Equity in Distribution of Public Subsidy for Noncommunicable Diseases among the Elderly in India: An Application of Benefit Incidence Analysis

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Abstract

Background:
Rapid ageing of the population and increasing non-communicable diseases (NCDs) among the elderly is one of the major public health challenges in India. To achieve the Universal Health Coverage, ever-growing elderly population should have access to needed healthcare, and they should not face any affordability related challenge. As most of the elderly suffers from NCDs and achieving health-equity is a priority, this paper aims to: - study the utilization pattern of healthcare services for treatment of NCDs among the elderly; -estimate the burden of out-of-pocket expenditure for the treatment of NCDs among the elderly and -analyze the extent of equity in distribution of public subsidy for the NCDs among the elderly.

Methods:
National Sample Survey data (71st round) has been used for the study. Exploratory data analysis and benefit incidence analysis have been applied to estimate the utilization, out-of-pocket expenditure and distribution of public subsidy among economic classes. Concentration curves and indices are also estimated.

Results:
Results show that public-sector hospitalization for NCDs among the elderly has a pro-rich trend in rural India. However, in urban sector, for both inpatient and outpatient care the poorest class has substantial share in utilization of public facilities. Same result is also observed for rural outpatient care. Analysis shows that out-of-pocket expenditure is very high for both medicine and medical care even in public facilities for all economic groups. It is also observed that medicine has the highest-share in total medical expenses during treatment of NCDs among the elderly in both the region. Benefit incidence analysis shows that the public subsidy has a pro-rich distribution for inpatient care treatment in both the
sectors. In case of outpatient care, subsidy share is the maximum among the richest in the urban sector and in the rural region the poorest class enjoys the maximum subsidy benefit.

Conclusions:

It is evident that a substantial share of the public subsidies is still going to the richer sections for the treatment of NCDs among the elderly. Evidences also suggest that procuring medicines and targeted policies for the elderly are needed to improve utilization and equity in the public healthcare system.

Background

Rapid ageing of the population, demographic and epidemiological transition along with increasing health inequity and inequalities impose major public health challenges in most of low- and middle-income countries (LMICs) [1-4]. The United Nations (UN) has documented that the population aged 60 years or above is growing at a rate of 3.26 per cent and by 2050 almost all areas except Africa would have nearly 25 per cent of their populations aged 60 or more [5, 6]. The pursuit of health equity in ageing societies raises several concerns – on the one hand there is persisting health inequity among social groups and on the other hand, distribution of scarce public healthcare resources always raises a question on distributive justice. Fair and effective functioning of the public health system is more important and relevant to elderly people as they carry higher burden of diseases, specifically noncommunicable diseases [7]. To achieve Universal Health Coverage (UHC), the World Health Organization (WHO) [8] has identified three aspects of healthcare systems – ensuring that all people receives the needed quality healthcare services, everyone should be protected from health threats and financial hardship due to treatment should be avoided. Additionally, Equity in health system is an international priority. This actually demands assessment of healthcare interventions among
socioeconomically disadvantageous sections. However, without considering the healthcare needs of the ever-growing numbers of elder people, UHC would be impossible to achieve [9].

In India, the proportion of population aged 60 years and above is projected to increase from 9 per cent (2015) to 20 per cent by 2050 [5, 6]. This percentage point increase is a remarkable increase in absolute terms. It is projected that the numbers of elderly in India would reach 159 million by 2025 [10] and it is also estimated that by 2050, elderly population would surpass the population of children below 14 years [11]. It is well documented in the literature that the increased burden of non-communicable diseases and subsequent healthcare need have put utmost concerns over the aged populations in India [12]. Literature have also indicated uneven access to healthcare services among the elderly in India for NCDs [13]. Moreover, the resource constraint public healthcare system poses additional challenges to meet the healthcare needs of the elderly people and reducing the socioeconomic inequity and inequalities in health. Analyzing literature on health of the elderly in India, Dey et al., (2012) found that the elderly population does not have access to needed healthcare and those who have physical access to healthcare services, many of them, face affordability related challenges due to cost of accessing the healthcare [13].

