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EVALUATION OF THE
NATIONAL DRUG POLICY PROGRAMME
DEMOCRATIC YEMEN

15-28 March 1988



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LIST OF ABBREVIATIONS

| | |
|------|---|
| APO | Associate Professional Officer |
| CMS | Central Medical Stores |
| DAP | (WHO) Drug Action Programme |
| DG | (WHO) Director General |
| DSE | German Foundation for Development Aid |
| EMRO | (WHO) Eastern Mediterranean Regional Office |
| HMI | Health Manpower Institute |
| IV | Intravenous (fluids) |
| NDC | National Drug Company |
| ORS | Oral Rehydration Salts |
| SE | Standard Error of the mean |
| WHA | World Health Assembly |
| WHO | World Health Organization |

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EXECUTIVE SUMMARY

From 14 to 28 March 1988 a WHO team visited Democratic Yemen to evaluate the National Essential Drugs Programme ("National Drug Policy Programme") that has been supported by the WHO Action Programme on Essential Drugs and Vaccines since 1984. The team studied whether the original objectives, as set in 1984, had been met; the impact of the programme on the availability and rational use of essential drugs in the country; how effective and efficient the WHO support had been; and whether the WHO support to the programme had been essential, whether further support is justified and the programme could be used as an example for other countries.

National drug policy

The Essential Drugs List is fully implemented in the public sector and the National Drug Policy Programme is completely integrated with the Ministry of Health. Three national workshops have taken place since 1984. The national workshop that is planned for November 1988 will discuss and adopt the revised National List of Essential Drugs, which will cover the private sector including the National Drug Company, and should involve as many clinicians as possible. A more active committee on drug selection should be established and all requests for inclusion of new drugs should be fully justified in the light of actual need and available resources. A computerized system of drug registration should be established as soon as possible.

Quantification of drug needs

The approach to quantification of drug needs has been systematic. Original rough estimates have been refined and revised in three consecutive stages. The results are used for ordering and distributing essential drugs.

Procurement, storage and distribution

The present procurement policy is substantially much more rational than in 1984. The policy aims to supply only essential, generic drugs to the public sector, using the Essential Drugs List for guidance. The Government has already decided to combine all drug procurement of the Ministry of Health, Hadramauth Governorate, National Drug Company, Army and Police and foreign currency allocations for the procurement of essential drugs for each of these institutions should be reviewed at the same time.

The Central Medical Stores is well organized, and many of its staff have been trained by WHO. Its semi-automated inventory control system needs to be computerized. Special indent forms should be introduced that will indicate, for each level of health care, the range of essential drugs and medical supplies that can be requested. In view of its excellent performance the Central Medical Stores should be used more often for training of Arabic speaking fellows from other countries from the region.

The availability of essential drugs within the project area, covering 40% of all health units, is considerably better than elsewhere (an average of 28.7 versus 17.1 essential drugs available in health units). The average number of non-essential drugs within the programme area is 1.4 (5%) and 17.4 (50%) outside. This improvement is impressive. In health centres and hospitals an

average of 55.1 essential and 12.6 non-essential drugs were found. Although the low percentage of non-essential drugs in these institutions is commendable, the overall number and quantity of essential drugs needs to be improved.

A survey on the availability of essential drugs in three private pharmacies showed that, on average, 80 drugs were available; of these, only 28 (35%) were essential. In view of the fact that the National Drug Company's budget is three times that of the Ministry of Health, the real impact and cost-effectiveness of the private market drug supply system can be questioned.

Drug quality control

Work on the establishment of the drug quality control laboratory has proceeded satisfactorily. Equipment is awaited and staff has been trained. A sum of \$ 100.000 should be reserved in the WHO Regular Budget for 1990-91 for equipment and training for the second phase.

Training in rational prescribing and dispensing

The impact of training in rational prescribing was studied in a sample of 38 health units. Additional training of health workers in part of the project area has resulted in a further improvement in their theoretical knowledge, especially among practical nurses. With regard to actual drug use in practice, prescribing patterns within the project area are more rational than outside, both in the percentage of patients receiving an antibiotic (25 versus 58) and in the percentage of antibiotics prescribed (46 versus 67). The average number of drugs per prescription is also lower (1.49 as compared to 3.01 in health centres and hospitals).

Continuing emphasis should be placed on the further training of health workers, by district workshops and a more intense system of supervision which should not be limited to drug supply and storage issues. Training seminars should also be organized for staff in hospitals and health centres. Staff of the Teaching Hospital and Medical Faculty should be actively involved in this.

The curriculum of the Medical Faculty does not yet include training in the essential drugs concept and the rational use of drugs; assistance should be given to the Faculty to prepare a training programme on the concept of essential drugs and rational drug use. A comprehensive syllabus should be prepared for approval and use by the Faculty.

Registration and legislation

A plan has been made for the establishment of a computerized drug registration system. Together with the new drug legislation, which was developed early in 1988, this will provide a crucial framework for the National Drug Policy Programme and its establishment should be pursued.

Management of the programme

The evaluation team was impressed with the progress achieved in the successful implementation of most components of the programme over the four years 1984 to 1988. In view of future emphasis on the training in rational drug use it is recommended that the staff of the unit be expanded by appointing a person trained in clinical pharmacology to coordinate all training activities in this area to assist in the preparation of a treatment guide, to establish a small drug information unit and to prepare a national drug policy newsletter.

Impact of the programme on the drug supply situation in the country

The team concluded that the procurement and distribution policy for the public sector is rational and effective but that the impact of the programme on the supply of drugs to the private sector has been negligible. However, the new procurement policy, the new drug legislation and the planned computerized drug registration system are powerful tools for the future.

The availability of essential drugs at health units has drastically improved in the programme area, and the present range and number of drugs available is adequate. Additional training in rational drug use has resulted in a further improvement in health workers' theoretical knowledge. Actual drug use in the programme area has become more rational, with considerably fewer injections and antibiotics being prescribed.

Effectiveness and efficiency of WHO support

The effectiveness of WHO consultants has been good, with 82% of all 216 recommendations in 21 reports being or having been implemented. Only two reports were of low standard, with few innovative or useful recommendations. This implies that more than 90% of the reports have been useful and it can therefore be concluded that the WHO consultancy support has been efficient.

All 25 staff members who received fellowships in the field of drug supply and management have returned to their position in the Ministry of Health and 21 are active in the field in which they were trained. All senior staff members in the Department of Pharmaceutical Services have been trained by WHO fellowships. The fellowships programme can therefore be regarded as effective and efficient.

The frequent coordinating meetings between staff of the programme and WHO (eight official and three unofficial meetings in four years, of which five were in the country) have greatly contributed to the smooth running and have been of direct practical support to the programme.

Has the WHO support been essential?

Having concluded that the WHO support has been effective and efficient it seems very unlikely that the Government alone would have been able to arrange for comparable consultancy services without the support from WHO, and the same applies to the WHO fellowships. The team therefore concludes that the WHO support has been essential for the success of the programme. However, this success is to an even greater extent due to the active interest of the Government. It is fortunate that, under these circumstances, WHO has been able to respond in a quick and flexible way. This adequate response was initially possible the WHO Regional Office and the Drug Action Programme were able to mobilize new funds for the first consultancy visits. The programme received a further boost through the special allocation from the DG's Development Fund. This untied contribution has enabled the Action Programme to give flexible support to the actual implementation of the programme, in addition to the contributions from the regular budget.

Is further WHO support justified?

In view of the positive findings of the evaluation it is concluded that further support by WHO is fully justified. This is particularly necessary for the implementation of the new drug legislation, the planned computerized drug registration system, the computer system for the Central Medical Stores, the drug quality control laboratory and the training programme in rational use of drugs.

Can the programme be used as an example for other countries?

The programme has shown great potential for demonstration, training and operational research. The evaluation team therefore recommends that the National Drug Policy Programme be established as a WHO Collaborative Centre for Drug Policies and Management.

INTRODUCTION

In February 1984 a two-man mission of the Action Programme on Essential Drugs and Vaccines (DAP) of the World Health Organization (WHO), consisting of Dr. E.Lauridsen, Programme Manager, and Dr. R.R.Chaudhury, Regional Adviser, Pharmaceutical, Diagnostic and Therapeutic Substances of the WHO Regional Office for the Eastern Mediterranean, visited Democratic Yemen. At the request of the Ministry of Health the mission attempted to gain a first hand impression of the drug supply system in support of the national primary health care programme. This visit was the start of a comprehensive collaborative programme between the Ministry of Health and the WHO.

From 14 to 28 March 1988 a WHO mission visited Democratic Yemen to evaluate the programme. The mission consisted of Dr. Aladin Alwan, WHO/STC, Dr. George Fernando, WHO/STC, Dr. Hans V. Hogerzell, WHO/DAP Technical Officer, Dr. Ali O. Salami, Assistant Deputy Minister of Health and National Programme Manager, and Dr. Godfrey Walker, WHO/DAP Medical Officer.

The objectives of this evaluation were to analyse whether:

- 1 the objectives of the programme, as set in 1984, have been met;
- 2 further support is justified and what should be the nature of such support;
- 3 the programme can be used as an example for other countries.

Specific questions to be answered were:

- a) What has been the impact of the programme on the drug supply situation in the whole country since 1984?
- b) What has been the impact of the programme on the availability and rational use of essential drugs in Lahej and Shebwa governorates?
- c) How effective and efficient have the WHO contributions been to the programme in the biennia 1984-85 and 1986-87?
- d) Has the WHO support been essential to the impact of the programme?

In the first part of this report an evaluation of all programme activities will be presented; after a short historical overview and a description of the original objectives of the programme, activities and the evaluation are given in sections according to these objectives.

Apart from the first appraisal report, no systematic baseline data from 1984 are available on the availability and rational use of drugs in Lahej and Shebwa governorates, the two governorates in which the National Drug Policy Programme has been most active. For this reason it was decided to perform a comparative study between these two governorates and Abyan governorate, in which no programme activities have taken place at the rural level. This approach has the additional advantage that the data from Abyan can be used as a baseline for future programme activities in that governorate.

The impact of the programme on the drug supply situation in the country as a whole was measured by making a comparison of the situation in various fields (selection of drugs, procurement, registration, etc) between 1984 and 1988.

The effectivity and efficiency of the WHO support was measured by analyzing the effect and impact of all WHO activities, and especially the impact of the visits and reports of WHO short term consultants, fellowships, supplies and equipment, support for local costs and coordinating meetings, over the biennia 1984-85 and 1986-87.

OBJECTIVES OF THE PROGRAMME AND SHORT HISTORICAL OVERVIEW

In this section a summary is given of all programme activities between February 1984 and February 1988, followed by an evaluation of their impact and efficiency. To enable a better overview the activities are divided and discussed according to the original objectives of the drug supply system rather than chronologically. However, a short historical review may be helpful and is presented first.

After the exploratory visit by Lauridsen and Chaudhury in February 1984 the following objectives of the programme were formulated and later accepted by the Ministry of Health:

- 1 Development of a national drug policy for the country which would include selection of drugs to be used at the different levels of health care;
- 2 Quantification of the need for the different essential drugs in the Lahej governorate;
- 3 Improvement of the system for the procurement, storage, transport and distribution of these essential drugs;
- 4 Establishment of a small basic drug quality control laboratory;
- 5 Training of the different categories of personnel involved in the use of drugs so that more rational prescribing and dispensing of drugs would be achieved;
- 6 Establishment of a small unit for the manufacture of intravenous and injectable fluids and another for the production of oral rehydration salts.

During 1984 several consultants visited the country to analyze the situation in some of the above mentioned fields and to give specific technical advice. The cost of this initial support was borne by the WHO Regular Budget from the Regional Office (WHO/EMRO) and supplemented by support from the Drug Action Programme (WHO/DAP).

In 1984 a pilot project was started in Lahej Governorate to test a drug supply system based on monthly drug ration kits. This pilot project was later expanded to include all health units and health centres in Lahej and Sheboa governorates. The project included a training programme.

In 1984 the WHO Director General, Dr. H. Mahler, and the WHO Regional Director, Dr. H.A. Gezairy, visited Democratic Yemen and the project area. In 1985 a special contribution of \$ 350.000 was received from the DG's Special Development Fund. This financial contribution enabled a quicker expansion and greater flexibility in the WHO support to the programme.

Early in 1986 the programme suffered some setback due to the political events that took place in the country. Several consultancies and meetings had to be postponed for at least six months. Surprisingly the supply of drug ration kits to the project areas was never interrupted.

Technical support to the programme has been paid from the WHO/EMRO regular country budget (\$ 408.088 over the two biennia), the DG's contribution (\$ 245.486 over 1985-87) and incidental support from WHO/DAP (approximately \$ 108.000). A budget summary is presented in Annex 1. All staff of the project, with the exception of the Special Service Agreement with the National Programme Manager, have been paid by the Government of Democratic Yemen, as well as all drug supplies.

In addition to the DG's contribution, the Government of Norway contributed \$ 1 million to the World Bank First Health Development Project, for the establishment of three regional stores including transport and equipment.

OBJECTIVE 1 Development of a national drug policy for the country which would include the selection of drugs to be used at the different levels of health care.

ACTIVITIES IN 1984-1988

Essential Drugs List

In April 1984 two WHO consultants, Dr. G.Walker and Dr. I.Borda, advised the Ministry of Health on a revision of the existing list of essential drugs which was used for the public sector. A national drug committee was established which discussed the proposed changes during 1984. In January 1985 a first National Workshop was organized in Aden, to which 63 senior doctors and pharmacists attended. After further discussions in working groups, the list was slightly amended and adopted. The same month the list was endorsed by the Minister of Health. This list, although widely distributed, did not include drugs used by the National Drug Company (NDC), the Army, the Police and Hadramouth governorate who continued the practice of doing their own purchasing.

In December 1985 a second National Workshop was held in Abyan Governorate. This workshop was intended to inform more doctors and pharmacists about the programme. A total of 64 participants attended, mostly from governorates other than Aden, including 13 expatriate doctors. In November 1986 a third workshop was held, in Hadramouth Governorate, attended by 47 participants from that area.

Early in 1986 the Essential Drugs List was printed and widely disseminated to all doctors, pharmacists and institutions in the country. Since 1987 the list, which specifies the level of care for each drug, is being used to limit the issue of drugs to health centres and general hospitals; only drugs on the list are being purchased by the Central Medical Stores (CMS).

In October 1987 a WHO consultant, Dr. I.Borda, proposed some changes to the list, which were discussed with the drug committee. The list, which contains 270 drugs in stead of 310, will be reviewed and finalized by a national workshop in November 1988 and its use will be enforced by the new drug legislation.

National Drug Policy and the procurement of drugs

In 1986 the Central Committee and the Council of Ministers adopted two important resolutions. The first directed the CMS and the NDC to follow the essential drugs policy in all drug procurement, and ordered the Ministry of Health to extend the national drug policy programme to all governorates. The second stated that the Faculty of Medicine should adapt the curricula to include teaching of the concept of essential drugs and rational drug therapy.

In 1987 a decision was taken by the Council of Ministers that all drug procurement, previously separated between CMS, NDC, Army, Police and Hadramouth, should be combined. This decision became effective in 1987 when a

committee, consisting of representatives from these institutions and chaired by Dr. A. Salami, Ass. Deputy Minister of Health, started to decide on drug procurement using generic names. Prior to these meetings, lists of drugs proposed for procurement were submitted to the Ministry of Health for approval. The number of drugs procured by the NDC, which was around 1800 in 1984 had already dropped to around 700 in 1987.

Drug information

On several occasions all health workers, including doctors and pharmacists and rural health workers, have been supplied with information on the programme. The three national workshops in Aden, Abyan Governorate and Hadramouth Governorate have involved many national experts. WHO publications (EMRO Drugs Digest, EMRO Drug Information Sheets for doctors and EMRO Drug Information Sheets for Community Health Workers - in Arabic) have been distributed to nearly all workers. Treatment schedules, based on the essential drugs list and the quantification study, have been translated into Arabic and have been distributed to all health workers. From time to time relevant articles have been distributed as well.

EVALUATION

Essential drugs list

In spite of the encouraging overall progress achieved in the National Drug Policy Programme there are still some components that require further strengthening. The Essential Drugs List (EDL) is only implemented in the public sector. Visits to the private as well as National Drug Company (NDC) pharmacies in the districts covered by the evaluation have shown that only 30-39% of drugs marketed are essential (defined as included on the national essential drugs list). The remainder are considered non-essential and include mainly a range of irrational fixed-ratio combination products (see p.24 "Availability of drugs in the private sector"). Even in the public sector, analyses of prescriptions in health centres and district hospitals have demonstrated that physicians as well as medical assistants occasionally prescribe drugs outside the essential drugs list.

The EDL requires wider (more comprehensive) implementation and should be adopted by the NDC. It should cover both the private and the public sector and should ultimately aim to cover the needs of the army and police medical services as well.

The list as it appears now should also undergo further revision in close collaboration with leading clinicians to ensure their future cooperation and the practical applicability of the list for all levels of health care. Since it should also respond to the therapeutic needs of specialized centres at the teaching hospital it is recommended to supplement it with a small list containing drugs only for specialist use. The workshop on rational use of drugs that is planned for November 1988 should involve a large number of clinicians and could be utilized for this purpose.

