Rational Use of Essential Drugs in the Public and Private Sector PHC Facilities in Bangladesh: Current Situation and Future Directions

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ABSTRACT

In Bangladesh, the National Drug Policy (NDP) of 1982 was instrumental in improving the supply of quality essential drugs at an affordable price, especially in the early years However, over time, evidences exist about the deterioration of situation both in terms of availability of essential drugs as well as rational use of drugs. This study examined the current status of the outcome objectives of the NDP in terms of availability, affordability and rational use of drugs in the primary healthcare (PHC) facilities in Bangladesh. To address this, the study covered a random sample of Upazila Health Complexes (UHC) in the rural areas (n=30) and a convenient sample of Urban Clinics (UC) in the Dhaka Metropolitan area (n=20) for observation, exit-interview and mini-market survey to collect data on WHO core drug use indicators in health facilities. Findings reveal the availability of essential drugs for common illnesses to be poor, varying from 6% in the UHCs to 15% in the UCs. Drugs dispensed out of total prescribed was higher in UHCs (76%) compared to UCs (44%). Dispensed drugs were not labeled properly, though 73% of the patients/care-givers reported to have understood the dosage schedule. Copy of an Essential Drugs List was available in 55% UCs and 47% UHCs with around 2/3rd drugs being prescribed from it. Polypharmacy was higher in the UCs (46%) than in the UHCs (33%). An antibiotic was prescribed in 44% of the encounters, more frequently for fever (36-40%) and common cold (26-34%) than for lower respiratory tract infection including pneumonia (10-20%). Prices of key essential drugs differed widely by brands (500% or more), seriously compromising the affordability for common people. This, the availability, affordability and the rational use of drugs have remained an illusory target to achieve in Bangladesh even 27 years after passing the much acclaimed NDP of 1982.

Key Words: Rational use of drugs, National Drug Policy 1982, Bangladesh

INTRODUCTION

BACKGROUND

An essential drug is a medicine considered as indispensable for treatment of a disease. The availability and accessibility of essential drugs is crucial for the successful functioning of any health systems (Chaudhury et al. 2005). The National Drug Policy (NDP) of 1982 was instrumental to improve the supply of quality essential drugs in Bangladesh at an affordable price (Islam 1999). An Essential Drug List (EDL) by the Government initially identified 150 (45 for rural PHC facilities) drugs with controlled price which was later reduced to 117 in 1993. The EDL has been revised and updated recently after 25 years to reflect advancement in medical science and now contains 209 drugs (Khan 2008).

Following the easy availability of essential drugs as a result of NDP 1982, irrational use of drugs such as over prescribing, multi-drug prescribing, use of unnecessary expensive drugs and overuse of antibiotics and injections became common, especially in case of the unqualified/semi-qualified allopathic providers in the informal allopathic sector (Islam 1999; Baqui & Chowdhury 1997). Aggressive marketing by the pharmaceutical companies in Bangladesh as well as free availability of 'prescription only' drugs in the unlicensed and unregulated drug retail outlets have worsened the situation (Baqui & Chowdhury 1997; Applebaum 2006; Islam & Farah 2007; Babu 2008; Samad 2009; Rahman et al. 2009).

A number of structural (to assess the pharmaceutical system's capacity to implement drug policy), process (to assess the activities necessary to implement drug policy) and outcome (to assess the availability and affordability of essential drugs, drug quality and rational use of drugs) indicators have been suggested by WHO to monitor national drug policies in any country (Brudon et al. 1999). There has been no study till date on monitoring national drug policies using these indicators (Islam 2006). A baseline survey done about 15 years ago on the use of drugs at the public sector PHC facilities (177 UHCs from 24 districts only) in Bangladesh found the availability and use of essential drugs very low, and also irrational and over-prescribing common (Guyon et al. 1994). There is a need of revisit after these long years to explore the current situation in a more comprehensive study which would include both public and private sectors, in rural and urban areas, preferably from a nationally representative sample. As a preamble to this, we begin by a brief review of the current state of drug governance in the country.

STATE OF DRUG GOVERNANCE IN BANGLADESH

The Directorate of Drug Administration (DDA) is the supreme Regulatory Authority in the country for drug related affairs such as licensing, production, import, export, quality control, pricing etc (DDA website http://www.ddabd.org). DDA is headed by a Director who is assisted by three Deputy Directors (one each for Registration and Quality control, Inspection and Licensing, and Drug Testing). There are 37 District offices staffed by 41 Superintendent of Drugs and 12 Drug Inspectors who are responsible for field level regulatory activities. A number of committees such as Drug Advisory Committee, Drug Control Committee, Pricing Committee, and Standing Committee for procurement of raw materials and import of finished drugs etc. comprising experts

from appropriate disciplines advise on relevant matters to the Licensing Authority. Besides, there are two Drug Testing Laboratories: one in Chittagong under the DDA and another one in Dhaka under the Institute of Public Health (IPH) of the Director General Health Services (DGHS). These laboratories test the quality of the pre-registration as well as post-marketed drugs. The regulatory mechanism for the production, marketing and use of drugs is limited by the Drugs Act 1940 (and the rules made under it in 1946) and the Drugs (Control) Ordinance 1982 (DDA website).

Bangladesh Pharmaceutical Industry has developed rapidly following the implementation of the NDP of 1982 (Reich 1994). In 2005, the pharmaceutical market was worth US$ 504 million and has been increasing at a steady average rate of 17.18% annually (Begum 2007). In 1980, eight multinational companies manufactured 75% of all products (by value) while indigenous pharmaceuticals now claim a market share of more than 75% (Ahmed 2007). At present, out of the top ten pharmaceutical companies, eight are indigenous. The top two indigenous pharmaceutical companies (Beximco and Square) now have a combined market share of about 25% (Begum 2007). Currently, there are 231 Allopathic drug manufacturing companies (and 204 Ayurvedic, 295 Unani and 77 Homeopathic companies) in the country and the number of registered items (in brand names) have exceeded 8000 (DDA website). Of the 231 allopathic manufacturers, 30 companies are considered as large scale units and dominate the market. The burgeoning pharmaceutical sector marked its achievements by successfully exporting its products to around 70 countries of Asia, Africa, Latin America and also, Europe (Begum 2007). The expansion of the pharmaceutical sector is further facilitated by the unique opportunity to capitalize on the exemption of patent regulations under WTO/TRIPS until January 1, 2016.

