American Scientific Research Journal for Engineering, Technology, and Sciences (ASRJETS)
ISSN (Print) 2313-4410, ISSN (Online) 2313-4402

http://asrjetsjournal.org/

# Studies on Drug Use Pattern and Cost Efficiency in Upozila Health Complexes in Dhaka Division of Bangladesh

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**Abstract**

The objective of the study was to investigate the pattern of drug use in public health facilities in Dhaka division of Bangladesh. The results obtained from 600 outpatients of 20 randomly selected Upozila Health Complexes were analyzed with an excel software program. Based on INRUD indicators of rational drug use were obtained from January-December in 2014. Average number of drugs per encounter was 3. On average the percentage of drugs prescribed by generic name was 49. Antibiotics were prescribed in 44% of prescriptions. 59 % of drugs prescribed appeared on the national essential drug list. Average consulting and dispensing time were observed to be 2 minutes and 22 seconds respectively. Patients who could repeat the correct drug dose schedule was 36%. Key drugs available in the health complexes were 51%. The average cost of drugs per encounter was Tk. 236. The average number of encounters with antibiotics per Upozila health complex was 13 and average cost of antibiotics per encounter was found to be Tk. 211. The prevalence of acute respiratory infection, dysentery, diarrhea, scabies, fungal infection and worm infection were 16.67, 18.50, 15.67, 16, 19.17 and 14% respectively. Total money spent for the treatment of dysentery, ARI, diarrhea, fungal infection, scabies and worm infection was Tk. 33.33, 22.08, 11.24, 28.09, 4.30 and 0.96% respectively.

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Rational drug use and drug availability at the facilities were not satisfactory. Adequate drug funding to ensure availability of essential drugs is vital to improve the situation. The care provided to patients was insufficient.

***Keywords:*** PHC: Primary Health Care; OPD: Out Patient Department; STG: Standard Treatment Guideline; EDL: Essential Drug List; ARI: Acute Respiratory tract Infection; UHC: Upozila Health Complex.

## 1. Introduction

There have been no comprehensive studies on drug use pattern in Bangladesh for at least a decade, which requires investigation of the state of the indicators relating to pharmaceutical system's capacity to achieve the stated goals, the degree to which necessary activities are carried out and progress over time and to assess availability, affordability, quality, and rational use [1]. A baseline survey, conducted in 1992 on the use of drugs at some public-sector facilities in rural Bangladesh, found that the availability and use of essential drugs were very low and irrational, and over-prescribing of drugs was common [2]. Since then, no study has been conducted to track the changes over the years and guide practitioners. This study aimed at fulfilling this knowledge gap by investigating the availability and rational use of drugs and the affordability of the common people in both rural and urban PHC facilities in the country. This is expected to help the policy-makers/practitioners understand the present situation and take remedial measures to reach the poor with 'quality drugs at low cost' [3]. Besides, responsiveness of the PHC facilities and client satisfaction were also explored.

## 2. Methodology

A cross-sectional descriptive study was conducted using both qualitative and quantitative tools to gather data on 6 common diseases-dysentery, ARI, diarrhea, scabies, worm and fungal infections between January-December 2014 at the 20 health facilities from a list of 119 Upozila Health Complexes (UHC) in Dhaka Division of Bangladesh. About 30 encounters per facility comprise a total of 600 encounters in the cross-sectional study. The study population was primarily outpatients who utilized the outpatient department (OPD) and OPD prescribers. Samples of prescriptions were collected from patients randomly. Mode of collection was copied prescriptions by photocopy or by digital camera after taking consent of patients.

Prescription encounters of 600 patients within the study period were randomly collected and recorded on an International Network for Rational Use of Drug indicator form to obtain prescribing pattern data. All the outpatient prescribers were interviewed with aid of a simple questionnaire to determine the level of use of the national standard treatment guidelines (STG) at the facilities.

Data was analyzed to measure drug use indicators with an excel software program. The study protocol was conducted in line with the requirements and approval of the administration.