In general, a more active committee on drug selection should be established with a wider representation of the various basic medical specialities in the faculty of medicine. All requests for inclusion of new drugs should be fully justified and carefully studied in the light of actual need and available resources. In addition, adequate measures should be taken to promote the rational use of drugs.

National drug policy and procurement of drugs

The present procurement policy of the Ministry of Health is much more rational than in 1984. The number of drugs purchased in 1983 was 236; in 1987 this figure had risen to 263. However, the number of emergency purchases (indicating weak planning) decreased from 17 in 1983 to 7 in 1987. The policy aims to supply only essential, generic drugs to the public sector, using the national essential drugs list for guidance. The effectiveness of the programme on availability of essential drugs will be discussed in detail elsewhere (see p.22 and Annex 3c), but the results are promising. This may be illustrated by the fact that in a sample of 12 district hospitals and health centres an average of 66.8 drugs were available. Of these drugs, only 12% were non-essential for that level of care.

The Central Committee decision to combine all drug procurement of the Ministry of Health, Hadramouth Governorate, NDC, Army and Police could have a significant impact on improving rational procurement and careful use of scarce resources at a national level. The next step should be to draw up a genuinely national essential drugs list, which is practical and acceptable for all health care levels in the country. This is planned for November 1988.

Procurement by the Ministry of Health, concentrating on generic essential drugs using international tender, can be expected to benefit from the computerized inventory and procurement system which is presently being developed in collaboration with WHO and the Swedish Board for Health and Welfare. Establishing this system is a logical expansion of the existing semi-automated book-keeping equipment that has been operational since 1981 and it should actively be supported.

Drug Information

A drug information service should consist of a facility for reference, eg. a group of experts with access to a library and international literature, and a system to actively disseminate selected information to various categories of health workers, eg. doctors, pharmacists and medical assistants. Both components of such a drug information service need strengthening.

With regard to the reference facilities, the proposed computerized drug registration and information service will greatly facilitate access to and use of information on drugs, manufacturers, ingredients, etc. The newly established section of quality control and inspection, for which several staff members have been trained by WHO fellowships and for which the administrative structure has been created, should become operational as soon as possible (see p.26).

There is an obvious need to provide regular, objective drug information to prescribers and dispensers through, for example, a quarterly or six-monthly

bulletin or newsletter. However it is difficult to see how this could be achieved at present, principally because of the unavailability of suitable people to undertake it. Nevertheless a one-page newsletter could be issued from time to time to communicate the new developments of the National Drug Policy Programme to all doctors and other health workers in the country. At the same time relevant publications from WHO/EMRO, and especially the WHO/EMRO Drugs Digest and the WHO/DAP Essential Drugs Monitor, should be widely distributed. The possibility of recruiting and training a national clinical pharmacologist for the programme, for whom the production of drug information could be one of the tasks (see also p.34), should also be considered.

OBJECTIVE 2 Quantification of the need for the different essential drugs in the Lahej governorate

ACTIVITIES IN 1984-1988

Quantification of drug needs in Lahej

In April 1984 two WHO consultants, Dr. G. Walker and Dr. J. Maneno, visited the area and collected some information on morbidity statistics, which was very limited at that time. Based upon proposed average treatment schedules, a preliminary estimate of drug needs for three health units was made. The consultants proposed that a standardised drug supply system be started using drug ration kits in these three health units and one health centre. They also proposed a recording system to generate more reliable morbidity data for future drug need estimates.

These recommendations were all followed and in October 1984 another WHO consultant, Dr. H.V. Hogerzeil, reviewed the additional data and proposed a more definitive content of the drug ration kits for health units and health centres. During 1985 and 1986 several thousands of health unit kits were procured and distributed to an increasing number of health units (126 in 1987).

Quantification of drug needs for the country

In 1986 it was felt that the kit content should be reviewed and that a national drug need estimate was necessary. For this purpose Mrs. M. Helling Borda (WHO/DAP) and Dr. H.V. Hogerzeil (APO, WHO/EMRO), reviewed all existing data (by that time morbidity statistics on over 350,000 outpatient consultations in Lahej Governorate) and estimated the total drug needs for all health units, health centres and general hospitals in the country. In addition to the morbidity based estimates of drug needs for the kits, a survey was performed by project staff during the supervisory visits, and information was collected from health workers regarding drugs that were in short supply or in abundance. These comments were taken into account in defining the content of the new drug ration kit. During the quantification exercise 24 nationals were trained in the principles of drug need estimation.

The 1986 Quantification Report has been used for the new health unit kit (ordered in 1987) and for many other purposes. It is presently being used to set the maximum quantities of drugs supplied to health centres; to limit the range of drugs supplied to general hospitals (together with the CMS essential drugs list); as a guide for the indent for each governorate. The treatment schedules for estimating the drug needs for the health units and health centres, have been translated into Arabic and distributed to all health workers, including doctors and pharmacists. These schedules were used in the district training courses in rational drug use and in the training of medical assistants in the Health Manpower Institute (HMI). The estimates for the cost of drug ration kits for Lahej and Shebwa Governorates assisted in securing sufficient funds for these kits in the 1988 budget.

EVALUATION

Quantification of drug needs

The approach to drug need quantification has been systematic and has been developed in a phased manner, beginning with morbidity data collection in a limited number of health units and one health centre, discussion and agreement on standard drug treatment schedules, and provision of drug kits for 500 patients at health units in two districts in Lahej governorate. After a pilot implementation period a reassessment of the range of drugs and the quantities provided was carried out. This was followed by full implementation and regular provision of drug kits to all health units in Lahej and Shebwa governorates, together with the in-service training of approximately half of the prescribing and dispensing health workers.

Information obtained during the course of the evaluation revealed that health workers found certain imbalances in the quantities provided in the ration kit, notably a surplus of ferrous sulfate tablets and oral rehydration salts, and a shortage of antibiotics. These imbalances are caused by a number of factors. The inadequacy of the original morbidity data is one reason but the most important is probably the fact that prescribers are not following the standard treatment schedules. It is expected that the revised kit will more closely reflect the needs of the health units. It is however recommended that increased efforts be given to supportive (or supervisory) visiting of prescribers to encourage closer adherence to standard treatment schedules.

OBJECTIVE 3 Improvement of the system for the procurement, storage, transport and distribution of these essential drugs

ACTIVITIES IN 1984-1988

Procurement

In 1984 the CMS procured most of its drugs through Crown Agents in London, who gave a flexible and reliable service at reasonable prices. The first WHO mission advised procurement of drug ration kits through UNICEF, but analysis of the services and prices obtained from Crown Agents led WHO to advise against this later in 1984, and as a consequence a large number of kits was procured through them in 1985 and 1986. However, the World Bank loan required the procurement of kits to be through UNICEF. These arrived later in 1987. The final agreement on the use of the WHO/UNICEF revolving fund in October 1987 led the government to order drug ration kits again from UNICEF; these kits were ordered in October and arrived in June 1988. In July 1987 a WHO consultant, Prof. N. Islam, advised the government on drug procurement. For a description of the new centralized drug procurement policy, see p.12.

Storage

In 1984 the Central Medical Stores were still housed in an old and inadequate building. However, in the course of 1985 the move was made to another more spacious building. Some storage equipment was ordered through WHO in 1985. A semi-automated book-keeping system had been operational since 1980, and is still giving good results. Monthly stock records with safety stock levels, reorder levels and warnings are produced, as well as basic consumption data per governorate. This system was started without any WHO assistance. Seven staff members have been trained, using WHO fellowships, by attending the 12-week Crown Agent's store management course in England and, for some, with an additional 2-week attachment to UNICEF in Copenhagen.

Regional stores in Lahej, Abyan and Hadramauth governorate were built in 1987 with technical support from WHO and financial support from the Norwegian Government through the World Bank. The buildings have now been finished apart from the compound wall and the shelving which will be supplied by the government. For each store a truck, a pick-up and a forklift are being supplied. The cars have already arrived and are being kept separately for use by the stores only. The stores will function: as delivery points for the three-monthly indentments from the regional hospitals and health centres; as delivery points for the health unit drug ration kits; as centres for the supervision of stores in hospitals and health centres in the governorate, and for some emergency stocks. Three more regional stores, for the remaining governorates Sheboa, Mahra and the island of Sokotra, have been included in the Second Health Development Project of the World Bank which will start in 1989. The regional store keepers were trained by WHO fellowships; one went to the WHO Regional Training Course in Amman, which was held in Arabic, and two attended the Crown Agents' course in London.

Distribution to health units

Distribution of drug ration kits started in the pilot project in Lahej governorate in July 1985 (three health units and one health centre). The data on morbidity and drug use in these institutions were the basis for the first quantification exercise in October 1984. Immediately after that, monthly kits for 15 health units were packed by CMS pending the arrival of larger numbers of kits from Crown Agents and UNICEF. In February 1985 Tuban district was included, followed by Dhala district in April and Radhfan district in October 1985. Hardly affected by the events in January 1986 the two remaining districts in Lahej governorate, Yaffa and Tor-Al-Baha, joined in May 1986. All four districts in Shebwa governorate were included in mid 1987. This has brought the total number of health units being supplied with drug ration kits to 126, which is 40% of the total number in the country.

The distribution system is based on two kits. The contents of the first kit, which is ordered from overseas, is given in Annex 2 A. A second kit containing dressings, disinfectants, ointments, syringes, envelopes and other disposables, is prepacked in Aden and distributed (Lahej governorate) or packed at the district level from bulk amounts supplied to the district collection point together with the drug kits (Shebwa governorate). Drug kits and the bulk supplies are delivered to the district level collection points at three-monthly intervals. Distribution of kits to health units is the responsibility of the district, but is usually arranged in such a way that the health unit worker collects his new kit every month from the collection point, for which he receives a travel allowance of YD 3 (\$ 9.00). This allowance has been paid from WHO project funds.

For each district one collection point has been selected, which is usually the district hospital or the major health centre. This was traditionally the place from which the health unit was supposed to receive its drugs. The number of health units served by one collection point is usually between five and ten. In Lahej governorate a supervisor has been appointed in each district. This person has been trained specifically by attachments to the programme in Aden and the CMS and by involvement in district workshops. He has been supplied with a motorbicycle costing \$ 600. In Shebwa funds were insufficient to do this and no supervisors have been appointed.

An introductory workshop was held in each district in which the new drug distribution system was started, and to which all district and peripheral staff attended. At these meetings the content of the kit, the record form and the standard treatment schedules were distributed and discussed. In three Lahej districts (Radhfan, Dhala and Tor-Al-Baha) a one-week training course in patient management and rational drug use was also held. In many districts the new monthly kit is only issued in exchange for the previous month's completed record form.

In governorates where drugs are not supplied by kits, health units request their drugs from the district health centre or hospital at three-monthly intervals and receive an amount which partly depends on the amount available at these places ("indent" system).

Distribution to health centres and hospitals

Health centres and hospitals request drugs from CMS at three monthly intervals; specific months have been designated for each institution. The request, screened by the regional supply officer, is scrutinized by the pharmacist in CMS, and only items that are designated for use at that level of health care (district hospital, teaching hospital, specialized units), are being supplied. For health centres and district hospitals quantities are limited by the estimates from the WHO quantification study.

The few health centres in the two project governorates (five in Lahej and one in Shebwa) were originally planned to be included in a kit system, using kits that were packed by CMS. In view of their low number this was discontinued and they are now treated like all other health centres.

Record form

In 1984 WHO advised on a standardised record form for health units, designed as a tick-sheet and listing exactly the diseases and complaints that the health workers were expected to diagnose and treat. This form was tested, adapted, and printed in Arabic (see Annex 2C). Although intended to be filled in after every patient contact, daily practice seems to be that the form is completed once a month from the daily patient attendance record book.

Record forms from health units in Dhala and Tuban district in Lahej during 1985 and 1986 and covering 342.979 outpatient consultations were used for the WHO quantification study, on the basis of which the content of the kit was revised.

Transport

In 1984 no distribution of supplies was arranged by CMS as all health centres and hospitals came to collect their drugs at three-monthly intervals. For the project areas (Lahej and Shebwa) CMS now delivers the drug ration kits at three monthly intervals to each district collection point. In Lahej there are approximately seven such points (the five districts plus two central health units that are on the route); in Shebwa there are only four. As the itinerary can be planned carefully the number of trips is so far limited, although the number may increase in the future. In 1985 WHO supplied a truck to the programme for this purpose; in 1988 a four-wheel drive truck was supplied for those districts that are difficult to reach.

Training

Apart from training in procurement and drug storage (see p.18 and 24) and rational drug use (see p.28), WHO fellowships were awarded to three senior officials from CMS and Lahej governorate for a study tour to Kenya in 1985 and Dr. Salami attended an international workshop in Nairobi in 1984. A summary of all fellowships in 1984-87 is given in Annex 1D.

EVALUATION

Procurement

An evaluation of the procurement system has been given under Objective 1 (see p.14)

Storage

The Central Medical Stores is well organized and well equipped with handling equipment, cupboards and shelves. Its operations are semi-automated with a bookkeeping machine that gives essential though not very detailed information on inventory and drug utilization. Improvements since 1984 are mainly due to the efforts of national staff and management. The only input from WHO has been some essential storage equipment and several fellowships (15 fellowships on procurement and storage, of which eight attended the Crown Agents course in England). It is encouraging to see that several visitors and trainees from overseas have visited the CMS for training purposes (eight trainees from Vietnam, Zanzibar and Iraq, see Annex 2D). These visitors have been very enthusiastic and have indicated that they found their stay very useful.

When drugs are issued (in response to requests from the district hospitals and health centres) the staff at the CMS only provide those which are on the essential drugs list and are in line with the level of specialization of staff in the institutions. The maximum quantities issued are based upon the WHO quantification report of 1986. The three-monthly requests from the institutions do not automatically follow the list of essential drugs for that level of care and as a result many non-essential drugs (drugs not assigned for use at that particular level) are requested. The CMS pharmacist has to review the request and will only supply the appropriate essential drugs.

EXAMPLE: Drugs requested on 25 January 1988 by Mukheras Health Centre (600 km from Aden, in Abyan governorate) arrived on 24 Feb 1988; of 159 drugs requested, 77 drugs were supplied and 82 were not; only 11 of the drugs that were not supplied were essential drugs.

It is recommended that special request (indent) forms be introduced, which list the drugs and medical items that are available for each level of health care, stating pack size. This would make handling at CMS easier because of the standardized format of the request and because the institutions could not request any items that are not regularly available and assigned for that level of health care. An alternative could be to have one standardised request form, on which the minimum level of health care is indicated for each item.

It is also recommended that CMS in Aden, in view of its excellent performance, is used more often for practical training in good storage and inventory control, especially for Arabic-speaking trainees.

Distribution to health units

A detailed study into the impact of the programme on availability of essential drugs at health units was performed (see Annex 3 for full details). As only limited baseline data from 1984 were available, availability of essential drugs in the project area (Lahej and Shebwa governorates) was compared with availability in a non-project area (Abyan governorate). Essential drugs were defined as those 34 drugs that were designated for health units in the National List of Essential Drugs of 1985. A representative sample of 19 health units within the project area and 7 health units outside were visited (see Annex 3A), and availability of essential and non-essential drugs was recorded. In health units in the project area an average of 28.7 essential drugs were available; outside the project area this figure was 17.1; this difference is highly significant ($P < 0.001$). It can therefore be concluded that the availability of essential drugs is better in the project area than outside. The reverse applies for the availability of non-essential drugs. In health units in the project area an average of 1.4 non-essential drugs were in stock, while outside the average number was 17.4 ($p < 0.001$).

Table 1 Availability of essential drugs at Health Units (average numbers)

| | Total nr. of drugs | Essential drugs | Non-essential (1) drugs |
|---|--------------------|-----------------|-------------------------|
| Health units in project area (n=19) | 30.1 (+1.17) | 28.7 (+0.96) | 1.4 (+0.83) |
| Health units outside project area (n=7) | 35.5 (+3.38) | 17.1 (+1.16) | 17.4 (+2.52) |

(1) Non-essential for that particular level of health care as stated in the National List of Essential Drugs, 1985

Having concluded that the availability of essential drugs is better in health units in the project area, it can also be concluded that nearly all drugs that were selected for use in health units were actually available, as the drug ration kit contains 27 drugs and small quantities of seven infrequently needed drugs are supplied additionally on request.

Cost of drugs provided by kits and indent

The cost of drugs in each ration kit is YD 39.200 (almost \$ 115). The kit is intended to be sufficient to treat 500-750 patients (i.e. an average cost of \$ 0.15 - 0.23 per patient). To make comparisons of these costs with those of drugs provided by indent via district hospitals or health centres, details, including their cost, were obtained of all drugs supplied to two representative non-project health units. Although these health units were seeing very different numbers of patients (approximately 300 vs 1000 per month) the amounts and cost of the drugs provided in 1987 were similar (\$ 1100 vs \$ 1225). The average drug cost per patient contact showed therefore considerable variation, from \$ 0.09 to \$ 0.32.

In view of this wide variation of average cost per patient contact in the non-project area it can be concluded that the traditional indent supply system is only to a limited extent related to morbidity or need. It encourages individual health workers to use drugs in their own idiosyncratic way. The kit system is of a similar average cost to the indent system and while it does not ensure the rational use of drugs it sets the borders within which rational drug use is more likely. It should be recalled that, although the average number of drugs available in health units within and outside the project area was similar, health units in the project area had only 5% nonessential drugs in stock while outside the project area it was as high as 50% (see Table 1 on p.22).

