

**PRICE VARIATIONS, AVAILABILITY AND AFFORDABILITY OF SELECTED  
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Article Received on 16/06/2021

Article Revised on 06/07/2021

Article Accepted on 26/07/2021

**ABSTRACT**

**Introduction:** Ensuring proper medicines at a reasonable cost to mass people is a great challenge for developing countries. The purpose of the study was to make a comparative view of medicines in the context of price, affordability and availability. The data will help to improve the availability and affordability of medicines for the mass people of the country. **Method:** The current study was performed using the standard described by the World Health Organization (WHO) named "Price measurement, availability and affordability and price components of medicine". Prices for selected fifty medicines were determined for the year of 2003, 2006, 2015 and 2019 to compare the price variations over the years. Medicine availability was measured by collecting data of manufacturer and from medicine shops, and affordability was determined by comparing the total cost of treatment of a disease. The major aim of the study was to show the price variations, availability and affordability of selected medicines in Bangladesh. **Result:** A vast difference was observed between prices of the most sold generics and the lowest price generic medicines available in Bangladesh. The prices of selected medicines were not so high in terms of international reference prices and the rate of increase of prices from previous years was reasonable and affordable by the population having the lowest income. There were several medicines for which the number of manufacturing companies was increasing in a very high rate and those medicines were also affordable to the mass people. **Conclusion:** It can be concluded from the study that the price variations of different medicines between the years were significant but the selected medicines were available all over the country and affordable by the people having the lowest income. A detailed survey may be performed on price components and mark-ups in medicines supply chain from the manufacturer to the end-user, that will help the policymakers to curb the price variations and make the medicines more available and affordable.

**KEYWORDS:** Price variations, Availability, Affordability, Innovator brand, Lowest priced generic, Most sold**INTRODUCTION**

Pricing of medicine and affordability is a great concern for the public and governments of developed and developing countries of the world. The high prices and low availability of medicines are prime obstacles to health services in developing countries. The medicine cost contributes significantly to the budget of developing countries. The main goal of the survey was to collect and analyze data on availability and affordability of medicines. The data will help to improve the availability and affordability of medicines for the people.

The specific objectives of the study were - (i) to measure patient prices for medicines for a selected group of

commonly used medicines for treating prevalent conditions in Bangladesh, (ii) to assess the affordability of standard treatment regimens using these medicines, (iii) to compare the prices of medicines found in the country with international reference prices and (iv) to compare the prices of innovator brand, most sold and lowest priced generic medicines.

The study will lead the others to perform such type of survey in national level. However, the purpose of the study was to make a comparative view of medicines in the context of price, affordability and availability.

Bangladesh is a South Asian country with an area of 147,570 square km and a total population of 163 million. Administratively Bangladesh is divided into 8 divisions and 64 districts.<sup>[1]</sup> The per capita national income in 2016-'17 was USD 1602 and per capita GDP USD 1538.<sup>[2]</sup> The rate of poverty is 23.5%.<sup>[3]</sup>

The average life expectancy of people is 70.9 years. The birth rate is 18.8 and mortality rate is 5.1 per 1000 cases. The population growth rate is 1.37%. A doctor is for 2039 people.<sup>[3]</sup> The total budget for health sector is only 5.17% of total budget of 2017-'18.<sup>[4]</sup> The people of the country have to bear the expense of the treatment by themselves. There are few government hospitals in which some essential medicines are delivered to the patient free of cost.

The pharmaceutical industry of Bangladesh is one of the first growing sectors. Now more than 97% of medicines are being manufactured in the country. Several drug manufacturing companies have got Good Manufacturing Practice (GMP) certificates by drug regulatory agencies of some developed countries. The pharmaceutical sector is enriched with higher technological resources and experienced and skilled pharmacists as well as other affiliated competent manpower. The Directorate General of Drug Administration (DGDA) under the Ministry of Health and Family Welfare is the Drug Regulatory Authority of Bangladesh. The DGDA controls all current drug regulatory activities in the country. It also regulates other activities of international marketing of some medicines. Currently, there are 29,334 medicine products and a total 269 drug manufacturing company.<sup>[5]</sup>

## METHODOLOGY

The World Health Organization/ Health Action International (WHO/HAI) methodology<sup>[6]</sup> was followed

for this study. A standard medicine price data collection form was developed. The medicines list included 14 drugs from global list, 36 drugs from national Essential Medicines List (EML). In total, 50 drugs were reviewed.

For each medicine data was collected on the - (i) innovator brand (IB), (ii) most sold generic equivalent (MSG) and (iii) lowest price generic equivalent (LPG)

All prices were converted to United States Dollar (USD) using the exchange rate at the beginning of survey on 17.07.2017 (\$1 USD = 82.39 Bangladeshi Taka). The international prices of 2015 were used as reference unit prices.<sup>[7]</sup> The local unit prices were collected from Bangladesh National Formulary<sup>[8]</sup> which is the directory for all drugs produced locally and marketed in Bangladesh. International reference prices were used to compare local prices to an international standard. To determine what drug prices mean in terms of affordability for mass people, some common treatment costs were measured and compared with the wage of the lowest-paid unskilled worker. The salary was 5300 Bangladeshi Taka<sup>[9]</sup> per month which was US\$ 68.00. In both private and public sectors, the availability of drugs at the time of data collection was determined.