## 3. Results

A total of 1800 individual drugs were prescribed for the 600 patients medical records. The average number of drugs per encounter was 3 (Figure 1) and the number of drugs per encounter ranged from 1 - 5 drugs.

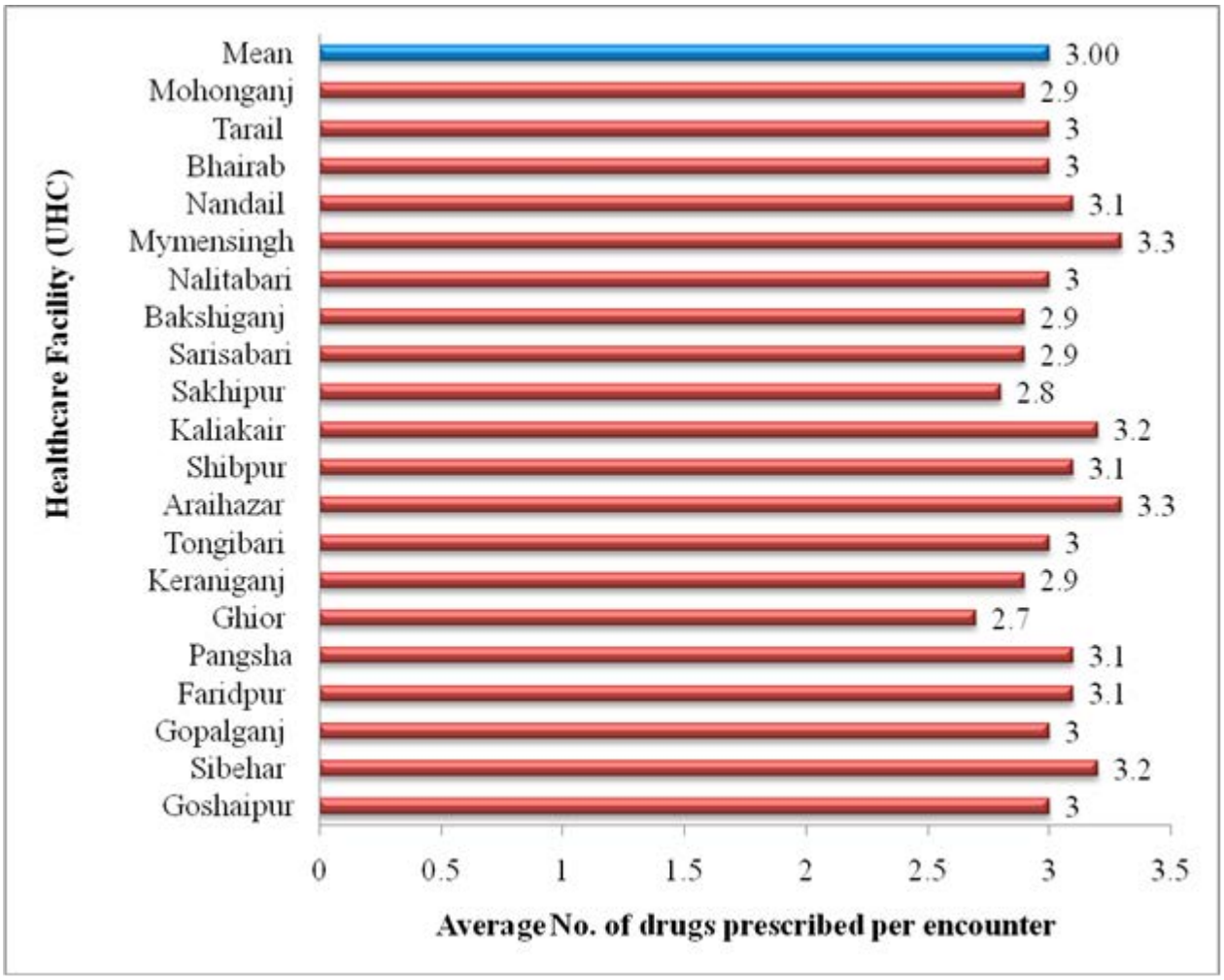


**Figure 1**: Indicator study showing average number of drugs per encounter

The number of encounters with antibiotics constituted 44% of the total number of drugs prescribed. Antibiotics commonly prescribed included; levofloxacillin, amoxicillin, ciprofloxacin, flucloxacillin, erythromycin, amoxicillin-clavulanic acid, azithromycin, cefuroxime, cefradine etc. Not a single encounter with injection was observed in any health facility under investigation which is very appreciable and encouraging. Generic prescribing constituted 49% of the total drugs prescribed and the proportion of drugs prescribed which were on essential drug list was 59% (Figure. 3).

The average consultation time which prescribers spent with a patient was 2 minutes and ranged between 1.6-3.4 minutes (Figure. 2). Observing the interaction between dispensers and patients at pharmacy window where clients were collecting their medications, the average dispensing time was 22 seconds (Figure. 2). The range for this indicator was between 18 seconds to 28 seconds. 36 percent of patients could repeat the correct dosage schedule for all the drugs they received, while 61% of total prescribed drugs were correctly dispensed. None of the dispensed drugs were adequately labeled. No Health complex was found to have the Standard Treatment Guidelines (STG) and there was no existence of regulatory measures to implement rational use of drugs. Only four out of twenty health complexes were found to possess the national essential drug list (18%).