Availability of drugs in health centres and hospitals

The availability of drugs was also studied in a sample of six health centres and six hospitals, both within and outside the project area. However, as no specific programme had been developed for this level of health care, these facilities were studied as one group. An average of 55.1 (range 19-96, SE 7.7) essential drugs and 12.6 (range 0-29, SE 2.9) non-essential drugs were found to be available; of the overall average of 66.8 available drugs, only 17% were non-essential.

It can be concluded that, although an average of 55.1 essential drugs implies a reasonable range of essential drugs being available, only about half of the essential drugs designated for the health centre and district hospital level are actually in stock. On the other hand, the low number of non-essential drugs indicates a rational procurement and distribution system, especially if it is realized that most of the non-essential drugs consist of old stocks that had not been destroyed or returned. The overall conclusion is therefore that the system of procurement and distribution of drugs to health centres and district hospitals is reasonably rational, but that insufficient essential drugs are being distributed.

It is therefore recommended that the present distribution system to hospitals and health centres be continued, but that more essential drugs, especially those designated only for these levels of care, be made available for district hospitals and health centres.

Record form

The morbidity record form developed by the project for health workers to report their monthly workload appears to have been used successfully and has provided information whereby drug use can be related to patient diagnosis or health problems. Ways of integrating the form into a more general and PHC oriented health information system should be explored.

Transport

The provision of four-wheel drive vehicles (both pickups and a lorry) have been crucial to implementing an efficient drug kit delivery system. The supply of motorcycles to district supervisors at a relatively modest cost (US\$ 600 each) has also been extremely important in assisting these people in being able to travel to health units.

Given the particularly rugged terrain of much of the country the provision of four-wheel drive vehicles and motorcycles has been completely justified. Without them there was no likelihood that kits could have been delivered to the many health units located in very inaccessible places. With the further expansion of the project to the remaining governorates it is recommended to continue to provide a small number of similar reliable all-terrain vehicles, as well as motorcycles to all district supervisors.

Training

Fifteen WHO fellowships have been awarded to ten staff members for studies in procurement and storage (see Annex 1D); of these, eight were awarded to attend the Crown Agents course in the UK. The course is fairly expensive, but gives a good theoretical background to inventory control, storage and distribution. It is commendable that all ten staff members involved have returned to the Ministry of Health, and that all ten are actually performing the duties they were trained for. All key personnel in the Central Medical Stores, as well as all three future managers of the Regional Medical Stores, have attended the Crown Agents course; the complete top and second level staff members in the Department of Pharmacy of the Ministry of Health have been trained with WHO fellowships. The conclusion is that the selection of candidates has been optimal and that the training programme has been planned well by the national programme coordinator.

A similar conclusion has to be made when the impact of all WHO fellowships is analyzed. In the period 1983-87 a total of 35 fellowships were awarded to 25 fellows (see Annex 1D); the average duration was 10.8 weeks and the average cost was US\$ 4811. Nearly all fellowships were awarded for practical training, and only three for formal postgraduate training and just one resulting in a postgraduate degree (a MSc in drug quality control). Again it is heartening to note that all fellows have returned to their country and are working in the Ministry of Health. Only four fellows are presently not active in the job for which they were trained (the production of IV fluids and ORS - the manufacturing plant was originally planned but has not yet been built). These fellows are now working in their original positions in the National Drug Policy Programme and the Teaching Hospital.

Availability of drugs in the private sector

A small survey was carried out to study the availability of essential drugs in the private sector. Three private pharmacies in Zingibar and Beyham were visited and all drugs available for sale were recorded. The results are shown in Table 2.

The results show that the average number of 80 drugs available to the public is consistently small. The percentage of essential drugs (35%) is disappointingly low, as is the percentage of generic drugs (11%). This result gives an impression of the selection of drugs by the National Drug Company.

The average number of only 28 essential drugs available from the private pharmacies show that less than 10% of all drugs on the National Essential Drugs List are available through the private channels. In a way this can be

Table 2 Availability of drugs in three private pharmacies, Dem.Yemen, 1988

| | Total nr. of drugs | Essential Drugs (1) | Generic Drugs |
|-------------------------|-----------------------|------------------------|------------------|
| Zingibar private pharm | 82 | 32 (39%) | 14 (17%) |
| Zingibar NDC pharmacy | 72 | 22 (30%) | 9 (12%) |
| Beyham private pharmacy | 87 | 29 (33%) | 4 (5%) |
| Average | 80 | 28 (35%) | 9 (11%) |

(1) Essential defined as included in the National List of Essential Drugs, 1985

interpreted as a compliment to the National Drug Policy Programme and the supply system for the hospitals and health centres. It obviously makes no sense for the private pharmacies to sell drugs that are available free of charge in the government health institutions. As a consequence the private pharmacies concentrate on non-generic non-essential drugs, exactly those that are not available in the public sector.

In view of the fact that the National Drug Company's budget is three times that for the Ministry of Health, the real impact and cost-effectiveness of the private market drug supply system with drugs procured through the NDC can be questioned. It is therefore recommended that the selection of drugs procured by the NDC be discussed with and approved by the Ministry of Health, and that the annual budget for the NDC be reduced in favour of an increased foreign exchange allocation for the Ministry of Health that has shown itself capable of procuring essential drugs only.

OBJECTIVE 4 Establishment of a small basic drug quality control laboratory

ACTIVITIES IN 1984-1988

Drug quality control

In 1984 a very small one-room laboratory was available in the Teaching Hospital which was not operational because of a lack of trained staff and basic equipment. In June 1986 a WHO consultant, Mr. E.Kkolos, Director of Pharmaceutical Services of Cyprus, visited Democratic Yemen to advise on the establishment of a drug quality control laboratory and on the necessary staff, training and equipment.

In 1986 three pharmacists were awarded WHO fellowships to study basic drug quality control techniques for one year in Bombay, Budapest and East Germany (the selection based on language abilities of the fellows). All returned to Democratic Yemen early in 1988; the person who went to Bombay received a MSc after a two-month extension.

In 1987 the government selected a three-room facility for the new laboratory, and a WHO consultant, Mr. L. Mettas from Cyprus, advised on the exact type and amount of equipment, glassware, disposables, reagents and chemicals, that would be needed to start the laboratory. He also advised on the lay-out of the new laboratory premises. In June 1987 WHO ordered all the supplies, as indicated by Mr. Mettas, for a total value of \$ 39,000. Not all had arrived by March 1988. Late in 1987 the rooms were equipped with shelves and benches, procured locally with WHO funds.

It is intended that, as soon as the equipment and chemicals have arrived, two pharmacists will be awarded a four-week fellowship in drug quality control in the laboratory in Cyprus, to learn from Mr. Mettas the daily use of the equipment that has been selected. Mr. Mettas could then join them for two months in Aden to assist the team in setting up the equipment and the protocols.

EVALUATION

Work on the establishment of the Drug Quality Control Laboratory has proceeded satisfactorily, following the visits of the WHO experts in November/December 1986 and April/May 1987. The necessary local staff has been trained and are available. An adequate building has been identified and the necessary worktops and shelving have been installed. Some improvements to the water supply, electricity and air conditioning are still needed and are being attended to by the Ministry of Health. Some of the equipment ordered through WHO has arrived and

the balance is awaited. Considering the above it will be possible to start the work planned in the first phase of this project by September 1988. This should contribute significantly to better drug management. It must however be noted that the sum of US\$ 100.000 required to commence the second stage of the project has not yet been secured. The allocation of this amount in the 1990/91 WHO country budget is strongly recommended.

OBJECTIVE 5 Training of the different categories of personnel involved in the use of drugs so that more rational prescribing and dispensing of drugs would be achieved

ACTIVITIES IN 1984-1988

National workshops

Three national workshops have been held, in Aden (January 1985), Abyan Governorate (December 1985) and Hadramuth (November 1986). A total of 180 participants have attended, mostly doctors and pharmacists in senior positions in the public sector. During these workshops the concept of essential drugs and rational drug therapy were discussed, and the national drug policy programme was presented.

Introductory workshops

In Lahej (Radhfan, Tuban, Dhala, Tor-al-Baha, Yafa districts) and Shebwa (Attaq and Beyham) a total of seven introductory workshops were organized. These workshops lasted three days and a total of 110 health workers have attended (average 16 per workshop). The programme included on the first day open discussions with the district governor, party officials, the director of health services, supply officers and hospital staff on the essential drugs programme. Detailed discussions took place with district health workers on the second and third days, introducing the drug ration kit, distribution system, record form, standard treatment schedules, and supervisory procedures.

Retraining of health workers

In Lahej (Radhfan, Dhala and Tor-al-Baha) three workshops were held to retrain health workers in the rational use of drugs. These workshops lasted a week and were attended by a total of 80 participants (average 27). Teaching staff included specialists from Aden, guided by Dr. Sallami and programme staff. During these workshops attempts were made to improve the diagnostic and therapeutic abilities of the health workers, concentrating on common diseases and symptoms and stressing the use of standard therapy schedules, which were discussed and distributed.

Graduate training

Basic training of medical assistants is carried out at the Health Manpower Institute (HMI) in Aden. The National Drug Policy Programme has, for many years, been involved in the teaching, for which the standard therapy schedules are a central theme. In November 1986 a WHO consultant, Dr. I. Borda, advised on the curricula for the institute. In general the programme includes the concept of essential drugs and rational drug use. Dr. Borda has, on several occasions, given guest lectures.

The medical faculty started its training programme in the seventies and medical students have graduated during the last five years. The curriculum is outdated and somewhat overburdened with information that has little relevance to the situation in the country. During 1985 Dr. Borda visited the faculty for discussions about adapting the curriculum to include the essential drugs concept, and in November 1986 he presented a detailed report on the changes that would be desirable. However, no changes have been made so far. A new Dean has been appointed recently, and early in 1988 the WHO Health Manpower Development group in the Regional Office advised on an extensive overhaul of the curriculum, reducing the total length from seven to six years. Dr. Borda's report is presently being considered.

Dr. Borda, on many occasions, has given guest lectures at the faculty (during his visits in April 1984, January 1985, November 1986 and October 1987).

Treatment Guide

In 1984 several examples of district treatment manuals from other countries were made available to the programme, with the intention that national experts could review and adapt them to the situation in Democratic Yemen. As this proved to be difficult a WHO consultant, Dr. James Bevan, visited the country in November 1985 to advise on the preparation of a patient management and treatment guide. In 1986 Dr. Bevan received a WHO Contractual Service Agreement to write such a guide. This draft document was submitted to the Yemeni authorities in 1987. Unfortunately the treatment schedules, which were used for quantification of drug needs and for all training activities, had not been available to Dr. Bevan, and the result was a treatment guide which had little relation to common practice in Democratic Yemen. The draft guide is more of a health reference book in the form of a small encyclopedia than a treatment guide for drug use, which was originally intended. It was decided to terminate the project.

EVALUATION

Rational use of drugs

In the present evaluation the actual situation with regard to the rational use of drugs and the possible impact of the programme were studied in three ways. First, in a sample of 19 health units in the project area and 7 units in non-project areas (see Annex 3A), the theoretical knowledge of health workers on the rational use of drugs was measured by means of a questionnaire consisting of five clinical cases and a few direct questions (see Annex 3B). Secondly, in every health unit in the sample the actual use of drugs was studied by analyzing the last hundred prescriptions, measuring the percentage of patients receiving an injection and an antibiotic, and the average number of drugs per prescription. Thirdly, prescriptions in several general hospitals, health centres and the teaching hospital were analyzed, concentrating on the treatment of certain "tracer" diseases (upper respiratory tract infection, urinary tract infection, osteoarthritis, and hypertension). The full report on these studies is given in Annex 3 but the results are summarized below.

Theoretical knowledge on rational use of essential drugs

The results of the survey among a sample of 45 health workers on theoretical knowledge on rational drug use are presented in Annex 3D. A summary of the scores is given in Table 3.

The results show a difference between the scores of health workers that have and have not received additional training. However, not all workers had received such training (and some had been transferred since) and the difference between the area as a whole in which training was given and that in which it was not are therefore less obvious. This is especially true in the case of medical assistants. The explanation for this phenomenon can probably be found in the fact that the basic training for medical assistants is of very good standard, with the rational use of essential drugs being a prominent part of the curriculum.

Table 3 Theoretical knowledge on rational use of drugs among rural healthworkers, Democratic Yemen 1988

| | Practical nurses (n=18) | Medical assistants (n=19) | Doctors (n=8) |
|---|----------------------------|------------------------------|------------------|
| Overall score (max.27) | 16.1 | 19.1 | 20.1 |
| Area in which no additional training had been given | 15.3 | 18.5 | |
| Area in which additional training had been given | 17.6 | 18.2 | |
| Within area that received additional training: | | | |
| Health workers that received no additional training | 16.4 | 15.6 | |
| Health workers that received extra training | 19.5 | 20.0 | |
| Hospitals and health centres | 14.0 | 20.3 | 20.1 |

It is interesting to compare the difference in score between project areas and non-project areas, i.e. areas with and without kit supply (see Table 4). This table shows that practical nurses seem to have benefitted most from being included in the project. The reversed difference for medical assistants, which is somewhat disturbing, might be explained by the fact that the educational level of medical assistants in Abyan (the non-project area in the survey) is known to be especially high.

Table 4 Theoretical knowledge on rational drug use among rural health workers in Democratic Yemen, 1988

| | Practical nurses (n=16) | Medical assistants (n=12) | Total (n=28) |
|-------------------------------------|----------------------------|------------------------------|-----------------|
| Project area (kit supply) | 17.1 | 17.8 | 17.3 |
| Non-project area (no kit supply) | 13.0 | 19.5 | 16.7 |

When the scores of practical nurses were analyzed in detail it became clear that both the introduction of the kit system and the district training courses seem to have contributed to the effect: practical nurses who had not been included in the project scored 13.0, those who had been working with the kit scored 16.5 and those who had been working with the kit and had received the additional training scored 17.6.

It can be concluded that there is a trend, particularly for practical nurses, in increasing levels of knowledge associated with the degree of intensity of the programme.

It should however be realized that, although from the side of the programme management considerable effort has been put into the various training programmes, the actual training received per health workers was still limited in time. Moreover, for many health workers the course took place one or two years before the survey, and some of the workers have been transferred since. This underlines the fact that continuous training and supervision remains needed. It is heartening to see, although no specific evaluation was carried out in that respect, that the basic training of medical assistants in the Health Manpower Institute in Aden seems to result in a good general standard of health workers in the field.

Rational use of drugs in practice: Health units

In a sample of 17 health units in the project area and 5 outside, actual drug use was studied by measuring the following parameters in the last hundred prescriptions of the institution:

- 1 Percentage of patients receiving an injection
- 2 Percentage of patients receiving an antibiotic
- 3 Average number of drugs per prescription.

The results, which were also compared with similar data from hospitals and health centres that were not included in the training programme, are given in Table 5. From this table it can be seen that the average number of drugs per prescription is considerably higher in health centres and hospitals (3.01) than in health units (1.49). The percentage of prescriptions containing an antibiotic is 46 in health units in the project area and that receive kits, and 67 in health units outside the project area that receive drugs by indent. The percentage of injections shows a similar difference between health units that receive kits and those that do not (25 and 58 respectively).

Table 5. Analysis of last 100 prescriptions in 33 rural health institutions

| | % with injections | % with antibiotics | Average nr.of drugs per prescription |
|---|-------------------|--------------------|--------------------------------------|
| Health units in project area (n=19) | 25 | 46 | 1.49 |
| Health units outside project area (n=5) | 58 | 67 | n.a. |
| Hospitals and Health Centres (n=9) | 32 | 61 | 3.01 |

It can be concluded that in the project area drugs seem to be used in a more rational way, both in the percentage of injections (25 versus 58) and in the percentage of antibiotics prescribed (46 versus 67). The effect seems mainly to be correlated with inclusion in the programme at all rather than with additional training in rational drug use.

It is recommended that continuing emphasis is put on the retraining of health workers, by district workshops and by an intensive system of supervision which should be extended to all project areas. Such supervision should not be limited to the supply and storage of essential drugs, but should include medical issues and the rational use of drugs as well.

Rational drug use in practice: health centres and hospitals

As mentioned in the previous section and in Table 5, 32 % of outpatients in health centres and hospitals received an injection and 61% an antibiotic. The average number of items per prescription was 3.01.

Partly for comparison with drug use at the health units, and partly as a more detailed study of prescription patterns in Democratic Yemen in general, a more specific analysis was made of drug prescribing for four tracer conditions

In another sample of hospitals and health centres from which prescription forms were collected. Prescriptions from the Teaching Hospital in Aden, from Laudar and Dhala district hospitals, and from Nissab, Mukheras and Hareer Health Centres were analyzed. The four conditions reviewed were: upper respiratory tract infection (189 prescriptions), urinary tract infection (83), osteoarthritis (29) and high blood pressure (33). The detailed results are given in Annex 3G and a summary of the results is given below.