Given this background, the paper attempts to study the extent of access to healthcare services and equity in distribution of public subsidy among the elderly who are suffering from noncommunicable diseases in India. Specifically, the objectives of the paper are –

1. To study the utilization pattern of healthcare services for treatment of NCDs among the elderly in India;

2. To estimate the burden of out-of-pocket expenditure (OOPE) for the treatment of NCDs among the elderly and
3. To analyze the extent of equity in distribution of public subsidy for the NCDs among the elderly people.

The paper has been divided into five sections, Background section provides a brief background and the objectives of the paper. Data and methodology of the paper has been discussed in the Methods section. Results section provides the results of the paper and the Discussion sections discusses the results of the paper. The final section concludes the paper.

Methods

Data:

National Sample Survey (NSS) 71st round unit level data on Social Consumption: Health (2014) has been used for the study. This is the most recent data available in India on morbidity, healthcare utilization and related out-of-pocket expenditure (OOPE). The data has been collected from 3,33,104 individuals living in 65,932 households. It is a nationally representative survey covering all states and Union Territories (UTs). NSS collects information on household level as well as individual level characteristics. It records the details of morbidity, hospitalization and corresponding OOPE for doctor’s consultation, diagnostic tests, medicine, transport and other related costs. The reference period for inpatient care was 365 days and for outpatient care it was 15 days. Sources of finance for treatment and insurance coverage information is also available in the data. Sample weights are reported for each household and individual in the data. This survey weights have been applied to scale up the estimates at the population level.

Disease group & MPCE class formation:

Following World Development Report (1993) [14] we have cross classified the ailments into three broad categories – Communicable (CD), Noncommunicable (NCD) and other
diseases (OD). The classified data has been analyzed to calculate the utilization of healthcare services for inpatient and outpatient care of the aged people suffering from NCDs. NSS also reports usual[1] monthly expenditure of the households. Organization for Economic Co-operation and Development (OECD) equivalence scale has been applied to construct the monthly per capita expenditure (MPCE) class from the household expenditure [15]. Specifically, we have divided the total monthly expenditure of a household \( T \) by the square-root of the household size \( N \) to get the MPCE \( = T/\sqrt{N} \). Then the MPCE has been arranged in ascending order and grouped into four quarters – Poorest (P), Lower Middle (LM), Upper Middle (UM) and Richest (R). However, cost of living largely varies across states and the sectors (rural and urban) within the states. To accommodate these differences, MPCE classes have been formed separately for each state[2] and sector.

Out-of-pocket expenditure estimation:
The OOPE has been reported under various heads in the NSS data separately for inpatient and outpatient care. This information has been used to calculate the OOPE on medicine and medical care[3]. OOPE for transport and other non-medical services like food, expenditure on escorts, lodging charges etc. has been added with the medical expenditure to get the total OOPE. In case of inpatient care, OOPE has been reported for each hospitalization episode separately. However, for the outpatient care, NSS reports the total OOPE under various heads for all the outpatient visits together (for multiple visits within the reference period). Therefore, for the present paper we have considered only those aged individuals who have reported noncommunicable diseases related outpatient care utilization in all the visits.