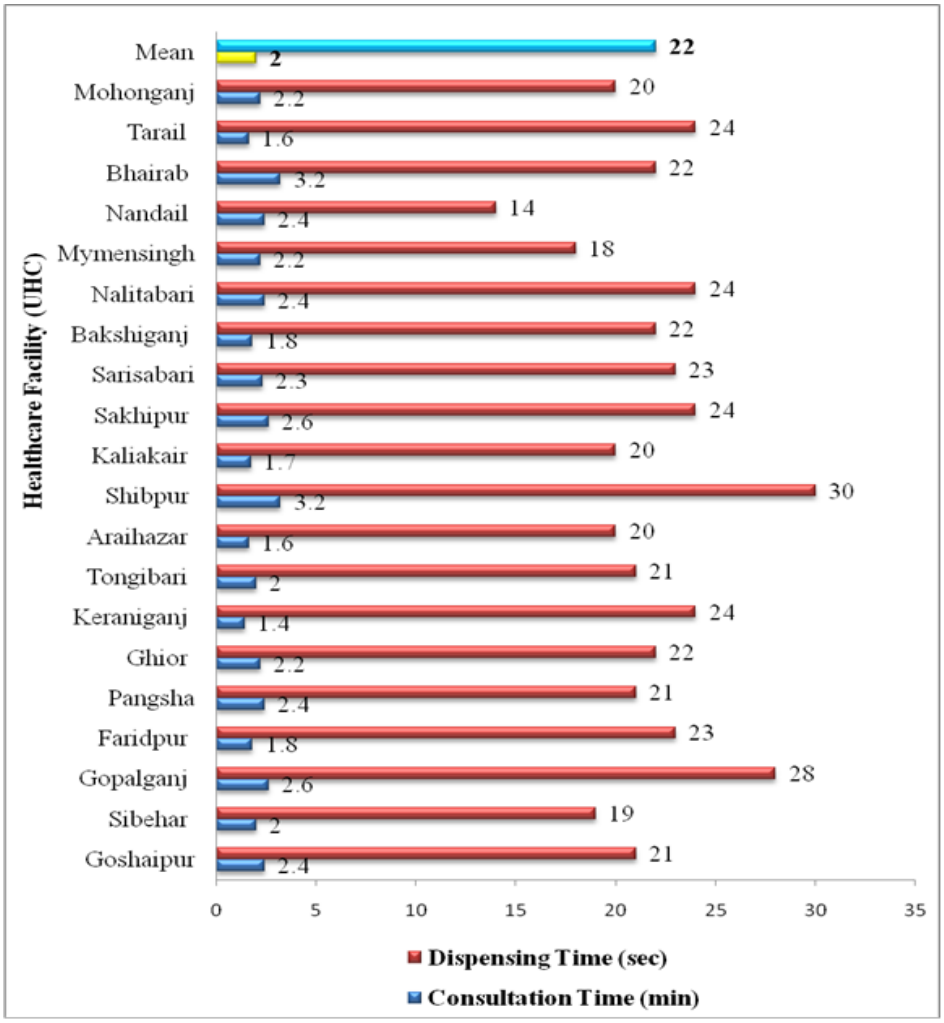


**Figure 2**: Indicator study showing average consultation and dispensing time

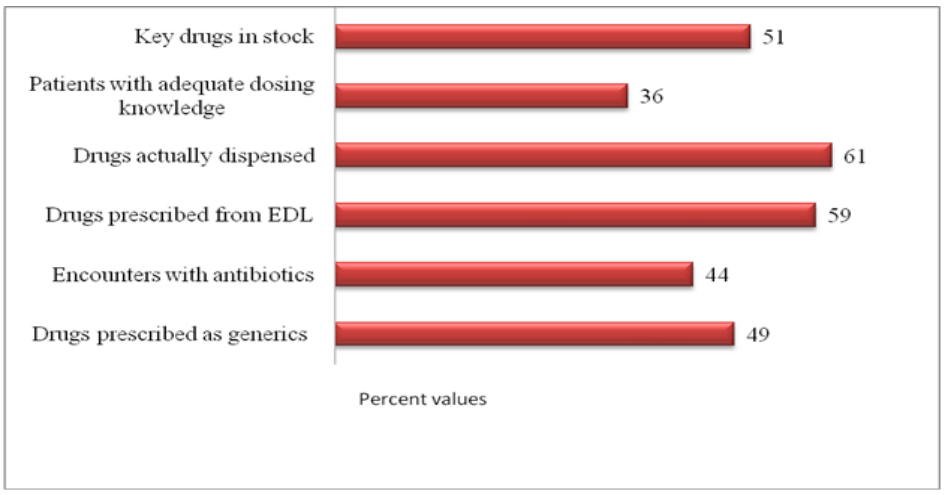


**Figure 3**: Result of different indicators in percent

The key drugs available at the health complexes were 51% (Figure. 3). The average cost of drugs per encounter was Tk.236. The average number of encounters with antibiotics per Upozila health complex was 13 and average cost of antibiotics per encounter was found to be Tk. 211. The prevalence of acute respiratory infection, dysentery, diarrhea, scabies, fungal and worm infection were 16.67, 18.50, 15.67, 16, 19.17 and 14% respectively (Figure. 4). Total money spent for the treatment of dysentery, ARI, diarrhea, fungal infection, scabies and worm infection was 33.33, 22.08, 11.24, 28.09, 4.30 and 0.96% respectively (Figure. 5).

**4. Discussion**

Study on drug use patterns seeks to monitor, evaluate, as well as make interventions so as to make medical care rational and cost-effective. The number of drugs prescribed per encounter of 3 obtained in this study was higher than the WHO's average of 1.6 -1.8, [4.4±0.1] drugs per encounter [4]. So 3 drugs per patient encounter for this study was comparatively high but lower than similar study conducted in Benin City, Nigeria twelve years ago which had recorded a value of 4.4 in a study conducted in private institution in the south-south region [5]. The higher number of drugs prescribed to patients tends to increase the risk of drugs interactions, affects patient compliance, encourages polypharmacy and causes serious patient harm. The overprescribing may have psychosocial impact on patients which encourages patients to believe that they need medications for any and all conditions, even trivial one. The concept that there is a pill for every ill is harmful.

