A baseline survey on use of drugs at the primary health care level in Bangladesh*

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The drug use pattern and the quality of care were assessed in 80 public sector facilities throughout rural Bangladesh. A total of 40 thana *health complexes and 40 union subcentres, the lowest level in primary health care facilities, were selected at random. A total of 2880 prescriptions, consultations, and drug-dispensing practices were studied, and the availability and use of essential drugs and of the essential drugs list were recorded.*

The average consulting time (54 seconds), the proportion of adequate examinations (37%), and prescription of drugs according to standard treatment guidelines (41%) were unsatisfactory. The mean number of drugs prescribed per patient was 1.44; 25% were treated with antibiotics, and 17% with metronidazole, irrespective of the diagnoses. The availability of drugs (54%) and the presence of an essential drugs list (16%) in the health facilities were low. However, 78% of the drugs were prescribed by their generic names, 85% complied with the essential drugs list, and 81% were dispensed according to prescription. The average dispensing time (23 seconds) and the proportion of patients who correctly understood the dosage (55%) were poor.

Introduction

The International Conference on Primary Health Care at Alma-Ata in 1978 provided a guiding framework for public health initiatives (*1*). Its declaration included appropriate treatment of common diseases and injuries, and the provision of essential drugs as two vital components of the primary health care concept. The provision of drugs is the component of primary health care that patients most often demand and expect. Nevertheless, drugs continue to be in short supply, even when large portions of the health care budget are allocated for their procurement.

In June 1982 Bangladesh introduced a national drug policy (NDP) and a drugs ordinance (*2*), which follow WHO guidelines on the selection of essential drugs (*3*). Since the enactment of the drug policy, the production, quality, and availability of essential drugs have significantly improved (*4*). Although consultations with doctors most commonly result in drugs being prescribed, very little is known about the proper use of drugs. The quality of health care, particularly the rational use of drugs, depends on a wide range of activities, such as making the correct diagnosis, prescribing the appropriate drug(s), and dispensing them properly. When used rationally, drugs cure ailments; on the other hand, they may be dangerous and can threaten life when used irrationally (*5*).

The WHO Conference of Experts on the Rational Use of Drugs, held in Nairobi on 25–29 November 1985, was an important turning-point (*6*). The International Network for the Rational Use of Drugs (INRUD) was established in 1989 to promote the rational use of drugs in developing countries (*7*). The network generated indicators in three main drug use areas; prescribing, patient care, and drug systems; 20 randomly selected facilities and 36 encounters in each area were the minimum required to have representative data.[a] Eleven studies on the rational use of drugs have been undertaken since 1989. The first study using these indicators was conducted in Dhaka, Bangladesh, in 1991, in two rural health centres in the same district, and may not reflect the situation in the whole of the country (*8*). Therefore, we carried out a larger study representing Bangladesh in general.

The aim of the current survey was to assess drug use for six common diseases and to record the avail-

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ability of essential drugs. The survey examined current treatment practices at outpatient clinics, including assessment of patient care in terms of history-taking, physical examination, and the time given to each patient; assessment of the dispensing process in terms of the time taken and whether drugs were dispensed according to prescription; patient's knowledge of how to take the drugs; the availability of twelve essential drugs on the survey date; and the availability of an essential drugs list in the facilities.

Table 1: **Details of districts and health care facilities, by division, included in the sampling frame of the study**

Division	No. of districts	No. of facilities[a]	
		THC	USC
Chittagong	6	42	99
Rajshahi	8	54	163
Khulna	6	41	77
Dhaka	4	40	122
Total	24	177	461

[a] THC = *thana* health centre; USC = union subcentre.

Methods

Medical colleges play a key role in improving the quality of diagnosis, drug use, and supervision and management capabilities of health professionals. The present survey was therefore implemented by one medical college's community medicine and pharmacology department in each of the four administrative divisions of Bangladesh. The survey was coordinated by the Improvement of Drug Management Project (IDM) at UNICEF/Dhaka, and by INRUD members in Bangladesh. The study was undertaken at the two lowest primary level facilities in the public sector: *thana* health complexes (THCs) staffed by five to eight doctors, who attend 200–300 outpatients per day; and union subcentres (USCs), staffed by a medical assistant who attends 50–100 outpatients per day.

