A Benzóico/A Salicílico pomada			Adesivo 25 cm X 5 m		
Cloroquina comp 150 mg base			Algodão Hidrófilo 500 mg		
Fenoximetil Penicilina Comp 500 mg			Ligaduras 75 cm X 9 m		
Mebendazol comp 100 mg			Gaze 20 cm X 6 m		
Paracetamol comp 500 mg			Sabão 500g		
Penicilina Procaina 3 0 MU					
Probenecide Comp 500 mg					
Sais de Rehidratação Oral/Pacotes					
Benzoato de Benzilo conc					

CONSULTAS REALIZADAS POR A P E s

Numero de A P E s que enviaram dados durante o mes	
Total de consultas realizadas pelos A P E s durante o mes	

NOTA ESTE RESUMO DEVE SER ENVIADO MENSALMENTE
MESMO NO CASO EM QUE O KIT B NÃO FOR RECEBIDO

REPUBLICA DE MOÇAMBIQUE
MINISTERIO DA SAUDE
Mod SIS C07

NOME DO DEPÓSITO _____
MES _____ ANO _____

RESUMO MENSAL DA DISTRIBUIÇÃO DOS KITS PARA NÍVEL PROVINCIAL E DISTRIAL

A) CONTROLE DE STOCK DOS KITS NOS DEPÓSITOS PROVINCIAL, DISTRIAL/ E DA MEDIMOC

KITS	NUMERO DE KITS			
	STOCK NO ÍNCIO DO MES	RECEBIDOS DURANTE O MÊS	DISTRIBUIDOS DURANTE O MÊS	STOCK NO FIM DO MÊS
A				
B				
C				

B) Nº DE KITS DISTRIBUIDOS ESTE MÊS AS PROVINCIAS, DISTRITOS OU UNIDADES SANITARIAS

NOME DAS PROVÍNCIAS DISTRITOS OU UNIDADES SANITÁRIAS	DATA	KIT A	KIT B	KIT C

Annex Seven EDP Kit Contents

PROGRAMA DE MEDICAMENTOS ESSENCIAIS

COMPOSICAO DO KIT -- 1992/1993

CONSULTAS EXTERNAS 1000
CATEGORIA PESSOAL MEDICO TEC DE MEDICINA
AGENTE DE MEDICINA ENF BASICO
UNIDADE SANITARIA CENTRO DE SAUDE

ITEM No	DISCRIPCAO	QUANTIDADE
	KIT A	
1	ADHESIVO 25MM X 10M	8
2	LIGADURAS 75MM X 9M	100
3	ALGODAO HIDROFILO 500G	4
4	ENVELOPE DE PLASTICO	1500
5	GAZE 200MM X6M	20
6	SABAO 450G	3
7	FIOS DE SATURA 45CM AGULHAS 24MM	20
8	CETREMIDA(15%)+CLOREXIDINA(1 5%) CONC SOLUCAO 1L	1
9	POVIDONE (10%) SOLUCAO 500ML	1
10	ACIDO BENZOICO(6%)+ACIDO SALICILICO(3%) POMADA 500G	1
11	VIOLETA GENCIANA PO 25G	1
12	LIDOCAINA(2%)+EPINEFRINA(1 100 000) INJ 50ML	1
13	ADRENALINA 1MG/ML INJ 1ML	10
14	DIAZEPAM 5MG/ML INJ 2ML	10
15	METILERGOMETRINA 0 2MG/ML INJ 2ML	40
16	CLORPROMAZINA 25MG/ML INJ 2ML	10
17	PENICILINA BENZATINICA 2 4MU (1 44G) INJ	50
18	PENICILINA PROCAINA 3MU (3G) INJ	100
19	KANAMICINA 2G INJ	75
20	AMOXICILINA SUSPENSAO ORAL 250MG/5ML 60ML	30
21	FENOXIMETIL PENICILINA 250MG COMP	500
22	SULFAMETAXAZOLE (400MG) + TRIMETOPRIM (80MG) COMP	2000
23	METRONIDAZOLE 250MG COMP	1000
24	NISTATIN 100 000IU SUPOSITORIOS VAGINAIS	75
25	TETRACICLINA 1% POMADA OFF 5G	75
26	CLOROQUINA 150MG BASE COMP	1500
27	CLOROQUINA 259MG (150MG BASE) INJ 5ML	20
28	MEBENDAZOLE 100MG COMP	800