## Selection of medicines

A total of 50 medicines were surveyed (Shown in **Table 1** and **Table 2**). All are registered in the Bangladesh and out of them 45 are listed in the national Essential Medicines List (EML). Medicines were selected from every main category and selection was based on the prevalence of diseases. Frequently prescribed drugs were listed for the survey.

**Table 1: List of global medicines surveyed.**

|   |                                     |
|---|-------------------------------------|
| 1. Amitriptyline 25 mg tablet             | 8. Diazepam 5 mg tablet             |
| 2. Amoxicillin 250 mg capsule/tablet      | 9. Diclofenac 25 mg tablet          |
| 3. Bisoprolol 5 mg tablet                 | 10. Metformin 500 mg tablet         |
| 4. Captopril 25 mg tablet                 | 11. Omeprazole 20 mg capsule        |
| 5. Ceftriaxone 1 gm powder for injection  | 12. Paracetamol suspension 24 mg/ml |
| 6. Ciprofloxacin 500 mg tablet            | 13. Salbutamol 0.1 mg/dose inhaler  |
| 7. Co-trimoxazole (8+40) mg/mL suspension | 14. Simvastatin 20 mg tablet        |

**Table 2: List of local medicines surveyed.**

|  |  |
|--|--|
| <b>Analgesic and anti-inflammatory</b><br>1. Allopurinol 100 mg tab<br>2. Ibuprofen 400 mg tab<br>3. Morphine sulfate 15 mg/ml inj.  | <b>Central Nervous System</b><br>19. Haloperidol 5 mg tab<br>20. Phenytoin 100 mg tab<br>21. Promethazine 25 mg tab  |
| <b>Cardiovascular Drugs</b><br>4. Acetazolamide 250 mg tablet<br>5. Amlodipine 10 mg tablet<br>6. Aspirin 75 mg tablet<br>7. Digoxin 0.25 mg tablet<br>8. Furosemide 40 mg tablet<br>9. Glyceryl Trinitrate 0.5 mg tablet<br>10. Heparin 5000 IU/ml inj. | <b>Anti infectives</b><br>22. Acyclovir 200 mg tablet<br>23. Azithromycin 500 mg tablet<br>24. Dapsone 100 mg tablet<br>25. Doxycycline 100 mg tablet<br>26. Fluconazole 150 mg tablet<br>27. Metronidazole 400 mg tablet<br>28. Povidone Iodine 1% solution |

|   |  |
|---|--|
| 11. Methyldopa 250 mg tablet<br>12. Propranolol 40 mg tablet<br>13. Spironolactone 25 mg tablet<br>14. Verapamil 80 mg tablet       | 29. Lamivudine 100 mg tablet<br>30. Rifampicin 450 mg tablet<br>31. Tetracycline HCl 1% ointment<br>32. Zidovudine 100 mg tablet |
| <b>Gastro Intestinal Drugs</b><br>15. Al(OH) <sub>3</sub> +Mg(OH) <sub>2</sub> (200+120) mg tablet<br>16. Misoprostol 0.2 mg tablet | <b>Supplementary Drugs</b><br>33. Calcium gluconate 10% vial<br>34. Vitamin B complex tablet                                     |
| <b>Anti-Diabetic Drugs</b><br>17. Insulin soluble 100 IU/ml inj.<br>18. Metformin 850 mg tablet                                     | <b>Respiratory System Drugs</b><br>35. Salbutamol 2mg/5ml suspension<br>36. Dexamethasone 0.5 mg tablet                          |

### Price of medicines

For each medicine, price was collected for the specific dose and dosage form. The median prices were collected for each medicine. Tablet and capsule were equivalent for comparison - (i) one tablet or capsule (tab/cap) was the unit for solid dosage forms, (ii) for liquid dosage forms, the price for each milliliter (mL) was collected, (iii) for ointment or cream price per gram was collected, (iv) for inhaler, the price per unit dose (1 puff) was used for comparison.

### Availability of medicines

The availability of medicines was expressed in two ways. One was the national availability of medicines which was calculated by counting the number of manufacturing company in the country. The manufacturer numbers were collected from Bangladesh National Formulary.<sup>[10-12]</sup> Medicine availability was collected for different years as in 2001, 2003, 2006, 2015 & 2019. The data for the year of 2019 up to June were collected from Directorate General of Drug Administration website. The other type of availability of medicine in retail pharmacies was expressed as percentage to the number of sites on the data collection day. Only those medicines were considered available which were found at the time of data collection.

