



Original Article

Prices, Availability And Affordability Of Essential Medicines For Non-Communicable Diseases: A Facility Based Survey In District Abbotabad

Khizran Mir^{1*} and Hafsa Ayyub²¹ Ayub Teaching Hospital, Abbottabad²University Institute of Radiological and Medical Imaging Sciences, The University of Lahore, Lahore, Pakistan* khizranmir@gmail.com

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*Corresponding Author:

Khizran Mir
 Ayub Teaching Hospital, Abbottabad
khizranmir@gmail.com

ABSTRACT

Non communicable diseases (NCDs) are spreading like an epidemic worldwide. Essential medicines are crucial for prevention and control of NCDs. Availability being a predictor of access to medicines is low in Low and Middle income countries (LMICs). **Objective:** To determine price, availability and affordability of essential medicines for NCDs in District Abbottabad **Methods:** This study was based on the standardized protocol provided by WHO and Health Action International (HAI) for determination of availability, prices and affordability of medicines. A total of 50 medicines for NCDs that were enlisted in Essential Medicine List of district Khyber Pakhtun Khawa were selected for the study. Twenty seven medicine dispensing facilities belonging to public, private and other basic health units (BHUs) sectors were surveyed in the district. Simple random sampling was employed to select facilities **Results:** The mean overall percentage availability of essential medicines for NCDs was 0.1% for original brand and 1.9% for low price generic in public sector. Overall availability was better in private and other sectors (32.9% for OB and 13.8% for LPGs and 5.3% for OB and 11.1% for LPG respectively). The prices in public procurement sector were competitive. The median price ratio (MPR) in public procurement sector was 0.56. Prices were higher comparatively in private sector with MPR 2.83 **Conclusions:** The availability of essential medicines for NCDs was poor in District Abbottabad. None of the sectors reached the WHO benchmark of 80% with regard to availability of medicines. LPGs were not frequently available in the private sector.

INTRODUCTION

Non-communicable diseases (NCDs) are killing more people worldwide than any communicable disease. The four broader categories of NCDs include cardiovascular diseases, chronic respiratory diseases, cancers and diabetes. According to World Health Organization (WHO) almost 38 million people lose their lives each year globally due to one or more non-communicable diseases. Almost two third of the overall mortality due to NCDs worldwide that is 28 million deaths only occur in LMIC [1]. Pakistan is facing a double burden of diseases with the NCD burden on rise. Approximately 80 million people are suffering from one or more chronic diseases in Pakistan and the projections have shown that the rate will increase from 10 to 15% in coming 10

years. Though NCDs can be prevented and properly treated to reduce the disability and death yet in Pakistan almost 2000 lives daily are lost to these diseases [2]. Unlike communicable diseases, NCDs are not curable and require lifelong treatment and care. These characters of NCDs tend to drain household resources especially in low resource settings mainly due to the continuous purchase of medicines. NCDs thus, have a well-established strong link to poverty [1]. Access to medicines was part of one of the Millennium Development Goals (MDG 8) and used as an indicator for monitoring the progress of MDGs. Recently, the Sustainable Development Goals (SDGs) precisely SDG target 3.b recognizes provision of access to essential medicines

and vaccines an important step towards achieving universal health coverage [3]. Moreover, access to EM has been realized as the part of right to health by United Nations Committee for Economic, Cultural and Social Rights [4]. Despite the realization of importance of access to medicine, about 30% of the world's population lack access to essential medicines and this lack of access is over 50% in settings with lowest resources in Africa and Asia [4]. Measuring access in its totality is complex and requires some indicators. As used by WHO and UN, availability and affordability are the key measures of medicine access [5]. Similarly, the overall health care expenditure on medicines is higher (25-70 %) in developing countries as compared to developed countries where it is less than 10% [6, 7]. The medicines for chronic diseases in 6 LMICs including Pakistan were reported as less than 8% in public sector except in Brazil where it was 30%. The treatment cost for Congestive heart diseases (CHD) ranges from 18.4 days' wages in Malawi to 5.4 in Pakistan to 1.5 in Sri Lanka [8]. More than a day's wages were required to purchase antihypertensive medication [9]. Purchase of medicines has the capability to push patients below the level of poverty. Three out four medicines that would impoverish large proportions of population (86%) were that for NCDs (Salbutamol inhaler, Glibenclamide, Atenolol and Amoxicillin) [10]. Previously in Pakistan public health facilities were reported to have extremely low median availability of low price generics (LPGs) (3.3%). Originator brands (OB) were more likely to be present in private retail pharmacies than generics (IB 54.2%, LPG 31.3%). Procurement prices were low in public sector but the medicines were not available [11]. Therefore, objective of this study was to determine price, availability and affordability of essential medicines for NCDs in District Abbottabad.