Low generic prescribing has been proven to irrationalize the use as well as increase the cost of drugs to patients. The results obtained on prescribing drugs in generic name at the rate of 49% were much lower than WHO stipulated reference value of 100 percent [50.5 ± 1.2]. Among others similar data have been reported in Ghana, Nigeria, Lebanon and Nepal with values of 39, 38, 35 and 35% respectively. The use of essential drug list helps promote rational drug use in outpatients department. The Figure of 59% obtained for drugs prescribed from the essential drugs suggests that, treatment of the six common diseases was not a good reflection of the drugs requirement of majority of its OPD clients. According to international standards, WHO's stipulated reference value for drugs listed on EDL should be 100% [96.9±0.6]. Furthermore, results obtained from this study was also observed to be very low compared with findings of studies done in Ghana from 1998-2002 which ranged between 92-93.9%.

Antibiotics play a key role in the treatment of infectious diseases which are prevalent especially in developing countries; however reports of their excessive use have been reported. The Figure of 44% prescriptions having antibiotics in this study was higher than values obtained from studies done in Nigeria 67.7 percent in 2004[4]. Findings from this study suggest the use of antibiotics in the health care facilities to be prudent compared to WHO recommendation of less than 30 percent (INRUD, 2004). Findings from this aspect of the study suggests prudent antibiotic use at the hospital and the low risk of serious clinical problems such as drug resistance, cost of retreatment, super-infections associated with antibiotic misuse and abuse.

Excessive use of injectables is common in developing countries. The Figure of 0 percent obtained in this study was however comparatively satisfactory as compared to the WHO stipulated standard reference values of 10.1 – 17.0, [53.7±4.3], for prescribing injection as reported from WHO sponsored field test in South Africa, Nigeria

[6]. This Figure is satisfactory than that reported in other countries like Sudan and Uganda [7], Nigeria [4]. This has been possible in Bangladesh due to the government of Bangladesh, professional associations and NGOs who have provided education on the danger of high injection use in this era of blood-borne infections. The low rate of injectables use observed in this study is likely to reduce risk of anaphylactic shock, tissue necrosis and asepsis in the patients.

The time patients spend with prescribers adequately influences their satisfaction of health services provided and adherence to drug therapy. The average time of 2 minutes that prescribers spent with patients at the UHCs observed in this study was not sufficient. During the study, it was observed that prescribing was done on pieces of papers and labeling was inadequate (containing trade names of products, the dosage and frequencies on drugs not properly written).There were long line of patients seeking services at some public health facilities which means the limited staff can spend less than five minutes with each patient. It takes more than five minutes to adequately conduct an assessment, evaluate laboratory reports, and prescribe a treatment regimen. The average dispensing time of 22 seconds obtained in this study was disappointing and suggested that, such a time was too short for proper interaction between the dispenser and patient. The need to ensure adequate dispensing counseling time need not be overemphasized; as all the work that goes into drug management cycle before the patients receives their medication would be rendered almost useless if there is poor dispenser-patient interaction at the time of collection of drugs. The percentage of drugs really dispensed was only 61 percent of the total prescribed drugs. Many of the dispensaries visited lacked the necessary dispensing tools such as tablet cutters, dispensing spoons, dispensing trays, calculator, dispensing bags, plastic mugs and even utensils for water storage.

A dispenser in Bangladesh refers to anyone who is not a graduate pharmacist but who is trained to dispense drugs, maintain stock records and assist in the procurement activities of assigned health facility. The majority of the dispensers interviewed did not have any formal of training. Most of the dispensers were below high school and other learned the art of dispensing on the job. Even though these dispensers said they received formal training in dispensing. The results further show that effective practice of good dispensing is far from being achieved considering the skill and knowledge of those serving as dispensers. This oversight is very unfortunate because the practice of dispensing is very crucial and integral part of the health sector. To remedy the poor self-esteem of dispensers, supervisors must constantly make the dispensers to know that their work is important and that their practice is significant to the healthcare delivery system.