Benefit Incidence Analysis
Benefit incidence analysis (BIA) is a method generally applied in the literature to study the extent of equity in any public system. It has both the horizontal[4] and the vertical
equity dimensions [16]. According to the literature, BIA is the net government subsidy weighted by the utilization rate [17, 18]. Mathematically, the BIA could be estimated by the formula -

\[ \pi_j = \sum \alpha_{ij} \frac{y_i}{\alpha_i} = \sum \delta_{ij} y_i \]

Where,

\( \pi_j = \text{Benefit of public subsidy enjoyed by group j (here MPCE class); } \alpha_{ij} = \text{utilization of service i (here inpatient and outpatient care for NCDs) by group j; } \alpha_i = \text{utilization of service i by all groups together; } y_i = \text{government’s net expenditure on service i and } \delta_{ij} = \text{group j’s share of utilization of service i.} \)

Specifically, is number of aged people from a particular MPCE class (j) who are suffering from NCDs and utilizing the public healthcare facilities. Total number of aged people suffering from NCDs in all the MPCE classes together forms the . The ratio of and is the utilization rate. To calculate the net government subsidy, we have applied the methodologies available from the literature [19-22]. In short, the net subsidy is the difference between the actual cost of providing a service and the user charges. The user charge for utilizing public facilities is available from the NSS data. However, the major challenge is to get the actual cost of providing the service in the public facilities. Following Bose 2018, Srivastava et.al., 2016; Bose & Dutta 2015; Bose 2014 [19-22], we have considered the modal OOPE of the private hospitals as the proxy for actual cost of providing the services in the public hospitals. To accommodate the differences in quality of care, severity of illness and cost of providing the services, state, sector, MPCE class and duration of stay in hospital (for inpatients only)/ total duration of ailment (for outpatient only) have been considered during calculation of modal OOPE in the private hospitals. OOPE for each hospitalization episode (or outpatient visit) has been subtracted from the corresponding modal private OOPE to calculate the net subsidy. Then the net
subsidy is weighted by the utilization rate to get the subsidy benefit of the individual[5]. We have added all the individual subsidy of a particular MPCE class to get the MPCE group specific subsidy. Share of each MPCE class in total subsidy benefit is the estimate of benefit incidence. Following O’Donnell et al., (2016) we have also calculated the concentration index and curves [23, 24].

[1] The usual expenditure includes – usual monthly expenditure for household purposes, monthly average expenditure amount (dividing the total expenditure by 12) for durable goods purchased during last one year and approximate monthly values of wage in kind, home-grown stock and free stock.

[2] The sample size for the North-eastern states and the UTs are very small in the NSS data. Therefore, we have clubbed all the North-eastern states (Sikkim, Nagaland, Mizoram, Tripura, Arunachal Pradesh and Meghalaya) and all the UTs (Chandigarh, Daman & Diu, Dadra & Nagar Haveli, Lakshadweep, Puducherry and Andaman & Nicobar Island) for the study.

[3] Medical cost includes package, consultancy, medicine, diagnostic test, bed charge (only for inpatient), other medical expenses like attendant charges, physiotherapy, personal medical appliances, blood, oxygen, etc.

[4] Horizontal equity: treating people with equal need equally; vertical equity: treating people with unequal need unequally.

[5] Following Wagstaff (2012), we have replaced all the negative values with zero here [17].

Results

The results of the paper have been represented under three subsections – utilization of healthcare services, OOPE for the treatment of NCDs and the benefit incidence of public
subsidy.

Utilization

Ailment group wise utilization of healthcare services for inpatient (IP) and outpatient (OP) care by the elderly people has been reported in Table-1. It is observed that 42 per cent of the total hospitalization and 54 per cent of the total OP visits are for NCDs in India among the elderly. Additionally, 46 per cent of the total hospitalization are for NCD-related treatment in the urban sector and the corresponding figure for the rural sector is 40 per cent.