METHODS

A descriptive cross sectional study was conducted in District of Abbottabad. Abbottabad is one of the 6 districts of Hazara region in the province of KPK, Pakistan. The district is further divided into 2 tehsils namely, Tehsil Abbottabad and Tehsil Havelian. In order to obtain a detailed view of the situation regarding access to medicine each tehsil was considered as a separate survey area. For each survey area data was collected for four sectors: public procurement, public sector health facilities, private sector consisting of registered pharmacies and o the other sector comprising of Basic Health Units (BHUs). The procurement for medicines is a centralized process in public sector. The Medicine Coordination Cell in the capital of KPK selects the rates and vendors for the procurement of medicines throughout the public health facilities of the province. The

medicines that are selected to be purchased at each facility are published online in Medicine Coordination Cell (MCC) list for each fiscal year. The public health sector in the district is divided into 3 levels that are primary secondary and tertiary care facilities. There is one District Head Quarter Hospital, 4 rural health centers, 52 basic health units and 57 civil dispensaries in the District. Employing the data collection technique mentioned in WHO/HAI manual for this survey 9 public health facilities were randomly selected throughout the district. Since BHUs were managed by an NGO (PPHI) therefore, were included in other sector. Nine BHUs were selected for every public health facility. The private sector was comprised of registered retail pharmacies located in the vicinity of the selected public sector facility. A total of 9 pharmacies were included in the study. For selection of medicines 8 NCDs were identified. They were hypertension, ischemic heart disease, heart failure, diabetes mellitus, asthma, COPD, mood disorders and joint related disorders. Furthermore, only those medicines that were listed in Essential Medicine List published by Health Department of KPK for these NCDs were included. As mentioned in EML, each level of health care must be provided with specific set of medicines so only those medicines were surveyed for each level of public health sector, other sector and private sector facilities. Out of 50 medicines that were selected for the survey 19 were to be present at all levels of health care facilities. Data were collected using a standardized form. In public sector civil dispensaries, rural health centers (RHCs) and District health quarters (DHQs) were visited to check the availability and verification of prices of selected medicines. As patients do not pay for medicines in public sector so the government health facilities were only surveyed for the availability of the selected medicines. In private sector, for both availability and the price of the medicine which the patient would pay private pharmacies were surveyed. In order to find out affordability of the treatments, affordability was expressed as 'the cost of therapy measured as compared to the daily wage of the lowest paid government worker'. The minimum per month salary of the worker working 8 hours a day is 15,000 Pakistani Rupees/month [12]. For each selected medicine for NCDs in the specific dosage form, with a predetermined strength up to two products were monitored regarding prices and availability, which were:

1. "Originator brand (OB) - the original patented pharmaceutical product
2. Lowest price generic equivalent (LPG) - the lowest priced in the facility at the time of survey" [13].

The availability of medicines across the district is reported as mean percentage availability. For international comparison of prices Management Sciences for Health

(MSH) prices were used. Median Price ratios (MPR) were calculated which compared the collected prices with the international standard prices. MPR of 1 or less than 1 shows an efficient procurement system in public sector and that of less than 2.5 shows competitive pricing in private sector. Less than 30% availability is considered very low and above 80% as high.

RESULTS

Public Sector Procurement Prices: The online MCC list for 2015-16 on official website of Health Department, KPK was reviewed. It was found that only 13 out of 23 essential medicines for NCDs were included in that list. No originator brand product was mentioned on the MCC list. Thus, only LPGs were included in the analysis and for comparison purposes. The MRP for lowest price generics for the 23 medicines was 0.56 times the international reference price that is the government is procuring essential medicines for NCDs at a price which is 0.56 times less than the international reference price. This shows that most of the prices were competitive and less than international reference prices.

