Original Research Article

Inequity in Utilization of Health Care Facilities in Urban India: An Application of Marginal Benefit Incidence Analysis

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ABSTRACT

Huge population pressure along with rapid urbanization has adversely impacted the morbidity-prevalence and hospitalization in urban India. However, no significant step has been taken by the government to strengthen the healthcare system in the sector. In this background, the paper aims to measure the extent of equity in utilization of healthcare services in urban India. The paper also intends to measure the marginal impact of strengthening of public healthcare facilities across economic classes. Applying Nation Sample Survey data, the paper shows that both morbidity reporting and hospitalization has increased in India. In terms of utilization of healthcare services, both the demand and supply side indicators are better in the urban sector compared to its rural counterparts. The impact has been reflected in the reporting of morbidity and the utilization of hospitalization care services also. Specifically, the utilization of public healthcare facilities is pro-poor in the urban sector. However, urban public healthcare services face multiple challenges like deficiency in infrastructure and manpower, overcrowding in hospitals etc. It is also revealed from the analysis that strengthening of the public healthcare facilities would be beneficial for the poor.

Keyword: Benefit incidence, marginal benefit incidence, health equity, urban India, healthcare utilization.

1. INTRODUCTION

Indian economy has witnessed a significant economic growth in the recent past. However, the favourable macroeconomic performance is a necessary but not sufficient condition for the significant development of the social sectors. The translation of economic growth into enhanced human capabilities lies at the heart of the development problem that faces most of the low-income countries; India is not an exception in this issue. Indicators of social development of the country are lower than the countries with the similar income level. Health, which is one of the most important factors of human life, is at miserable condition instead of this financial achievement in terms of growth.

In the developing country like India, the role of public sector is important in ensuring healthcare delivery to all sections of the society. However, the current status of healthcare infrastructure in India and the huge regional and inter-class disparity can be primarily attributed to the poor healthcare expenditure by the government. It is stagnant at mere 1 per cent of the GDP for last three decades. It has been observed that out of the total health spending, the share of the out-of-pocket (OOP) payment is more than 70 percent. [1] This high level of OOP expenditure is adversely affecting the living condition of the people of the country and many people cannot access healthcare services due to financial reasons. [2,3]

To address the constrains that the public health system faces, in 2005, Indian Government launched the National Rural Health Mission (NRHM), which among many other provisions, aimed at increasing public spending on healthcare. In addition, during that period India and her states have introduced National Health Insurance Policy (RashtriyaSwasthaBima Yojana-RSBY) for the people living below the poverty line, free medicine for all (in some states) and many other changes in health system. Now, it has been an issue of debate that whether the recent reforms in economic as well as healthcare policies have been successful in improving the utilization of public healthcare facilities and equity in the health system. It is documented from the National Sample Survey (NSS) reports on Morbidity and Healthcare [4-6] that reporting of morbidity & hospitalization has increased significantly in India (Table- A1 in appendix). Increase in reporting of morbidity and hospitalization have led a pressure in the existing public health facilities over time. The mismatch between the demand and supply of public healthcare services could play an important role in mushrooming of the private healthcare facilities (and consequently higher expenditure for healthcare services) in a growing economy like India. Therefore, role of public sector is very important to meet this increasing demand and to arrest high out-of-pocket expenditure.

With the objective to achieve universal access to healthcare through strengthening the healthcare system, institutions and capabilities, NRHM has been successfully implemented by India and her states. The positive impact of public investment has been observed in utilization of public healthcare facilities in the country. Utilization of public facilities for both in-patient and out-patient treatment have started increasing in the rural sector. However, no step was taken to strengthen the health system in the urban sector. The impact of such negligence has been reflected in the household survey conducted by NSS (2014). The share of public facilities for out-patient visits remains almost stagnant for the last two decades in the urban sector. Whereas, hospitalization rate in public institutions is decreasing over time in the region (See Table-A2 in appendix).

In this background, this paper attempts to capture the equity in utilization of public healthcare facilities in urban-India. Specifically, the objective of the paper is to study the morbidity & hospitalization reporting pattern across socio-economic classes of urban-India. The study also aims to identify the socio-economic factors determining access to public healthcare facilities and finally to measure the marginal impact of strengthening the public healthcare facilities on different economic groups in the region. The entire paper has been divided into five sections. *Section-2* presents the data structure, socio-economic groups formed for the analysis and methodology adopted. *Section-3* has been divided into four subsections to describe the results, *Section 3.1* reports the morbidity and hospitalization pattern, *Section 3.2* analyzes the socio-economic determinants influencing the access to public healthcare facilities and *Section 3.3* reports the results of benefit and marginal benefit analysis. Section-4 discusses the results and Section-5 concludes the paper.

