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**Extended Abstract**

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**IMPACT OF SHIFT IN NATIONAL PRICING POLICY ON ESSENTIAL  
MEDICINE PRICES IN INDIA**

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**Abstract**

Pricing policies are important mechanisms used by countries to control pharmaceutical markets and ensure the accessibility and availability of essential medicines. India has regulated the ceiling prices of essential medicines since the 1970s through various DPCOs (Drug Price Control Order). The ceiling price of essential medicines was decided through a Cost-Based Pricing method (CBP) until the government introduced a Market-Based Pricing mechanism (MBP) in 2013 as a consequence of the National Pharmaceutical Pricing Policy, 2012. This study analyzes impact of this shift on essential medicine prices in India. Data was collated from state and public medicine procurement agencies and tenders. Initial results suggest that the shift in National Pricing Policy 2012 did not have a uniform impact on prices of all the essential medicine.

**Keywords: Essential Medicines, Price Control, Health Policy, Health Intervention**

## **1. Introduction**

The lack of affordable medicine is one of the key causes of the inaccessibility of medicines in most of the low- and middle-income countries (Mendis, 2008), (Cameron, 2009), (Mathewos, 2021). Medicines, apart from taking up a major share of out-of-pocket expenditure (WHO, 2004), also create a dent in the government budgets (WHO, 2008). According to WHO, better access to medicines and vaccines can save 10 million Onset of Covid-19 virus has further brought into focus the criticality of access to medicines with the pandemic resulting in medicine shortage due to issues in manufacturing, supply, and distribution of medicines combined with affordability (Alexander, 2020).

As with other countries in the developing world, medicine accessibility is a critical issue in India. (Kotwani, 2009), (Roy, 2012), (Kotwani, 2013). With a large section of the population belonging to economically weaker sections combined with a diverse social geographical set up, access to affordable medicines is a huge challenge in India.

Additionally, the National Health Accounts (2016) shows that, in India, more than 50 percent of total health expenditure is in form of out-of-pocket expenditure (OOPE). In India, OOPE stands at 2.2 percent of total Gross Domestic Product of the country. Even though the situation is similar in state level as well, the OOPE varies from 47 percent to 78 percent in different states (NHA 2016).

But rather more significant impact on the pricing of the medicines can be from change in the pricing policy of medicine brought in 2012. NPPA (National Pharmaceutical Pricing Authority), the autonomous body of India, apart from fixing, revising and monitoring of the essential medicines, enforces drug price control orders in India. With the new pricing policy, pricing of the medicine departed from the traditionally followed cost-based pricing method and introduced a new method called the market-based pricing method. Under this method, the ceiling price of the medicine is the “simple average of price of all brands having at least 1 percent market share of the total market turnover of that drug and a notional 16 percent retailers’ margin is added.

## **2. Review of literature**

Unaffordability of essential medicines is a major deterrent in access to healthcare. (Danzon et al (2015) find that Drugs are least affordable in lower-income countries and prices in MLICs

are positively related to the skewness of income distribution. According to Turner (2019), Cost is a major factor that restricts access to critical care in low- and middle-income countries. Ali et al (2015) find a link between the unaffordability of medicines and inaccessibility of medicines to poor. They also suggest for appropriate pricing policies to control medicine prices. In similar lines, Single Exit Price policy introduced in South Africa in 2004 reduced the price of essential medicines significantly (Moodley et al, 2019). Similarly National pharmaceutical policy showed decrease in price and increase in supply of generic medicines in Mali (Maïga, 2010). But all the policy intervention didn't have the same success story. Reference pricing system introduced in Finland in 2009 to induce competition showed only a temporary decrease in the price of the antipsychotic medicines (Koskinen et al, 2015). In Egypt, External Reference Pricing system showed mixed response from the policy intervention to decrease medicine prices (Mohamed et al, 2016).

Government of India introduced DPCO, 2013 to implement the National Pharmaceutical pricing policy, 2012 to fix the ceiling prices of 348 drug prices (Chaudhuri, 2015). This policy faced severe criticism from several academicians such as (Srinivasan et al, 2013), (Jain, 2013) and (Sachan, 2014). The major criticism was that the regulation is in the paper only but does not effectively control the price. This regulation will encourage the companies to push for the substitutes for the medicines on the essential list. The policy regulation doesn't have any impact on the essential medicines out of fixed-dose combinations as well. This study intends to study the impact of drug price control policy on essential medicine prices in India using quantitative methods.

### 3. Model

For this study, we have used a segmented linear regression model using interrupted time series by Wagner et al (2002). The same methods have been followed by many recent intervention analysis in the health sector (( Zhao et al (2021), Rong et al (2020), Moodley (2019), Kwon et al (2019) and Selvaraj et al (2019) )

$$Y_t = \beta_0 + \beta_1 time_t + \beta_2 intervention_t + \beta_3 tiintervention + e_t$$

Here,  $Y_t$  is the price of medicine.  $time_t$  indicates the time passed from the start of the observational period.  $intervention_t$  is a dummy variable indicating the intervention, 0 indicating the time before intervention, and 1 after the intervention.  $tiintervention$  is a

continuous variable indicating time since the intervention.  $\beta_0$  indicate the baseline level of outcome, that is mean price per medicine per year at time zero,  $\beta_1$  estimate the baseline trend, the change in price before the intervention,  $\beta_2$  estimate the level change in the medicine price immediately after the intervention,  $\beta_3$  estimate the change in the trend in the price of medicine after the intervention.

## **5. Results**

Three out of 21 generics showed a significant positive change in level ( $p < 0.1$ ). Dolopar 500mg, Dolo 500mg and Omee 20mg showed an immediate decrease in its price after the policy intervention. 10 out of 21 generics showed a significant change in slope after the intervention ( $p < 0.1$ ). They are Defenac, Dolopar, Mox500, Blumox, Tiniba, Domstal, Rantac, Zinetac, Omee and Omez. Out of these 10 medicines, while 5 medicines showed a positive price change, 5 medicines showed negative price change due to the policy intervention.

## **6. Conclusion**

The impact of the intervention is not uniform among all the medicines but, it was different in terms of size and pattern. While the price of some medicines increased after intervention significantly, some medicines' prices went down due to intervention. Further studies should be conducted on why the impact of the Market-based Pricing system impacts the medicine prices differently in India.

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