Share of NCDs in total OP visit among the elderly is around 60 per cent in the urban sector. Around 50 per cent of all the OP visits in the rural India are for NCDs. Further bifurcating the IP and OP utilization across MPCE classes, we could observe that there is a positive relationship between MPCE class and utilization of healthcare services for treatment of NCDs among the elderly in India (Table-2). As we move from the poorest to the richest class utilization of healthcare services increases both for IP and OP care. Similar trend is observed in both the sectors. The highest utilization of IP care in the rural sector is among the richest (39 per cent) followed by the UM (25 per cent) and LM (20 per cent) class. Corresponding percentages for the urban sector are 31 per cent, 28 per cent and 23 per cent respectively. Lowest utilization of IP care is recorded by the poorest class (17 per cent) of the rural sector followed by the urban-poorest (19 per cent) class. Richest class of the rural and urban sector utilizes the maximum OP care followed by the UM class. Poorest class of both the regions has the lowest access to OP visits in India. Further analyzing the data to check the utilization pattern of public facilities for the treatment of NCDs among the elderly, we could notice that the richest class of the rural sector has the highest utilization of public healthcare facilities for the IP care and the poorest class has the lowest utilization (Table-3).
On the other hand, in the urban sector UM class has the highest utilization of public IP care followed by the poorest class. Interestingly, utilization of public facilities for the OP care is the maximum for the poorest class in both the sectors in India. The lowest utilization of public facilities is observed among the LM and UM class for the rural and urban sector respectively.

*Out-of-pocket Expenditure*

Table-4 reports the MPCE class wise OOPE for public and private healthcare facilities in India. Three sets of estimates have been made separately for IP and OP care – medicine, medical and total OOPE. It is observed that the total OOPE in the private facilities is around 1.5-2 times high in the rural sector and it is around 2-4 times high in the urban sector compared to the public facilities. This trend is uniformly observed in both the IP and OP care. For both IP and OP care, poorest class is spending the lowest amount to purchase medicine during utilization of public institutions and as we move towards the richest class the medicine-OOPE increases. The same pattern is observed in both the sectors. However, the medical and total OOPE for the poorest class is higher than the LM class for public sector hospitalization in the rural sector. It is clear from the table that medicine is an important component in the total medical expenses for both IP and OP care in public facilities.

In case of IP care, the medicine expenditure ranges from 32-53 per cent of the total medical expenses. Interestingly, the share of medicine in total medical expenditure is around 80 per cent for public sector OP visits. In both the sectors, the highest medicine share is recorded by the LM class for IP care and UM class for OP visits. Surprisingly, the poorest class is also spending a substantial proportion of their total medical cost to purchase medicine during public sector hospitalization or OP visit.

The above result then raises a question that who is enjoying the benefit of the public
subsidy. The NSS data has been analyzed and the MPCE class wise share of subsidy benefit for IP and OP care has been calculated and reported in Table-5. It is observed that the distribution of public subsidy for IP care is pro rich and the maximum subsidy share is recorded by the richest class and the poorest class has the minimum share. It is also observed that the poorest class has the minimum share in total subsidy for inpatient care in the rural sector followed by the UM and the LM class. The richest class of both the regions enjoys the maximum subsidy benefit during their hospitalization. In the urban sector, on the other hand, the lowest subsidy share is recorded by the LM class followed by the poorest class. Interestingly, there is no specific trend in distribution of public subsidy for OP care. However, the richest class enjoys the maximum subsidy benefit followed by the poorest class. The lowest subsidy is observed for the UM class. Sector wise bifurcation of the benefit incidence shows that the poorest class of the rural sector has the maximum benefit share followed by the richest class for OP care. On the other hand, the richest class enjoys the maximum subsidy benefit followed by the LM class in the urban sector. For better understanding of the distribution of the subsidy, we have derived the concentration curves and presented in Figure-1.

The distribution of public subsidy is clearly showing a pro-rich trend as the subsidy benefit distribution line lies below the equal distribution line for the IP care in both the sectors. We have also represented the 95 per cent confidence interval for each benefit distribution curve (grey shaded area). Analyzing the distribution of public subsidy for the OP care, we could observe that the benefit distribution line has crossed and merged with the equal distribution line. Therefore, it is very difficult to comment on the distribution pattern of the subsidy benefit from the graphs. To know more about the distribution pattern of the public subsidy we have calculated the concentration indices. The sign of the concentration
index indicates the direction of the public subsidy – pro-rich or pro-poor and the magnitude of the index reflects the strength of variability.