ITEM No	DISCRIPCAO	QUANTIDADE
29	PRAZIQUANTEL 600MG COMP	100
30	LACTATO DE RINGER INJ 500ML	5
31	SAIS DE REHIDRATACAO ORAL PACOTE PARA 1L	300
32	SAL FERROSO (60MG) +ACIDO FOLICO (0 25MG) COMP	4000
33	HIDROXIDO DE ALUMINIO 500MG COMP	400
34	SALBUTAMOL 4MG COMP	600
35	CLORFENARAMINA 4MG COMP	300
36	ACIDO ACITIL SALICILICO 500MG COMP	1000
37	PARACETAMOL 500MG COMP	600
38	BENZOATO DE BENZILO CONC (90%) SOLUCAO 1L	2
39	RETINOL (VITAMINA A) 60MG (200 000IU) CAPSULAS	100

PROGRAMA DE MEDICAMENTOS ESSENCIAS

CONSULTAS EXTERNAS 500

CATEGORIA PESSOAL ENF ELEMENTAR ENF DE SMI

COMPOSICAO DO KIT -- 1992/1993

UNIDADE SANITARIA. POSTO DE SAUDE

ITEM No	DISCRIPCAO	QUANTIDADE
	KIT B	
1	ADHESIVO 25MM X 10M	4
2	LIGADURAS 75MM X 9M	50
3	ALGODAO HIDROFILO 500G	2
4	ENVELOPE DE PLASTICO	500
5	GAZE 200MM X6M	10
6	SABAO 450G	2
7	CETREMIDA(15%)+CLOREXIDINA(1 5%) CONC SOLUCAO 1L	1
8	ACIDO BENZOICO(6%)+ACIDO SALICILICO(3%) POMADA 500G	1
9	VIOLETA GENCIANA PO 25G	1
10	PENICILINA PROCAINA 3MU (3G) INJ	100
11	SULFAMETAXAZOLE (400MG) + TRIMETOPRIM (80MG) COMP	1000
12	CLOROQUINA 150MG BASE COMP	1000
13	MEBENDAZOLE 100MG COMP	300
14	SAIS DE REHIDRATACAO ORAL PACOTE PARA 1L	200
15	TETRACICLINA 1% POMADA OFF 5G	40
16	SAL FERROSO (60MG) +ACIDO FOLICO (0 25MG) COMP	2000
17	SALBUTAMOL 4MG COMP	200
18	ACIDO ACITIL SALICILICO 500MG COMP	1000
19	PARACETAMOL 500MG COMP	200
20	PROBENCID 500MG COMP	50
21	BENZOATO DE BENZILO CONC (90%) SOLUCAO 1L	1

PROGRAMA DE MEDICAMENTOS ESSNECIAIS CONSULTAS EXTERNAS 250

CATEGORIA PESSOLA APE'S, SOCORRISTA SERVENTE

COMPOSICAO DO KIT --1992/1993 UNIDADE SANITARIA P S L T OU APES

ITEM No	DISCRIPCAO	QUANTIDADE
	KIT C	
1	ADHESIVO 25MM X 10M	3
2	LIGADURAS 75MM X 9M	50
3	ALGODAO HIDROFILO 500G	2
4	ENVELOPE DE PLASTICO	500
5	GAZE 200MM X6M	3
6	SABAO 450G	2
7	CETREMIDA(15%)+CLOREXIDINA(1 5%) CONC SOLUCAO 1L	1
8	ACIDO BENZOICO(6%)+ACIDO SALICILICO(3%) POMADA 500G	1
9	CLOROQUINA 150MG BASE COMP	500
10	MEBENDAZOLE 100MG COMP	100
11	SAIS DE REHIDRATACAO ORAL PACOTE PARA 1L	100
12	TETRACICLINA 1% POMADA OFF 5G	25
13	SAL FERROSO (60MG) +ACIDO FOLICO (0 25MG) COMP	1000
14	ACIDO ACITIL SALICILICO 500MG COMP	200
15	BENZOATO DE BENZILO CONC (90%) SOLUCAO 1L	1