### Affordability of medicines

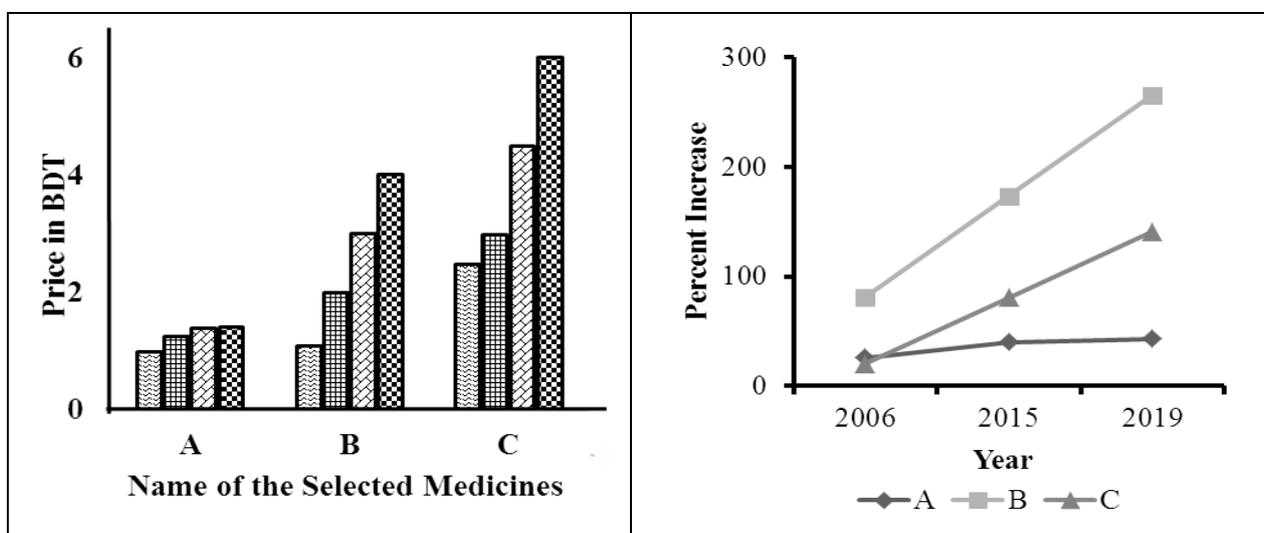
The affordability of medicine was calculated as the number of days' wages that the lowest paid unskilled worker would have to pay for a standard treatment. As the government hospitals provide medicines to the patients free of cost, only the private sector medicine price was considered. The most common disease conditions were taken as a standard for treatment approaches.

## RESULTS AND DISCUSSION

The data for each medicine were collected from different sites and national formularies. Then the data were entered into the program of MS Excel Workbook, given by the WHO/HAI. To avoid errors, data were checked and re-entered into the program. For a comparative study, prices of medicines of different years were collected.

### Prices of medicines

The prices of selected medicines of different years (2003, 2006, 2015 and 2019) were collected and listed. There were several medicines for which the prices increased rapidly. The price variations over the years were shown in **Figure 1a** and **1b**.



**Figure 1a. Increasing price per unit dose of some medicines (Most Sold Generics).**

**Figure 1b. Percent increase of some medicines (Most Sold Generics).**

Here, Panel A indicates Ibuprofen 400 mg tab/cap; panel B indicates Metformin 500 mg tab/cap; panel C indicates Metformin 850 mg tab/cap and = Year 2003, = Year 2006, = Year 2015 and = Year 2019

**Figure 1a** showed that the price of Ibuprofen (400 mg) was BDT 1.00 in 2003, BDT 1.26 in 2006, BDT 1.40 in 2015 and BDT 1.43 in 2019; the price of Metformin (500 mg) was BDT 1.10 in 2003, BDT 2.00 in 2006, BDT 3.01 in 2015 and 4.02 in 2019; the price of Metformin (850 mg) was BDT 2.50 in 2003, BDT 3.00 in 2006, BDT 4.51 in 2015 and 6.02 in 2019.

**Figure 1b** showed that the price of Ibuprofen (400 mg) increased 26% from 2003 to 2006, 40% from 2003 to 2015 and 43% from 2003 to 2019; the price of