The concentration indices are presented in Table-6. It has to be noted here that a positive value of the index denotes a pro-rich distribution of subsidy benefit and a negative value signifies pro-poor distribution. It is observed that the distribution of subsidy benefit is pro-rich for IP care and pro-poor for OP care. Specifically, for both the sectors pro-rich distribution is observed for the IP care and for the OP care the distribution is pro-poor in the rural sector and pro-rich in the urban sector.

Discussion

The present paper has analyzed NSS (2014) unit level data on Social Consumption: Health to study the utilization pattern of healthcare services for treatment of NCDs among the elderly in India. The paper also attempts to analyze the burden of OOPE and the extent of equity in distribution of public subsidy among the elderly for NCD-related treatments. It is emerged from the analysis that the prevalence of NCDs among the elderly is very high in India. Hospitalization and OP visits for the NCD related treatment is the highest among all ailment groups for the elderly. Overall utilization of healthcare services shows a pro-rich distribution for both IP and OP care and in both the sectors in India. Utilization of public IP care services has a pro-rich trend in the rural sector. However, the utilization of public facilities for IP care in the urban sector and the OP visits in both the sector have no specific trend. Interestingly, the poorest class enjoys a substantial share in total utilization of public healthcare facilities for these services in the rural and urban sector. The OOPE on medicine is very high among all MPCE groups both for IP and OP care. It is also observed that the OOPE on medicine takes a substantial share of the total medical expenditure even in the public facilities. Further analyzing the data, it has emerged that the richest class enjoys the maximum subsidy for IP care in both the sectors. However, the
poorest class of the rural sector and the richest class of the urban sector records the maximum subsidy share for OP visits. The study has multiple implications and the discussion section analyzes the implications and compare the findings with other similar studies. This section also proposes possible causes and consequences of the findings. Although there is no specific study available on benefit incidence of public subsidy for NCD related care among the elderly in India, however, few studies have implemented BIA to examine the distribution of public subsidies across socioeconomic groups. Using NSS 52\textsuperscript{nd} round data Mahal et al., (2001) showed the state level variations in utilization of public healthcare services [25]. Their results indicate that for few states the utilization of public healthcare services is pro-poor; however, for many states the distribution is skewed towards the rich. A recent study by Bowser et al., (2019) [26] show that the public outpatient and delivery care is pro-poor in India. The study also documented the state level variations in benefit distribution among the MPCE classes for inpatient and delivery services. Bose and Dutta (2018) [19] analyzed the NSS 71\textsuperscript{st} round data to examine the effectiveness of health financing strategies in three Indian States – Tamil Nadu, Rajasthan and West Bengal. Their results show a pro-poor distribution of public subsidy for IP care. The study also documented the success of medicine distribution scheme in Tamil Nadu and Rajasthan. It is also revealed from our study that medicine has a substantial share in total medical expenditure; specifically, in OP care. If we compare the utilization of public facilities and the benefit share across MPCE groups, we could observe that there is a direct relationship between the two parameters for rural IP care. This actually indicates the barriers in access to IP care facilities in the region. Hospitalization episode not only put direct financial burden on the households; the OOPE burden of it also indirectly pushes the households towards catastrophe and impoverishment through wage loss [27]. It has
been observed from the NSS data that most of the Poorest elderly people in the rural sector are illiterate and they are not financially dependent on others (Table-A1). This actually indicates that most of the poorest elderly people are working in the informal sector and wage loss due to hospitalization puts double burden on the households. Literature has also documented most of the aged people are casual or self-employed informal worker who are not entitled to formal retirement benefits and have very low ability to afford healthcare expenses. Consequently, they face paradoxical challenges of remaining both healthy and employed in old age [28]. Interestingly, in the urban sector, the richest class has the lowest utilization share for IP care; however, the benefit share is the maximum for the class. It is argued in the literature that the rich are more likely to utilize more healthcare services (like consultancy, bed, diagnostic tests etc.) [21] during their hospitalization and have longer stays in the public hospitals [29]. Moreover, most of the aged people in both the regions are not covered by any health insurance scheme (Table-A2). Consequently, the aged people are forced to spend the entire hospitalization expenses from their pocket. Hence, the IP utilization of the poorest class might be very low due to poor purchasing capacity [13]. Utilization of OP care and corresponding benefit incidence could be interpreted through access to free medicine from the healthcare facilities. Utilization of public facilities and benefit share are also high for the groups who have more access to free medicine in both the sectors (Table-A3). Surprisingly, more than 51 per cent of the richest class in urban India also have access to free medicine and consequently the benefit share of the group is also the highest in the region. Importantly, the poorest class of the rural sector has the highest utilization of public OP care, share in total benefit and access to free medicine. Strengthening the public health facilities through National Health Mission (NHM) flexi-pool for NCDs, National Programme for Healthcare of the Elderly (NPHCE) might have helped
the poorer sections of the society to access needed OP care in the rural sector. Analyzing state level data Selvaraj et al., (2014) [30] and Bose & Dutta (2018) [19] have showed that free distribution of medicine has impacted the health system in three ways – improvement in access to healthcare, financial risk protection and health system expansion. Therefore, it has to be noted here that following the changing disease pattern, regular updation of the essential drug list (EDL) is primarily needed. It would help the patients to get their required medicines from the public facilities. The study by Bose & Dutta (2018) [19] documented that in West Bengal most of the people are suffering from NCDs and most of them are utilizing public facilities for treatment. However, they are forced to purchase medicines from the market as most of the drugs listed in the EDL[1] are either of communicable diseases or antibiotics.