Every day, new products are entering the market. With the meagre resources (such as two drug testing labs and around fifty drug inspectors/superintendents) at hand, it is very difficult for the DDA to supervise and monitor such a large sector. As a result, many drugs are entering the market without proper quality assessment procedures. For example, in a testing by the drug regulating authority, 69% of paracetamol tablets and 80% of ampicillin capsules manufactured by small companies were found to be of below acceptable standard (USP 2004). In another assay of drugs involving 15 brands of ciprofloxacin, 47% of the collected samples were found to contain less than required ingredients (USP 2004). According to a media report, only the top 20 to 25 companies out of 200+ produce quality drugs in the country (The Bangladesh Observer June 20, 2006). This has resulted in flooding of the market with counterfeit drugs, sub-standard drugs and expired drugs (Anon 2004, The Daily Star August 1, 2006). These fake and low-quality drugs are responsible for poisoning and death (UNHCR 2006), and development of resistance to life-saving antibiotics (Okeke et al. 1999).

Next comes the problem of distribution of manufactured drugs. Drugs in the public sector hospitals and facilities are distributed by the Central Medical Stores (WHO, 1985). Outside this sector, the retail distribution presents a totally chaotic situation without any regulatory mechanism. According to law, the persons dispensing drugs at the drugstores should have at least a short training of eight weeks duration (Certificate Course) before one can apply for a drug shop (Pharmacy) license. This Certificate Course is conducted by the Bangladesh Pharmaceutical Society (BPS) in cooperation with the Bangladesh Chemist and Druggist Samity (BCDS) through 45 Tutorial Centres. But in practice, this is hardly followed. According to the BCDS, there are about 64,000 licensed (of which 14,000 are members of the Samity) and around 70,000 unlicensed drugstores in the country involved in selling drugs 'over-the-counter' (Zahedee 2008). Thus, most of the sales people at these drug stores do not have

training in dispensing of drugs, not to speak of diagnoses and treatment which they frequently do (see below). As they have no other channel of information from the formal sectors open to them, they fall easy prey to the aggressive marketing strategies of the pharmaceutical companies (Appalbaum 2006). Irrational use of drugs such as over prescribing, multi-drug prescribing, use of unnecessary expensive drugs and overuse of antibiotics and injections are the most common problems found with these retailers (Ahmed & Hossain 2007).

Drug retail shops are often the first and only source of healthcare outside home for a majority of patients in developing countries (Kamat & Nichter 1998). Thus, Bangladesh is no exception in this regard. Any body can buy any drug in any amount including addicting drugs without prescription from these drug stores. In reality, there are no 'prescription-only' drugs in Bangladesh. These shops are the main channels through which the counterfeit, substandard and expired drugs are marketed (The Daily Star, Nov. 14, 2003). There is no regular monitoring and supervision system in place to regulate these drug stores.

Finally, there is the issue of pricing of drugs. Bangladesh is one of the few countries where there is high out-of-pocket (OOP) expenditure on drugs by households which amounts to around 70% of the total OOP expenditure on health (GoB 2003). One of the main objectives of the Drug Policy of 1982 was to make available quality essential drugs at an affordable price. Thanks to the policy of buying raw materials from international competitive markets under NDP of 1982, the prices of the essential drugs fell sharply in the following years (Ahmed 2004). From 1981 to 1991, retail price of drugs increased by 20% only in the local currency. Before Drug Policy, the retail price of drugs used to be fixed by the Ministry of Trade upon discussion with DDA. Following recommendations of the NDP, a pricing committee with experts from stakeholder groups decides on the price of the locally produced drugs, and also endorse prices of imported drugs/non-essential drugs produced locally after review.

RATIONALE AND OBJECTIVES

Availability of Essential Drugs is an important factor to prevent bypass of PHC facilities by the community for accessing services (SIDA 2001). Despite years since NDP was implemented, evidences exist for frequent and persistent unavailability of Essential drugs, especially in the government health facilities (Omer & Cockcroft 2003, Oxfam_). For a comprehensive study of national drug policies, structural (to assess pharmaceutical system's capacity to achieve stated goals), process (to assess the degree to which activities necessary are carried out and progress over time) and outcome (to assess availability, affordability, quality and rational use) need to be studied (Brudon et al. 1999). Due to constraints in time and resources, we limited ourselves to study only the outcomes to have an understanding about the effectiveness of the Drug Policy. This particular study explored the achievements of the three outcome objectives (out of four, quality excluded because it was beyond our capacity) of the NDP of Bangladesh with respect to the availability, affordability, and rational use of Essential Drugs in PHC facilities in the country. This is expected to help the policy makers/programme implementers to understand how far the Drug Policy in Bangladesh has been effective in reaching the poor with 'quality drugs at low cost' and what needs to be done in future to improve the prevailing situation.

Objectives: To study how far the outcome objectives of the National Drug Policy in terms of availability, affordability, and rational use of essential drugs in the public and

private sectors PHC facilities in both rural and urban areas of Bangladesh. have been achieved.

Specific:

1. Study the availability of Essential Drugs (as per latest Essential Drugs List) in the public and private sector health care facilities in the rural (UHC, Drug shops) and urban (Dhaka City Corporation) areas of Bangladesh

2. Study the affordability of Essential Drugs by exploring the price differentials of different brands of drugs for common illnesses (e.g., diarrhea, dysentery, ARI, hyperacidity, fever, worm infestation etc.)

3. Study the rational use of drugs by allopathic health care practitioners (MBBS doctors, Medical Assistant/SACMOs, and Village doctors) through studying their prescribing behaviour for specific illnesses including dispensing practices by pharmacists/drug dispensers and consumer (patient/attendants) understanding and compliance

MATERIALS AND METHODS

STUDY DESIGN

This study was designed as a facility-based cross-sectional study which can be easily implemented using science graduates as data collectors, as experience has shown the difficulty of involving doctors/students (medical/pharmacy) for short assignments, especially in the rural areas. Moreover, out purpose was not to assess the QoC of the doctors/medical audit but to assess the specific aspects of the behaviour of the health providers with respect to the rational use of drugs at the grassroots. Given the use of standard indicators (Table A), WHO suggests that it can be implemented "by individuals without special training or access to many resources" (e.g., testing drugs for quality) (INRUD & WHO 1993).

Table A. WHO core indicators to investigate drug use in health facilities (INRUD and WHO 1993)

Prescribing indicators	
1	Average number of drugs per encounter .
2	% of drugs prescribed by generic name*
3	% of encounters with an antibiotic prescribed
4	% of encounters with an injection prescribed
5	% of drugs prescribed from essential drugs list
Patient care indicators	
6	Average consultation time
7	Average dispensing time
8	% of drugs actually dispensed
9	% of drugs adequately labeled
10	Patient's knowledge of correct dosage
Facility indicators	
11	Availability of copy of essential drugs list
12.	Availability of key drugs

* not recorded in this study

The study combined cross-sectional quantitative survey with occasional observations. The different components of the survey were

i) Availability of Essential Drugs in different facilities (availability of essential drugs list; availability of essential drugs for common illnesses).
ii) Affordability: Mini-market survey for price of essential drugs for common illnesses.
iii) Rational use of drugs:

a) Prescribing practices av. no. of drugs prescribed, % antibiotics prescribed, % drugs prescribed by generic name, % Inj. prescribed, % drugs prescribed from ED list for common illnesses by different providers (such as the MBBS doctors, Medical Assistants, Village doctors) at Upazila and urban (City Corporation) levels.
b) Dispensing practices at these health facilities (av. dispensing time, % drugs actually dispensed, % drugs adequately labeled, information given on dose regimen).