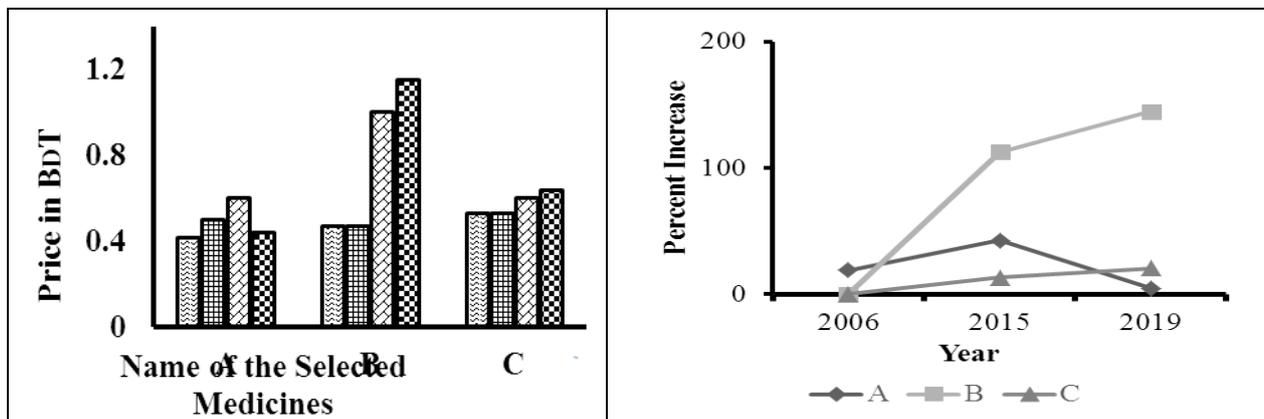
Metformin (500mg) increased 81% from 2003 to 2006, 174% from 2003 to 2015 and 265% from 2003 to 2019; the price of Metformin (850mg) increased 20% from 2003 to 2006, 80% from 2003 to 2015 and 141% from 2003 to 2019. It was observed that the price hike for Metformin (500mg) was very sharp.

Again, the variations of prices of Most Sold Generic (MSG) and Lowest Price Generic (LPG) over the years vary significantly. The variations in prices only for the year 2019 were shown in **Table 3**.

**Table 3: Some drugs with high differences between Most Sold Generic (MSG) and Lowest Price Generic (LPG) in June, 2019.**

| Medicine                    | Unit Price of MSG in BDT | Unit Price of LPG in BDT | Differences in Percentage |
|-----------------------------|--------------------------|--------------------------|---------------------------|
| Amitriptyline 25 mg tablet  | 1.76                     | 1.00                     | 176%                      |
| Ciprofloxacin 500 mg tablet | 15.05                    | 8                        | 188.12%                   |
| Diazepam 5 mg tablet        | 0.69                     | 0.21                     | 328.57%                   |
| Diclofenac 50 mg tablet     | 1.51                     | 0.18                     | 838.88%                   |
| Haloperidol 5 mg tablet     | 1.01                     | 0.49                     | 206.12%                   |
| Heparin 5000 IU/ml          | 127                      | 60                       | 211.66%                   |
| Metformin 500 mg tablet     | 4.02                     | 2                        | 201%                      |
| Omeprazole 20 mg capsule    | 5.02                     | 2.95                     | 170.16%                   |
| Phenytoin 100 mg tablet     | 4.01                     | 2.01                     | 199.50%                   |

Sometimes prices increased and sometimes remained almost the same. These data are shown in **Figure 2a** and **2b**.



**Figure 2a. Variation of prices of some medicines among consecutive years.**

**Figure 2b. Percent increase in prices of medicines among consecutive years.**

Here, Panel A indicates Promethazine HCl 25 mg tab/cap; panel B indicates Dexamethasone 0.5 mg tab/cap; panel C indicates Furosemide 40 mg tab/cap., and = Year 2003, = Year 2006, = Year 2015 and = Year 2019.

**Figure 2a** showed that the price of Promethazine (25 mg) was BDT 0.42 in 2003, BDT 0.50 in 2006, BDT 0.60 in 2015 and BDT 0.44 in 2019; the price of Dexamethasone (0.50 mg) was BDT 0.47 in 2003, BDT 0.47 in 2006, BDT 1.00 in 2015 and 1.15 in 2019; the price of Furosemide (40 mg) was BDT 0.53 in 2003, BDT 0.53 in 2006, BDT 0.60 in 2015 and 0.64 in 2019.

**Figure 2b** showed that the price of Promethazine (25 mg) increased 19 % from 2003 to 2006, 43% from 2003 to 2015 and 5% from 2003 to 2019; the price of Dexamethasone (0.50 mg) increased 0% from 2003 to

