Public Health

IMPACT OF AN ESSENTIAL DRUGS PROGRAMME ON AVAILABILITY AND RATIONAL USE OF DRUGS

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Summary Availability and rational use of drugs was assessed in a random sample of 19 peripheral health units in two governorates in Democratic Yemen in which an essential drugs programme has been operational for the past few years. Findings were compared with those from seven health units in one governorate in which no such programme had been started. On average, 27 essential drugs were available in the programme area, compared with 17 in the control area. Programme areas carried on average 1 non-essential drug, compared with 17 in control areas. Average stock was adequate for 4 weeks in programme areas and for 1 week in control areas. Health workers in the programme area scored slightly, but not significantly, better in a test on theoretical knowledge on rational drug use. However, programme areas differed considerably from control areas in patterns of drug use, with fewer injections (24·8% *vs* 57·8% of prescriptions) and fewer antibiotics (46·3% *vs* 66·8%) being prescribed in programme areas, which also had fewer drugs per prescription (1·5 *vs* 2·4). The programme has significantly improved the availability and rational use of essential drugs in peripheral health units.

INTRODUCTION

OF the 5000 million people in the world, 1300–2500 million have little or no regular access to essential drugs.[1] The WHO Action Programme on Essential Drugs and Vaccines is supporting about forty developing countries in the implementation of a national essential drugs programme.[2] The two main objectives of such national programmes are to improve the availability and rational use of essential drugs. Some essential drugs programmes have been operating for several years and it is important to evaluate their impact.

In Democratic Yemen, a country with 2·4 million inhabitants, the government started a national essential drugs programme in 1984 with assistance from WHO. WHO support concentrated on technical advice concerned with the selection, procurement, storage, and distribution of essential drugs, quality control, legislation, drug registration, and training in the logistics of drug supply and rational use. A national formulary has been produced and drugs have been clearly designated for use at certain levels (taking into account the skill of health workers and the morbidity seen). At the primary health care level in the programme area 31 drugs (the essential drugs, defined as those appropriate for use at health units) are provided. To improve drug supply and distribution to health units, monthly drug ration kits were introduced; a kit contains 24 essential drugs in quantities estimated to be needed for about 750 outpatient consultations. Procaine benzylpenicillin is the only injection in the kit. Seven other injectable drugs are issued according to need. Health units are facilities providing only outpatient care and staffed by medical assistants or nurses. At the time of the evaluation (March, 1988) two of the six governorates in the country were included in the kit supply system, which covered 122 (36%) of all health units. Drug ration kits are distributed every three months from the Central Medical Stores to a number of district collection points, usually health centres or hospitals, from which the kits are supplied every month to health units. In the other four governorates health units make indents for drugs from the district hospital and, depending on availability, receive supplies from them.

When the drug ration kit system was introduced three-day seminars were organised at the district level for all prescribing staff working at health units. These seminars concentrated on discussing standard treatment guidelines which had been prepared by the Ministry of Health. At a later stage one-week district seminars covering other issues related to rational drug use were held; about half of the health workers attended these seminars. Outside the programme area no training was given.

To assess the impact of the national essential drugs programme samples of health units from the two governorates in which the programme had been implemented (programme area) were compared with those from a governorate where it had not (control area).

TABLE I- AVAILABILITY OF DRUGS IN HEALTH UNITS IN DEMOCRATIC YEMEN

—	Programme area (n = 19)	Control area (n = 7)	p
Number of essential drugs available*	27·3 (4·7)	17·1 (3·1)	<0·001
Number of non-essential drugs available	1·4 (3·6)	17 4 (6·7)	<0·001
Average stock of seven marker drugs (in weeks)	4·1 (4·1)	1·4 (2·3)	<0·05

Values are means (SD).
*Drugs designated for use in health units.

SUBJECTS AND METHODS

19 (16%) of the 122 health units in the programme area and 7 (12%) out of 58 in the control area were randomly selected. All 26 health units were visited, and a standard procedure was followed. Availability of drugs was established by listing all drugs in stock at that time. These were aggregated into essential drugs (those which have been specifically classified as appropriate for use at health units[3]) and non-essential (those which have not). The quantity in stock was recorded for seven "marker" drugs (acetylsalicylic acid, chloroquine, mebendazole, metronidazole, oral rehydration salts, procaine benzylpenicillin injection, and sulfadimidine). These quantities were expressed as estimated duration for which the stock could be adequate; the estimate was based on average patient attendance for each health unit.

Health workers' knowledge in relation to the rational use of drugs was obtained by asking them a standard set of questions based on five hypothetical clinical cases. Their answers were scored out of a total of 27. Actual drug use was measured by analysing the last 100 prescriptions at 17 health units in the programme area and 5 in the control area; records at the other units were insufficient for analysis. For each of the 100 prescriptions the following was noted: (i) the number with injections, (ii) the number with an antibiotic, and (iii) the total number of drugs.

RESULTS

At health units in the programme area an average of 27·3 essential drugs were available, compared with 17·1 in the control area ($p < 0·001$) (table I). In the programme area the average number of non-essential drugs was 1·4 compared with 17·4 in the control area ($p < 0·001$). Programme areas had in stock an average of 4·1 weeks' supply of the seven marker drugs, while the control area had only 1·4 weeks' supply ($p < 0·05$). Differences were also statistically significant for each of the individual marker drugs except chloroquine.