A three-day workshop was organized in July 1992 to adapt the WHO/INRUD Indicators on Drug Use and to identify the six commonest diseases encountered in the outpatient clinics in rural Bangladesh. These were as follows: watery diarrhoea, dysentery with blood, helminthiasis, pneumonia, acute respiratory tract infections, and scabies. During the workshop, standard treatments and minimum examination requirements were defined. The revised indicators, listed in Tables 2–4, were tested during the workshop in two different sites.

The survey had a cross-sectional descriptive design, using both retrospective and prospective data. Stratification was by division and by type of facility, to identify possible variations. The four administrative divisions in Bangladesh consist of 64 districts; however, only 24 districts were selected for the present study because the IDM project, which is supported by UNICEF, is scheduled to be implemented there. From all the rural government health facilities in these districts, ten *thana* health complexes (THCs) and ten union subcentres (USCs) were selected in each division using a stratified random sampling procedure. Table 1 shows the number of districts, THCs and USCs, by division, included in the sampling frame.

For each facility, retrospective data from September 1991 to August 1992 were collected from the outpatient registers; 36 encounters were selected by systematic random sampling. Prospective data on the quality of patient care were collected by observing the consultation and the examination of 36 cases presenting with one of the six, selected common diseases. Observations were made in the consultation room without interrupting normal activities. The consultation time was taken to be the time of exchange between the patient and the doctor. The quality of dispensing and each patient's understanding about the dosage were assessed prospectively by observation and exit interviews of all 36 selected patients. Each facility's main store was visited to assess the availability of twelve essential drugs. The essential

Table 2: **Quality of care, regarding consultations in the study health facilities**

Indicator	Facility[a]		
	THC (n = 1440)	USC (n = 1440)	Country (n = 2880)
Average consultation time per patient ± SD (sec)	60 ± 12	48 ± 12	54 ± 12
% of patients receiving an adequate examination ± SD	41 ± 9	32 ± 7	37 ± 9
% of patients treated according to defined standard ± SD	43 ± 12	39 ± 7	41 ± 10

[a] THC = *thana* health centre; USC = union subcentre; country = THC + USC.

drugs list had to be shown before it was recorded as being present.

A three-day training programme for field workers was held in each of the four divisions. In each division three investigators and eight interviewers participated in the training on data collection and supervision given by INRUD members and UNICEF staff. Medical students, medical graduates, intern doctors, and medical faculty lecturers served as interviewers. Field visits were undertaken to provide the investigators and interviewers with practical experience. During this training the THCs and USCs to be surveyed were randomly selected.

In each division four pairs of interviewers collected data from health facilities; the activities of the interviewers were supervised by two investigators. The data were analysed manually by the principal investigator and one co-investigator over a two-day period. Data were consolidated using a summary form. The analysis was presented by facility, by division and by the country as a whole. The statistical significance of the results was determined using Student's *t*-test.

Results

Consultation pattern

The quality of care (Table 2) provided to patients was assessed by examining the consulting practices of doctors in the THCs (n = 1440) and medical assistants in the USCs (n = 1440). The average consulting time per patient was 54 seconds (range: 36–72 seconds). The average consultation time in the THCs (60 seconds) was significantly greater than that in the USCs (48 seconds; $P<0.001$). Only 37% (22–52%) of the patients were adequately examined relative to the previously defined standard; the difference in this respect between those examined in the THCs (41%) and in the USCs (32%) was statistically significant ($P<0.001$). The variations between the divisions and facilities in terms of consulting times and the proportion of patients who were adequately examined are shown in Fig. 1 and 2, respectively. Prescribers followed the standard treatment guidelines for only 41% of the patients. Although use of standard treatments did not differ significantly between the THCs and USCs, there was a broad variation between divisions and facilities from a minimum of 29% to a maximum of 59% (Fig. 3).