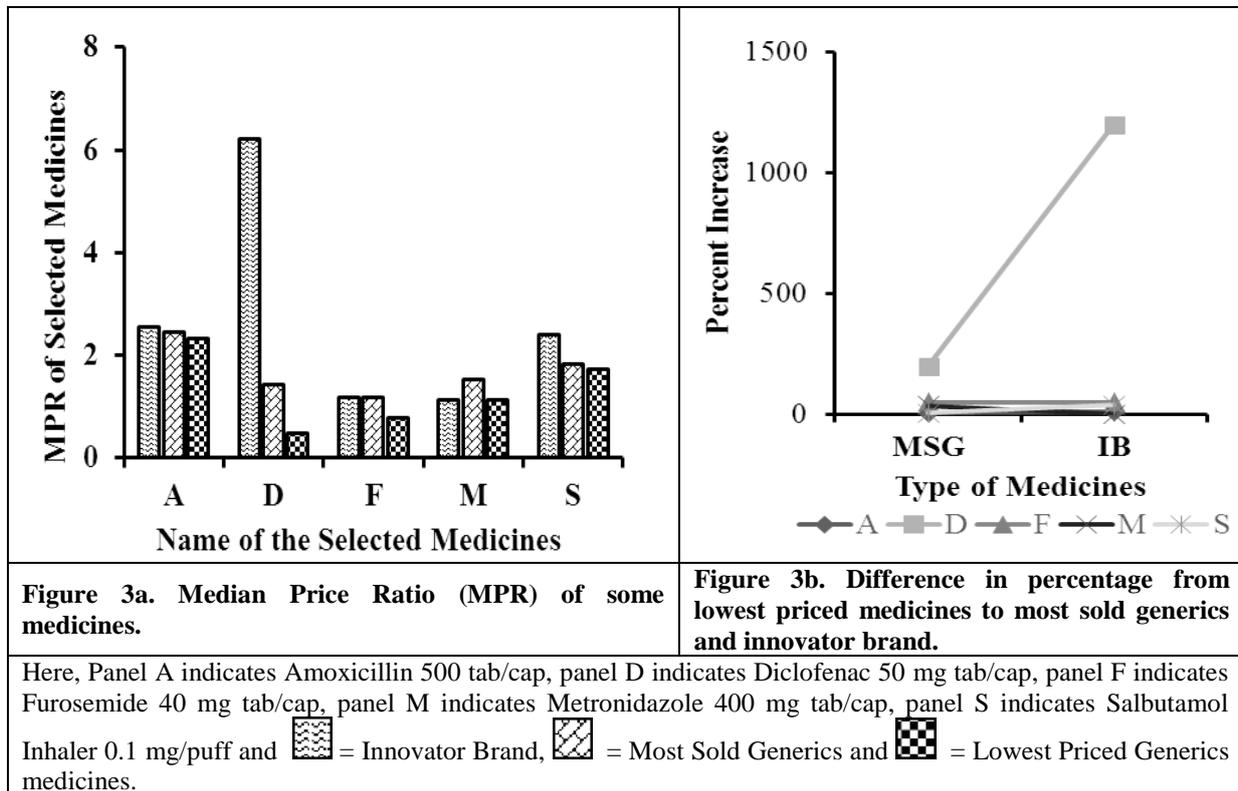
2006, 113% from 2003 to 2015 and 145% from 2003 to 2019; the price of Furosemide (40 mg) increased 0% from 2003 to 2006, 13% from 2003 to 2015 and 21% from 2003 to 2019.

Median Price Ratio (MPR) of medicines was calculated to observe how many times greater or lesser the price of local medicines to international reference unit prices. The formula for calculating MPR is as below:

$$\text{Median Price Ratio (MPR)} = \frac{\text{Median Local Unit Price}}{\text{International Reference Unit Price}}$$

Here, it is important that the price of both types, should be in the same currency. Three types of medicines (Innovator Brands, Most Sold Generics and Lowest Price Generic) MPRs were calculated. It was observed that in most of cases, MPRs of Innovator Brands were greater than Most Sold Generic medicines. MPRs of Lowest

Price Generics were smaller than Most Sold Generic medicines. Three types of medicines (Innovator Brands, Most Sold Generics and Lowest Price Generic) MPRs were calculated. These data were shown in the **Figure 3a** and **3b**.



**Figure 3a** showed that the price of Amoxicillin (500 mg) was BDT 2.56 for Innovator Brand, BDT 2.46 for Most Sold Generics, BDT 2.337 for Lowest Price Generics; the price of Diclofenac (50 mg) was BDT 6.21 for Innovator Brand, BDT 1.434 for Most Sold Generics, BDT 0.478 for Lowest Price Generics; the price of Furosemide (40 mg) was BDT 1.176 for Innovator Brand, BDT 1.176 for Most Sold Generics, BDT 0.784 for Lowest Price Generics; the price of Metronidazole (400 mg) was BDT 1.136 for Innovator Brand, BDT 1.543 for Most Sold Generics, BDT 1.132 for Lowest Price Generics; the price of Salbutamol Inhaler (0.1 mg/puff) was BDT 2.406 for Innovator Brand, BDT 1.841 for Most Sold Generics, BDT 1.736 for Lowest Price Generics.

**Figure 3b** showed that the price of Amoxicillin (500 mg) increased 5.26 % from LPG to MSG, 9.54% from LPG to IB; the price of Diclofenac (50 mg) increased 200% from LPG to MSG, 1199% from LPG to IB; the price of Furosemide (40 mg) increased 50% from LPG to MSG, 50% from LPG to IB; the price of Metronidazole (400 mg) increased 36.3% from LPG to MSG, 0.355% from LPG to IB; the price of Salbutamol Inhaler (0.1 mg/puff) increased 6.04% from LPG to MSG, 38.59% from LPG to IB.

#### Availability of medicines

For assessing medicine availability, manufacturers of each medicine were counted. This gave the national availability of the medicines. By collecting data from different retail pharmacies, availability of medicines at regional level was determined.