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iv) Understanding and compliance with dosage regimen and perceptions of patients/attendants on drugs availability, affordability, efficacy and cost of drugs through exit interview.

SAMPLING

Rural sample

A total of 30 Upazila Health Complexes (UHCs) was taken at random from the six divisions proportionate to the size of the divisions (Table B).

Table B. Distribution of study upazilas proportionate to the size of the divisions

Division	Total No. of UHCs	% of total	No. of sample UHCs out of 30	Comments
Dhaka	120	25	8	
Chittagong	96	20	6	
Rajshahi	124	26	8	Random selection
Khulna	59	12	4	
Barisal	40	9	2	
Sylhet	37	8	2	

Also, one drug shop each from the neighbourhood of the UHC/market where a medical assistant/*Palli Chikitsok* provides treatment was included to represent the informal sector (total 30 shops)

Urban sample

This was exclusively taken from Dhaka City Corporation (DCC) area due to constraints in resource and time. Under the Urban PHC Project (UPHCP), 8 NGOs are providing outpatient (preventive and curative) services in 10 areas of the DCC. Of these, DCC and one NGO are serving in two areas each and the rest six NGOs are working in one area each. From each area, two clinics were randomly chosen from a list of clinics provided by the NGOs in their respective areas. Thus, the urban sample comprised of a total of 20 clinics.

Patients

30 patients attending OPD for common acute illnesses were enrolled in the study from each facility (UHC, Drug shop, urban clinic) from the total patients visiting in two typical working days (consecutive) until the required number of patients was obtained. Patients were selected by systematic random sampling to avoid bias from timing of the survey (rush hours in the beginning or end of clinic sessions) or freshness or fatigue of the health care providers/workers. For details, see below. [Total patients> {(30+30)x30}+ {30x20}>(1800+600)>2400]

TOOLS

A structured form was developed and tested to record relevant data on prescribing and dispensing practices from patient-provider interaction. Another pre-tested, semi-structured questionnaire was used for recording information from the exit interview. A reference list of key essential drugs for common illnesses was prepared for this study from the Govt. approved latest EDL dated 8 April 2008 (See Table C below). The

common illnesses were selected from top 20 morbidities reported by BBS and reality check of patient registers from the govt. UHCs, and the key drugs selected by the investigators who are both medical graduates and Public Health specialists. This reference list was used to check whether key drugs for common illnesses were available in the facilities and also, for information on the prices of drugs (maximum and minimum) through mini-market survey.

THE SURVEY

The study passed through the usual institutional review process at BRAC Research and Evaluation Division and ethical review board of the James P. Grant School of Public Health, BRAC University for ethical approval. Data were collected through observation and recording information (prescribing and dispensing practices), face-to-face interview (exit interview) and mini-market survey (price of essential drugs) by the interviewers after obtaining informed verbal consent (see below for details). All interviewers hired for the study underwent a five-day training which consisted of didactic lectures on the content of the instruments (structured check-lists, questionnaires) followed by repeated practice sessions outside the study areas and long de-briefings. There were 20 interviewers including two supervisors who were divided into six teams. The day-to-day field activities of the teams were overseen by a field researcher based in the upazila field office. The whole survey activity was supervised and managed by the authors who made frequent field visits and provided assistance and guidance when needed. The survey was completed within 30 working days (18 Feb. - 24 Mar. 2009, including training).

Table C. Reference list of key essential drugs for common illnesses (from EDL)

Sl.	Common illnesses/conditions	Key drugs
1	Fever (with cold), pain	Acetaminophen (Tab) Acetylsalicylic acid (Tab)
2	Hyperacidity including peptic ulcer	Aluminium hydroxide+Magnesium hydroxide (Tab, Liquid) Ranitidine (Tab)
3	Diarrhoea	ORS
4	Dysentery, amoebic	Metronidazole (Tab, Syrup)
5	Typhoid fever	Ciprofloxacin (Cap, Tab, Syrup)
6	Worm infestation	Mebendazole/albendazole (Tab)
7	ARTI including pneumonia	Amoxycillin (Syrup) Co-trimoxazole (Tab, Syrup)
8	Vitamin deficiency including iron deficiency	Iron+Folic acid (Tab) B Complex (Tab, Syrup) Ascorbic acid (Tab)
9	Hypertension	Atenolol (Tab), Nifedipine (Tab)
10	Hypersensitivity reactions	Prednisolone (Tab)
11	Eye/Ear infection	Chloramphenicol (Eye/Ear drops) Chloramphenicol (Eye ointment)
12	Skin infection (fungal)	Miconazole (skin ointment/cream)
13	Ascabies	Benzylbenzoate lotion
14	Wound (surgical)	Chlorhexidine solution (dressing)

Prescribing and dispensing practices

For this part of the study, the randomly selected UHC/Urban Clinic was observed for two consecutive days (excluding any atypical day such as NID etc.) during the usual office hours (9am to 1:30 pm). A structured format was used to record relevant information of the 30 OPD patients selected through systematic random sampling. The survey team (two members) started the day by taking permission from the UHFPO/Clinic-in-Charge to proceed with the study in the particular facility, exploring whether there is an EDL (in file or posted in public) in the facility, and going through the record of the past seven days to get an idea about the average no. of patients attending the facility. The latter information was used to decide upon the interval required for taking systematic random sample of 30 patients. Thus, each 'n'th patient was included for observation.

One interviewer placed himself at the door of the Doctor's chamber and recorded the time of entry and exit of the sampled patient by a stopwatch. The prescribing indicators were recorded by scrutinizing the prescription slip immediately after the doctor-patient interaction, outside the doctor's chamber. Another interviewer posted near the dispensary followed the sampled patient when s/he came out of the chamber. The time of submitting the prescription slip to the dispenser and the time when the drugs were served was recorded and the dispensing time calculated. The no. of drugs in the prescription slip, the no. of drugs served by the dispenser and the labeling of the drugs served were recorded. Labeling was defined as a mean by which the drug can be identified (e.g., name of the drug inscribed on to the cap or tab, or if disposed of in original package). Next, the same interviewer conducted the exit interview of the patient (attendant of the patient if minor) to elicit information on their understanding of dosage of the drugs dispensed, satisfaction with services, and prices of essential drugs. The interview was conducted in a place away from the prescribing and dispensing sites and within the premises of the facility. The whole process continued in this cycle until information of 30 patients was recorded.