Drug use

The drug use pattern examined in the 80 health facilities is shown in Table 3. The mean number of drugs prescribed for an individual patient was 1.44;

Fig. 1. **Consulting times in the *thana* health centres (THC) and union subcentres (USC) in the study.**

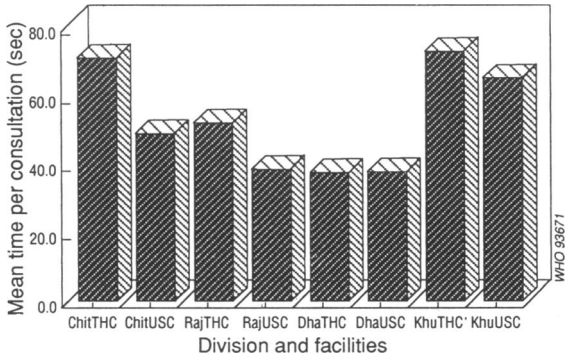

Fig. 2. **Proportion of adequate examinations in the *thana* health centres (THC) and union subcentres (USC) in the study.**

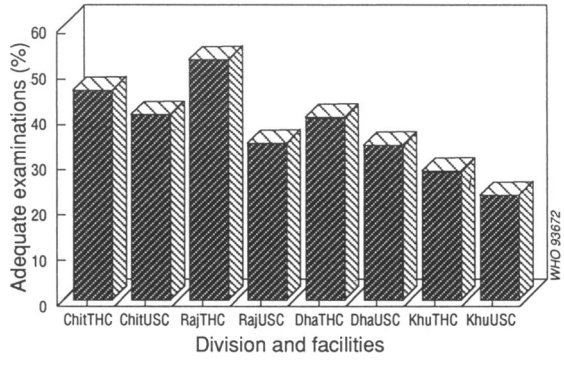

Fig. 3. **Proportion of treatments that were standard in the *thana* health centres (THC) and union subcentres (USC) in the study.**

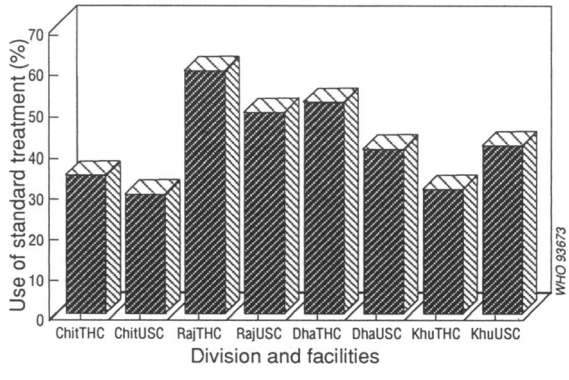

Table 3: **Drug use patterns in the study health facilities**

Indicator	Facility[a] THC (n = 1440)	USC (n = 1440)	Country (n = 2880)
Mean number of drugs prescribed per patient ± SD	1.40 ± 0.16	1.48 ± 0.12	1.44 ± 0.15
% prescribed antibiotics ± SD	25 ± 8	24 ± 4	25 ± 7
% prescribed metronidazole ± SD	15 ± 7	18 ± 9	17 ± 8
% prescribed drugs by generic name ± SD	77 ± 5	78 ± 6	78 ± 6
% prescribed drugs from essential drugs list ± SD	89 ± 6	82 ± 10	85 ± 9

[a] THC = *thana* health centre; USC = union subcentre; country = THC + USC.

of 2880 prescriptions studied, 59% were for one drug, 36% were for two drugs, and 5% for three or more drugs. The difference in the mean number of drugs prescribed was significantly different (P <0.05) in the USCs (1.48) and THCs (1.40). The proportion of patients treated with an antibiotic, irrespective of the specific disease was 25% (range: 14–37%) (Fig. 4). The rate of metronidazole prescription was 17% (range: 4–31% for all diagnoses (Fig. 5)); however, the THCs and USCs did not differ significantly in their rates of antibiotic or metronidazole prescription.

A total of 78% (range: 69–86%) of the drugs were prescribed using their generic name. The prescribers followed the essential drugs list, i.e., 85% of the prescribed drugs were from the list (range: 71–98%). THCs (89%) complied significantly better with the list than USCs (82%) (P <0.01). The proportions of generic use and use of drugs from the essential drugs list varied slightly between facilities and divisions.

Dispensing practices

The quality of care was assessed by examining the dispensing practices (Table 4). The average time taken to dispense the drugs was 23 seconds (range: 20–30 seconds) for each patient, with no difference between THCs and USCs. Of the drugs prescribed, on average 81% (range: 75–91%) were given to the patients. A total of 55% of the patients knew when and how to take the quantity of drugs dispensed; at the THCs 57% of the patients understood the correct dosage, a significantly higher proportion than at the USCs (53%; P <0.01). However, the dispensing times, proportion of patients whose knowledge was correct, and the percentage of prescribed drugs dispensed varied slightly between facilities and divisions.