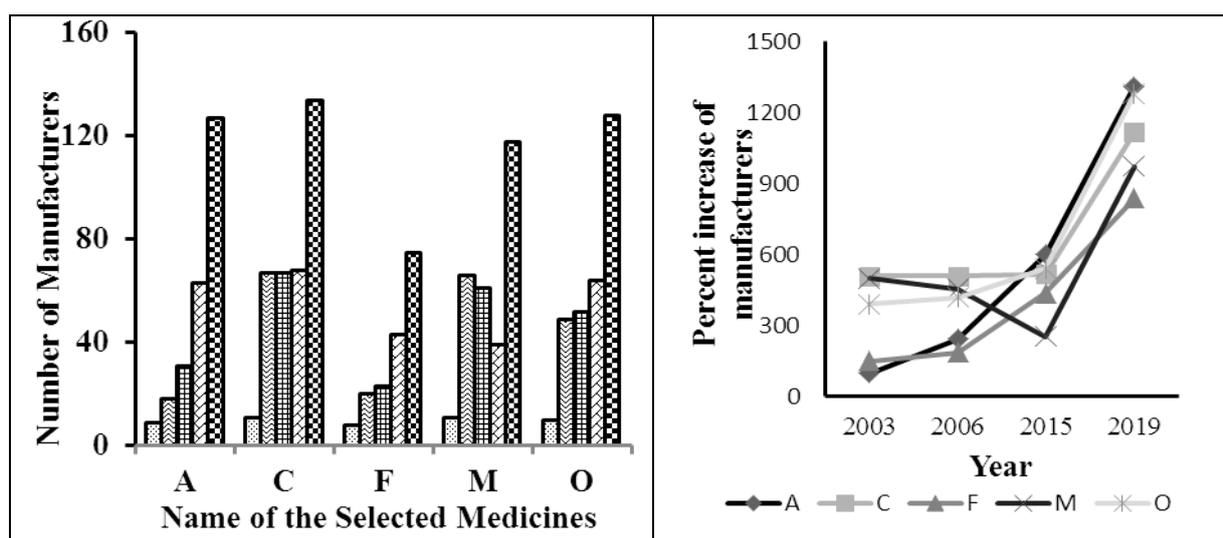
A total of 20 retail pharmacies were visited to collect data about the described medicines. Availability of a medicine was ensured when one outlet had the medicine as a specific dose and dosage form on the time of data collection. However, data were collected from different types of retail pharmacies- large, small; medicine shop, model pharmacy; medicine stores located near both the public and the private hospitals. The medicine shops were located in different regions of the Dhaka Metropolitan City, Bangladesh. The data were shown in Table 4.

**Table 4: Availability of most sold generic equivalent medicines in retail pharmacies.**

| Availability (percentage) | Medicines  |
|---------------------------|--|
| No Pharmacies             | Dapsone, Lamivudine, Zidovudine  |
| 1% - 24%                  | Acetazolamide, Acyclovir, Digoxin, Heparin, Methyldopa, Spironolactone, Verapamil  |
| 25% - 49%                 | Allopurinol, Amitriptyline, Calcium gluconate, Dexamethasone, Glyceryl Trinitrate, Haloperidol, Morphine, Oxytocin, Phenytoin, Tetracycline  |
| 50% - 74%                 | Amlodipine, Aspirin, Bisoprolol, Captopril, Diazepam, Digoxin, Doxycycline, Erythromycin, Furosemide, Insulin, Misoprostol, Povidone Iodine, Propranolol, Simvastatin  |
| 75% - 100%                | Al(OH) <sub>2</sub> +Mg(OH) <sub>2</sub> , Amoxicillin, Azithromycin, Ceftriaxone, Ciprofloxacin, Co-trimoxazole, Diclofenac, Fluconazole, Ibuprofen, Metformin, Metronidazole, Omeprazole, Paracetamol, Salbutamol, Vitamin B complex |

The number of drug manufacturing companies also increased in the consecutive years. Several medicines

manufacturing companies' data were shown in the **Figure 4a** and **4b**.



**Figure 4a. Manufacturers number of some medicines across years.**

**Figure 4b. Percent increase of manufacturers across years.**

Here, Panel A indicates Azithromycin 500 mg tab/cap; panel C indicates Ciprofloxacin 500 mg tab/cap; panel F indicates Fluconazole 150 mg tab/cap; panel M indicates Metronidazole 400 mg tab/cap; panel O indicates Omeprazole 20 mg tab/cap and = Year 2001, = Year 2003, = Year 2006, = Year 2015 & = Year 2019.

**Figure 4a** showed that the number of manufacturers of Azithromycin (500 mg) was 9 in 2001, 18 in 2003, 31 in 2006, 63 in 2015 and 127 in 2019; that of Ciprofloxacin (500 mg) was 11 in 2001, 67 in 2003, 67 in 2006, 68 in 2015 and 134 in 2019; that of Fluconazole (150 mg) was 8 in 2001, 20 in 2003, 23 in 2006, 43 in 2015 and 75 in 2019; that of Metronidazole (400 mg) was 11 in 2001, 66 in 2003, 61 in 2006, 39 in 2015 and 118 in 2019; that of Omeprazole (20 mg) was 10 in 2001, 49 in 2003, 52 in 2006, 64 in 2015 and 128 in 2019.