The proportion of patients with upper respiratory tract infection receiving an antibiotic was very high at 78% for the Teaching hospital, 88% at the district hospitals and 82% in health centres (Annex 3G, table 8-9). The majority of the conditions included under respiratory tract infection were stated in terms which indicated that they were probably due to a viral agent eg. coryza or influenza. Even in the minority of cases where a diagnosis of tonsillitis was stated many would be viral. However, the Ministry of Health standard treatment schedules advocates phenoxymethylpenicillin as appropriate treatment for cases of tonsillitis, yet this was given in only 22% (with a further 27% receiving procaine benzylpenicillin injections) of patients who were prescribed an antibiotic. The other patients received a wide range of antibiotics.

As would be expected almost all patients diagnosed as having a urinary tract infection were treated with an antibiotic (Annex 3G, table 10-11). However only 4% were prescribed sulfadimidine and the most frequently used antibiotics were cotrimoxazole (43%) and ampicillin (20%). Over a quarter of patients were prescribed inappropriate antibiotics either on grounds of efficacy (chloramphenicol, erythromycin and procaine benzylpenicillin) or cost (nitrofurantoin). In addition a substantial proportion of patients were receiving other drugs inappropriately i.e. about 40% anticholinergic drugs and around 20% furosemide.

Analysis of prescriptions for osteoarthritis (Annex 3G, table 12) revealed a high usage of the relatively expensive drug ibuprofen (69% of patients in the teaching hospital) and frequent prescription of more than one non-steroidal anti-inflammatory drug per patient. Eighty percent of all patients received a vitamin preparation.

Overall the treatment of hypertension was unsatisfactory (Annex 3G, table 13). This applied to the choice of hypertensive drug (71% receiving methyldopa, only 24% a thiazide and no patients reserpine) but also the high degree of treatment with diazepam (68%) and furosemide (54%), both of which have a very limited use, if any, in the treatment of hypertension.

In summary it can be concluded that while very few non-essential drugs are being prescribed, several essential drugs are consistently overprescribed eg. antibiotics in the treatment of respiratory tract infections; expensive alternatives such as methyldopa in hypertension and ibuprofen in arthritis; inappropriate drugs, for instance diazepam and furosemide in hypertension and furosemide for urinary tract infections. These irrational prescribing practices are only likely to improve if prescribers are more effectively included in continuing education and if this is supported by attractively presented objective information.

Health centres and hospitals have so far not been included in the National Drug Policy Programme other than indirectly through selection and availability

of drugs by the Central Medical Stores. The present study shows that very few non-essential drugs are being prescribed; however, there is a marked over-consumption of the essential drugs. This result ties in with the previous observation that only 17% of drugs available in hospitals and health centres were non-essential, with many of them being old stock. It shows that the supply system has drastically improved and rationalized the selection of drugs available to prescribers and patients; however, within the scope of essential drugs being available, there is room for improvement in their rational use.

It is therefore recommended that training seminars be organized for staff of hospitals and health centres, as is done for rural health workers. This is especially important as it was felt that rural health workers were to a great extent influenced by the prescription patterns of the doctors. It is also recommended that a strong effort be made to include teaching staff and clinical teachers of the Medical Faculty and the Aden teaching hospital in this exercise (see also below). It is further recommended that a treatment guide be prepared for use by general doctors and other prescribing staff (see p.35).

Graduate training

The programme has established good links with the Health Manpower Institute. Several programme staff are regular lecturers at the HMI, and the curriculum has been developed in close collaboration with the programme. WHO consultants have given guest lectures to the students, and students have, on several occasions, assisted the programme in the analysis of morbidity statistics from programme areas.

In spite of several WHO consultations the present curriculum of the medical faculty does not contain any teaching in clinical pharmacology and the essential drugs concept. Recommendations made by WHO consultants have not been taken into consideration so far. Basic pharmacology is taught at a late stage of the medical study (fifth year). The present situation is obviously a major setback to the programme.

The participation of two members of the evaluation team in the workshop on revision of the curriculum held in the Medical Faculty (20-21 March 1988) provided an excellent opportunity to propose new changes, which were basically accepted by the faculty and participants of the workshop. It is now provisionally agreed to teach basic pharmacology in the third year and clinical pharmacology in the fifth year as part of internal medicine, with strong emphasis on the essential drugs concept. To achieve this will require persistent follow-up and a more active involvement by the national programme. In view of the present lack of teaching staff in basic and clinical pharmacology it is recommended that assistance be given to the Faculty of Medicine in the preparation of the training programme and preparation of a comprehensive syllabus for approval and use by the Faculty.

In view of the lack of qualified pharmacologists in the country the programme should identify two nationals with a medical background who are interested in the essential drugs concept, for further training in clinical pharmacology. These persons should be recruited by the programme to coordinate all basic and post-graduate training, to assist in the preparation of the treatment guide, to establish a small centre for drug information and to prepare the national drug policy newsletter (see also p.14).

It is also recommended that yearly prizes be established for the best essay on essential drugs, with one prize of \$ 1000 for doctors and final year medical students, and another prize of \$ 500 for rural health workers and final year students of the Health Manpower Institute.

Treatment Guide

At an early stage in the programme it was recognized that to use drugs rationally prescribers working particularly at health units required additional training and continuing support. It was also agreed that they would be assisted in rational drug use if they all had a copy of a locally appropriate treatment manual.

The draft "Treatment Guide" prepared by a WHO consultant in 1986 does not deal adequately with many of the most common and important diseases and illnesses seen in Democratic Yemen and includes many conditions of very limited importance in the country. It is more of a health/illness dictionary than a treatment guide which is especially relevant to patient conditions seen at health units and centres.

The decision to stop the project was unfortunate, but necessary. The principal problem was that the contract to write the guide was made at a time when national treatment schedules had not yet been discussed and drawn up. A second problem was that the consultant was not very receptive to the specific needs of the programme and suggestions by the programme staff, resulting in a final product with little relevance.

The basic justification for developing a treatment guide to be provided to all prescribing health workers at health units and centres remains and this should be given high priority. During our visits to rural facilities and discussions with many health workers it was clear that they would welcome a treatment manual relevant to their day-to-day work. Almost all of those visited had copies of the duplicated short standard treatment schedules developed in 1984 by the programme. They were said to be useful and frequently referred to. Health workers who did not have the treatment schedules available, complained that their predecessors had taken the copy with them.

In view of the unsuccessful experience with this component of the programme it will be particularly important that care is taken to select a person to prepare the initial text who is fully conversant with what is required. While it is understood that it was not possible in 1984 for national experts to prepare a suitable text, it is recommended that further efforts be made to identify a local expert to adapt the treatment schedules from the 1986 quantification report and other materials which the WHO could provide.

National workshop

In view of all the above observations and the need to involve as large a number of physicians and national staff as possible, it is recommended that the number of participants to the Fourth National Workshop on Essential Drugs planned for November 1988 be increased to approximately 200. The objectives of the workshop would be to discuss the new draft National Essential Drugs List (which will include the private sector, the Army and the Police), and to review and adopt a National Formulary which is presently being prepared.

OBJECTIVE 6 Establishment of a small unit for the manufacture of intravenous and injectable fluids and another for the production of oral rehydration salts.

ACTIVITIES IN 1984-1988

Local production of ORS and IV fluids

No production of drugs, vaccines or injectables exists in Democratic Yemen. To analyze the need for and feasibility of the establishment of a local manufacturing plant for IV fluids and ORS two WHO consultants, Rafaelli and Faust, visited the country in March 1984. They doubted whether a plant for IV fluids would be competitive and advised that a foreign pharmaceutical company be invited to establish such a facility. They were also of the opinion that the ORS plant could only be feasible if combined with the IV plant.

In December 1985 a consultancy firm was contracted by WHO to reassess the situation, and the detailed report of their consultants Birch and Krogboe concluded that savings of 7-13% were possible after a number of years, assuming that demand and revenue would increase over the years.

In view of the strategic importance of the local production of intravenous solutions and the fact that the necessary staff are already in government service a request for support has been made to DANIDA. Because of a misunderstanding the request was not granted high priority by the Ministry of Planning and was, consequently, not considered in detail during discussions with the donor. It will again be presented in 1988.

In the meantime two pharmacists have been trained for three months in Budapest in the production of IV fluids and ORS, supported by WHO fellowships. They returned in 1987. Two pharmacy technicians were trained during six months in 1987, in Amman.

EVALUATION

Local production of ORS and IV fluids

The evaluation team reviewed the various consultant reports and considered that the setting up of a IV fluid and ORS manufacturing plant would ensure the ready availability of life saving drugs in amounts adequate to treat the population. However, in view of the estimated need of only 200.000 litres of IV fluids and 850.000 packets of ORS for a population of 2.4 million, it seems doubtful that demand will be enough to justify the investment and running costs of a large manufacturing plant. It is recalled that even much larger countries have decided against the establishment of such a plant, on these grounds.

ACTIVITIES IN 1984-1988

In the course of the programme a few other activities were started which do not fit within the original six objectives of 1984. These activities are: drug registration and legislation, and management support. These two subjects will be dealt with separately.

Drug registration and legislation

In 1984 an outdated drug law existed and there was no drug registration system. Especially after the meeting on the Revised Drug Strategy in Nairobi in November 1985 it became clear that registration and legislation are important mechanisms to restrict and rationalize the use of drugs. In July 1987 Dr. N. Islam, from Bangladesh, visited the country to advise on a national drug policy. In January 1988, after several postponements, Dr. B. Joldal from Norway was recruited as a WHO consultant to draft new drug legislation. This draft has been translated into Arabic and will be discussed in the Council of Ministers in April 1988.

In connection with registration it was arranged that Democratic Yemen would obtain the new Swedish computerized drug registration system. For this purpose two WHO consultants, Mr. H. Mandahl and Mr. P. Manell, visited the country in January 1988 to analyze the situation and collect the necessary material to adapt the standard software to the national specifications. Dr. Sallami and three staff members attended the WHO/DSE Training Course in Drug Registration in Berlin in September 1987, followed by a study tour to four drug regulatory agencies in Europe; two staff members attended a specific computer training course for the registration system, in Uppsala, in November 1987.

Management support

Staff

In the course of time more and more staff have been recruited for the programme, and by 1988 the total number had risen to approximately eight, including two pharmacists. Since September 1985 Dr. Ali Sallami, Ass. Deputy Minister of Health and Director of Pharmacy and Health Technology, was appointed as WHO national programme manager with a special service agreement with WHO.

Premises

At first the office of Dr. Sallami and the CMS were the only premises available to the programme. However, in 1986 a separate building close to CMS was made available by the Ministry of Health. This building contains several offices and store areas which can be used for prepacking and storing the essential drug ration kits. It is also the location for the machines for tablet counting,

tube filling and labelling that have been supplied by WHO and which are used to prepare the kits.

Office equipment

Some basic office equipment (photocopiers, calculators, stationery) have been supplied by WHO. In 1985 an English-Arabic FALCON computer was supplied, which, contrary to information given in advance, was not fully IBM compatible. As the computer proved of limited use for anything other than Arabic typewriting, another computer, an IBM/XT, was supplied in 1987. This computer is now frequently used by the Programme Manager for managerial tasks, including spreadsheet functions, wordprocessing of training materials and consultant reports.

Transport

In 1985 a landrover was supplied to the programme for use in supervision, training and management tasks. In 1988 another landrover was provided for the same purpose.

Coordination with WHO and technical support

In 1984 it was decided to arrange for six-monthly contacts between the national programme manager and WHO. After the first visit in 1984, staff from the WHO Regional Office (Dr. R.R.Chaudhury and later Dr. H.V.Hogerzell) visited Democratic Yemen in October 1984, January 1985, December 1985, November 1986 and March 1988; Dr. Salami visited the Regional Office in May 1985 and July 1986; Dr. Hogerzell met with Dr. Salami in Berlin in September 1987. This resulted in eight planned contacts in four years, of which five took place in Democratic Yemen; another three informal meetings during the WHA and international meetings have not been included. A detailed evaluation of the programme was planned for 1987 but was executed in March 1988.

EVALUATION

Drug registration and legislation

In view of the complex issues involved in drug legislation and registration and the division of responsibilities between the Ministry of Public Health and the National Drug Company, it is only in the last year that formal procedures have been agreed to update the drug law and arrangements made for drug registration. Prior to this, considerable preparatory work was undertaken, including the establishment of a national drug committee in 1984, three national workshops in 1985 and 1986 and the publication of the National Essential Drugs List in 1986.

The proposed new drug legislation will be discussed by the Council of Ministers in April 1988 and, after the necessary amendments, should come into force later this year. The fact that WHO/EMRO has arranged for a quick translation of the draft into Arabic has been very useful.

The registration system is likely to be very helpful in supporting the Ministry of Health in rationalizing the supply of drugs to both the public and

the private sector, in supplying the drug inspectorate with the necessary lists of drugs that have been approved for sale and use, and in producing updated versions of the National Formulary (all these facilities are available in the computerized system).

The two major developments (a new drug law and registration system) will provide a crucial framework for the National Drug Policy Programme and should actively be supported.

Management support

The evaluation team were impressed with the progress achieved in the successful implementation of most components of the National Drug Policy Programme over the four years 1984 to 1988. The team considered that this was principally a result of the leadership provided by Dr. Ali O. Sallami as the National Programme Manager, and the work of the members of his management support team. This management team has set realistic priorities and annual plans of work which have resulted in the phased implementation of the programme.

The equipment provided under the programme (including photocopiers, calculators, computers and three vehicles) have contributed to the efficient working of the management unit.

As increasing emphasis will be placed in the future on activities to encourage rational drug use it is recommended that the staff of the unit be expanded by appointing a person, trained in clinical pharmacology, to be responsible for this aspect.

DISCUSSION

In this section an attempt is made to answer the questions that were formulated in the introduction to this evaluation. The discussion will follow the questions posed there.

What has been the impact of the programme on the drug supply situation in the whole country since 1984?

In answering this question the public and private sector have to be dealt with separately. With regard to the private sector, the National Drug Policy Programme has only recently (1987) been involved in measures that may result in rationalization. The new procurement policy, according to which the National Drug Company will submit its selection of essential drugs to the Ministry of Health for approval prior to issuing the tender, is very likely to improve the situation. So far no effect of the new policy can be seen, but this could hardly be expected as the new drug orders have not yet arrived in the country. The new drug legislation and the planned computerized registration system are very likely to have a positive effect in the future.

The range of drugs available in the private sector seems limited (see p.24), with an average of only 80 drugs available in three rural pharmacies. Of these 80 drugs, only about one third were essential, many of the other drugs being non-essential branded products in consumer-oriented small packages. This suggests that, in general, only about one tenth of the country's range of essential drugs are available through the private sector. In view of this apparent limited impact on the people's health it seems doubtful whether it is justified that the NDC receives a foreign currency allocation for drugs which is nearly three times that of the Ministry of Health.

With regard to the public sector the impact of the programme is impressive. Especially commendable is the procurement policy by the Ministry of Health which concentrates on drugs on the Essential Drugs List, tendered for as generic drugs in hospital packages (see pp.12 and 14). The distribution procedure is very mature, with three-monthly indents by each health centre and hospital. The fact that the CMS pharmacist reviews the requests and adjusts the selection of drugs to the relevant level of care and their quantities to the expected patient load makes the allocation system very effective. This is well illustrated by the fact that only 17% of the drugs available in the health centres and hospitals were found to be non-essential, most of these being old stock (see p.23).

The fact remains that the average of 55.1 essential drugs available in health centres and hospitals is too low. For health centres with a regular staff of medical assistants and little emphasis on in-patient care the number would be adequate, but in the light of the government policy to staff all health centres with physicians it is not. The same applies for the general hospitals.

It can be concluded that the impact of the programme on the supply of drugs to the private sector has been negligible, but that the new procurement policy, the new drug legislation and the computerized registration system are powerful tools for the future. The procurement and distribution policy for the public sector is rational and effective, although the number and quantities of essential drugs present in health centres and hospitals were found to be rather inadequate.

What has been the impact of the programme on the availability and rational use of essential drugs in Lahej and Shebwa governorates?

In this evaluation the drug supply situation in the programme area (Lahej and Shebwa governorates) was compared with a non-programme area (Abyan governorate). In a representative sample of 19 health units in the programme area an average number of 28.7 essential drugs were available, as opposed to 17.1 in the non-programme area (see Annex 3D). The average number of non-essential drugs in the programme area was 1.4 (5%) and 17.4 (50%) in the non-programme area. Assuming that the present situation in Abyan represents the previous situation in Lahej and Shebwa, the improvement is impressive. These results show also that the availability of essential drugs to health units in the programme area is adequate, with 83% of all essential drugs selected for health units actually found in stock.

With regard to rational use of drugs this evaluation has studied both the theoretical knowledge and the actual practice of health workers both in and outside the programme area. The theoretical knowledge was studied by means of a standardised "test" based on five hypothetical clinical cases. A clear difference could be established between the scores of health workers that had received additional training in rational drug use and those that had not (see Annex 3D). This difference was especially obvious among practical nurses and further analysis of their scores suggested that both an inclusion in the programme (introductory workshop, drug supply by means of monthly ration kits) and the additional one-week training in rational drug use had contributed to the effect.

Actual prescription patterns were found to be different in and outside the programme area, with a considerably smaller percentage of patients receiving an injection (25% vs 58%) or an antibiotic (46% vs 67%) in the project area. Full details are given in Annex 3E. No clear relation with the additional training in rational drug use could be shown, suggesting that inclusion in the programme with selection and quantities of drugs being limited by the monthly kit supply are mainly responsible for the difference.