	Overall Mean Percentage Availability (%)	Percentage Availability At Tertiary Level Health (%)	Percentage Availability At Secondary Level Health Facilities (%)	Percentage Availability At Primary Level Health Facilities (%)
Originator Brand	0.1%	0.1%	0.0%	0.0%
Lowest Priced Generic	1.9%	1.7%	1.5%	1.8%

Table 1: Overall Percentage Availability Of EM For NCDs In Public Sector of Dist. Abbottabad (Both Tehsils)

The mean percentage availability of essential medicines for NCDs was found to be very low at all levels of health care in Dist. Abbottabad. Not a single public sector outlet was found to have all the medicines selected for the study. The mean percentage availability of essential medicines (EM) for NCDs in originator brand at Primary, Secondary and tertiary levels were 0.0%, 0.0%, 0.1% respectively. Overall, mean percentage availability of EM in public sector of district Abbottabad was 0.1%. Likewise, the mean percentage availability of essential medicines (EM) for NCDs in lowest priced generic at Primary, Secondary and tertiary levels were 1.8%, 1.5%, 0.7% respectively. Overall, mean percentage availability of EM in public sector of district Abbottabad was 1.9%. The overall percentage availability was better in the other sector that is the BHUs in both tehsils i.e. for originator brand in Tehsil Abbottabad and tehsil Havelian

	Tehsil Abbottabad	Tehsil Havelian
Originator brand	4.2%	6.6%
Lowest priced generic	10.5%	11.8%

Table 2: Overall Percentage Availability Of EM For NCDs In the Other Sector of Dist. Abbottabad

LPGs are found to be more prevalent in this sector of Dist. Abbottabad. In tehsil Abbottabad the mean availability of originator brand product was 4.2% and that of LPG was 10.5%. In tehsil Havelian the mean percentage availability of originator brand product was 6.6% and that of lowest price generic was 11.8%. As shown in Table 3 the overall mean percentage availability was found to be quite better in private sector. However, originator brand products were found to be more prevalent than LPGs.

	Overall mean percentage availability (%)	MPR (IQR)
Originator brand	31.6%	2.1(1.03 - 2.69)
Lowest priced generic	13.1%	1.51(0.82 - 3.95)

Table 3: Overall Percentage Availability and MPR Of EM For NCDs In Private Sector of Dist. Abbottabad (Both Tehsils)

The median MPR for branded products was 2.1 times the international reference price. For LPG, the median MPR in the District Abbottabad was found to be 1.51 times the international reference price. Although a large difference exists in the minimum and maximum MPR, generally the prices for LPG are also found to be higher than the international reference price.

Cross Sector Comparisons:

Table 4 shows that the highest availability of medicines for NCDs was recorded in the private sector of the District. The percentage availability was comparatively better in the other sector with respect to the public sector. Yet it was low as compared to the private sector.

	Public Sector	Other Sector	Private Sector
Originator brand product	0.1%	5.3%	32.9%
Lowest priced generics	1.9%	11.1%	13.8%

Table 4: Cross sector comparison of Percentage Availability of Essential Medicines for NCDs in District Abbottabad

Table 5 shows the comparison of MPR for the medicines across the three sectors. Only 7 medicines were found to have comparable prices in both sectors. In public procurement sector only LPG were found so comparison was done only for LPG in both sectors.

	Public Sector	Private Sector
MPR (Lowest Priced Generics)	0.56%	1.58%

Table 5: Cross Sector Comparison for Median MPR of Essential Medicines For NCDs

The percentage difference between private and public procurement sectors prices was found to be 239.5% (auto calculated by the Excel workbook). This means that in private sector the prices for LPG were 239.5% more than the public procurement sector

Affordability:

Table 6 shows the affordability of the selected medicines for NCDs. Most of the standard treatments with LPG were affordable in the District. Only Simvastatin requires more than one-day wage to buy a month's supply.