**Figure 4b** showed that the number of manufacturers of Azithromycin (500 mg) increased 100% from 2001 to 2003, 244% from 2001 to 2006, 600% from 2001 to 2015 and 1311% from 2001 to 2019; that of Ciprofloxacin (500 mg) increased 509% from 2001 to 2003, 509% from 2001 to 2006, 518% from 2001 to

2015 and 1118% from 2001 to 2019; that of Fluconazole (150 mg) increased 150% from 2001 to 2003, 188% from 2001 to 2006, 438% from 2001 to 2015 and 838% from 2001 to 2019; that of Metronidazole (400 mg) increased 500% from 2001 to 2003, 455% from 2001 to 2006, 255% from 2001 to 2015 and 973% from 2001 to 2019; that of Omeprazole (20 mg) increased 390% from 2001 to 2003, 420% from 2001 to 2006, 540% from 2001 to 2015 and 1280% from 2001 to 2019.

**Affordability of medicine**

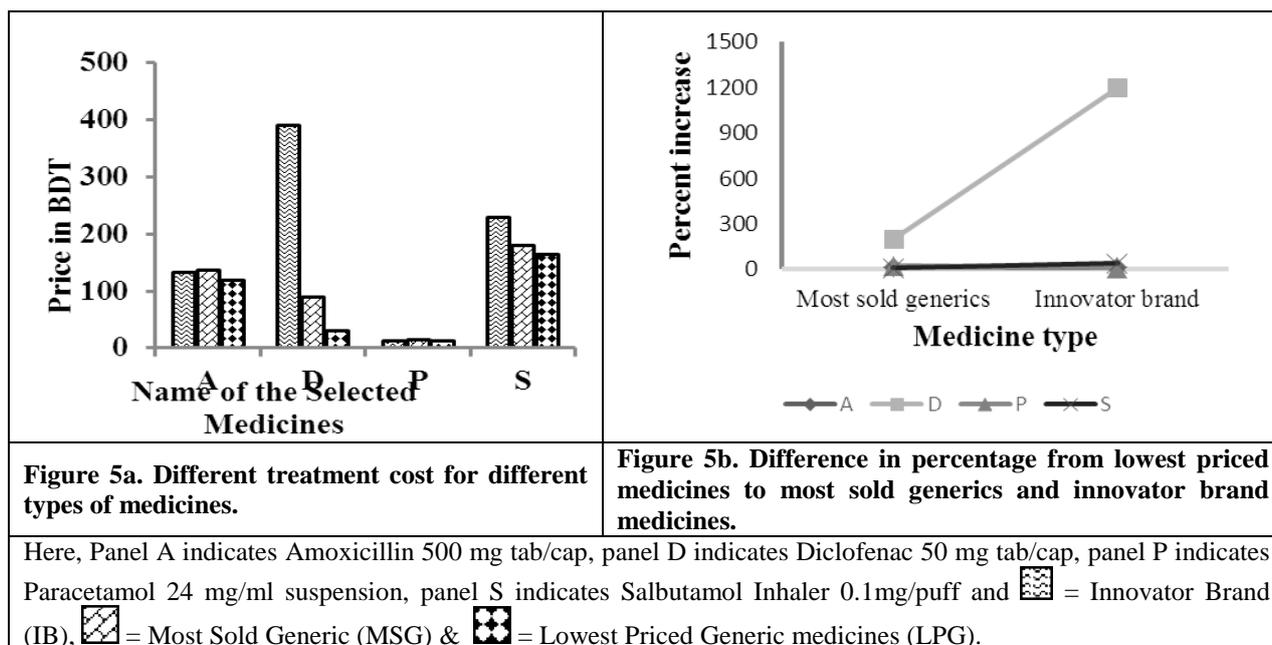
Medicine affordability was determined by calculating the cost of standard treatment of a pathological condition (**Table 5**). The prices of most sold generic medicines were used here. The prices of medicines of 2015 were considered. The lowest monthly wage of unskilled person was considered as 5300 BDT.