Drug availability

The availability of the twelve marker essential drugs in stock and the presence of the essential drugs list in

Fig. 4. **Proportion of patients prescribed antibiotics in the *thana* health centres (THC) and union subcentres (USC) in the study.**

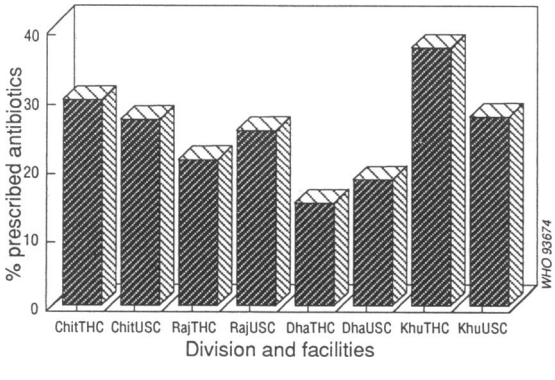

Fig. 5. **Proportion of patients prescribed metronidazole in the *thana* health centres (THC) and union subcentres (USC) in the study.**

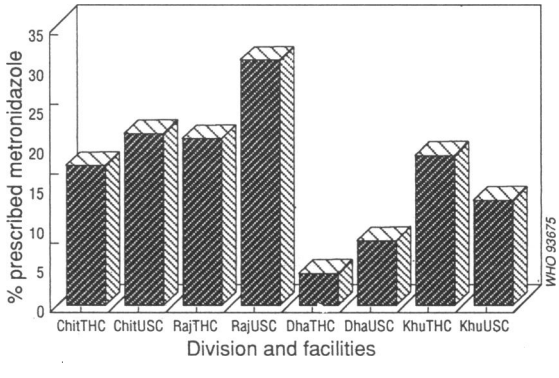

Table 4: **Availability of essential drugs and the essential drugs list in the study health facilities**

Indicator	Facility[a] THC (n = 40)	USC (n = 40)	Country (n = 80)
% availability of 12 essential drugs ± SD	63 ± 2	46 ± 11	54 ± 12
% presence of the national essential drugs list ± SD	28 ± 11	5 ± 9	16 ± 15

[a] THC = *thana* health centre; USC = union subcentre; country = THC + USC.

the drug store on the day of survey were other indicators studied (Table 5). On average, the facilities had 54% (range: 27–65%) of these twelve marker drugs in stock. In the USCs 46% of the drugs were available, while in the THCs 63% were available. This difference was significant (P <0.001). Only 16% of the facilities possessed the essential drugs list; 28% of the THCs had an essential drugs list, compared with 5% of the USCs (P <0.001).

Discussion

The average consultation time (54 seconds) was quite low; at the THCs the average consultation time (60 seconds) was higher than at the USCs (48 seconds) but was still unsatisfactory. Only 37% of the patients were examined adequately, with the proportion being slightly higher in the THCs (41%) than in the USCs (39%). At the THCs, where the medical staff were doctors, the quality of care, in terms of time spent with the patient and the proportion who were adequately examined, was slightly better than in the USCs, where the staff were medical assistants. Nevertheless, the quality of care was unsatisfactory in both facilities. The very short consultation times as well as the lack of adequate examinations bring into question the appropriateness of the diagnoses being made. Furthermore, only 41% of the patients received adequate treatment in line with the standard guidelines.

Generally, the mean number of drugs being prescribed was adequate compared with the standard treatment defined (1.44 drugs per patient); doctors at the THC level prescribed slightly less (38% of patients received two or more drugs) than medical assistants at the USCs, where 43% of the patients received two or more drugs. The rates of prescribing antibiotics and metronidazole were not different for doctors (THCs) and medical assistants (USCs). The proportion of the patients treated with antibiotics (25%) was relatively low compared with levels reported in studies conducted in other countries, e.g., 43% in Nepal, 56% in Uganda, 63% in Sudan (*8*). The use of metronidazole was high for all diagnoses (17%), given that none of the diseases studied required this drug as treatment. Also, it reflects the high national prevalence of diarrhoea and the excessive use of metronidazole to treat this condition. A secondary analysis for diarrhoeal diseases would permit better understanding as to how they are treated.