Simultaneous with the activities at the UHC, the third member of the team was posted at the most popular private practitioners (MA/SACMOs, *Palli* Chikitsks) drug shop in the market nearest to the UHC. He had to attend the shop both at the morning and evening to cover the practicing time of the particular provider. The tool used for recording information at the drug shops was slightly modified. He recorded relevant information on prescribing and some aspects of dispensing (e.g., labeling of drugs sold, dosage instruction etc.). Next, he conducted an exit interview of the patient, a little away from the drug shop and the provider to maintain privacy. He stopped until 30 patients were found or the expiry of two days, whichever was earlier.

Checking drug stocks in the UHCs and Urban Clinics

The reference list of key essential drugs for common illnesses was used to check whether the listed drugs were available on the day of survey. The list was read one by one before the store-keeper/dispenser and he was asked to show the drugs, if present. When the drug could be shown, only then it was recorded as available.

Mini-market survey

To find the market variation in prices of essential drugs for common illnesses, a mini-market survey was conducted. In the vicinity of the UHC studied, 10 drug shops were randomly chosen and the prices of the drugs using the above reference list of key

RESULTS

A total of 1800 patient-provider encounters in the rural areas (900 at UHCs, 900 at Drug shops) and 595 patient encounters in the urban area (Dhaka City Corp., DCC) were brought under observation in the study. A total of 1,995 individual drugs were prescribed in 30 UHCs, 2,526 drugs in 30 drug shops, and 1,507 drugs in 20 Urban Clinics.

SOCIODEMOGRAPHIC CHARACTERISTICS

Around 27% of the patients in the rural areas, and around 40% of the patients in the urban area were under five years of age while 40-50% of the patients were under 15 years of age (Table 1). The proportion of elderly patients ($\geq$60 years) seeking care at UHCs were twice that of the rural drug shops and Urban Clinics. Both at the UHCs and the Urban Clinics, women sought care in greater proportion than men.

Table 1. Socio-demographic characteristics of the study sample %

	Rural		Urban (DCC Area)
	UHCs	Drug shops	DCC/NGO clinics
Age			
0-5	29.1	24.7	39.3
6-14	13.1	14.3	12.3
15-29	23.2	27.3	24.4
30-44	17.3	19.2	13.6
45-59	10.0	10.9	7.1
$\geq$60	7.2	3.6	3.4
Sex			
Male	42.1	50.3	31.8
Female	57.9	49.7	68..2
N	900	900	595

Table 2 presents five most common illnesses diagnosed by the attending doctors and reported in the exit interview by the respondents. Variation was observed in the distribution of illness profiles among the different health facilities. For example, in the drug shops, more patients went for treatment of diarrhea and fever and much less for ARI.

Table 2. Common illnesses (as per diagnosis of providers) for which the patients sought care in the health facilities %

	Rural		Urban
	UHC	Drug shop	DCC/NGO clinics
Fever	31.0	36.0	30.0
Cough/cold	21.0	22.0	28.0
ARI (including pneumonia)	10.5	2.0	11.0
Diarrhoea	5.0	10.0	6.0
Dysentery	7.2	6.0	5.0
Body ache	11.4	13.0	14.3
Hyperacidity	8.0	6.4	4.0
Weakness	6.1	6.3	8.0
Hook worm infestation	2.2	1.4	1.0
Eye/ear infection	1.2	1.4	1.0

POLYPHARMACY

One or two drugs were most frequently prescribed from the UHCs and Urban Clinics compared to the drug shops (Table 3). On the other hand, polypharmacy such as three drugs (43%), and four or more drugs (19%) was most prominent in prescriptions from the drug shops. Also, poly pharmacy was more commonly found in the Urban Clinics compared to the UHCs.

Table 3. Polypharmacy by study areas

	Rural		Urban
Prescription containing no. of drugs	UHCs	Drug shops	DCC/NGO clinics
One	18.1	5.4	14.8
Two	49.0	33.1	38.9
Three	27.0	42.8	30.0
Four or more	5.9	18.7	16.2
N	900	900	596

Average number of drugs prescribed per encounter (prescription) was highest for the drug shops (3) and lowest for the UHCs (2) (Table 4). The drug shops also prescribed an injection in 4% of the encounters compared to none for the UHCs and Urban Clinics. In 44% of encounters in the UHCs and Urban Clinics, an antibiotic was prescribed while the proportion rose to 60% in case of drug shops. In.more than 60% of the encounters in the UHCs and the Urban Clinics, drugs were prescribed from the EDL while the proportion was only 44% in case of drug shops.

Table 4. Core drug use indicators by study areas

	Rural		Urban*
	UHCs	Drug shops	DCC/NGO clinics
Average number of drugs per encounter	2.2	2.8	2.5
% of encounters with an antibiotic prescribed	45.0	59.8	42.7
% of encounters with an injection prescribed	0.0	4.2	0.0
% of drugs prescribed from essential drugs list	63.0	44.4	66.1
Average consultation time (min)	1.8	5.1	5.8
Average dispensing time (min)	0.9	NA	2.1
% of drugs actually dispensed	76.3	NA	44.0
% of drugs adequately labeled	65.4	100.0	43.0
% patient's knowledge of correct dosage (self-reported)	73.0	90.0	76.0
% facilities having a copy of essential drugs list	47.0	NA	55.0
% facilities where at least 15 essential key drugs are available	8.0	NA	15.0

*Dhaka City Corporation areas; NA=not applicable

Average consulting time during patient-provider interaction was less than two minutes in UHCs while it was more than five minutes in case of the Drug shops and Urban Clinics (Table 4). Average dispensing time was also lowest for the UHCs (<1 minute). The proportion of drugs dispensed out of those prescribed was much higher in the UHCs (76%) compared to the Urban Clinics (44%). Only 65% of the drugs dispensed in the UHCs and 43% in the Urban Clinics were labeled. More than 70% of the patients from the UHCs and Urban Clinics reported that they knew how to take the dispensed drugs; this proportion was 90% for patients seeking treatment from the drug shops.