**Table 5: Affordability of medicines for selected disease condition.**

| Condition                           | Medicine name                        | Treatment schedule                                 | Total Cost (BDT) | Number of days wages |
|-------------------------------------|--------------------------------------|--|------------------|----------------------|
| 1. Asthma                           | Salbutamol 0.1 mg/dose Inhaler       | 1 inhaler of 200 doses                             | 180              | 1.0188               |
| 2. Diabetes                         | Metformin 500mg cap/tab              | 1 cap/tab x 2/day x 30 days = 60                   | 180              | 1.0188               |
| 3. Hypertension                     | Bisoprolol 5mg cap/tab               | 1 cap/tab x 30 days = 30                           | 300              | 1.698                |
| 4. Hypertension                     | Captopril 25 mg cap/tab              | 1 cap/tab x 2/day x 30 days = 60                   | 180              | 1.0188               |
| 5. Hypercholesterolemia             | Simvastatin 20 mg cap/tab            | 1 cap/tab x 30 days = 30                           | 360              | 2.0377               |
| 6. Depression                       | Amitriptyline 25 mg cap/tab          | 1 cap/tab x 3/day x 30 days = 90                   | 180              | 1.0188               |
| 7. Adult respiratory infection      | Ciprofloxacin 500 mg cap/tab         | 1 cap/tab x 2/day for 7 days = 14                  | 210              | 1.188                |
| 8. Pediatric respiratory infection  | Co-trimoxazole 8+40 mg/ml suspension | 5ml x 2/day x 7 days = 70 ml                       | 29.75            | 0.168                |
| 9. Adult respiratory infection      | Amoxicillin 500mg cap/tab            | 1 cap/tab x 3/day x 7 days = 21                    | 136.5            | 0.7725               |
| 10. Adult respiratory infection     | Ceftriaxone 1 g/vial Injection       | 1 injection  | 190              | 1.0756               |
| 11. Anxiety                         | Diazepam 5mg cap/tab                 | 1 cap/tab x 7 days = 7                             | 3.5              | 0.0198               |
| 12. Arthritis                       | Diclofenac 50mg cap/tab              | 1 cap/tab x 2/day x 30 days = 60                   | 90               | 0.509                |
| 13. Pain/inflammation of pediatrics | Paracetamol 24mg/ml suspension       | child 1 year: 120mg (=5ml) x 3/day x 3 days = 45ml | 15.3             | 0.0866               |
| 14. Ulcer                           | Omeprazole 20mg cap/tab              | 1 cap/tab x 30 days = 30                           | 120              | 0.679                |

The treatment cost for a specific disease conditions also varied depending on the type of medicines used. **Figure 5a** and **5b** showed treatment cost of some commonly

occurring diseases; treated by different types of medicines.



**Figure 5a** showed that the treatment cost of Amoxicillin (500 mg) was BDT 133 for Innovator Brand, BDT 137 for Most Sold Generics, BDT 120 for Lowest Price Generics; the treatment cost of Diclofenac (50 mg) was BDT 390 for Innovator Brand, BDT 90 for Most Sold Generics, BDT 30 for Lowest Price Generics; the treatment cost of Paracetamol (24 mg/ml) was BDT 14

for Innovator Brand, BDT 15 for Most Sold Generics, BDT 13 for Lowest Price Generics; the treatment cost of Salbutamol Inhaler (0.1 mg/puff) was BDT 230 for Innovator Brand, BDT 180 for Most Sold Generics, BDT 165 for Lowest Price Generics.

**Figure 5b** showed that the treatment cost of Amoxicillin (500 mg) increased 14% from LPG to MSG, 11% from LPG to IB; that of Diclofenac (50 mg) increased 200% from LPG to MSG, 100% from LPG to IB; that of Paracetamol (24 mg/ml) increased 21% from LPG to MSG, 7% from LPG to IB; that of Salbutamol Inhaler (0.1 mg/puff) increased 9% from LPG to MSG, 39% from LPG to IB.

The economic condition of Bangladesh is also growing healthy. The per capita national income is also increasing every year (**Table 6**). So, the medicines are also becoming more affordable. The following table gives some idea about health and economic status of Bangladesh.<sup>[13]</sup>

**Table 6: Change of health and economic condition among different years.**

| Year | Per Capita income (in current USD) | Per Capita health expenditure (in USD) | Total budget for health sector (crore in BDT) |
|------|------------------------------------|--|---|
| 2001 | 430                                | 10                                     | 1252  |
| 2003 | 450                                | 11                                     | 1410  |
| 2006 | 560                                | 14                                     | 4784  |
| 2015 | 1466                               | 32                                     | 12695   |
| 2018 | 1909                               | 37                                     | 17516   |

Bangladesh is a developing country and about one fourth of its population remains under poverty line. So, the medicine price should be lower than that of any other developed country. However, from the above study it is clear that the lowest priced generic medicines are much less than international reference price (IRP). But, for several medicines, there are great differences between most sold generics and lowest priced generics. The government should look after this side. The availability of the medicines in private pharmacies is also good. Only a few rare medicines were completely unavailable in pharmacies. The drug manufacturing companies in the country are also increasing rapidly. This is good for our drug industry but it must be ensured that all the medicines are of sufficient quality.

### CONCLUSION

The survey on medicine prices in Bangladesh showed wide differences between the originator brand medicines and their generic equivalents in the private sector, the price difference between originator brand medicines and the generic equivalents being nearly three-fold. In the private sector, both originator brands and most sold generics often cost nearly same to their international reference price. The essential medicine prices are systematically lower than those of other medicines compared to international reference price. It is important to point out that the availability expressed in the results refers to all fifty surveyed medicines. These medicines were available and affordable. The data for all types of charges and added values in different steps of supply chain from manufacturers to customers can't be determined due to lack of sufficient manpower.

### Declaration of interest

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of this article.

### ACKNOWLEDGEMENTS

This work has been funded by a grant from the University of Dhaka (Number-Regi/Admin-3/65743-45, Dated: 28/03/2019).

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