Despite the nationally representative data has been used in this analysis, there area several limitations of the present study and the data. Following the literature, we have also considered the private OOPE as the proxy of actual cost of providing the services in the public facilities. However, a proper costing study of the services provided through the public health system could give us a better picture. In the NSS data there is no specific information available on the severity of illness either for IP or OP care. Therefore, we have used the duration of stay in hospital or the duration of suffering from the illness as the proxy of severity of the illness. On the other hand, in NSS data, the OOPE for all the OP visits (for multiple visits within the reference period) are given together. It forces us to consider those individuals who have visited healthcare facilities for NCDs in all OP cases. If NSS also provide the details of severity of illness and OOPE for each OP visit, estimation would be more robust. Finally, sample size of the UTs and the North-eastern states were very low. To analyze the data, we have clubbed all the UTs and all the North-eastern states to get enough sample for the study.
The paper discusses about the Fair Price Medicine Shops (FPMS) of West Bengal. As per the contracts with the Government, the FPMS should at least keep all the medicines of the EDL and sell them at a discounted price to any patient carrying a valid prescription.

Conclusions

Rapid ageing of the population and increasing NCDs among the elderly is one of the major public health challenges in India. Additionally, very high OOPE for the treatment even in the public facilities exacerbates the situation. To achieve the UHC goals, on the other hand, distribution of public subsidies should be effectively allocated among the socio-economically weaker sections. This analysis demonstrates that a substantial share of the public subsidies is still going to the richer sections for the treatment of NCDs among the elderly.

Analysis has also revealed that medicine is the most important component in OOPE during NCDs. Therefore, procuring medicine would be a policy-priority to reduce OOPE and increase utilization of healthcare facilities in the public sector. The policy makers in India should use the available information and monitor the extent of equity in public healthcare spending for NCDs among the elderly. As the share of elderly in the population and their suffering from NCDs are increasing, targeted policies should be taken to improve utilization, access to medicine, other healthcare services and public subsidy for the disadvantaged would be primarily important to achieve healthcare goals in India.