Health workers in the programme area scored higher, but not significantly so, on the clinical case histories than did those in the control area (17·3 *vs* 16·7). However, since the seminars were held there has been considerable movement of health workers, and when the knowledge of those who had actually attended was compared with those who had not, the difference was significant (19·7 and 16·1, $p < 0·01$). In the programme area 421 prescriptions (24·8%) contained an injectable drug compared with 289 (57·8%) in the control area; similarly, 788 (46·3%) in the programme area contained an antibiotic, compared with 334 (66·8%) in the control area ($p < 0·001$). The average number of drugs per prescription was 1·5 in the programme area and 2·4 in the control area ($p < 0·01$).

DISCUSSION

The essential drugs programme seemed to have a considerable impact on drug availability and use. Of the 31 drugs designated as essential on average 27 (88%) were available in health units in the programme area. In control areas, however, on average only 17 (55%) essential drugs were available. Non-essential drugs constituted over half of all drugs in stock at control health units, and they were not therapeutic alternatives for the essential drugs that were lacking; most of them were drugs designated for use only at the health centre and district hospital level (eg, methyldopa, frusemide, and dexamethasone injection), and health unit workers usually are insufficiently trained to prescribe them correctly. Stock levels of essential drugs (4·1 *vs* 1·4 weeks of anticipated use for seven marker drugs) show that not only the range of drugs, but also the average stock, was larger in programme areas than outside.

Although few resources within the programme have been allocated to improving rational diagnosis and treatment, there were statistically significant differences in rational drug "knowledge" between those who had and those who had not attended training sessions. Health workers in the programme area said they often referred to the standard treatment schedules and many had put them up on the wall for easy reference. Two health workers who did not have a copy of the schedules complained that their predecessor had taken it with him.

Programme and control areas also differed considerably in drug usage patterns, with programme areas being more sparing in their prescription of injections (24·8 *vs* 57·8%) and antibiotics (46·3 *vs* 66·8%) as well as in the average number of drugs given per prescription (1·5 *vs* 2·4). These figures should be further compared with those obtainable if standard treatment schedules had always been followed when patients were treated at health units ("theoretical drug need"). Norms based on morbidity data specific for Democratic Yemen[4-6] suggest that injections were required for only 17% of consultations and antibiotics for 23%, and the average number of drugs required per prescription was 1·4 (see table II). This implies that, despite the programme's substantial impact on the number of drugs and injections prescribed, antibiotics are still much overprescribed, although their use has dropped.

The restriction of the range of drugs available in the drug ration kits probably had a greater influence than did health worker training alone on improved drug use—the kits limit the number of injectable drugs designated for use at health units, and what is not there cannot be given. This influence applies to a lesser extent to antibiotics, which cannot be omitted from the kit although their quantity may be reduced.

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TABLE II—ANALYSIS OF PRESCRIPTIONS IN HEALTH UNITS IN DEMOCRATIC YEMEN

—	Theoretical drug need* (n = 1000)	Programme area (n = 1700)	Control area (n = 500)	p†
Prescriptions containing an injectable drug‡	17·2	24·8	57·8	<0·001
Prescriptions containing an antibiotic‡	22·7	46·3	66·8	<0·001
Average number of drugs per prescription	1·4	1·5	2·4	<0·01

*According to morbidity pattern and standardised treatment schedules specific for health units in Democratic Yemen.
†Programme area *vs* control area.
‡Findings given as percentages.

REFERENCES

1. The world drug situation. Geneva: World Health Organisation, 1988; 53.
2. Summary of progress in the WHO Action Programme on Essential Drugs and Vaccines. Geneva: World Health Organisation, 1987. Doc WHO/DAP/87.8· 12–13.
3. Sallami AO, Kassim FA. Standard list of drugs and national formulary. Aden: Ministry of Health, 1986.
4. Helling-Borda M, Hogerzeil HV. Essential drugs for Democratic Yemen· estimating drug requirements. Alexandria· World Health Organsation, 1986: 38–61.
5. Hogerzeil HV, Sallami AO. Estimating drug needs for health units in Democratic Yemen. Alexandria: World Health Organisation, 1987; *E Mediterranean Reg* Hlth Serv J no 2· 32–37.
6. Estimating drug requirements. Geneva: World Health Organisation, 1988. Doc WHO/DAP/88.2.

"Without much scientific medicine he had built up an enormously successful consulting practice in gastroenterology. How had he done it?

"'Well,' said Hugh, 'I obey Osler's dictum. I listen to the patient telling me the diagnosis. I never interrupt a patient. I take down all that she tells me [the "she" is significant]. I read it back to her and I say if she remembers anything I have left out she must tell me. So the patient feels I really know her case. That ensures her confidence in me. I examine her and may prescribe treatment there and then. Or I may admit her to a nursing home for an X-ray and a test meal. In any case, I exclude cancer and assure her that I can tell her not to worry about cancer. That is often the therapy that really matters. Or I turn her over to the surgeons if cancer is still a real possibility. In any case the patient is satisfied that I understand her problem. If it comes to treatment, constipation is almost always a big part of any gastroenterological complaint. So I teach her how to infuse senna tea. I don't prescribe it as a made-up medicine. I want to give her an involvement in her own treatment that is direct and simple. I ask her to come back and see me in a month if she is not better. I have very few returns. I keep happy and fully informed both the patient and her doctor.'

"There it was. It was not for nothing that in his Berlin and Paris days—which were de rigueur for young aspiring physicians before the first world war—Hugh had studied psychology and psychiatry. He understood their limitations but he had learnt what they had to tell him about patients and their problems. And he applied his understanding with common sense and good effect."—JAMES HOWIE. Portraits from Memory. Dr Hugh Morton (1883–1941). London: British Medical Journal, 1988: 102.