It can be concluded that the availability of essential drugs has drastically improved in the programme area, and that the present range and number of drugs available is adequate. Within the situation of a basic training of medical assistants which includes training in the rational use of essential drugs, additional training of health workers in part of the project area has resulted in a further improvement in their theoretical knowledge, especially among practical nurses. Actual drug use in the programme area has become more rational, with considerably fewer injections and antibiotics being prescribed.

How effective and efficient has WHO support been in the period 1984-1987?

In this evaluation an attempt is made to assess the effectivity and efficiency of WHO support to the programme. Full details on the nature and cost of WHO support in the biennia 1984-85 and 1986-87 are given in Annex 1.

Consultants

In the period from February 1984 to February 1988 a total of 20 different WHO staff members, consultants and temporary advisers produced 21 technical reports, which are listed in Annex 1B. The total cost of consultants support is \$ 104.946 over the two biennia (excluding five trips by WHO staff). This amount compares favourably with the costs of permanent expatriate staff if these would have been recruited for the programme. The average cost for the fifteen reports by external consultants is approximately \$ 6500 per consultation.

In Annex 1B the quality and effectiveness of each report has been assessed by analysing its recommendations, noting for each of them whether it was merely repeating a previous recommendation, expanding on an existing trend, or presenting a real innovation; and noting whether the recommendation was later implemented or not (or is still pending with the expectation that it will be implemented in 1988).

From a total of 216 recommendations, 156 (72%) have been implemented, with an additional 21 (10%) likely to be implemented in 1988. Of all recommendations, 45 (21%) were merely repeating things that had been said before, 117 offered helpful advice although building on existing trends, and 54 (25%) were really innovative.

There is very little material from other evaluations to be compared with these figures. The implementation rate seems high, and if this is taken as evidence of quality and usefulness of the reports, the result is encouraging. Some consultants, however, were dealing with a specific request and were expected to deliver a product rather than a set of recommendations (eg. an estimate of future drug needs, or a treatment guide). For these consultancies the quality of the product itself should be reviewed rather than the recommendations.

In concluding it can be said that the effectiveness of WHO consultants has been good, with an expected 82% of all recommendations and an expected 76% of innovative recommendations being implemented. Only two reports can be regarded as of low standard, with few innovative or useful recommendations. This implies that more than 90% of the reports have been useful and it can therefore be concluded that the WHO consultancy support has been efficient.

Supplies

In the two biennia under study supplies and equipment to a total amount of \$ 274.000 have been supplied to the programme. A detailed list is given in Annex 1C, in which the items are differentiated according to their purpose: management support, computer, training material, prepacking material, quality control and transport.

The effectiveness of the supplies may be measured by observations whether the goods are still available and in operating order, and whether they are actually used for the purpose they were intended for. After inspecting all the items on site the evaluation team concluded that no items are missing and that all, except the Falcon computer, are being used properly (see p.38). The drug quality control equipment is not yet operational but will be so in the near future.

It should be stressed here that the evaluation team is of the opinion that the vehicles supplied to the programme (two landrovers for the management team in 1985 and 1988, and six motorcycles for district supervisors) are being used up to capacity and constitute a vital tool in the day-to-day running of the programme, particularly in view of the rugged terrain and the insufficiency of public transport facilities. It should also be mentioned that the capital goods (filling and labelling machines) and consumable supplies (eg. prepacking materials) have enabled the programme to prepare hundreds of drug ration kits in Aden, which has greatly contributed to the self-sufficiency and flexibility of the programme. The supply of basic office equipment and training materials (photocopier, typewriter, flipchart) have enabled the programme management to organize the office work and training courses in a reasonably efficient way. It may be recalled here that in the last few years all draft consultants' reports have been typed on the word-processor and have been reproduced by the programme before the consultant left the country.

It can be concluded that the WHO support has been effective and, apart from the FALCON computer, reasonably efficient. The long lead time between requesting supplies from WHO and actual delivery (up to 18 months) is accepted as a fact of life but necessitates a careful record of all supplies in the pipeline.

Fellowships

A full record of all fellowships used in the programme is given in Annex 10. In the period from February 1984 to April 1988 a total of 35 fellowships were awarded to 25 fellows, with an average duration of 10.8 weeks and an average cost of \$ 4800 each. Only three fellowships were awarded for post-graduate studies (one year courses in drug quality control; one of these resulted in a MSc after a two-month extension), the majority being practical training courses of one to three months' duration.

The effectiveness of the WHO fellowships may be judged by the fact that all 25 fellows have returned to the country and continue to work with the programme. Only four are not active on the job they were trained for as the IV/ORS manufacturing plant was not started so far. All four returned to their original positions in the Ministry of Health.

Another important aspect is the fact that all senior staff of the Pharmacy Department of the Ministry of Health have now been trained by WHO fellowships, including the Director of Pharmaceutical Services (Dr. Ali Sallami) and his four section heads for Pharmacies, Procurement, Supplies and Quality Control, together with most of their staff. This training ties in very well with the recent reorganization of the Ministry and its future tasks. In fact the separation between the National Drug Policy Programme and the Ministry of Health, which never was very strict anyway, has completely been removed with all sections now being part of the programme.

Based on the above observations it can be concluded that the fellowships programme has been both effective and efficient.

Local costs

In the two biennia under study a total amount of \$ 101.522 has been spent on local costs. A detailed break-down is given in Annex 1E, in which the expenditure has been specified for workshops, training, printing, prepacking, transport and fuel, collection of drugs, supervision and evaluation, and renovation and maintenance.

The most remarkable feature of this list is the fact that considerable amounts have been spent on running cost for the drug distribution and training programme in Lahej and Shebwa. Most of this amount has been spent on overtime, per diems and travel allowances for local staff.

It is difficult to balance cost and benefit on this particular issue. In the four years, 3080 drug ration kits have been distributed for a total value of approximately \$ 400.000 (\$ 125 each). This amount has to be compared with an amount of \$ 41.114 spent on transportation costs and collection allowances, showing that 10% of the value of the drugs has been needed to get them to the health units. Considering the savings by rational selection of drugs, well-balanced quantities included in the kit and lower level of losses by theft and damage, when compared to the indent method (by which 50% non-essential drugs are being distributed to health units, see Annex 3C), it can be concluded that this money has been spent in a cost-effective way.

The question remains whether WHO should have spent programme funds for this purpose. This issue touches upon the question whether WHO should have been involved in the actual implementation of a national programme at all, apart from giving technical advice. It is the opinion of the evaluation team that, from the moment it was agreed that WHO would assist in the operational side of the national programme (and this moment came with the special contribution of the Director-General's Development Funds), there was sufficient justification to give this type of direct support. The supply of vehicles to the programme falls in the same category of assistance. Discussions with national experts revealed that without such operational support it would have been very unlikely that a distribution and training programme could have started at all. It is heartening to see that, after all this effort, both availability and rational use of essential drugs have markedly improved in the programme area.

It can be concluded that the funds for local costs have been spent in an effective and efficient manner. As the WHO Action Programme on Essential Drugs and Vaccines both in Headquarters and in the Regional Office had received a special mandate to give direct support to the implementation of the programme at governorate level, it is justified that WHO funds have been spent in this way.

Has the support by WHO been essential to the impact of the programme?

In the previous sections we have concluded that the programme has had a significant impact on the availability of essential drugs in the country as a whole and on the rational use of essential drugs in the programme area. We

have also concluded that most of the WHO support, and especially the consultants and fellowship programmes, have been effective and efficient. We now have to answer the question whether this support has been essential to the impact of the programme; in other words, whether the country would have been able to achieve a similar programme with a similar impact without the help of WHO.

It is interesting to reconstruct how the programme started at all. At a WHO intercountry meeting on essential drugs for primary health care in Amman in 1983 Dr. Sallami, Assistant Deputy Minister of Health, became interested in the concept of essential drugs. After discussions with Dr. R.R. Chaudhury, then Regional Adviser in WHO/EMRO, it was decided that Dr. Chaudhury would visit Democratic Yemen together with the Programme Manager from the Drug Action Programme in Geneva. This visit triggered the establishment of the programme. We can safely conclude that without the WHO meeting in Amman and the following orientation visit by two senior WHO experts, no WHO support would have been given. More important however is that without the active interest from the government in the person of Dr. Salami, nothing would have been started.

We have concluded that the 21 consultant reports have had a real impact on the programme, with approximately 80% of all recommendations being implemented by the government. It seems very unlikely that the government would have been able to arrange for consultancy services of such an international standard without the support from WHO.

The same applies for the fellowships programme. Very important has been the fact that the fellows have been carefully selected and motivated by Dr. Salami, resulting in the commendable record of a zero-percent drop-out rate. On the other hand it seems unlikely that similar training programmes could have been arranged by the government alone.

The case is less clear with the supplies. Supplies could, in principle, have been ordered and paid for by the government. WHO has, however, given valuable advice on the selection of certain items, eg. the equipment for the new quality control laboratory. WHO has also been in a position to supply goods for which the Ministry of Health would have encountered difficulties in obtaining the necessary foreign exchange (eg. computers, vehicles). The ultimate proof lies however in the future, when the government hopefully will acknowledge the medical and economical relevance of the programme and will supply the necessary items from their own funds. The fact that the government has always supplied the essential drugs for the programme can be interpreted as a very positive sign.

As with the supplies, with regards to local costs WHO received a special mandate to assist in the practical implementation of the programme at the governorate level and as such the expenditure was justified and cost-effective. Again the final proof that the support is effective in the long run will be found in the hope that the government will take over the running costs of the programme. It is a very positive sign that the government intends to take over the running costs in the existing programme areas, and will bear these costs in all new areas from the start.

One other component of the WHO support should be mentioned here. The frequent coordinating meetings between staff of the programme and WHO (eight official and three unofficial meetings in four years) have greatly contributed to a smooth running and direct support to the programme. During these meetings Plans of Action could frequently be prepared or adjusted, and a quick and flexible follow-up of administrative procedures could be achieved. At the same time there has been ample opportunity for off-the-record discussions and unofficial advice.

In view of the above observations it can be concluded that WHO support has been essential to the success of the programme. However, this success is to an even greater extent due to the active interest of the government, and especially to the never failing efforts of Dr. Ali Sallami who, as Assistant Deputy Minister and WHO National Programme Coordinator, has played a key role. His ability to look into the future and his energy to pursue the problems of the present have been the real basis of the achievements. It is fortunate that, under these circumstances, WHO has been able to respond in a quick and flexible way. This adequate response has been possible through the fact that, initially, the WHO Regional Office and the Drug Action Programme have mobilized extra funds for the first consultancy visits; the programme received an essential boost through the special contribution from the DG's Development Fund, which enabled WHO to give flexible support to the actual implementation of the programme.

Is further support justified and what should be the nature of such support?

In view of all what has been said above it is obvious that a continuation of technical support by WHO is fully justified. This is particularly necessary for the implementation of the new drug legislation, the new computerized drug registration system, the new computer system for the Central Medical Stores, the drug quality control laboratory and the training programme in rational drug use, all of which are in a critical stage of their development. It also applies for all activities related to training in rational drug use.

The fact that the support for actual implementation at governorate level has been effective and efficient justifies its continuation. This justification would increase even further if the government, at either national or governorate level, would undertake to fund the running costs of the drug supply and supervision programmes that have been established so far, and this seems to be the case.

This evaluation will not, in great detail, list all areas of future support. Several recommendations have been made as part of the observations and discussions on each of the original objectives; these recommendations are summarized in the next section. The extent and nature of future WHO support will have to be discussed separately on the basis of this evaluation and these recommendations. WHO should also assist the national authorities in obtaining external donor support for further expansion of the National Drug Policy Programme.

Can the programme be used as an example for other countries?

In view of the conclusions of this evaluation it will be obvious that the programme has a great potential for demonstration, training and operational research. Especially sharing of experiences of the workings of the Central Medical Stores, the distribution system and, in general, the careful planning of programme activities can be very instructive. The programme can also be a testing ground for new methodologies or assist in the development of more refined techniques of drug distribution and training.

A logical framework for such activities would be to establish the programme as a WHO Collaborative Centre for Drug Policies. The evaluation team therefore recommends that this is actively pursued by both the government and WHO. The programme has matured to an extent that both WHO and other country programmes could greatly benefit from its experiences.

Training and operational research will require staff time and financial resources and it is not realistic to expect the present programme to take this additional burden. It is therefore recommended that, whether the programme will ultimately become a Collaborative Centre or not, special WHO funds be allocated for this purpose. The budget for these activities should be based on a separate Plan of Action, which should be prepared as soon as possible.

RECOMMENDATIONS

General

- 1 In view of the excellent performance of the National Drug Policy Programme and the optimal use made of WHO resources in the period 1984-1988, further WHO support to the programme is fully justified (p.46).
- 2 WHO should assist the national authorities in obtaining external donor support for the further expansion of the National Drug Policy Programme (p.46).
- 3 The National Drug Policy Programme should be established as a WHO Collaborating Centre for Drug Policies and Management (p.47).

National Drug Policy

- 4 The National Workshop planned for November 1988 should involve as large a number of clinicians as possible, and should discuss and adopt the draft National List of Essential Drugs. At the same workshop supplementary lists should be prepared for specialized units (p.13).
- 5 A more active committee on drug selection should be established with a wider representation of the various basic medical specialities. All requests for inclusion of new drugs on the National List should be fully justified and carefully studied in the light of actual need and available resources. In addition, the committee should take adequate measures to promote the rational use of drugs (p.14).
- 6 A computerized system of drug registration should be established as soon as possible (p.39).
- 7 A one-page newsletter should be issued to communicate the new developments of the national drug policy to all doctors and health workers (p.14).

Procurement, storage and distribution

- 8 The procurement of essential drugs for the Ministry of Health, Hadramauth governorate, the National Drug Company, the Army and Police should be combined. At the same time the foreign currency allocations to each of these institutions should be reviewed (p.14).
- 9 The semi-automated system of inventory control at the Central Medical Stores should be replaced by a computerized system that is linked to the drug registration system and the drug procurement system (p.14).
- 10 Special indent forms should be introduced that will indicate, for each level of health care, the range of essential drugs and medical supplies that can be requested from the Central Medical Stores (p.21).
- 11 The Central Medical Stores in Aden should more often be utilized in training programmes for Arabic speaking fellows in the management of drug procurement, storage and distribution (p.21).

- 12 The number of essential drugs actually supplied to hospitals and health centres should be increased (p.23).
- 13 The morbidity record form that is presently used in the programme should be integrated into a more general and PHC oriented health information system (p.23).
- 14 In view of further expansion of the programme a small number of all-terrain vehicles for central staff and motorbicycles for district supervisors should be supplied (p.24).

Drug quality control

- 15 A sum of \$ 100,000 should be reserved in the 1990-91 WHO Regular Budget for the second phase of the drug quality control laboratory (p.27).

Training in rational drug use

- 16 Continuing emphasis should be put on the retraining of health workers, by district workshops and by a more intensive system of supervision. Such supervision should not only concentrate on the supply and storage of essential drugs, but also on medical issues and the rational use of drugs (p.32).
- 17 Training seminars should be organized for the staff of hospitals and health centres. Staff of the Teaching hospital and Medical Faculty should actively be involved in this exercise (p.34).
- 18 Assistance should be given to the Faculty of Medicine in the preparation of the training programme on the concept of essential drugs and rational drug therapy; a comprehensive syllabus should be prepared for approval and use by the Faculty (p.34).
- 19 Two nationals with a medical background should be identified for further training in clinical pharmacology. These persons should be recruited by the programme to coordinate all basic and post-basic training in rational drug use, to assist in the preparation of a treatment guide, to establish a small drug information centre and to prepare the national drug policy newsletter (pp 14,34,45).
- 20 Yearly prizes should be established for the best essay on essential drugs, with one prize of \$ 1000 for final year medical students and doctors, and one prize of \$ 500 for rural health workers and final year students of the HMI (35).