Medicines	Diseases	No. of daily wages required to buy 30 day supply of medicine			
		OB Public sector	Private sector	LPG Public sector	Private sector
Atenolol 50 mg	Hypertension	N/A	0.5	0.02	0.1
Enalapril 5 mg	Hypertension	N/A	0.6	N/A	0.2
Glibenclamide 5 mg	Diabetes Mellitus	N/A	0.2	0.1	0.1
Metformin 500 mg	Diabetes Mellitus	N/A	0.2	0.1	0.1
Salbutamol 100ug inhaler	Bronchial asthma	N/A	0.3	0.3	0.3
Simvastatin 20 mg	CVD/ Hypercholesteremia	N/A	1.8	N/A	0.3

Table 6: Treatment Affordability with Essential Medicines for NCDs

Metformin, Glibenclamide and Atenolol were found to be most affordable with respect to both product types. Although the standard treatments of hypertension, DM and chronic respiratory diseases were found to be affordable but this cannot be generalized to the co morbidities of these diseases which require treatment with multiple drugs simultaneously.

DISCUSSION

The study results revealed that the mean overall percentage availability of essential medicines for NCDs was 0.1% for original brand and 1.9% for low price generic in public sector. Overall availability was better in private and other sectors. The prices in public procurement sector were competitive. The median price ratio (MPR) in public procurement sector was 0.56. Prices were higher comparatively in private sector with MPR 2.83. Most of the medicines require less than a day wage to buy 30 days treatment.

Public Sector

Procurement Prices

The median MPR of the essential medicines being purchased in the government sector of District Abbottabad shows that

the prices obtained are competitive and reasonable as compared to international reference price. The previous survey conducted in Pakistan in 2004 reported that the MPR for LPG ranged from 0.24 to 1.04 with a median MPR of 0.57 [11]. the later in the present study was 0.56. These MPRs are consistent with the Indian procurement prices in the region [14].

Availability of EM for NCDs in public and other sector:

Against the WHO and HAI standard of 80% health facilities should have essential medicines available [15], the mean percentage availability of medicines for NCDs was extremely low in public outlets. Overall mean percentage availability of essential medicines for NCDs at all levels in the public sector of District Abbottabad was 0.1%. In 2004 it was reported to be 3.3% for the country but the surveyed medicines included medicines for both communicable and non-communicable diseases [11]. Due to public-private partnership the availability of medicines was found to be better in this sector (11.1%) than public sector but still remains suboptimal. The results of this study are consistent with that of India where the percentage availability of basket of medicines including those for NCDs was suboptimal [14]. Similarly, low availability of medicines for NCDs has been reported for many other LMIC especially in public sector [8].

Availability and Prices of EM for NCDs in Private Sector:

The results of this study with regard to the availability and prices are consistent with the results reported for majority of the LMICs that is the prices are much higher than international reference price along with good availability of medicines in the private sector [16]. As this study reported that originator brands were prevalent in the private pharmacies of the district as compared to the LPGs similar trend has been reported from India and Brazil [8, 14]. Previously a survey conducted in Pakistan (2004) reported that originator brands were found to have good availability in the country's private sector as compared to the LPGs [11]. On the contrary, in Sri Lanka the availability of LPGs was found to be higher in private sector as compared to the branded products which consequently increases the affordability and access to essential medicines for NCDs in the country [17].

Affordability: As shown from the data of this study most of the standard treatments are affordable with LPGs and in some cases with originator brands as well. According to Pakistan Economic Survey 2013-14 the percentage of people living below the poverty line (US \$1.25 a day) was 21.04 and that of US \$2 a day was almost 60% [18]. So it can be said that the minimum wage of unskilled government worker can present overly optimistic results. Pakistan can save up to \$38,830,406 by just switching 9 medicines including those that are prescribed for NCDs from originator brand to LPG in

its private practice [19]. This shift will definitely increase access to essential medicines for NCDs especially for those that are living below poverty line. Secondly, although affordability was calculated following the proposed method by WHO and HAI that is, on the basis of daily wages of unskilled government employee require to buy a month's supply of medicines there may be a proportion of population living below this income level. The affordability may be an over presentation for these population groups. Thirdly, due to selection of a specific number of medicines for the survey it was not possible to include the alternative dosage forms and therapeutic alternatives of these medicines. Finally, differences exist between the originator brand and LPG product's quality and which have not been accounted for in the survey.

CONCLUSION

In District Abbottabad most of the essential medicines prescribed for NCDs have extremely low availability in public sector. In the other sector availability was better than public sector but was very low as compared to the private sector. Though the availability was found to be fairly good in private sector, the prices were higher than international reference price for most of the drugs for both product types.

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