Drug availability has been proved to significantly influence the utilization of health services and patient satisfaction. In this study, 61% of drugs prescribed were dispensed at the pharmacy and was lower than findings (73.4 percent) obtained from a survey of the pharmaceutical sector in the Ghana GNDP (2002). With only about a quarter of the encounters receiving all their prescribed drugs at the dispensary, this no doubt influenced significantly the proportion of the patients who utilized its pharmaceutical services.

Significant correlation exists between patients' knowledge about medication therapy, utilization of health care services as well as compliance to medication. Patient's knowledge of the correct dosage schedule in this study was observed to be 36% which was lower than findings (77.7 %) obtained in Jordan.

All key drugs are considered fast moving medications which are essential and ought to be available at all times. The study results of 51 percent key drug availability at the facilities was much lower than those from Cameroun, Tanzania, Mozambique, Swaziland and Nepal which ranged from 72-100 percent. Much as the availability of key drugs is important to the delivery of health care services, strict adherence to this list alone will not improve treatment practice if its selection is not based on a standard treatment guideline.

Essential drugs can also be used inappropriately if there are no standard treatment guidelines for disease management (WHO/MSH, 2003). No Health complex was found to have the STG (Standard Treatment Guidelines) and there was no existence of regulatory measures to implement rational use of drugs. Only four out of twenty health complexes were found to possess the national essential drug list (18%). It is important to ensure improved availability of the STG to all prescribers in the facility, as it serves as an educational tool to guide health prescribers in providing cost effective treatment to patients in the health sector.

The survey revealed that 16.67% of the total encounter contained ARI (Acute Respiratory Tract Infection) cases. The prevalence of other common diseases was 15.67 (Diarrhea), 18.50 (Dysentery), 16 (Scabies), 14 (Worm infection) and 19.17% (Fungal infection). The prevalence of diarrhea has been reduced to great extent. This might be due to the public awareness about the diarrhea management and use of ORS.

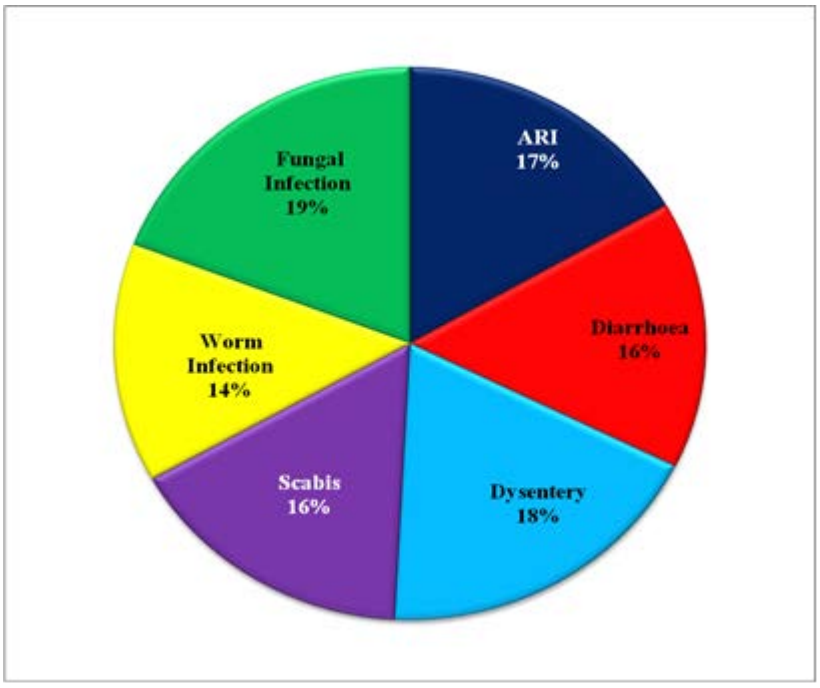


**Figure 4**: Prevalence of 6 common diseases

The average cost of drugs per encounter of Tk. 236 obtained in this study was so high due irrational prescribing in UHCs. From the data it was found that 40-50% drugs were prescribed irrationally at the UHCs. These lead to unnecessary increase in drug cost. In our case the drug costs of irrationally and unnecessarily prescribed drugs were approximately 50-55 % of the total drug costs. The average number of encounters with antibiotics per UHC and average cost of antibiotics per encounter both were disappointing 13

and Tk. 211 respectively.