A N N E X E S

Approximate analysis of WHO/ENRD funds used for the
National Drug Policy Programme, Democratic Year, 1984-87 (in US \$)

| | 1984-85 | | 1986-87 | | Total | | |
|--------------------|---------------------------------------|------------------------------------|----------------------------------|--|---------------|------------------------------------|----------------------------------|
| | Regul. Bud EN/YEA/EDV 091/RB/84 | D6's DF EM/YEA/EDV 092/RB/84 | DAP/HQ Contrib. (VD funds) | Regul. Bud. EM/YEA/EDV 001/RB/86 | | D6's DF EM/YEA/EDV 001/RB/86 | DAP/HQ Contrib. (VD funds) |
| Staff costs | 17743 | 6089 | 27020 | 32367 | 21727 | 104946 | |
| Supplies | 103936 | 19300 | 58609 | 70836 | 77100 | 329772 | |
| Fellowships | 46980 | 4000 | 4000 | 160482 | 2297 | 153959 | |
| Participants | | | | | 30000 | 30000 | |
| Local costs | 11563 | 24388 | | 23981 | 40300 | 102232 | |
| Progr. supp. costs | | | | | 22285 | 22285 | |
| Total | 180222 | 51777 | 89629 | 227866 | 193709 | 18000 | 743194 |

Source: (for EM allotments: AFJ system as per 31.12.85 and 31.12.87, "TOTAL OBLIGATIONS"
(for DAP contributions: Estimates from IA's, CSA's and PA's in DAP files

Analysis of impact of WHO staff and consultants reports 1984-88

| | Status | Dates | Specific Activity | Recommendations Made | | | | | Recommendations Implemented | | | | | Recommendations Pending | | | | |
|---------------------------------------|-----------------------------|------------------|---------------------|----------------------|-----|-----|-----|------|-----------------------------|-----|-----|-----|-------|-------------------------|-----|-----|-----|-------|
| | | | | Rep | Exp | Inn | Tot | %Inn | Rep | Exp | Inn | Tot | %Impl | Rep | Exp | Inn | Tot | %Pend |
| E.Lauridsen R.Chaudhury | WHO/DAP WHO/EMRO | 3-10 Feb 84 | POA 84-85 | 1 | 12 | 9 | 22 | 41% | 1 | 10 | 9 | 20 | 91% | 1 | 1 | 5% | | |
| H.Faust | UNICEF | 21-28 Mar 84 | | | 3 | 2 | 5 | 40% | 2 | 1 | 1 | 4 | 60% | | 0 | 0% | | |
| S.Rafaelli | STC | 21-28 Mar 84 | | | 2 | 2 | 4 | 100% | 1 | 1 | | 2 | 50% | | 0 | 0% | | |
| I.Borda | TA | 3-16 Mar 84 | | | 4 | 5 | 9 | 10% | 3 | 5 | 1 | 9 | 90% | | 0 | 0% | | |
| G.Walker J.Maneno | TA TA | 4-18 Mar 84 | Quant Lahej | 2 | 1 | 1 | 4 | 25% | 2 | 1 | 1 | 4 | 100% | | 0 | 0% | | |
| H.Hogerzeil | TA | 19-26 Oct 84 | POA 85 | 2 | 7 | 5 | 14 | 36% | 2 | 7 | 5 | 14 | 100% | | 0 | 0% | | |
| I.Borda H.Hogerzeil | TA TA | 5-12 Jan 85 | Workshop ED list | 1 | 6 | 3 | 10 | 30% | 1 | 4 | 2 | 7 | 70% | | 0 | 0% | | |
| A.Salami H.Hogerzeil | TA WHO/EMRO | 12-14 May 85 | POA 85-86 | 10 | 6 | 4 | 20 | 20% | 10 | 5 | 4 | 19 | 95% | | 0 | 0% | | |
| R.Chaudhury P.Hogerzeil R.Lacey | WHO/EMRO WHO/EMRO STC | 25 Nov-1 Dec 85 | Workshop POA 86 | 4 | 14 | 4 | 22 | 18% | 3 | 12 | 3 | 18 | 82% | | 0 | 0% | | |
| J.Bevan | STC | 30 Nov-5 Dec 85 | | 1 | 1 | | 2 | 0% | | | | 0 | 0% | | 0 | 0% | | |
| Birch&Krogboe | STC | 6 Dec-15 Nov 85 | Feas.IV/ORS | | | | | | | | | | | | | | | |
| A.Salami H.Hogerzeil | TA WHO/EMRO | 28-31 Jul 86 | POA 87-89 | 4 | 18 | 6 | 28 | 21% | 1 | 17 | 1 | 19 | 68% | | 0 | 0% | | |
| M.Helling-Borda | WHO/DAP | 1-15 Nov 86 | | | 3 | 2 | 5 | 40% | 2 | | 2 | 4 | 40% | 1 | 1 | 2 | 40% | |
| M.Helling-Borda H.Hogerzeil | WHO/DAP WHO/EMRO | 1-15 Nov 86 | Quant. country | | 3 | 4 | 7 | 57% | 3 | 2 | 5 | 7 | 71% | | 1 | 1 | 14% | |
| I.Borda | STC | 7-23 Nov 86 | | | 2 | 1 | 3 | 33% | 2 | 1 | 3 | 4 | 100% | | 0 | 0% | | |
| E.Kkolios | STC | 26 Nov-10 Dec 86 | Plan DQC | 3 | 11 | 3 | 17 | 18% | 3 | 4 | 1 | 8 | 47% | | 6 | 1 | 7 | 41% |
| L.Mettas | STC | 25 Apr-2 May 87 | Eq.DQC | | | | | | | | | | | | | | | |
| M.Islam | STC | 16-26 Jul 87 | | | 9 | 4 | 13 | 13% | 8 | 2 | | 10 | 67% | | 0 | 0% | | |
| A.Salami H.Hogerzeil | FEL WHO/DAP | 10 Sep 87 | POA 87-89 | 2 | 10 | 0 | 12 | 17% | 1 | 7 | 2 | 10 | 56% | | 1 | 1 | 2 | 11% |
| H.Mandahl P.Manell | STC STC | 5-10 Jan 88 | Plan computer | | 5 | | 5 | 0% | 1 | | 1 | 2 | 20% | | 4 | 4 | 80% | |
| S.Solovoi | STC | 25 Jan-7 Feb 88 | New law | | 2 | 1 | 3 | 28% | 2 | | 1 | 3 | 100% | | 1 | 1 | 1 | 57% |
| TOTAL | | | | 45 | 117 | 54 | 216 | 25% | 37 | 84 | 35 | 156 | | 9 | 15 | 6 | 21 | |
| | | | | impl 82% 72% 65% 72% | | | | | pend 0% 13% 11% 10% | | | | | | | | | |

LEGENDA: Rep = repeating an existing recommendation; Exp = expansion of existing recommendation; Inn = innovative recommen

List of WHO supplies (\$) for the National Drug Policy Programme, Democratic Yemen (1984-87)

| Date PA | Total Amount (\$) | Managet support | Computer | Training material | Prepack material control | Quality control | Transprt | Description |
|------------------|-------------------|-----------------|----------|-------------------|--------------------------|-----------------|----------|---|
| 21.11.84 | 23300 | 4500 | | | 18600 | | | prepacking materials, binding machine, tablet counter box files |
| 21.11.84 | 800 | 800 | | | | | | Landrover 4WD plus spares, 4WD truck with spares |
| 14.1.85 | 31000 | | 17000 | | | | 31000 | Falcon computer + software |
| 17.3.85 | 17000 | | | 1930 | 27070 | | 3000 | tube filling machine, label printer, 4 motorcycles, calculators, flipcharts, copying paper |
| 13.8.85, 20.1.86 | 32000 | | | | | | | typewriter, computer furniture, prepacking boxes, straps and seals, 3 motorcycles, office furniture |
| 22.8.85, 2.6.86 | 18000 | 3300 | | | 12200 | | 2500 | office supplies |
| 22.8.85 | 1100 | 1100 | | | | | | tablet disintegration tester |
| 8.1.86 | 3500 | | | | | | 3500 | overhead projector, training materials, slide projector |
| 25.5.86 | 5200 | | | 5200 | | | | IBM computer plus software |
| mid 86 | 10000 | | | 10000 | | | 52000 | four-wheel drive truck with tail lift |
| 12.11.86 | 52000 | | | | | | | office furniture, typewriter, copying materials |
| 12.11.86 | 13000 | | | | | | | spectrophotometer and other drug quality control equipment and materials |
| 21.5.87 | 39000 | | | | | | 39000 | Landrover 4WD and spare parts |
| 29.6.87 | 18500 | | | | | | | |
| TOTAL | 264200 | 22700 | 27000 | 7130 | 57870 | 42500 | 88500 | |

(*) Figures are derived from PA's; actual figures, including transport costs, are higher. The actual amount spent on supplies, according to the AFI system, is \$ 329772 in 1984-87

PA: Purchase Authorization

Impact fellowships
Essential Drugs Programme (National Drug Policy Programme), Dem. Yemen 1984-88

| Name | Date | Fellowship | Country | Duration | Present position | Not practising |
|--|--|--------------------------|-------------|------------|-----------------------------|----------------|
| ESS. DRUGS POLICY, DISTRIBUTION SYSTEMS | | | | | | |
| Fahdl A Kassew | Jun 84 | Study tour | Kenya | 2 weeks | Superint. CMS, Aden | |
| Dr Naqi Awad | Jun 84 | Study tour | Kenya | 2 weeks | Dir. Nat. Drug Company | |
| Abdulla Ahmed | Jun 84 | Study tour | Kenya | 2 weeks | Dir. Hlth Serv. Dhala | |
| PROCUREMENT, STORAGE | | | | | | |
| Fahdl A Kassew | Jun 84 | CA course proc/stor | UK | 12 weeks | Staff ED programme | |
| Abdulqadr Ba-Salah | Jun 84 | CA course proc/stor | UK | 12 weeks | Man. RMS Hadramauth | |
| Moh. Anis Anwar | Jan 85 | CA course proc/stor | UK | 12 weeks | Staff CMS, Aden | |
| Moh. Anis Anwar | Apr 85 | UNIPAC | Copenhagen | 2 weeks | Staff CMS, Aden | |
| Fahdl A Kassew | Oct 85 | Proc for dev. proj | UK | 4 weeks | Staff ED programme | |
| Moh Fadhl Mohsin | Apr 86 | CA course proc/stor | UK | 12 weeks | Staff ED programme | |
| Saleh Nasser Zaabel | Mar 86 | WHO Course logistics | Amman | 2 weeks | Man. RMS Lahej | |
| Ahmed Saleh Al-Awaari | Sep 86 | CA course proc/stor | UK | 12 weeks | (Head proc section MOH) | |
| Kassew Abdel Aziz | Mar 87 | CA course proc/stor | UK | 12 weeks | Superint. CMS, Aden | |
| Khaled Jarmoon | Sep 87 | CA course proc/stor | UK | 12 weeks | Staff CMS, Aden | |
| Hussain Saad | Nov 87 | CA course proc/stor | UK | 12 weeks | Staff CMS, Aden | |
| Moh Fadhl Mohsin | Nov 87 | Comput. inventory syst | Uppsala | 4 weeks | Staff ED programme | |
| Fahdl A Kassew | Apr 88 | Comput. inventory syst | Uppsala | 4 weeks | Staff ED programme | |
| Kassew Abdel Aziz | Apr 88 | Comput. inventory syst | Uppsala | 4 weeks | Superint. CMS, Aden | |
| PRODUCTION IV FLUIDS/ORS | | | | | | |
| Dr. Gamal S. Alkaaki | Sep 86 | Production IV fluids | Budapest | 13 weeks | Pharm. Teaching Hosp | (1) |
| Dr. Adel Moh Haten | Sep 86 | Production IV fluids | Budapest | 13 weeks | Teacher Hlth Manp. Inst | (1) |
| Yassin Abdo' Muselah | Jan 87 | Production IV fluids | Amman | 26 weeks | Staff ED programme | (1) |
| Mahmoud Ahmed Yacoub | Jan 87 | Production IV fluids | Amman | 26 weeks | Ph. techn. Teaching hosp | (1) |
| DRUG QUALITY CONTROL | | | | | | |
| Dr. Badr Jaffer | Oct 86 | Drug Quality Control | Budapest | 40 weeks | Staff Drug Qual Control Lab | (2) |
| Dr. Mahdi Ahmed | Jun 86 | MSc Drug Qual Contr | Bombay | 52 weeks | Staff Drug Qual Control Lab | (2) |
| Dr. Suheil Ibrahim | Feb 86 | Drug Quality Control | E-Berlin | 40 weeks | Staff Drug Qual Control Lab | (2) |
| REGISTRATION, LEGISLATION | | | | | | |
| Dr. Abdulla Nasser | Sep 86 | Registr/legislation | Amman | 6 weeks | Head Pharmacy section, MOH | |
| Dr. Ali O. Salami | Sep 87 | WHO/DSE regulation | W-Berlin | 3 weeks | Ass. Dep. Minister | |
| Dr. Abdulla Nasser | Sep 87 | WHO/DSE regulation | W-Berlin | 3 weeks | Head Pharmacy section, MOH | |
| Dr. Ali Saleh Muthana | Sep 87 | WHO/DSE regulation | W-Berlin | 3 weeks | Head QQC/Insp. section, MOH | |
| Dr. Abdulqadr Al-Bakri | Sep 87 | WHO/DSE regulation | W-Berlin | 3 weeks | Head Supply section, MOH | |
| Dr. Ali O. Salami | Oct 87 | Studytour regul bodies | Scandinavia | 2 weeks | Ass. Dep. Minister | |
| Dr. Abdulla Nasser | Oct 87 | Studytour regul bodies | Scandinavia | 2 weeks | Head Pharmacy section, MOH | |
| Dr. Ali Saleh Muthana | Oct 87 | Studytour regul bodies | Scandinavia | 2 weeks | Head QQC/Insp. section, MOH | |
| Dr. Abdulqadr Al-Bakri | Oct 87 | Studytour regul bodies | Scandinavia | 2 weeks | Head Pharmacy section, MOH | |
| Ms. Shifa H. Bashieb | Dec 87 | Comput. registr. systems | Uppsala | 4 weeks | Staff registr. section MOH | |
| Totals: | | | | | | |
| | 74 fellowships by | | average | 10.6 weeks | | |
| | 24 fellows; | | | | | |
| | 24 fellows still working in Ministry of Health or ED programme | | | | | |
| | 4 fellows not on the job they were trained for. | | | | | |

NOTES: (1) Manufacturing plant for IV/ORS not yet commissioned
(2) Regional Medical Stores and Drug Quality Control Laboratory ready per Apr 1988

LEGENDA: MOH: Ministry of Health; CMS: Central Medical Stores; RMS: Regional Medical Stores; DSE: German Foundation for Development Aid; CA: Crown Agents; QQC: Drug Quality Control

Local costs used in National Drug Policy Programme, Democratic Yemen, 1984-87 (in US \$)

| | Workshops | Training | Printing | Prepacking | Transport | Collection | Supervision | Renovation | Total |
|-------|-----------|----------|----------|------------|-----------|------------|-------------|-------------|--------|
| | | | | | & fuel | of drugs | Evaluation | Maintenance | |
| 1984 | | 1700 | 3000 | | 1700 | | | | 6400 |
| 1985 | 17919 | 3658 | 1681 | 1752 | 7600 | 4017 | | | 36027 |
| 1986 | 36600 | 6608 | 8000 | 3079 | 3450 | 7998 | 1000 | | 33135 |
| 1987 | | 6964 | 3368 | 3900 | 11149 | | | 579 | 25960 |
| Total | 20719 | 17230 | 9081 | 9899 | 17950 | 23164 | 2700 | 579 | 101522 |

REVISED QUANTITIES FOR STANDARD KIT FOR HEALTH UNITS, PER MONTH
FOR 300 PATIENTS

| | | |
|------------------------------------|----------|----------|
| Aspirin 300 mg tab. | 3000 | YD 1.000 |
| Aluminium Hydroxyde Tab. | 500 | .500 |
| Eucocaine NBB or Erobanthiline Tab | 500 | .450 |
| Chloroquine tab. 200 mg | 500 | 1.250 |
| syrup bottle 100 ml | 2 | .200 |
| Chlorpromazine tab. 25 mg. | 25 | .020 |
| Ergometrine tabs. | 25 | .020 |
| Ferrous Sulphate tabs. | 2000 | .800 |
| Hydrocortisone Cream tube | 5 | .600 |
| Lorexane Lotion 100 ml. | 5 | .750 |
| Mebendazole tabs. | 100 | .200 |
| Metronidazole tabs. | 100 | .200 |
| Multivitamine | 1000 | .400 |
| Noescapine tabs. | 1000 | 2.520 |
| Oral Rehydration Salt | 100 | .300 |
| Paracetamol 500 mg | 1000 | 1.000 |
| Proc. Pen. inj. 10 ml | 100 | 7.000 |
| Penicillin tabs. | 200 | 1.600 |
| Penicillin syrup bottle | 25 | 5.200 |
| Phenergan tabs. | 300 | .260 |
| syrup ml. | 500 | .520 |
| Phenobarbitone tabs. | 50 | .045 |
| Senna tabs. | 50 | .045 |
| Sulphadimidine tabs. | 1000 | 1.770 |
| Tedral tabs. | 100 | .420 |
| Tetracycline caps. | 250 | .680 |
| eye ointment tube 5 g. | 10 | .200 |
| Water for inj. 10 ml. | 100 | .800 |
| Benzoic Acid / Sal. Acid ointment | 5 x 25 g | .500 |
| Chlorhexidine Sol. | 2.5 ltr. | 1.000 |
| Gentian Violet Sol. | 500 ml | 1.000 |
| Iodine Sol. Tincture | 250 ml | 1.000 |

YD 53,150

BOX 2 :

| | | |
|--------------------------|-----------|-------|
| Bandage 2" | 5 Doz. | .440 |
| Bottles Plain 60 ml. | 20 Bottle | .400 |
| Rib 120 ml | 10 Bottle | .300 |
| Cotton Wool 500 g | 1 Roll | .120 |
| Elastic Plastic Strip | 1 Pack | .115 |
| Disposable Syringe 2 ml. | 5 | .080 |
| 5 ml. | 5 | .100 |
| Disposable needle 14 | 10 | .080 |
| Emergency Suture | 1 Pack | 2.050 |
| Envelopes for Tabs. | 2000 | .600 |
| Gauze White 6 yards | 1 Roll | .188 |
| Lable Plain White | 20 | .060 |
| Paraffin Gauze | 5 | .850 |
| Spirit Ear Drops | 10 Bottle | .500 |