Table 6. Core drug use indicators in the rural public sector (Upazila Health Complexes, UHCs) by division

	Divisions					
	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Sylhet
Average number of drugs prescribed	2.28	2.34	2.13	2.23	2.21	2.12
% of encounters with an antibiotic prescribed	66.0	59.0	40.0	42.0	37.0	33.0
% of encounters with an injection prescribed	0.0	0.0	0.0	0.0	0.0	0.0
% of drugs prescribed from essential drugs list	67.0	61.0	63.0	67.0	57.0	74.0
Average consultation time (min)	0.91	2.3	1.61	0.90	2.41	1.3
Average dispensing time (min)	0.70	1.2	0.80	0.51	1.2	0.73
% of drugs actually dispensed	85.0	70.0	74.0	92.0	77.0	72.0
% of drugs adequately labeled	71.0	65.0	64.0	85.0	60.0	42.0
% patient's knowledge of correct dosage (self-reported)	92.0	93.0	73.0	79.0	57.0	47.0
% facilities having a copy of essential drugs list	50.0	33.0	63.0	50.0	50.0	0.0
% facilities where at least 15 key essential drugs are available	0.0	17.0	12.5	0.0	0.0	0.0

The status of core drug use indicators in the Drug shops (attended by MA/SACMOs, *Palli* Chikitsks) is shown in Table 7. Average no. of drugs prescribed per encounter was highest in Sylhet (4 drugs) compared to other divisions (around 3 drugs). In more than 70% of the encounters in Sylhet and Khulna, an antibiotic was prescribed. Only in drug shops in Chttagong and Khulna, in more than 55% of encounters, drugs were prescribed from the EDL. Average consultation time at the Drug shops was eight minutes in Barisal while it was only four minutes in Rajshahi. Interestingly, all drugs dispensed from the Drug shops with adequate labeling. Around 90% of the patients (or their attendants) reported that they knew the proper dosage schedule of the drugs prescribed. In 83% of the drug shops in Chittagong, the providers have seen a copy of EDL while no providers in Rajshahi and Sylhet have seen it. The drug shops maintained a good stock of all the 20 Essential Drugs in the reference list.

The status of core drug use indicators in the Urban Clinics in the DCC area is presented in Table 8 by the different NGOs who operate the clinics. In DCC, Marie Stopes and PSKP clinics, on an average three drugs were prescribed per encounter compared to only two for the other clinics. The proportion of antibiotic prescribed per encounter in these clinics (DCC 62%, Marie Stopes 50% and PSKP 57%) were also greater than those prescribed in the other clinics (a little over 30%). None of the clinics prescribed injections. Above 70% of the drugs in the BAPSA, PSTC and PSKP clinics were prescribed from the EDL while the proportion was <60% in Shimantik and Marie Stopes clinics.

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Table 7. Core drug use indicators in the rural private sector (drug shops) by division

| | Divisions | | | | | |
	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Sylhet
Average number of drugs prescribed	3.4	2.62	2.62	2.74	2.72	3.8
% of encounters with an antibiotic prescribed	63.0	53.0	56.0	70.0	59.0	75.0
% of drugs prescribed from essential drugs list	40.0	57%	47.0	55.0	37%	36.0
Average consultation time (min)	8.3	5.0	4.6	6.7	3.6	6.3
% of drugs actually dispensed	100.0	100.0	100.0	100.0	100.0	100.0
% of drugs adequately labeled	100.0	100.0	100.0	100.0	100.0	100.0
% patient's knowledge of correct dosage (self-reported)	100.0	92.0	93.0	99.0	79.0	87.0
% drug shops where providers have seen a copy of essential drugs list	50.0	83.0	50.0	25.0	0.0	0.0
% drug shops where 20 key essential drugs are available	100.0	100.0	100.0	100.0	100.0	100.0

Average consultation time was highest in BAPSA clinics (8 minutes) followed by DCC clinics (7 minutes) while it was lowest in Narimaitree clinics (3 minutes) (Table 7). Average dispensing time was 3+ minutes in Shimantik and DCC clinics while this was less than one minute in case of BAPSA clinics. Eighty percent of the prescribed drugs were dispensed from PSTC clinics while this was very low in case of the DCC (31%), Shimantik (25%) and PSKP (36%) clinics. A similar trend was noted in case of labeling of the dispensed drugs.

About 90% of the patients seeking treatment from the Shimantik, Narimaitree, BAPSA and DCC clinics reported that they were knowledgeable about the correct dosage schedule of the drugs dispensed (Table 7). All the sample clinics of the Shimantik, Narimaitree and Marie Stopes had a copy of EDL while the PSTC clinics had none. Only 50% of the Narimaitree and Marie Stopes clinics, and 25% of the DCC clinics had 15 of the Essential Drugs in the reference list.

Table 9 presents findings from exit interview on satisfaction of respondents (patients or their attendants) with services received from different facilities by sex. Mean waiting time at UHCs (17 minutes) was less than Urban Clinics (24 minutes), but higher than Drug shops (8 minutes). The respondents uniformly reported that the doctors listened attentively to their problems. The UHCs did poorly in terms of physical examination (42%) and maintenance of privacy (34%) compared to the other facilities (>76% and 66%. respectively). Compared to 70% in the UHCs and 95% in the Drug shops, only 34% of the respondents in the Urban Clinics reported to have received all prescribed drugs from the facilities. A negligible proportion of respondents from the UHCs reported about paying unofficial charges. Overall, the level of satisfaction with services received was quite high (80%), though a little less in the UHCs. Overwhelming proportion of the respondents said that they would suggest their friends/relatives to visit these facilities.

Table 8. Core drug use indicators in the urban areas of DCC by NGOs

	DCC/NGO clinics (Dhaka City Corporation area)							
	DCC	BAPSA	PSTC	Shimantik	Nari-maitree	Marie Stopes	UTPS	PSKP
Average number of drugs prescribed	3.0	2.3	2.2	2.2	2.48	2.97	2.3	2.62
% of encounters with an antibiotic prescribed	61.7	30.0	32.0	35.0	33.4	50.0	35.0	57.0
% of encounters with an injection prescribed	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
% of drugs prescribed from essential drugs list	65.0	73.0	78.0	56.0	66.0	59.0	67.0	72.0
Average consultation time (min)	7.2	7.9	4.9	5.8	2.8	5.8	5.7	5.4
Average dispensing time (min)	3.0	0.82	2.0	3.5	1.3	2.5	1.9	1.6
% of drugs actually dispensed	31.0	66.0	81.0	25.0	44.0	41.0	51.0	36.0
% of drugs adequately labeled	31.0	63.0	81.0	25.0	35.0	41.0	47.0	36.0
% patient's knowledge of correct dosage (self-reported)	89.0	90.0	68.0	93.0	93.0	62.0	47.0	80.0
% facilities having a copy of essential drugs list	75.0	50.0	0.0	100.0	100.0	100.0	25.0	50.0
% facilities where at least 15 key essential drugs are available	25.0	0.0	0.0	0.0	50.0	50.0	0.	0.0

Table 9. Findings from exit interview on satisfaction with services received % by sex and facilities