One of the aims of our study was to calculate the percent drug cost for each selected category disease. The percent values of six common diseases were calculated from the total costs of drugs of all the health complexes. The pie chart (Figure 5) shows percent drug cost for each selected category disease. It shows that the highest amount of money was spent for the treatment dysentery (33.33%) and ARI treatment (22.08%). Money spent for the treatment of diarrhea, fungal infection, scabies and worm infection was 11.24, 28.09, 4.30 and 0.96% of total cost respectively.

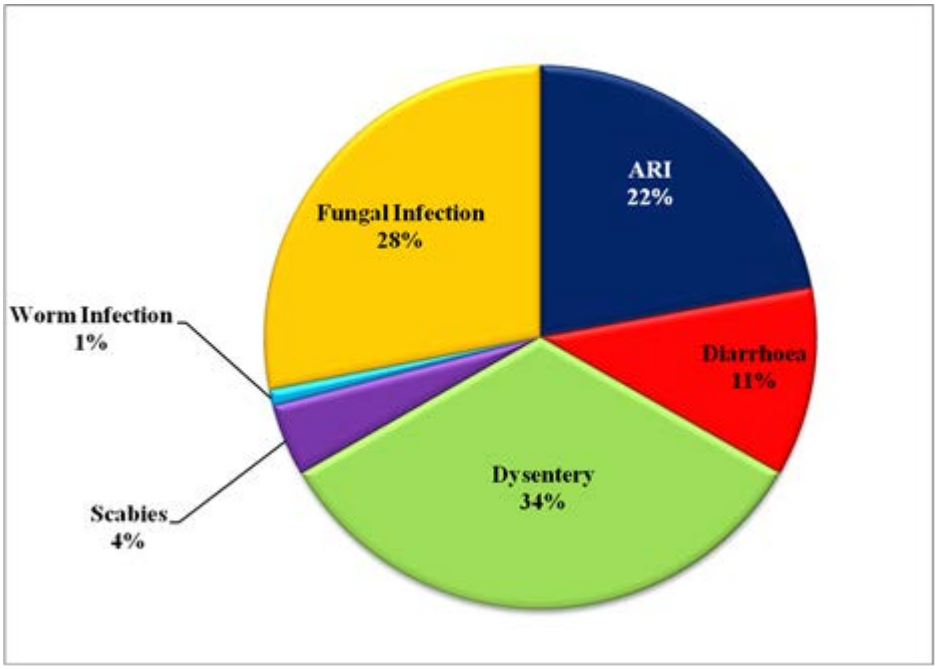


**Figure 5**: Drug cost for 6 common diseases

## 5. Conclusion

The pattern of rational drug use at Upozila Heath Complexes in Dhaka Division in Bangladesh was not satisfactory, though the level of injection use at the facilities was recommendable compared to WHO index and encouraging. Drugs were prescribed unnecessarily and irrationally where no drug therapy should be required. Cost of unnecessary and irrational prescribing was enormous in terms of money**.** Intervention is needed to improve prescribing behaviors of doctors such as short problem based training course in pharmacotherapy and rational use focused workshops can improve prescription behavior and skills. Clear and comprehensives rules should be formulated and implemented by the government to ensure rational prescribing. There is a need to improve patients' knowledge on dispensed drugs and availability of essential guidelines and key drugs in the stock. The result obtained in this study provides a baseline for researchers and policy makers in Bangladesh, to monitor and make the necessary educational, managerial and regulatory interventions, to improve the situation in the health care facilities.

**Acknowledgement:**

The authors express their gratitude to the authorities of the Upozila Health Complexes and outdoor patients for rendering all possible support and cooperation to pursue the research work.

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