In the 80 facilities studied, an average of 78% of the drugs were prescribed using generic names, and 85% were from the essential drugs list. Both of these levels are satisfactory and result from the implementation of the national drug policy, which emphasizes the use of essential drugs in Bangladesh. It is mandatory for THCs and USCs to purchase 70% of their drugs from a partly state-owned drug manufacturer (Essential Drugs Companies Ltd.), which markets all of its products under generic names. The availability of the essential drugs list was low (16%), but this did not adversely affect the generic prescribing. However, at the USCs, where the list was often not available, the tendency of prescribers to comply with its recommendations was lower.

Pharmacists took an extremely short time (average, 23 seconds) to dispense drugs to the patients and there was no difference between THCs and USCs in this respect. This, as well as the short con-

Table 5: **Quality of care, regarding dispensing of drugs in the study health facilities**

Indicator	Facility[a] THC (n = 1440)	USC (n = 1440)	Country (n = 2880)
Average dispensing time per patient (sec) ± SD	23 ± 3	23 ± 4	23 ± 3
% of patients dispensed drugs according to prescription ± SD	80 ± 3	82 ± 6	81 ± 5
% of patients with knowledge about their dispensed drugs	57 ± 5	53 ± 7	55 ± 6

[a] THC = *thana* health centre; USC = union subcentre; country = THC + USC.

sultation time, could explain why only 55% of the patients knew how and when to take their medicines. A poor level of comprehension among the patients might have been expected; however, the number of drugs prescribed was low, and this might explain why patients' understanding was relatively high. A total of 81% of the drugs dispensed were by prescription. This finding should be viewed with caution. Medicines are often prescribed according to the supplies available at the health centre on the day concerned, and not necessarily according to what the patient needs. During the consultations most of the prescribers had a list of the drugs that were available. The availability of the twelve drugs under review was low (54%), and was lower for USCs (46%) than THCs (63%). The low or nonavailability of essential drugs directly affects prescribing patterns. In Bangladesh, the drug supply is limited because of financial constraints. However, even without the government increasing its drugs expenditure, specific improvements in the management of drugs, could reduce wastage, expiry, and irrational use; improved drug management improves the availability of drugs within the health system without increasing expenses (*9*).

The present study represents the largest survey carried out using the WHO/INRUD indicators on drug use[b] and serves as a basis for evaluating future interventions undertaken by the Improvement of Drug Management Project in Bangladesh. The results are very similar to those reported in a study carried out in Dhaka in 1991 (*8*). Because of the large sample size used in our study (80 facilities) and the low variability of the results, the findings should be representative of the situation regarding drug use in the public health system in rural Bangladesh. However, further similar studies also need to be carried out to cover the private health sector, which provides care for a large number of patients in Bangladesh. Also, inpatient prescribing and care were not included in this study. In particular, studies need to be conducted to investigate the drug use pattern in the medical colleges and teaching hospitals, where medical students first learn and practise prescribing.

[b] See footnote *a*, p. 265.

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Résumé

Enquête sur l'utilisation des médicaments dans les centres de soins de santé primaires au Bangladesh

Le mode d'utilisation des médicaments et la qualité des soins ont été évalués dans 80 centres de soins du secteur public (40 centres de *thana* et 40 centres secondaires constituant le premier échelon des soins de santé primaires), choisis au hasard dans l'ensemble des zones rurales du Bangladesh. Au total, 2880 prescriptions, consultations et visites avec délivrance de médicaments ont été étudiées. En outre les enquêteurs ont noté si la liste des médicaments essentiels et les médicaments essentiels eux-mêmes étaient disponibles.

La durée moyenne des consultations (54 secondes), la proportion des examens réalisés dans des conditions adéquates (37%) et le taux de prescription des médicaments conformément aux directives normalisées de traitement (41%) laissaient à désirer. Le nombre moyen de médicaments prescrits par patient a été de 1,44; 25% des patients ont reçu des antibiotiques et 17% du métronidazole, quel que soit le diagnostic. La disponibilité des médicaments dans les centres de santé était faible (54%) et 16% seulement des centres possédaient la liste des médicaments essentiels. Toutefois, 78% des médicaments ont été prescrits par leur nom générique, 85% d'entre eux figuraient sur la liste des médicaments essentiels et le pourcentage de médicaments délivrés conformément à la prescription était de 81%. Les résultats sont médiocres en ce qui concerne le temps moyen consacré à la délivrance des médicaments (23 secondes) et la proportion de patients ayant bien compris la façon de les prendre (55%).

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