	UHC			Drug shop			UPHCP		
	Male	Female	All	Male	Female	All	Male	Female	All
Waiting time at facilities (Mean)	14.6	18.6	16.9	6.43	8.89	7.65	23.9	24.6	24.5
Doctors listened to problems attentively	94.0	94.0	94.0	100.0	100.0	100.0	98.0	99.0	99.0
Doctors examined physically	44.0	40.0	42.0	73.0	83.0	78.0	76.0	76.0	76.0
Doctors maintained privacy	35.0	33.0	34.0	63.0	75.0	69.0	62.0	68.0	66.0
Got all prescribed medicine from facilities	65.0	73.0	70.0	97.0	93.0	95.0	29.0	37.0	34.0
Paid unofficial charge	4.0	3.0	3.0	NA	NA	NA	0.0	0.0	0.0
Satisfied with services	84.0	83.0	84.0	99.0	100.0	99.9	95.0	95.0	95.0
Will suggest to relatives/friends to visit these facilities for seeking healthcare	93.0	93.0	93.0	100.0	100.0	100.0	99.5	98.0	99.0
N	379	521	900	453	447	900	189	406	595

Table 10 presents the results of the mini-market survey for the lowest and highest price of the essential drugs in the reference list for common illnesses. A wide variation in the lowest and highest market prices of the same drugs were found from the survey. Sometimes the differences were more than 500% e.g., Tablet IFA (1650%), Tab B-

Complex (one bottle, 650%), Tab Mebendazole (900%), Benzylbenzoate Lotion 9817%), Chloramphenicol ointment (543%), Miconazole ointment (592%), and Tab Metronidazole (500%). The results of the survey by Division is shown in Appendix Table 1.

Table 10. Lowest and highest price of selected essential drugs for common illnesses (Taka)

SI	Essential drug list	Current market price (Taka)		% difference
		Lowest price (TK)	Highest price (TK)	
1	ORS (Oral Dehydration Solution	2.00	5.00	150
2	Cotrimazole single table	0.80	2.50	213
3	Cotrimazol syrup	11.0	26.65	142
4	Amoxycline syrup	20.0	60.0	200
5	Ciprocine tablet	4.0	16.0	300
6	Ciprocine syrup	37.0	95.00	157
7	Aluminium hydroxide+ Magnesium hydroxide tablet	0.50	1.50	200
8	Aluminum hydroxide +magnesium hydroxide	11.0	65.00	491
9	Tab Ranitidine (150 mg)	1.00	4.00	300
10	Tablet Paracetamol (500 mg)	0.50	2.00	300
11	Tablet Acetylsalicylic cyclic (Aspirin 300mg)	0.50	2.00	300
12	Tablet IFA (Iron + Folic Acid)	0.20	3.50	1650
13	Tablet B complex per bottle	12.00	90.0	650
14	Tablet Ascorbic acid	0.50	2.00	300
15	Tablet Mebendazole	0.50	5.00	900
16	Tablet Albendazole	1.00	6.00	500
17	Tablet Atenolol 50mg	0.70	4.00	330
18	Tablet Prednisolon	0.50	1.50	200
19	Benzylbenzoate lotion 25%	6.0	55.0	817
20	Chloramphenicl eye drop	10.0	35.0	250
21	Chloramphenicol ointment	7.0	45.0	543
22	Nasal drop	6.0	35.00	483
23	Miconazol ointment	13.0	90.0	592
24	Tablet Metronidazole 400 mg	0.50	3 00	500

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DISCUSSION

This study was done to explore the current state of the availability, affordability, and rational use of essential drugs in the public and private sector PHC facilities in both rural and urban areas of Bangladesh. In doing this study, we used WHO Core indicators to investigate drug use in health facilities which comprised prescribing, patient care and facility indicators (INRUD & WHO 1993). The study covered a representative sample of UHCs (30) and Drug shops (30) in the rural areas and a sample of Urban Clinics (20) in the DCC area for observation, exit interview and mini-market survey to collect relevant data. Findings revealed a poor state of the availability, affordability and rational use of essential drugs in the public and private sector PHC facilities in Bangladesh. These are discussed below with implications for improving the situation in the country.

Polypharmacy or prescribing three or more drugs increases the risk of drug interactions, dispensing errors and proper comprehension of correct dosage schedules (INRUD & WHO 1993). In this study, polypharmacy was found to be practiced in great proportion than past; compared to 5% polypharmacy reported by Guyon et al. (1994) in the UHCs, we found this to be 33% which is alarming. On an average, the number of drugs prescribed per encounter in the UHCs (2.2) was higher than observed in the above study (1.4). However, >2 drugs per encounter was also observed in other studies from India (Karande et al. 2005; Chaudhury et al. 2005), Laos (Keohavong et al. 2006), Serbia (Jankovic et al. 1999), and Tanzania (Nsimba 2006). In case of the Urban Clinics and the Drug shops, the proportion of polypharmacy was even higher (46-61%); such high proportion was also seen in Indonesia (Arustiyono 1999).

The proportion of encounters with an antibiotic prescribed in the UHCs (45%) (irrespective of the specific disease) in this study was higher than the earlier Bangladesh study (25%) (Guyon et al. 1994), and also other studies (Karande, 2005; Hamadeh et al. 2001; Shankar et al. 2002; Massele et al. 2001). Encounters with an antibiotic prescribed were even higher in the Drug shops (60%) where unqualified and semi-qualified providers like *Palli Chikitsoks* and medical assistants respectively attended patients; such a high proportion was observed in Cambodia (Chareonkul et al. 2002). This is not surprising as in rural Bangladesh, the provider/prescriber and the dispenser are very often the same person thus giving rise to conflict of interest (Axon, 1994). To maximize profit, they may prescribe drugs in stock whether it is needed or not, especially the costly ones like the antibiotics. Added to this are the aggressive marketing strategies of the pharmaceutical companies, especially for the unqualified/semi-qualified providers who fall easy prey to them as they don't have any other channel of information from the formal sectors open to them. Thus, irrational use of antibiotics is seen across the different spectrum of providers (Trap & Hansen 2001; Ahmed & Hossain 2007; Kristiansson et al. 2008; Rahman et al. 2009) and is responsible for giving rise to the development of antibiotic resistance (Larsson 2003).

Interestingly, an Injection was rarely prescribed in the UHCs or the Urban Clinics; in the Drug shops, only in 4% of the encounters an Injection was prescribed. This is far less than that reported by Kermode & Muani (2006) from northern rural India (43%), but higher than that reported in another study from Mumbai, India (0.2%) (Karande et al. 2005).