2. DATA & METHODOLOGY
Data
For the present study we have used the National Sample Survey (NSS) 71st round (2014) unit level data. The 25th schedule of the survey provides information on "Social Consumption: Health". A stratified multi-stage sampling design has been adopted for the survey to collect data from 65,932 households with 55 percent representation of the rural sector.

Groups Formation
NSS provides information on usual monthly expenditure of the households; it has been used to generate monthly per capita expenditure (MPCE). Due to difference in

cost-of-living, the MPCE in the rural and urban sectors do not always correspond. So, we have classified the households into MPCE quintiles (poorest, poor, middle, rich and richest class) in each sector separately. It is presumed that the decision to access healthcare facilities is partially or fully taken by the household head and to study the effect of education on the decision on access to healthcare facilities of the households are classified according to the level of educational attainment of the head of the household. Four categories defined here are illiterate, up to primary, up to secondary and above secondary. The social group reflected in the caste of the household is also likely to be an important determinant of the access pattern. Hence, the households are categorized under general and backward classes where Scheduled Castes (SC), Schedule Tribes (ST) and other backward classes (OBC) households are clubbed under the latter group. To capture the living condition of the households, we have constructed an index combining household characteristics. As high correlations among the factors have been found, we have run the principle component analysis (PCA) and formed a composite living condition index (LCI). The values of the index have been categorized under four groups – Low, Medium, High and Highest (details of the analysis have been given in appendix) living condition. At individual level, information on three factors which might influence the reporting of morbidity and access to healthcare facilities was available from NSS: insurance coverage of the individual (INS) age of the person (AGE) and sex (SEX). Insurance coverage of the individual has been classified under three categories: no insurance coverage, covered under publicly provided insurance (RSBY, Central Government Health Scheme: CGHS, ESIS: Employer State Insurance Scheme etc.) and individuals covered under private insurance facilities. Here, five different age groups are defined as (0–5 years), (6-14 years), (15–34 years), (35–59 years) and 60 years and above.

Methodology

For the prevalence of morbidity and choice of provider for treatment, exploratory data analysis has been carried out. To identify the correlates of choice of provider logistic regression has been applied at the individual level data. Here both the odds ratio and the marginal effects of each socio-economic factor has been considered separately.

Many studies have implemented the Benefit Incidence Analysis (BIA) to examine the equity in access and distribution of public subsidies. [7,8-10] In BIA, analysts examine the distribution of current public spending among different socio-economic groups. Wagstaff [9] has discussed the different aspects of BIA methodology and McIntyre and Ataguba [10] have made the researchers aware of the probable mistakes those may affect the final results in case of non-judicious application of the method. However, the Marginal Benefit Incidence (MBI) analysis could be useful to study the marginal impact of increase (or decrease) in public expenditure (or facilities) on different socio-economic groups. [11]

In our analysis, we have estimated average (BIA) as well as marginal benefit incidence of utilization of public healthcare facilities for in-patient and out-patient care services. Here we have defined the average utilization rate as the proportion of individuals in a particular MPCE class who are utilizing the public healthcare facilities (out-patient/in-patient). The *average odds of utilization* (AOU) has been defined as the ratio of one MPCE class to the overall average. Mathematically, $AOU = (U_i / U_A)$, where, U_i is the proportion of total population within MPCE class 'i' (i = poorest, poor, middle, rich and richest) who have utilized the public healthcare facilities and U_A is the proportion of total population who have utilized the public healthcare facilities. The *marginal odds of utilization* (MOU) for a particular MPCE class has been defined as the change in the quintile wise utilization rate as the provisioning of

the public healthcare facilities changes relative to the change in the overall utilization rate of the public healthcare facilities (at the state level). Mathematically, MOU = (δU_i/ δU_A), where, δ implies the marginal change. Applying the following steps, it is possible to estimate the AOU from our data, however there is no straight forward way to estimate the MOU from the cross-sectional data. Lanjouw and Ravallion [11] have described a method to estimate MBI from cross-sectional data. However, they have taken NSS region as the unit of analysis instead of individual. So, this method is useful only when the individual level data are not available. Younger [12] and Warr, Menon and Rasphone [13] have modified the methodology for application at individual level data. Following them, we have analyzed the individual level data of NSS. We have used logit model to estimate the equation –