YD. 5.883

SUPPLEMENTARY BOX WITH INJECTABLE OF LISTED USE

(Supplement to Health Units and Health Centres alike, to be distributed every 4-6 months or on request)

| | | |
|----------------------------|----|----------|
| Adrenaline inj. 1 ml. | 10 | YD 0.160 |
| Aminophylline inj. 10 ml | 10 | 0.140 |
| ATS 50,000 U | 10 | 1.500 |
| Chloroquine inj. 100 mg/ml | 10 | .600 |
| Chlorpromazine inj. 50 mg | 10 | .060 |
| Ergometrine inj. | 10 | .180 |
| Lidocaine vial 35 ml | 10 | .660 |
| Pethidine inj. | 10 | .114 |

YD 3.414

REVISED DRUG KIT CONTENT
FOR HEALTH UNITS

NATIONAL DRUG POLICY
PROGRAMME

| DRUG | HEALTH UNIT |
|--------------------------------------|----------------------------|
| <u>GROUP 1. INJECTIONS</u> | <u>QUANTITY FOR 750 TC</u> |
| Adrenaline inj. 1 mg/ml | 2 |
| Diazepam inj. 10 mg/2ml | 2 |
| Ergometrine inj. 0.5 mg/ml | 6 |
| Lidocain 2% inj 20 ml | 8 |
| Penicillin procain inj 3 MU | 50 |
| Water for inj. 10 ml | 50 |
| <u>GROUP 3. TABLETS AND CAPSULES</u> | |
| Acetylsalicylic acid tab 300 mg | 2000 |
| Aluminium hydroxide tab 500 mg | 500 |
| Aminophylline tab 200 mg | 100 |
| Atropin tab 0.6 mg | 100 |
| Chlorpromazine tab 25 mg | 50 |
| Codein tab 30 mg | 100 |
| Ergometrine tab 0.5 mg | 25 |
| Ferrous sulph/folic acid tab 60/0.2 | 2000 |
| Lexative tab 7.5 mg | 50 |
| Mebendazole tab 100 mg | 100 |
| Metronidazole tab 100 mg | 500 |
| Multivitamin tab | 1000 |
| Paracetamol tab 500 mg | 100 |
| Phenobarbitone tab 60 mg | 200 |
| Phenoxymethyl penicil tab 250 mg | 1000 |
| Promethazine tab 25 mg | 200 |
| Sulphadimidine tab 500 mg | 1000 |

المركز - الوحدة الصحية _____ المديرية : _____

| 5 > | أكثر من خمس سنوات وأكثر | < 5 | أقل من خمس سنوات | إلى : _____ الفترة من : _____ |
|-----|---|-----|---|--|
| | 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 | أمراض مستوطنة : - ملاريا - بلهارسيا |
| | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 00000 00000 00000 | أمراض الأطفال المعدية : حصبة سعال ديكري - التكايف |
| | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | أمراض الجهاز الهضمي : - إسهال ديدان معوية : - الدودة المستديرة - الدودة القبرصية - ديدان أخرى طفيليات : - أميبيا ، جاردية إضطرابات معوية أخرى : - معص مومي «دون إسهال» - بكتريا وطروش - إسهال - داء التبرص |
| | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 00000 00000 00000 | أمراض الجهاز التنفسي : - التهاب الفوز - التهاب الشعب الهوائية - التهاب رئوي |
| | 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 | إضطرابات الجهاز الدوري : أمراض القلب - أمراض الأوعية الدموية |
| | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 00000 00000 00000 | الدم - التقيحية : - سوء تغذية - فقر دم - اضطراب - فقدان الصفائح |
| | 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 | إضطرابات عصبية : - تشنج - ارتج |
| | 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 00000 00000 00000 | أجهزة الحصى : - صداع - تشنجات «صرع» - عدوي جهاز عصبي |
| | 00000 00000 00000 00000 00000 00000 00000 00000 | | 00000 00000 00000 00000 00000 00000 | العيون : - التهابات العين - ضمور العين |

CANDIDATES VISITED THE PROGRAMME IN A STUDY TOUR

1987-88

| DATE | NAME | COUNTRY | STATUS | SPONSERING AGENCY | DURATION OF STUDY |
|------------|------------------------------|-----------|---|-------------------|-------------------|
| 26 Nov.87 | Mr. Phan Ten. | Vietnam | Director, Ess. Drug Prog. | WHO, DAP | 2 Weeks |
| 26 Nov.87 | Mr. Ya Ngoc Tin. | " | Department of Pharmacy. | WHO, DAP | 2 Weeks |
| 30 Dec.87 | Mr. Mohamad Sidqi Abdul Aziz | Iraq | Director Medical Supply Al Taala Governorate | WHO, EMRO | 4 Weeks |
| 30 Dec.87 | Mr. Najah Amir Resham | Iraq | Director of Drug Store Sadam's Camp | WHO, EMRO | 4 Weeks |
| 5 Dec.87 | Dr. Salima Kidawa Khamis | Tanzanian | | UNICEF | 3 Weeks |
| 5 Dec.87 | Mr. Abdul Kadir Othman Ahead | " | | UNICEF | 3 Weeks |
| 23 Jan. 88 | Dr. Athanas Sually. | " | Director, Ess. Drug Prog. Zanzibar | UNICEF | 3 Weeks |
| 23 Jan. 88 | Mr. Anwar Khatib. | " | | UNICEF | 3 Weeks |

ANNEX 3 AVAILABILITY AND RATIONAL USE OF ESSENTIAL DRUGS
Survey among 26 Health Units, 6 Health Centres and 6 Hospitals
Democratic Yemen, 1988

Annex 3A Introduction, materials and methods

In Democratic Yemen the supply of essential drugs by means of monthly drug ration kits started in 1985 in one district of Lahej Governorate. By the end of 1987 all nine districts in Lahej and Shebwa Governorates were included in the scheme, covering a total of 122 health units (40% of the country). In all districts of the project area three day introductory workshops were held before the new kit supply system was implemented; in three districts in Lahej (Dhala, Radfan and Tor-al-Baha) additional five-day training courses in rational drug use were organized, introducing standard treatment schedules.

In this study the impact of this programme on the availability and rational use of drugs in the health units was measured; a comparison was made between health units within the programme area and a control group in Abyan Governorate (in which no programme had been implemented) as well as a comparison with health centres and district hospitals.

Materials and methods

Selection of health units.

Drug kits were used and additional training was given in three districts in Lahej (group UA). Drug kits were used but no additional training was given in two districts in Lahej and in all four districts of Shebwa (group UB); no kits were used and no training was given in all five districts of Abyan (group UC). From each of the three groups, two or three districts were selected to represent the different geographical zones (mountain or desert areas, easy or difficult access). Within the selected districts, approximately one in every four health units was selected by lot; reserve selections were made in case the selected units could not be contacted or were closed. Reserve selections were used in four cases. The three groups UA, UB and UC consisted of 11, 8 and 7 Health Units respectively (see Table 1).

Selection of health centres and general hospitals.

In addition, health centres and district hospitals in the three governorates were studied. As no specific essential drugs programme had been developed for these facilities, no distinction was made within this group. The group (H) consisted of six health centres and six hospitals from a total of eight and eighteen, respectively (see Table 2).

Survey

Principal staff in each facility was interviewed in a standardised way (see questionnaire in Annex 3B). The interview covered general information (opening times, number of patients, number of emergencies), availability of drugs, supply, storage and rational use of drugs, recording of drug use, and

supervision. A standardised questionnaire was also used to test theoretical knowledge of rational drug use, utilizing five case studies; this test was given separately to all prescribers in the unit. Inspection of the unit was carried out in a standardised way, inspecting patient register, drug storage, drug stock, vaccine storage, vaccine stock and sterilization equipment.

Availability of drugs

Availability of drugs was measured by counting all drugs that were in stock at the moment of inspection, dividing them into essential and non-essential drugs. Essential drugs were those that had been designated for use at that level of health care by Ministerial decree of January 1985 and published in the National Essential Drugs List. For seven key essential drugs (aspirin, chloroquine, mebendazole, metronidazole, ORS, procain penicillin injection and sulfadimidine) quantities in stock were measured.

Rational use of drugs

Rational use of drugs was measured by analyzing the last hundred prescriptions from the patient register (health units) or from the pharmacy (health centres and hospitals), counting the average number of injections, the average number of antibiotics, and the total number of items per prescription. In addition to this the survey on rational drug knowledge was used.

Table 1 Selection of health units

| Govt. | Nr.of distr. | Nr.of HUnits | Distr. selected | Nr.of HUnits | HUnits selected | |
|----------------|--------------|--------------|-----------------|--------------|-----------------|---------------------|
| LAHEJ | 5 | 80 | Dhala | 25 | 5 | UA1 Marat |
| | | | | | UA2 Zabaid | |
| | | | | | UA3 Al Markoula | |
| | | | | | UA4 Al Uzla | |
| | | | | | UA5 Shuka | |
| | | | Tor Al-Baha | 19 | 6 | UA6 Al Khetabia |
| | | | | | UA7 Al Farasha | |
| | | | | | UA8 Al Ghol | |
| | | | Yafa | 11 | 3 | UA9 Huwairab |
| | | | | | | UA10 Al Nabia |
| | | | | | | UA11 Al Sokaya |
| SHEBWA | 5 | 42 | Nissab | 9 | 3 | UB1 Akwar |
| | | | | | | UB2 Gabal Al Yezidi |
| | | | | | | UB3 Al Gorba |
| | | | Beyhan | 9 | 2 | UB4 Wasit |
| | | | | | | UB5 Al Hagar |
| | | | | | | UB6 Khawra |
| | | | | | | UB7 Nukoub |
| | | | | | | UB8 Moukos |
| | | | Khanfar | 15 | 3 | UC2 Aryab |
| | | | | | | UC3 Amsorra |
| UC4 Al Khubair | | | | | | |
| UC5 Al Kod | | | | | | |
| | | | | | UC6 Al Rowa | |
| | | | | | UC7 Zingibar | |
| TOTAL | 14 | 180 | 7 | 109 | 26 | |

Table 2 Selection of health centres and hospitals

| Govt. | Nr.of hosp | Nr.of hlth.c | Hospitals selected | Hlth.C selected | Names |
|--------|------------|--------------|--------------------|-----------------|----------------|
| LAHEJ | 8 | 5 | 3 | 3 | H1 Laboos |
| | | | | | H2 Dhala |
| | | | | | H3 Tor Al-Baha |
| | | | | | H7 Yahar |
| | | | | | H8 Hareer |
| SHEBWA | 4 | 1 | 1 | 1 | H9 Al Madharba |
| | | | | | H6 Beyhan |
| ABYAN | 6 | 2 | 2 | 2 | H12 Nissab |
| | | | | | H4 Laudar |
| | | | | | H5 Nagi |
| | | | | | H10 Al Wadhea |
| | | | | | H11 Mukheras |
| TOTAL | 18 | 8 | 6 | 6 | |

CHECK LIST FOR HEALTH UNITS

General information

Name institution:
District:
Date:

Name, title in-charge:
Information obtained from:

Staff: Nurses: Midwives:
Med. Assistants: Health Guide: Others:

What are the usual opening hours for the patients:
Mornings: Afternoons:
Closed on Fridays? Other days closed?

How often do you see emergency cases outside these hours?
How many emergency cases did you see in the last month?
What were the diagnoses? Treatment Referral
1
2
3
4
5

Availability of essential drugs

Kit supply

Date last delivery of drug kit:
How many kits?
Kit delivered or collected?
Allowance received?
How much?
Is delivery regular?
Delivery dates last six months:
Which drugs are often in short supply?

Which drugs are often in abundance?

What do you do with surplus drugs?

Bulk supply

From where do you get your drugs?
Do you receive drugs without ordering?
Do you order drugs?
How many items were requested last time?
What was the delay between last order and delivery?
How many items were supplied?
Which drugs are often in short supply?

Which drugs are often in abundance?

What do you do with surplus drugs?

Storage

Is there a store keeper?

Training:

Are drugs stored according to system?

alphabetical order
tablets, injections etc
no system

Are bincards used?

for all drugs
for injections
for antibiotics
not used at all

Are they up-to-date?

Is there a record of incoming stocks, with dates?

Do you observe the rule "First-in first-out"?

Rational use of drugs

Is there a patients register?

Does it contain diagnosis and treatment?

Is it complete and up-to-date?

Are standard treatment schedules available and used?

Is a record form prepared and sent to district supervisor?

Do you keep copies of the record forms?

Supervision

Do you know who is your supervisor?

Who is it?

When was the last supervisory visit?

By whom?

When was the previous visit?

By whom?

At the last visit, what was done:

drug delivery
delivery of other materials
collecting of record form
inspection of drug stock
inspection of drug use
teaching drug supply
teaching rational drug use
teaching diagnosis/treatment
payment of salary
other:

How many OPD patients: 1984 1985 1986 1987 Last month

OPD (Adults):

OPD (Children):

Antenatals:

Vaccinations:

Admissions:

CHECKLIST DRUGS IN STOCK (HEALTH UNIT)

| | In stock (1) | Check quantity (2) | Recard quantity (2) | Date last delivery (2) |
|----------------------|-----------------|-----------------------|------------------------|---------------------------|
| acetylsalicylic acid | tab 300 mg | * | * | * |
| adrenaline | inj 1 mg/ml | : | : | : |
| aluminium hydroxyde | tab 500 mg | : | : | : |
| aminophylline | tab 200 mg | : | : | : |
| atropin | tab 0.6 mg | : | : | : |
| benzoic/sal.ac oint | tub 30 g | : | : | : |
| benzylbenzoate | btl 1 ltr | : | : | : |
| boric spirit eardr | btl 10 ml | : | : | : |
| chlorhexidine 5% | btl 1 ltr | : | : | : |
| chloroquine | syr 60 ml | : | : | : |
| chloroquine | tab 150 mg | * | * | * |
| chlorpromazine | tab 25 mg | : | : | : |
| codein | tab 30 mg | : | : | : |
| diazepam | inj 10 mg/ | : | : | : |
| ergometrine | tab 0.5 mg | : | : | : |
| ergometrine | inj 0.5 mg | : | : | : |
| ferrous sulph/folic | tab 60/0.2 | : | : | : |
| gentian violet | pow 25 mg | : | : | : |
| haemorrhoid ointment | tub 30 g | : | : | : |
| hydrocort 1% cream | tub 30 g | : | : | : |
| iodine tincture | btl 300 ml | : | : | : |
| laxative compound | tab 7.5 mg | : | : | : |
| lidocain 2% | inj 20 ml | : | : | : |
| lindane 1% cream | tub 25 g | : | : | : |
| mebendazole | tab 100 mg | * | * | * |
| metronidazole | tab 100 mg | * | * | * |
| multivitamin | tab | : | : | : |
| ORS | pow 1 ltr | * | * | * |
| paracetamol | tab 500 mg | : | : | : |
| penicillin procain | inj 3 MU | * | * | * |
| penicillin susp | syr 120 ml | : | : | : |
| pethidine | inj 100 mg | : | : | : |
| phenobarbitone | tab 60 mg | : | : | : |
| phenoxymeth.penecil | tab 250 mg | : | : | : |
| promethazine | syr 1 ltr | : | : | : |
| promethazine | tab 25 mg | : | : | : |
| sulphadimidine/cotin | tab 500 mg | * | * | * |
| tetracyclin 1% eye | tub 5 g | / | : | : |
| water for inj | inj 10 ml | : | : | : |

- (1) Please mark with (x) the drugs that are in stock
(2) Please note down only for drugs marked with (*)

Other drugs in stock:

Vaccines in stock: BCG vaccine
diphtheria-pertussis-tetanus
diphtheria-tetanus
measles
polio (inj)
polio (oral)
tetanus

Store:

Is the store well arranged?
Is the store clean?
Can it be locked?
Is there a refridgerator?
Does it work?
Has it got a thermometer?
Does it work?

Sterilizing:

What method is used?
What fuel is used?
Is fuel in stock?
How long is the boiling time?