Abbreviations

NCDs – Non-communicable diseases
LMICs – Low and middle-income countries
UN – United Nations
UHC – Universal Health Coverage
WHO – World Health Organization
OOPE – Out-of-pocket expenditure
NSS – National Sample Survey
UTs – Union Territories
CD – Communicable diseases
OD – Other diseases
OECD – Organization for Economic Co-operation and Development
P – Poorest
LM – Lower middle
UM – Upper middle
R – Richest
BIA – Benefit incidence analysis
IP – Inpatient
OP – Outpatient
NHM – National Health Mission
NPHCE – National Programme for Healthcare of the Elderly
EDL – Essential drug list

Declarations

**Ethics Approval and Consent to Participate:** Not Applicable

**Consent for publication:** Not Applicable

**Availability of Data & Material:**
The study is based on secondary data and all the data are available in the public domain.

**Competing Interests:**
There is no competing interest.

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**Authors’ Contributions:**

MB conceptualizes the paper. MB and SB have done all analysis and prepared the manuscript. Both the authors approved the final version of the manuscript.

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Tables

| Ailment Group | Inpatient | | | Outpatient | | |
|---------------|-----------|---|---|-----------|---|---|
|               | Rural | Urban | Combine | Rural | Urban | Combine |
| CD            | 19.57 | 20.97 | 20.03 | 39.70 | 32.20 | 36.90 |
| NCD           | 39.78 | 46.14 | 41.87 | 50.25 | 60.46 | 54.05 |
| OD            | 40.65 | 32.90 | 38.11 | 10.05 | 7.34  | 9.04  |

Source: Authors’ estimation based on NSS data (2014).
Table-2: MPCE Class wise Utilization of Healthcare Services for NCDs in India (in %)

| MPCE Class | Inpatient | | | | Outpatient | | | |
|---|---|---|---|---|---|---|---|---|
| | Rural | Urban | Combine | Rural | Urban | Combine | |
| Poorest | 16.75 | 18.80 | 17.49 | 19.51 | 20.18 | 19.79 | |
| Lower Middle | 19.54 | 23.04 | 20.80 | 22.83 | 21.35 | 22.22 | |
| Upper Middle | 25.02 | 27.55 | 25.93 | 25.64 | 26.14 | 25.85 | |
| Richest | 38.69 | 30.60 | 35.77 | 32.02 | 32.33 | 32.15 | |

Source: Authors’ estimation based on NSS data (2014)

Table-3: MPCE Class wise Utilization of Public Hospitals for NCDs (in %)

| MPCE Class | IP | OP | | | | |
|---|---|---|---|---|---|
| | Rural | Urban | Combine | Rural | Urban | |
| P | 21.92 | 28.09 | 23.87 | 26.94 | 32.07 | |
| LM | 24.65 | 25.90 | 25.04 | 23.22 | 24.96 | |
| UM | 25.39 | 28.36 | 26.33 | 25.50 | 21.47 | |
| R | 28.03 | 17.65 | 24.74 | 24.34 | 21.50 | |

Source: Authors’ estimation based on NSS data (2014).
| Service | Precinct | Rural Public | Rural Private | Urban Public | Urban Private |
|---------|----------|--------------|--------------|--------------|--------------|
|         |          | Medicine     | Medical      | Total Medicine | Total Medical |
| Inpatient Poor est | 2301 .48 | 5343 .13 | 7130 .09 | 4465 .87 | 1736 .17 | 1924 .47 | 1980 .48 | 4722 .13 | 6046 .73 | 537 .40 | 14.8 | 6 | 296 .06 | 1 |
| Lower Middle | 2590 .60 | 4857 .07 | 6612 .02 | 5622 .20 | 2056 .97 | 2286 .40 | 3440 .76 | 7299 .74 | 9235 .27 | 648 .22 | 262 .37 | 6 | 289 .22 | 0 |
| Upper Middle | 4594 .99 | 9262 .84 | 1136 .50 | 5903 .44 | 2699 .42 | 2961 .29 | 3692 .94 | 9470 .28 | 1169 .62 | 628 .34 | 402 .17 | 8 | 438 .26 | 6 |
| Rich est | 4017 .16 | 1214 .98 | 1522 .31 | 8911 .31 | 3936 .34 | 4312 .85 | 5989 .78 | 1855 .45 | 2147 .91 | 106 .10 | 97 .0 | 3 | 692 .38 | 9 |
| All | 3508 .41 | 8260 .21 | 1048 .73 | 7021 .29 | 3017 .52 | 3315 .61 | 3788 .63 | 1007 .20 | 1218 .70 | 810 .33 | 469 .76 | 5 | 506 .13 | 6 |