$$Y_{pis} = \alpha_{is} + \beta_{is} X_{rs}$$

Where, Y_{pis}= 1 if individual is utilizing public healthcare facilities

  = 0 otherwise

'p' denotes the individual household member, 'i' is the MPCE class as mentioned before, 's' is the sector (rural or urban) of the individual and r is the state/state group. It has to be noted here that, we have clubbed all the north-eastern states and all Union Territories (UTs) as their individual representation in the sample is very small and formed two groups: North-eastern states and UTs. X_{rs} is the average utilization of sector 's' of the state 'r'. The estimated value of the coefficient of X_{rs} (i.e., $\hat{\beta}_{is}$) gives us the value of MOU. An adjustment has been made to estimate the adjusted MOU. Here, we have taken the ratio of MOU of a particular MPCE class and the MOU of all classes together.

3. RESULTS
3.1: Reporting of Morbidity & Hospitalization
To capture the differences in demand for healthcare services, self-reported morbidity and hospitalization are considered with respect to different socioeconomic characteristics. In India, about 10 per cent of the individuals on the average (9.04 per cent in the rural area and 12.47 per cent in the urban area) are reporting morbidity within the last 15 days of the recall period in 2014. Based on NSS 71st (2014) round data Table-1 represents the percentage distribution of morbid and hospitalized people across MPCE classes, sex, social groups, education of the household head and age groups of the urban India.

Table 1: Reporting of Morbidity & Hospitalization across Different Socio-economic Groups in India (in %)

Group	Subgroups	OP		IP	
		Rural	Urban	Rural	Urban
MPCE	Poorest	7.43	9.72	2.49	3.26
	Poor	8.57	11.38	2.91	4.23
	Middle	9.47	12.01	3.20	4.44
	Rich	8.87	14.42	3.80	4.84
	Richest	12.06	18.06	5.71	5.94
SEX	Male	8.09	10.40	3.38	4.16
	Female	10.04	14.70	3.50	4.54
SG	Backward	8.46	12.40	3.30	4.45
	General	11.04	12.58	3.93	4.18
EDU	Illiterate	8.00	10.92	3.06	4.15
	Up to Primary	10.69	13.48	3.79	4.61
	Up to Secondary	9.12	13.41	3.71	4.81
	Above Secondary	8.89	11.67	3.44	3.76
AGE	0—5	9.77	10.63	2.77	4.01
	6—14	4.82	6.37	1.32	1.81
	15-34	4.67	5.03	2.54	2.58
	35-59	11.42	17.44	4.45	5.38
	60 & above	29.35	41.21	10.13	13.65
All		9.04	12.47	3.50	4.40

Source: Estimated from NSS 71st round (2014) Data.

In all counts and for all categories, the urban sector is reporting higher morbidity compared to the rural sector. Except for the 'rich' MPCE class of the rural sector, the reported morbidity is an increasing function of economic status and social status in terms of casts. Self-reported morbidity of female is greater than that of male in both the sectors and the discrepancy is more prominent for the urban sector. Morbidity reporting of the male and female of the rural sector are 8.09 and 10.04 per cent, respectively, whereas the corresponding figures for the urban sector are 10.40 and 14.70 per cent respectively. It is observed that with the increase in age, the reported morbidity initially decreased and then starts increasing for the age group above 14 years.

People from the household where head has up to primary level of education reports the maximum morbidity in both the sectors and with the increase in the level of education of the head of the household beyond primary level, both the sectors experience a declining trend in morbidity reporting.