DRUGS USED IN HEALTH UNIT
 Name:

Last 100 patients

INJECTIONS

total

| | | | | | |
|--------------------|---------------|-------|-------|-------|-------|
| adrenaline | inj 1 mg/ml | 00000 | 00000 | 00000 | 00000 |
| diazepam | inj 10 mg/2ml | 00000 | 00000 | 00000 | 00000 |
| ergometrine | inj 0.5 mg/ml | 00000 | 00000 | 00000 | 00000 |
| lidocain 2% | inj 20 ml | 00000 | 00000 | 00000 | 00000 |
| penicillin procain | inj 3 MU | 00000 | 00000 | 00000 | 00000 |
| pethidine | inj 100mg/2ml | 00000 | 00000 | 00000 | 00000 |
| water for inj | inj 10 ml | 00000 | 00000 | 00000 | 00000 |

other:

| | | | |
|-------|-------|-------|-------|
| 00000 | 00000 | 00000 | 00000 |
| 00000 | 00000 | 00000 | 00000 |
| 00000 | 00000 | 00000 | 00000 |
| 00000 | 00000 | 00000 | 00000 |
| 00000 | 00000 | 00000 | 00000 |

Total number of injections:

ANTIBIOTICS:

On HU list:

| | | | | | |
|--------------------|------------|-------|-------|-------|-------|
| metronidazole | tab 100 mg | 00000 | 00000 | 00000 | 00000 |
| penicillin procain | inj 3 MU | 00000 | 00000 | 00000 | 00000 |
| penicillin susp | syr 120 ml | 00000 | 00000 | 00000 | 00000 |
| penicillin tabs | tab 250 mg | 00000 | 00000 | 00000 | 00000 |
| sulphadimidine | tab 500 mg | 00000 | 00000 | 00000 | 00000 |
| tetracyclin 1% eye | tub 5 g | 00000 | 00000 | 00000 | 00000 |

Outside HU list:

| | | | | | |
|------------------|------------|-------|-------|-------|-------|
| ampicillin | cap 250 mg | 00000 | 00000 | 00000 | 00000 |
| ampicillin susp | syr 40 ml | 00000 | 00000 | 00000 | 00000 |
| cotrimoxazole | syr 100 ml | 00000 | 00000 | 00000 | 00000 |
| penicill benzath | inj 2.4 MU | 00000 | 00000 | 00000 | 00000 |
| tetracycline | tab 250 mg | 00000 | 00000 | 00000 | 00000 |
| <i>other</i> | | 00000 | 00000 | 00000 | 00000 |
| | | 00000 | 00000 | 00000 | 00000 |
| | | 00000 | 00000 | 00000 | 00000 |
| | | 00000 | 00000 | 00000 | 00000 |

Total number antibiotics:

Total number of drugs issued
 to 100 patients:

Average number of drugs
 per consultation:

Questionnaire for Health Unit staff (clinical questions)

1 A child is 18 months old. It is brought by his mother, who says that he has eight watery stools over the past twenty hours. He has no fever but has vomited twice. On examination he is lethargic, but his chest, ear and throat are clear. What is the diagnosis? What treatment would you give?

2 A child, twelve years old, complains of fever (39) for the last two days with headache and pain on swallowing. What examination would you carry out to establish the diagnosis? What treatment would you give?

3 A young man complains for the last two days about dry cough, especially in the evening. He has no fever or other symptoms. What treatment would you give?

4 A child aged two has a fever and congested eyes. On examination a rash is found on the face and trunk. There have been three similar cases during this week. What is the diagnosis? What treatment would you give? (if an antibiotic is given, ask for the reason)

5 A 35-year old man complains of loose stools with mucus, tenesmus (cramps) for the past five days. He has no fever or signs of dehydration. He has had a similar complaint four weeks ago. What is the likely diagnosis? What treatment would you give?

FOR EACH TREATMENT SPECIFY DRUG, DOSAGE, FORMULATION, ROUTE AND DURATION

6 Do you know what an expiry date means? Can you show an example? Is there any other way to find out whether a drug is not in good condition? Can you give an example?

7 Are you satisfied with the standard treatment schedules? (give reasons) Do you think the patients are satisfied? Do you think you need more drugs than the ones in the kit? If so, which drugs, and why?

Patients

As some villagers or patients about the availability of drugs now and in the past; and about the service given by the health unit. Ask for complaints as well.

Annex 3C Availability of essential drugs

In group UA an average of 29.7 essential drugs were available at the time of inspection; no non-essential drugs were present. In group UB 25.1 essential drugs and 2.4 non-essential drugs were found; in group UC 17.1 essential drugs and 17.4 non-essential drugs. In health centres and hospitals an average of 56 essential and 12 non-essential drugs were present. In group UA and UB together (health units supplied through drug ration kits), 27.3 essential and 1.4 non-essential drugs are available, as compared to 17.1 essential and 17.4 non-essential drugs in the health units without kits.

Table 3 Drugs available in health units, health centres and general hospitals

| Group | Nr.of ess. drugs (kit) | Nr.of ess. drugs (bulk) | Nr.of non-ess. drugs (bulk) | Total nr. of drugs | % drugs non-ess. |
|------------|------------------------|-------------------------|-----------------------------|--------------------|------------------|
| UA (n=11) | 25.1 | 3.6 | | 28.7 | 0% |
| UB (n=8) | 22.8 | 2.3 | 2.4 | 27.5 | 9% |
| UC (n=7) | | 17.1 | 17.4 | 34.5 | 50% |
| H (n=12) | | 55.1 | 11.7 | 66.8 | 16% |
| HU(kit) | 24.1 | 3.2 | 1.4 | 28.7 | 5% |
| HU(no kit) | | 17.1 | 17.4 | 34.5 | 50% |

UA: Health units with kit supply, additional training

UB: Health units with kit supply, no additional training

UC: Health units without kit supply, no additional training

H: Hospitals and health centres, no kit supply, no additional training

Conclusions

- 1 In health units in the project area the average number of essential drugs available is 27.3, which is 83% of the 33 essential drugs that are being distributed to that level of health care; in the non-project area only 17.1 (52%) essential drugs are available. In health units in the project area more essential drugs are therefore available than in the non-project area, and the number of available drugs is adequate.
- 2 In health units in the non-project area more non-essential drugs are present than in the project area. In the project area the percentage of non-essential drugs is only 5% while in the non-project area it is 50%.

Annex 3D Rational use of drugs: Theoretical knowledge

The results of the test on theoretical knowledge on rational drug use are presented in Table 4. It can be seen that workers in group UA as a whole (the area in which additional training was given) score 17.8, which is better than those in groups UB and UC in which no such training was given (16.5 and 16.7 respectively). Not all workers in the area UA received the additional training (some had been transferred in the mean time). In table 5 the score is compared between those workers that had actually received the additional training and those that had not.

Table 4. Results of test on theoretical knowledge on rational drug use

| Group | Pract.nurse | Med.ass. | Doctor | Total |
|-------|-------------|----------|--------|-------|
| UA | 17.6 | 18.2 | | 17.8 |
| UB | 16.5 | 16.5 | | 16.5 |
| UC | 13.0 | 19.5 | | 16.7 |
| H | 14.0 | 20.3 | 20.1 | 19.5 |
| Total | 16.1 | 19.1 | 20.1 | |

UA: Health units with kit supply, additional training

UB: Health units with kit supply, no additional training

UC: Health units without kit supply, no additional training

H: Hospitals and health centres, no kit supply, no additional training

Table 5 Theoretical knowledge on rational use of drugs of health workers in programme area

| | Nurses | Med.assist | Total |
|-------------------------|--------|------------|-------|
| Extra training received | 19.5 | 20.0 | 19.7 |
| No extra training | 16.4 | 15.6 | 16.1 |

Conclusions

- 1 The average score of workers that received additional training in rational drug use is higher than those that did not receive the training (19.7 and 16.1 respectively); however, not all workers in the project area received the training.
- 2 Apart from the additional training, the use of drug ration kits seems also have had a positive effect on the average score; this effect is particularly notable with practical nurses.

Annex 3E Rational use of drugs: drug use in practice

The results of the analysis of the last hundred prescriptions in each health unit are given in Table 6. From this table it can be seen that the average number of drugs per prescription is considerably higher in health centres and hospitals (3.01) than in health units (1.47-1.52). It can also be seen that the percentage of prescriptions containing an antibiotic is 45 in those health units that receive kits (group UA and UB), while it is 67 in health units that receive drugs in bulk (group UC) and 61 in health centres and hospitals (group H). The percentage of injections shows a similar difference between health units that receive kits and those that do not (25 and 58, respectively).

Table 6 Rational use of drugs

| Group | % Injections | % Antibiotics | Average nr.of drugs per prescription |
|----------|--------------|---------------|--------------------------------------|
| UA | 27 | 46 | 1.47 |
| UB | 22 | 47 | 1.52 |
| UC | 58 | 67 | n.a. |
| H | 32 | 61 | 3.01 |
| HU kit | 25 | 45 | 1.43 |
| HU nokit | 58 | 67 | 1.50 |

UA: Health units with kit supply, additional training

UB: Health units with kit supply, no additional training

UC: Health units without kit supply, no additional training

H: Hospitals and health centres, no kit supply, no additional training

n.a: Not available

Conclusions

- 1 The percentage of patients that receive an injection is smaller in the project area than in the non-project area.
- 2 The percentage of patients that receive an antibiotic is smaller in the project area than in the non-project area.
- 3 The difference in use of injections and antibiotics seems directly related to the use of drug ration kits rather than to additional training in rational drug use.

Annex 3f

Other data

During the survey several other data were collected which are not directly linked to the availability and rational use of drugs. These data are summarized in Table 7. For details on the health units in each group, see Annex 3A.

Table 7 Other data (UA and UB are the project area)

| | UA | UB | UC | Total |
|---|------|------|------|-------|
| Staff | | | | |
| Medical assistants | 55% | 13% | 86% | 50% |
| Practical nurses | 82% | 88% | 71% | 81% |
| Midwife | 27% | 13% | 43% | 27% |
| Workload | | | | |
| Patient contacts/month | 396 | 392 | 850 | 519 |
| Emergencies/month | 26 | 18 | 36 | 26 |
| Records | | | | |
| Patient register complete | 100% | 100% | 100% | 100% |
| | 82% | 75% | 71% | 77% |
| Training, supervision | | | | |
| Standard treatment schedules | 91% | 63% | 0% | |
| Av. time since last supervisory visit (in months) | 1 | 3 | 10 | |
| Storage facilities | | | | |
| Store well arranged | 55% | 50% | 29% | |
| Fridge in working order | 45% | 75% | 100% | |
| Sterilizing facilities | | | | |
| Method: boiling | 100% | 88% | 71% | 88% |
| hot air | | | 29% | 8% |
| disposables | | 12% | | 4% |
| Fuel: gas | 64% | 71% | 80% | 70% |
| kerosine | 36% | 14% | | 22% |
| electricity | | 14% | 20% | 9% |
| Fuel in stock | 73% | 100% | 100% | 86% |
| Vaccines in stock | | | | |
| BCG | 45% | 38% | 100% | 58% |
| DTP | 36% | 50% | 86% | 54% |
| Measles | 45% | 50% | 86% | 58% |
| Poliomyelitis | 45% | 50% | 86% | 58% |
| Tetanus | 36% | 50% | 57% | 46% |

Conclusions

- 1 There are very few medical assistants and midwives in UB (Shebwa and parts of Lahej)
- 2 Supervision is much more frequent in the project area (UA and UB)
- 3 Storage facilities in the project area (UA and UB) are slightly better than in the non-project area

Annex 3G Drug use in health centres and hospitals, Democratic Yemen 1988

Introduction

Drug use in health centres and hospitals in Democratic Yemen was studied by analyzing prescriptions from three health centres (Nissab, Mukheras and Hareer), two district hospitals (Laudar and Dhala) and the teaching hospital in Aden. From a wealth of information, only prescriptions for Upper Respiratory Tract Infection, Urinary Tract Infection, Osteoarthritis and High Blood Pressure, were analyzed in detail. The results are presented below and comments are given on pp 32-33.

Table 8 Upper Respiratory Tract Infection (the majority were given as URTI or common cold, with a few as pharyngitis, influenza and tonsillitis)

| | Number of prescr. reviewed | Av-nr.of drugs per prescr. | & with antibiotic | % with vitamins | % with analgesics/ antipyretic |
|----------------|----------------------------|----------------------------|-------------------|-----------------|--------------------------------|
| Teaching Hosp | 60 | 3.2 | 78 | 30 | 43 |
| District hosp. | | | | | |
| Laudar | 24 | 2.8 | 96 | 12 | 84 |
| Dhala | 44 | 3.2 | 84 | 42 | 97 |
| sub-total | 68 | 3.0 | 88 | 32 | 91 |
| Health centres | | | | | |
| Nissab | 6 | 3.2 | 100 | 50 | 67 |
| Mukheras | 43 | 3.2 | 88 | 42 | 96 |
| Hareer | 12 | 2.7 | 66 | 25 | 97 |
| sub-total | 61 | 2.9 | 82 | 38 | 92 |

Table 9 Upper Respiratory Tract Infection: antibiotics prescribed

| | Teaching Hospital nr (%) | District Hospitals nr (%) | Health Centres nr (%) | Total nr (%) |
|-----------------------------|--------------------------|---------------------------|-----------------------|--------------|
| procaine benzylpenicillin | 6 (13) | 21 (35) | 16 (32) | 43 (27) |
| phenoxymethylpenicillin | 10 (21) | 14 (23) | 10 (20) | 34 (22) |
| tetracycline | 7 (15) | 6 (10) | 13 (26) | 26 (17) |
| ampicillin | 6 (13) | 8 (13) | 5 (10) | 19 (12) |
| co-trimoxazole | 7 (15) | 4 (7) | 3 (6) | 14 (9) |
| erythromycin | 3 (6) | 2 (3) | 2 (4) | 7 (4) |
| cloxacillin | 5 (11) | | | 5 (3) |
| sulfadimidine | | 3 (5) | | 3 (2) |
| benzathine benzylpenicillin | | 2 (3) | | 2 (1) |
| chloramphenicol | 2 (4) | | | 2 (1) |
| Total | 47 | 60 | 50 | 157 |

Table 10 Urinary Tract Infections: analysis of prescriptions

| | Number of prescr. revw'd | Av.nr drugs per prescr. | % with anti-biotic | % with anti-cholin-ergics | % with mist. pot. citr. | % with furo-semide | % with analg/antipyr. |
|----------|--------------------------|-------------------------|--------------------|---------------------------|-------------------------|--------------------|-----------------------|
| Teach.H | 27 | 2.9 | 100 | 44 | n.a. | 26 | 19 |
| Dist.H. | | | | | | | |
| Laudar | 11 | 2.6 | 91 | 36 | 55 | 9 | 18 |
| Dhala | 7 | 3.0 | 86 | 57 | 71 | | 14 |
| subtot. | 18 | 2.8 | 89 | 44 | 61 | 6 | 17 |
| Hlth.C | | | | | | | |
| Nissab | 2 | 4.0 | 100 | 50 | | | 100 |
| Mukheras | 24 | 3.3 | 100 | 33 | 67 | 33 | 13 |
| Hareer | 12 | 3.3 | 100 | 50 | | 8 | 18 |
| subtot. | 38 | 3.4 | 100 | 39 | 42 | 24 | 26 |

Table 11 Urinary Tract Infections: antibiotics prescribed

| | Teaching Hosp | | Distr.Hosp | | Health Centres | | Total No (%) |
|-----------|---------------|----|------------|----|----------------|----|--------------|
| | No | % | No | % | No | % | |
| cotrim | 16 | 64 | 4 | 25 | 12 | 36 | 32 (43) |
| ampicil | 3 | 12 | 5 | 31 | 7 | 21 | 15 (20) |
| nitrofur | 3 | 12 | 5 | 31 | 4 | 12 | 12 (16) |
| tetracyc | 1 | 4 | | | 4 | 12 | 5 (7) |
| proc.pen | | | | | 4 | 12 | 4 (5) |
| sulfadim | | | 2 | 13 | 1 | 3 | 3 (4) |
| erythrom | 1 | 4 | | | 1 | 3 | 2 (3) |
| chloramph | 1 | 4 | | | | | 1 (1) |
| Total | 25 | | 16 | | 33 | | 74 |

Table 12 Osteoarthritis: analysis of drugs prescribed

| | Teaching Hosp | | Distr. Hospitals | | Health Centres | | Total No (%) |
|---------------------------------------|---------------|----|------------------|------|----------------|------|-----------------|
| | No | % | No | % | No | % | |
| Non-steroid | | | | | | | |
| indometh | 9 | 31 | 6 | 100 | 11 | 55 | 26 (47) |
| ibuprofen | 17 | 69 | 1 | 17 | 7 | 35 | 25 (45) |
| acet.sal.ac | 2 | 7 | 3 | 50 | 5 | 25 | 10 (18) |
| paracetamol | | | | | 1 | 5 | 1 (2) |
| Subtotal | 28 | 97 | 10 | 100* | 29 | 100* | 62 (100)* |
| Vitamins | 21 | 72 | 3 | 50 | 20 | 100 | 44 (80) |
| corticost. | 3 | 10 | 1 | 17 | 3 | 15 | 7 (13) |
| calcium lact | 4 | 14 | | | 3 | 15 | 7 (13) |
| Nr. prescr. reviewed | 29 | | 6 | | 20 | | 55 |
| Av.nr.of drugs per prescription | 2.4 | | 2.5 | | 2.8 | | 2.6 |

* Over 100% as more than one non-steroidal anti-inflammatory drug prescribed per patient.

Table 13 High Blood Pressure: analysis of drugs prescribed

| | Teaching Hosp | Distr.hospitals | Health Centres | Total (%) |
|-----------------------------|---------------|-----------------|----------------|-----------|
| methyldopa | 22 | 3 | 4 | 29 (71) |
| thiazides | 10 | | | 10 (24) |
| propranolol | 4 | | | 4 (10) |
| nifedipine | 1 | | | 1 (2) |
| furosemide | 18 | 1 | 3 | 22 (54) |
| diazepam | 23 | 1 | 4 | 28 (68) |
| vitamins | 8 | 2 | 3 | 13 (23) |
| Nr. of prescr. reviewed | 33 | 3 | 5 | 41 |
| Av.nr. drugs per prescr. | 4.0 | 5.0 | 4.0 | 4.0 |