| Service | Precinct | Urban Public | Urban Private | Combine Public | Combine Private |
|---------|----------|--------------|--------------|----------------|----------------|
| Outpatient Poor est | 188 .15 | 239 .47 | 294 .21 | 331 .38 | 502 .25 | 590 .63 | 107 .94 | 135 .01 | 185 .60 | 367 .01 | 514 .23 | 564 .90 |
| Lower Middle | 223 .78 | 296 .02 | 379 .18 | 334 .86 | 453 .89 | 519 .10 | 261 .62 | 354 .14 | 417 .20 | 593 .79 | 862 .54 | 934 .24 |
| Upper Middle | 372 .06 | 441 .22 | 538 .45 | 474 .87 | 612 .17 | 676 .15 | 352 .17 | 407 .95 | 464 .97 | 501 .42 | 737 .11 | 806 .50 |
| Rich est | 364 .20 | 454 .13 | 548 .75 | 529 .62 | 724 .28 | 833 .00 | 348 .31 | 463 .22 | 523 .90 | 716 .13 | 992 .38 | 107 .97 |
| All | 294 .04 | 365 .93 | 449 .22 | 452 .92 | 616 .37 | 703 .23 | 270 .12 | 343 .52 | 401 .45 | 587 .82 | 833 .64 | 908 .19 |

Source: Authors’ estimation based on NSS data (2014).

| MPCE Class | Inpatient | Outpatient |
|------------|-----------|------------|
| Rural | Urban | Combine | Rural | Urban | Combine |
| Poorest | 9.90 | 21.05 | 16.09 | 40.61 | 18.28 | 28.55 |
| Lower Middle | 27.84 | 11.69 | 18.88 | 16.24 | 26.81 | 21.95 |
| Upper Middle | 26.63 | 30.15 | 28.58 | 15.57 | 17.32 | 16.51 |
| Richest | 35.63 | 37.11 | 36.45 | 27.59 | 37.59 | 32.99 |

Table-4: MPCE Class wise Average Out-of-pocket Expenditure for NCD-related Inpatient and Outpatient Care in India (in INR)

Table-5: MPCE Class wise Benefit Incidence for Inpatient & Outpatient care in India (in %)
| Service | Sector | No. of Observations | Index Value | Robust Std. Error | p-value |
|---------|--------|---------------------|-------------|-------------------|---------|
| IP      | Rural  | 1526                | 0.171       | 0.043             | 0.001   |
|         | Urban  | 1271                | 0.119       | 0.080             | 0.152   |
|         | Combine| 2797                | 0.141       | 0.053             | 0.013   |
| OP      | Rural  | 709                 | -0.211      | 0.107             | 0.061   |
|         | Urban  | 588                 | 0.057       | 0.096             | 0.557   |
|         | Combine| 1297                | -0.125      | 0.085             | 0.158   |

Source: Authors’ estimation based on NSS data (2014)
Figure 1

Figure-1: Concentration Curves of the Benefit Incidence of Public Subsidies for IP & OP Care (Source: Authors’ estimation)

Supplementary Files

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Appendix.docx