On the other hand, about 3.44 per cent of the rural and about 4.34 per cent of the urban people have been hospitalized during 2014 in India. It is observed from the Table-1 that as we move from lower to higher MPCE classes hospitalization rate in both rural and urban sector increases. Interestingly, female (excluding child birth) of both the sectors have utilized more hospitalization care facilities compared to the male. In the rural sector, more hospitalization cases have been reported by the general classes compared to the socially backward sections. Whereas, opposite pattern has been observed in the urban sector. Aged people (60 years or above) of both the sectors are experiencing the maximum hospitalization in India followed by the people belonging to the age group of 35 years to 59 years. The lowest hospitalization rate has been counted by the people belonging to 6-14 years of age group in both rural and urban sectors. Families where household head is illiterate are reporting the lowest hospitalization rate compared to all other education-groups. The rural sector experiences the maximum utilization of the hospitalization care when the household head has up to primary level of education whereas in the urban sector it is the maximum for the households when the head has the education up to secondary level. It has also been observed that most of the people who are not utilizing public facilities for their treatment (NSS collects this information for out-patient care only) in the urban sector are complaining about the quality of the services at public institutions. A substantial proportion of the patients going to the private providers for treatment are also reporting long waiting time as the barrier to access public healthcare services in urban India. Therefore, quality of care and opportunity cost of time are the two-major reason for non-utilization of public facilities for treatment in urban India. However, apart from these supply-side components, there are some demand-side factors also which determine the access to public institutions for treatment. In the following section we have tried to examine the role of different socio-economic factors in determining access to public facilities in urban-India.

3.2: Determinants of Access to Public Healthcare Facilities

In order to understand the causal factors responsible for access to public healthcare facilities, logistic regression is run on the access variable with different social and economic characteristics as correlates. Here we have defined the binary variable "access to public healthcare facilities" (0 as Private and 1 as Public) to have a limited dependent model with explanatory variables like MPCE class to represent economic factor, social group (SG) to account for socio-cultural factors, Living condition Index (LCI), insurance coverage (INS) of the household member to capture the level of financial risk protection, education (EDU) of the household head, age

(AGE) to capture demographic characteristic and gender (SEX).

$$PUB_i = \ln\left(\frac{P_i}{1-P_i}\right) = \theta_0 + \theta_1 MPCE + \theta_2 SG + \theta_3 LCI + \theta_4 INS + \theta_5 EDU + \theta_6 AGE + \theta_7 SEX + \varepsilon_i;$$

In our analysis, P_i = P [PUB_i= 1] and all the variables are categorical. The influence of all these socio-economic factors on the choice of healthcare provider (during out-patient and in-patient care) has been studied and the corresponding odds ratio and marginal effects are reported in Table-2.

It is clear from the result that, as we move from lower to higher MPCE classes the probability to access public facilities decreases and it is uniformly observed for in-patient and out-patient care. 'Others' social group has significantly lower access to public out-patient care facilities compared to the socially backward groups. Similar result has also been found for the access to in-patient care in the sector. Household with better living condition than the reference category prefers private healthcare provider for their treatment during in-patient and out-patient care.

Table-2: Determinants of Access to Public Facilities in Urban India				
Variable	Odds Ratio		Marginal Effects	
	Out-patient	In-patient	Out-patient	In-patient
MPCE (Reference: Poorest)				
Poor	0.76***	0.84***	-0.05***	-0.04***
Middle	0.72***	0.76***	-0.06***	-0.07***
Rich	0.54***	0.61***	-0.11***	-0.11***
Richest	0.44***	0.43***	-0.13***	-0.18***
SG (Reference: Backward)				
Others	0.79***	0.93**	-0.04***	-0.02**
LCI (Reference: Low)				
Medium	0.93	1.03	-0.01	0.01
High	0.59***	0.83***	-0.10***	-0.04***
Highest	0.55***	0.54***	-0.11***	-0.14***
INS (Reference: No Insurance Coverage)				
Social Insurance	1.67***	1.24***	0.09***	0.05***
Private Insurance	0.77**	0.47***	-0.04**	-0.15***
EDU (Reference: Illiterate)				
Up to Primary	1.15**	0.94	0.02**	-0.01
Up to Secondary	1.03	0.84***	0	-0.04***
Above Secondary	0.95	0.70***	-0.01	-0.08***
AGE (Reference: 0-5 years)				
0-14 years	1.67***	1.30***	0.07***	0.06***
15-34 years	1.67***	1.31***	0.07***	0.06***
35-59 years	1.93***	1.25***	0.10***	0.05***
60 years & above	1.98***	1.18***	0.10***	0.03***
SEX (Reference: Female)				
Male	0.95	0.95*	-0.01	-0.01*
No. of observations	14179	19826	14179	19826
Pseudo R^2	0.0514	0.0572	0.0514	0.0572
LR	772.72***	1508.41***	772.72***	1508.41***

Note: ***: significant at 1%; ** significant at 5%; *significant at 10%;
Source: Estimated from NSS 71st Round (2014).