The EDL (Essential Drug List) comprises a core list of minimum medicine that satisfies the health care needs of the majority of the population in a particular country, and should be available at all times in adequate quantity and in appropriate dosage form (Brudon et al. 1999). The latest updated and revised EDL in Bangladesh was released on 8th April, 2008, 24 years after the last one in 1984 (GoB 2008). An alarming fall (from 85% in 1994 to 63% in 2009) in the proportion of drugs prescribed from the EDL in the UHCs was observed compared to the earlier study by Guyon et al. (1994). Similar level of prescription from EDL (around 60%) was reported in Serbia (Janković, et al. 1999) but higher level was reported in India (Karande et al. 2005), Laos (Keohavong 2006), Tanzania (Simba 2006) and Cambodia (Chareonkul et al. 2002). Thus, Bangladesh is behind other low-income countries in this aspect of rational drug use.

The quality of care provided was measured by the time taken in consulting with the patient and the time taken to dispense the drugs prescribed including providing instruction on how to take the drugs. Average consulting and dispensing time in the UHCs appeared to have increased from what is found by Guyon et al. (1994) (from less than one minute to two minutes and from 23 seconds to about 60 seconds respectively), but lacked behind the other countries e.g., Serbia (Jankovac et al. 1999). Such a short time is neither adequate for history-taking and examination of the patients nor giving them sufficient information on drug dosage schedule and on the necessity of completing the dosage as instructed for recovery. The Drug shops and the Urban Clinics performed better than the UHCs in this respect.

None of the drugs dispensed from any of the facility was labeled properly (name, generic name of drug and dosage). In this study we considered drugs as labeled if the drug could be identified by either the inscription on its body or the name printed when disposed in the original package. Even with this proxy indicator, we found the UHCs and the Urban Clinics to be performing poorly in this aspect. Such poor labeling of drugs dispensed was also seen in India (Karande et al. 2005), Tanzania (Simba 2006) and Cambodia (Chareonkul et al. 2002). Patients' knowledge of correct dosage was estimated in this study by self-reporting since proper labeling was mostly absent and instructions on how to take the drugs were given verbally. An improvement in patient/respondent's knowledge of correct dosage since 1994 (Guyon et al.) was observed in case of the UHCs (from 57% to 73% in this study), comparable to other studies (Karande et al. 2005; Keohavong et al. 2006), while a lower level of such knowledge was observed in other studies (Simba 2006; Chareonkul et al. 2002).

The facility indicators presented a mixed picture. While comparing with the previous study on UHCs (Guyon et al. 1994), an improvement occurred regarding the presence of a copy of the EDL (from 28% to 47%) but deterioration was observed in the availability of essential drugs from the reference list prepared for treatment of common illnesses (from 63% to 6%). Thus, availability of essential drugs appeared to be a major constraint in rational management of common illnesses. This is also consistent with the fact that lack of medicines was the most common complaint (others being bad staff attitude, bad service, difficult to reach, extra payment, non-availability of doctors etc.) for which progressive deterioration in the use of government health services occurred during 1999-2003 (Cockcroft et al. 2007).

The regional variation in case of UHCs and organizational variation in case of Urban Clinics in the DCC area in the drug use indicators found in this study draws our attention to the micro-level of the problem such as variation by region or by the NGO activities in the urban region. This need to be taken care of while instituting specific interventions.

The anarchy prevailing in the drugs market is well amplified by the wide variation found in the price of drugs based upon brands, sometimes the difference ranging from an overwhelming 500 to 1000+%. This is the result of poor regulatory and supervisory activities by the Directorate of Drug Administration (DDA) in Bangladesh as discussed earlier. As Out-of-pocket expenditure for drugs is high in Bangladesh, and all prescribed drugs at the facilities are not available always, this contributes to the catastrophic health expenditure for the poor households (Xu et al. 2003; Doorslaer et al. 2007).

Responsiveness or responding to people's expectations is one of the three main objectives of the health system (WHO 2000). For enhancing responsiveness to the expectations of population several actions such as respect for the person (dignity, confidentiality, autonomy), attention to health needs of the client, provision of basic amenities etc. are needed. There was a tendency to respond to some of these needs as observed from the exit interview of the respondents. Further testimony is provided by the level of satisfaction and also, willingness to recommend friends/relatives to visit these facilities. However, concerted efforts are needed to reduce the gaps identified.

STRENGTHS AND WEAKNESSES OF THE STUDY

This study is an improvement from the earlier study on the UHCs (Guyon et al. 1994) in that it covered a larger, representative sample of the upazilas proportion to the size of the divisions in the country, and it also additionally included a sample of private sector Drug shops and a sample of NGO facilities from the urban areas. Thus, the study gives a comprehensive idea about the state of rational drug use in both the public and private sector (profit and non-profit) PHC facilities in Bangladesh. The sample size was adequate (both facilities and individual encounters) as per INRUD & WHO (1993) recommendations to compare facilities. Primary, prospective data were collected to estimate different indicators. A combination of observation, exit-interview and mini-market survey was used to collect relevant data by trained interviewers under the direct supervision of the investigators.

On the other hand, due to constraint of time and resources and practical reasons, certain components could not be estimated as per INRUD & WHO recommendations (1993). One example is 'labelling'. As a matter of fact, none of the UHCs and Urban Clinics followed the proper way of labeling drugs such as writing the name of the patient, name of the generic drugs, and dose instructions. In that situation, we had to use alternative ways: identification of drugs by inscriptions on it or name printed when disposed in original package. Another example is 'patient's knowledge of correct dosage'. As the instructions were given verbally and the drugs were not properly labeled, we accepted respondent's statement that s/he understood how to take the drugs prescribed as a proxy for the knowledge indicator. For obvious reasons, information on certain indicators such as dispensing time or % of drugs dispensed was not collected from the drug shops. Preliminary investigation found generic prescribing so uncommon that this indicator was excluded from the roster. Also, we did not explore whether drugs prescribed was according to standard guidelines as most of the recorded diagnosis was not specific enough. Neither could we test the quality of drugs due to lack of resources.

Lastly, due to time and resource constraints, the urban sample consisted of clinics in DCC area only. However, the way the sample was taken also provided an opportunity to explore the individual performances of the NGOs operating in the area.

CONCLUSIONS

From the above discussion, following conclusions are made:

- There has been deterioration in prescribing practices of drugs over time especially in rural Bangladesh; on an average more and more drugs are being prescribed with less and less use of EDL for prescribing. Generic prescribing is almost non-existing.

- Polypharmacy is alarmingly on increase including misuse and overuse of antibiotics, especially at the drug shops and the Urban Clinics.

- Consulting time is inadequate for a proper history-taking and examination of the patient; dispensing time is too short for making any meaningful communication on the drugs being prescribed and dispensed, including side-effects etc. There is no labeling of drugs dispensed; information dissemination on dosage schedule is done verbally and therefore, patient interpretation and compliance is questionable.

- There is anarchy prevailing in the drug market due to absence of any tangible presence of a regulatory authority. The retail prices of key essential drugs for common illnesses vary widely, depending upon brands. This raises the issue of affordability, especially for the rural poor.