Interestingly, it is found that, people with private health insurance coverage have significantly higher preference for private health provider compared to the people who have no insurance coverage. Whereas, people who are covered under some social insurance (like RSBY, CGHS, ESIS etc.), prefers public facilities for treatment (Appendix Table-A3). Up to primary level of education of the household-head contributes favourably to the enhancement of access probability in the public institutions. However, if the education class is above secondary-level then the probability of accessing public facilities go down for any type of care. Compared to the reference class (0-5 years of age) all other age groups have higher probability to access public facilities for treatment both for in-patient and out-patient care. Odds-ratio of

the gender covariate shows higher chances of the female in utilization of public facilities for their treatment.

3.3: Marginal Benefit Incidence Analysis

It is evident from the above results that provisioning of public facilities has a positive impact on different socio-economic groups. However, one crucial question here is that 'what would be the extent of strengthening the public healthcare services on different economic groups'? Would it benefit the financially weaker sections or not? Our present analysis is not sufficient to answer this question. Following the existing methodology, we have implemented the marginal benefit incidence analysis to assess how the changes in the level of provision (increase or decrease) would impact on different economic classes in urban-India. The results have been presented in Table-3.

Table-3: Average & Marginal Odds of Access to Public Facilities for Out-patient and In-patient Care in Urban India						
MPCE	Out-patient			In-patient		
	AOU	MOU	Adj. MOU	AOU	MOU	Adj. MOU
Poorest	1.40	1.05***	1.17	1.43	1.07***	1.18
Poor	1.11	0.96***	1.07	1.19	1.10***	1.21
Middle	0.99	1.09***	1.22	0.97	1.02***	1.12
Rich	0.74	0.68***	0.76	0.78	0.77***	0.85
Richest	0.72	0.54***	0.60	0.56	0.64***	0.70
All	1.00	0.90***	1.00	1.00	0.91***	1.00

Note: ***: significant at 1%; AOU: average odds of utilization, MOU: marginal odds of utilization, Adj. MOU: Adjusted marginal odds of utilization; Source: Estimated from NSS 71st Round (2014).

The estimates of the average odds of utilization suggest that the utilization of public facilities for out-patient care is pro-poor in the urban sector. In the urban sector, among 100 people utilizing the public facilities for out-patient treatment, about 28 people (1.40 times of one fifth) are from the poorest quintile and 22 people (1.11 times of one fifth) are from the poor class. The average odds of utilization of the richest MPCE class are 14 per cent followed by the rich class (about 15 per cent). The adjusted marginal odds of utilization of public facilities also reflect the same results. The table shows that, if the public provisioning of out-patient care increases by 100 units, about 23 units (1.17 times of one fifth) of the total patients would be from the poorest MPCE group. Adjusted marginal odds of utilization also confirm that the equity would persist if the provisioning of public ambulatory healthcare services increases in the urban sector.

Table-3 also reports the average and marginal odds of utilization for public in-patient care facilities in the urban sector. It is evident from the AOU result that, out of 100 patients admitted in the public institutions about 28 patients are from the poorest class; and the utilization decreases gradually as higher MPCE class is considered. Richest quintile has the lowest access to public hospitals for hospitalized treatment (12 patients out of 100 hospitalized in the public institutions). The adjusted marginal odds of utilization imply that about 24 people from the poorest class would be there if additional 100 people start utilizing public facilities for their in-patient care treatment. Whereas, increase in utilization of the in-patient service would be the maximum for the poor MPCE class in this sector. Utilization share would be the lowest for the richest quintile (14 in-patient out of 100) in increase in publicly provided hospitalization care facilities followed by the rich class (18 in-patient out of 100). This signifies that marginal utilization rate in the urban sector favours the poor compared to the rich classes in terms of in-patient care facilities.

4. DISCUSSION

The equity in utilization of public healthcare services in urban India has been analyzed in this study. It has been observed that the reporting of morbidity and hospitalization have increased over time in

India. Urban sector has reported higher morbidity and hospitalization than the rural sector. The sector has experienced rapid improvement of the supply as well as demand side factors over time. Mainly the economic reform during early 90's has changed the structure of the urban sector enormously. Employment opportunities have induced huge in-migration in the urban sector. Increasing population pressure within the small geographical boundary have constructed the slums at the peripheries. Highly dense population along with abysmal living condition, lack of proper drinking water, sanitation and drainage facilities have adversely affected the health condition of the slum population. In the rural sector the impact of globalization was not so significant. However, changes at the macro level, always had some trickle-down effect on the rural areas and the socio-economic conditions along with healthcare facilities have undergone changes over time (mainly after introduction of NRHM). Therefore, both rural and urban sector experience increasing morbidity reporting and hospitalization, but the rate of increase always remains higher for the urban sector.

For our present study, NSS 71st round data on "Social Consumption: Health" has been analyzed to examine the morbidity pattern and utilization of public healthcare facilities in urban India. Prevalence of morbidity and hospitalization pattern have been studied across different socio-economic factors. Due to better information, perception and availability of services, urban sector is reporting more morbidity compared to its rural counterpart in every aspect. It is also observed that people with better socio-economic condition have reported higher morbidity and hospitalization than their weaker counterparts. As NSS only captures demand side information, it is difficult to comment on the supply side barriers of utilization. However, few information available from NSS which could indirectly reflect the supply side issues also. The study also measured the impact of increase in public provisioning of healthcare services on different economics classes. Basically, when the demand for healthcare services increases, role of public sector is very important to maintain equity in utilization, arrest high out-of-pocket expenditure and its adverse consequences on households and finally to prevent non-utilization of healthcare services and utilization of informal health facilities.

Analyzing the NSS data, it has been observed that the private sector plays a significant role in the provision of out-patient care. However, public sector experiences a moderate increase in utilization of public facilities for out-patient treatment compared to the previous NSS round (2004). Share of public facilities when compared to the previous round, shows a sharp decline in hospitalization. Basically, the urban public healthcare services face multiple challenges. Deficiency in infrastructure and manpower, overcrowding in hospitals are some of the key issues. [14] Importantly, the utilization pattern of public hospitals is pro-poor in the sector, meaning a higher proportion of those in poorer MPCE class utilize public facilities for hospitalization than among the richer MPCE classes. The pro-poor utilization pattern of the public health facilities is a positive indicator from the equity perspective. The economically strong sections are mostly utilizing private facilities as they have higher purchasing power and higher opportunity cost of time compared to the poorer classes. Earlier studies [3-6] have pointed out that many people who are accessing private facilities for treatment are reporting 'long waiting time' and their 'dissatisfaction about the services' as the primary cause for not utilizing public healthcare services. In our study, it has also come out that most of the people are complaining about the quality of the services and long waiting time in the public institutions for treatment. Further analysis on determinants of access to public institutions shows that socially backward

classes utilize more public facilities than other social groups which again provide a good signal from the social perspective. As most of these socially backward sections are historically deprived from many social benefits and they are financially vulnerable also. Living condition which reflects the economic status, awareness and cleanliness, shows an inverse relationship with the utilization of public institutions. Interestingly, people who have insurance with private provider prefer private institutions for treatment in both the sectors in India. However, people who are insured with publicly provide insurance (either social or tax-based) facilities prefers to utilize public institutions. Sundararaman and Muraleedharan [15] in their study have analyzed insurance coverage pattern across different MPCE classes and they have observed that both private and public insurance coverage are mostly concentrated among the non-poor classes. Many publicly provided health insurance schemes (like CGHS, ESIS etc.) are applicable for hospitalization in public institutions only. Therefore, most of the people with public health insurance facilities have a tendency to utilize public facilities for treatment. Education level of the household-head also plays an important role in choosing the provider for treatment. The highest education groups show a strong pro-private preference. Basically, higher educational attainment has an influence on income of a household and this income-effect dominates in case of healthcare access. Female has higher access to public facilities for both in-patient and out-patient care. This study represents the extent of equity in utilization of public healthcare facilities. The result of benefit incidence for out-patient and in-patient care shows that equity persists (as the distribution shows a pro-poor trend) in utilization of public institution in the urban-region. In other words, vertical equity in utilization of public institutions prevails for both the services (Equity has two dimensions – horizontal and vertical. Horizontal equity means providing equal

opportunity for equal need to people with different socio-economic background. Vertical equity, on the other hand, means people should be treated unequally based on their unequal socio-economic background). MBI estimates the marginal change in benefit of public services across different socio-economic groups due to increase (or decrease) in provisioning of the services. The MBI results shows that increase in public provisioning of in-patient and out-patient care facilities would benefit the poorer-sections of urban India.