RECOMMENDATIONS

The key objective of the National Drug Policy in Bangladesh was to make available quality essential drugs at an affordable price to the people including rational use of drugs. In terms of availability and affordability of essential drugs, the policy has been a grand success initially as discussed earlier, but the rational use of drugs has remained an illusory target to achieve. Many factors are responsible for this, but the foremost is the lack of political commitment as well as lack of cooperation from the medical establishment. This study shows the miserable state of essential drug use, availability and affordability in the PHC level facilities 27 years after the NDP 1982.

From a review of the study findings, following recommendations-in-brief are made for consideration of the policy makers to improve the situation:

- Good quality Essential Drugs for common illnesses (as listed in the national EDL) at an affordable price should be made available at the PHC level facilities, especially the public sector facilities throughout the country---that's the basic minimum expected by the people from the pharmaceutical and health establishment of the country 38 years after independence!

- The EDL is updated in 2008 after 24 years; this should be done more regularly at five years interval to incorporate rapidly changing therapeutic scenario worldwide; it will be more convenient if the EDL is organized by illnesses/diseases instead of current alphabetical listing. The EDL should be made widely available and made mandatory to display publicly in any drug dispensing facilities including all types of drug shops and pharmacies

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- Regulatory supervision by the DDA (with imposition of sanctions as necessary) should be strengthened for controlling the quality and price of the drugs. Both human resource and technical capacity (e.g., establishment of drug testing labs) need to be developed for this to take effect. Further, the DDA can collaborate with consumer interest groups (e.g., Consumers' Association of Bangladesh) in order to device a price control mechanism and identifying fake or counterfeit drugs.

- Measures should be taken to motivate and convince the medical profession (qualified and unqualified or semi-qualified, formal or informal sector) about the necessity of the rational use of essential drugs at the PHC facilities including avoidance of polypharmacy, overuse and misuse of antibiotics, generic prescribing and prescribing from the national EDL. Policy makers should also think how the consulting time can be increased for quality provider-patient interaction

- Education and training combined with managerial and regulatory interventions are needed to rationalize drug dispensing at the more than 80.000 Drug shops in the country as well public and private sector health facilities; proper labeling of drugs dispensed, and counseling patients/attendants on dosage and side-effects are also needed

- Lastly, a comprehensive evaluation of National Drug Policy using the background, structural and process, and outcome indicators is urgently needed to have a state-of-the-art knowledge on Bangladesh situation. This will provide policy makers necessary guidance in improving the present miserable situation with respect to production and rational use of drugs

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Appendix Table 1. Price distribution of medicine in market by division

	Barisal		Chittagong		Dhaka		Khulna		Rajshahi		Sylhet		All	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
ORS	2.00	5.00	2.00	5.00	2.00	5.00	2.00	5.00	2.50	5.00	2.50	5.00	2.00	5.00
Cotrimazole tablet	0.90	2.50	0.80	2.20	1.00	2.50	1.00	2.50	0.85	2.00	1.00	2.50	0.80	2.50
Cotrimazole Syrup	11.0	25.00	12.0	25.00	12.0	25.00	12.0	25.00	11.0	25.00	16.0	26.65	11.00	26.65
Amoxycline syrup	20.0	55.0	20.0	48.00	25.0	60.0	27.0	48.00	20.0	50.0	30.0	48.0	20.00	60.00
Ciprocine tablet	4.00	14.00	5.00	15.00	4.00	15.00	4.00	15.00	4.00	16.00	5.00	15.00	4.00	16.00
Ciprocine syrup	60.0	90.0	40.0	90.00	37.0	95.00	42.0	90.00	50.0	95.00	55.0	90.00	37.00	95.00
Aluminum +magnesium hydroxide tablet	0.50	1.50	0.35	1.50	0.50	1.50	0.50	1.50	0.50	1.50	0.50	1.50	0.50	1.50
Aluminum hydroxide +magnesium hydroxide	30.0	55.00	20.0	55.00	11.00	60.0	11.0	55.00	20.00	65.00	30.0	65.00	11.00	65.00
Tab ranitidine (150 mg)	1.00	2.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00	2.00	1.00	4.00
Tablet Aceaminophen 500 mg	0.50	1.70	0.50	2.00	0.50	2.00	0.50	2.00	0.50	1.50	0.50	2.00	0.50	2.00
Tablet acetylsalicylic acid (Aspirin)300 mg	0.50	2.00	0.50	2.00	0.50	2.00	0.50	2.00	0.50	2.00	0.50	2.00	0.50	2.00
Tablet IFA(Iron and Folic Acid)	0.20	2.50	0.20	3.00	0.20	3.00	0.20	4.00	0.20	3.50	0.20	3.50	0.20	3.50
Tablet B complex/ bottle	17.00	90.0	14.00	52.00	12.00	90.0	18.00	45.00	14.00	82.0	18.00	85.0	12.00	90.00
Tablet Ascorbic acid	0.80	2.00	0.60	2.00	0.50	2.00	0.75	2.00	0.50	2.00	0.80	1.80	0.50	2.00
Tablet metronidazole 100	0.50	5.00	0.50	5.00	0.50	5.00	0.60	5.00	0.50	5.00	0.50	5.00	0.50	5.00
Tablet albendazole 400	1.00	5.00	1.20	5.50	1.00	6.00	1.50	6.00	1.00	5.00	2.50	5.00	1.00	6.00
Tablet Atenolol 50 mg	0.70	0.80	0.70	2.00	0.70	4.00	0.70	1.00	0.70	3.00	0.70	1.00	0.70	4.00
Tablet Prednisolon	0.60	0.90	0.50	1.00	0.50	1.50	0.50	1.00	0.50	1.00	0.50	1.00	0.50	1.50
Benzylbenzoate lotion 25%	10.0	20.00	14.00	50.0	12.0	50.00	10.0	42.00	6.0	55.0	14.00	25.0	6.00	55.00
Chloramphenicol eye drop	14.00	60.0	14.00	35.00	10.0	35.0	14.00	32.00	11.0	35.0	15.00	35.0	10.00	35.00
Chloramphenicol ointment	7.00	16.0	3.00	25.0	7.00	30.0	8.00	38.0	7.00	17.0	7.00	45.0	7.00	45.00
Nasal drop	6.00	35.0	6.00	12.0	6.00	34.0	6.00	10.0	6.00	18.0	6.00	30.0	6.00	35.00
Micronazol ointment	13.0	50.0	28.0	50.0	13.0	90.0	16.0	60.0	18.0	55.0	18.0	65.0	13.00	90.00
Metronidazole 400 mg	0.60	1.50	0.60	3.00	0.50	2.00	0.60	1.50	0.50	1.50	0.60	2.00	0.50	3.00

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