This study is consistent with past findings that the poorer-sections have higher access to public facilities compared to those who are better off. [15,16] The study has some limitations also. Primarily, NSS collects self-reported information on morbidity and hospitalization. Surveys based on self-reported morbidity are known to under-estimate the chronic conditions and latent morbidities. Moreover, perception about illness is highly dependent on socio-economic factors, health awareness, availability of and access to healthcare services.

5. CONCLUSIONS

Despite the high growth rate and stable economic and political condition, India has failed to make significant progress in health. Huge population pressure along with poor living condition, lack of access to safe drinking water and sanitation have adversely affected the health of the urban sector in India. Consequently, prevalence of morbidity and hospitalization requirement have increased over time in the sector, however, public facilities have not strengthened at the same pace to provide needed healthcare services to its population. Moreover, poor quality and inadequacy of public facilities have compelled the urban-people to utilize private health facilities. As most of the socio-economically weaker sections are using public facilities and increase in public provisioning of healthcare services would maintain equity in utilization of healthcare services in the region.

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APPENDIX

Appendix-A: Note on Principal Component Analysis (PCA)

We have taken four different indicators to construct the living condition Index (LCI), viz., type of latrine, drainage facility, sources of drinking water and energy for cooking. NSS provides information of different categories for each of these four indicators (like open, covered, underground, no drainage etc.). Here, we have ordered each of these categories from 'bad quality' to 'good quality' and assign chronological numbers (1 for worst). Thus, higher number represents better condition for that variable. To check the multicollinearity, we have run the pair-wise correlation. The pair-wise correlation matrix for these variables shows that the factors are significantly correlated with each other.

Pair-wise Correlation Matrix				
	Latrine	Drainage	Water	Energy
Latrine	1			
Drainage	0.4831**	1		
Water	0.2362**	0.3264**	1	
Energy	0.5366**	0.5080**	0.3542**	1

Note: ** signifies values are significant at 5% level.

Principal Components:

Component	Eigenvalue	Difference	Proportion	Cumulative
Comp1	2.24472	1.44981	0.5612	0.5612
Comp2	0.79491	0.280061	0.1987	0.7599
Comp3	0.51485	0.069323	0.1287	0.8886
Comp4	0.44553	.	0.1114	1

No. of observation: 65925

So, we have applied the PCA to construct a composite index using these four indicators. The overall Kaiser-Meyer-Olkin (KMO) value (0.7376) comes higher than .60 (threshold level), so we the PCA is statistically justified here. The *eigen* value for only one factor was higher than 1, which actually suggested to take only one factor. We have generated the factor for LCI and divided it into four quarters – low, medium, high and highest.

Table A1: Reporting of Morbidity and Hospitalization in India: Evidence from Three NSS Rounds (per 1000 population)

Service Type	NSS Period	Rural	Urban	All India
OP	1995-96	55	54	55
	2004	88	99	91
	2014	89	118	98
IP	1995-96	13	20	15
	2004	23	31	25
	2014	35	44	37

Source: Estimated from NSS 71st round data (2014).

Table A2: Share of Public Facilities in Utilization of Out-patient & In-patient Care Services in India (in %)

		1995-96	2004	2014
OP	Rural	19.0	22.4	28.3
	Urban	20.0	19.2	21.2
IP	Rural	43.8	41.7	41.9
	Urban	43.1	38.2	32.0

Source: Estimated from NSS 71st round data (2014).

Table A3: Distribution of Health Insurance Coverage in Urban India

MPCE	Not Covered	Government Funded	Employer Supported (non-govt.)	VHI	Others
Q1	91.4	7.7	0.6	0.0	0.2
Q2	87.5	10.6	1.3	0.5	0.2
Q3	84.7	12.9	1.3	1.0	0.1
Q4	79.7	13.5	3.3	3.4	0.1
Q5	66.6	15.1	5.6	12.4	0.3
All	82.0	12.0	2.4	3.5	0.2

Note: VHI: Voluntary health insurance; Source: Estimated from NSS 71st round data (2014).

How to cite this article: Bose M. Inequity in utilization of health care facilities in urban India: an application of marginal benefit incidence analysis. Int J Health Sci Res. 2018; 8(2):188-198.

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