

Original Articles

Inequity in access to inpatient healthcare services for non-communicable diseases in India and the role of out-of-pocket payments

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ABSTRACT

Background. Growing evidence suggests that non-communicable diseases (NCDs) result in considerable economic burden for individuals and households. With the poor facing a greater burden of NCDs than the rich in India, we undertook this study to analyse the horizontal equity in utilization and vertical equity in out-of-pocket expenditure for NCD care.

Methods. We used data of 14 large Indian states from the National Sample Survey 60th round to compute hospitalization rates for NCDs. Mean per capita consumption expenditure (MPCE) was computed and used as a proxy measure for socioeconomic status. Out-of-pocket payment as a proportion of MPCE was estimated by wealth quintile (Q) to assess the vertical equity in payments. Concentration index (Col) was computed to measure the extent of equity, and its 95% confidence interval was estimated to assess statistical significance.

Results. Overall, NCD hospitalizations in public facilities in India were used more by the poor (Col -0.041), while the rich used proportionately more services in the private sector (Col 0.174). Out-of-pocket expenditure in public facilities was consistently lower than that in private facilities in urban and rural areas. The mean out-of-pocket expenditure for inpatient services for NCDs was found to be more among the rich in both public (Q5 ₹13 016, Q1 ₹4 197) and private (Q5 ₹22 974, Q1 ₹8 225) facilities.

Conclusion. Public facilities are utilized more by poorer individuals. Strengthening the capacity of the public sector to deliver NCD care is required to meet equitable outcomes.

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INTRODUCTION

In India, non-communicable diseases (NCDs) are the leading cause of mortality, and responsible for 60% of all deaths and 62% of all disability-adjusted life years (DALYs) lost.¹ NCDs accounted for nearly 40% of all hospital stays and 35% of all outpatient visits in 2004. This figure is a marked rise compared to 32% hospital stays and 22% outpatient consultations in 1995–96, and is projected to rise even further. Thus, NCDs put a major burden on the health system, besides posing a challenge for households to finance treatment.² NCDs are projected to cause a cumulative loss of US\$ 237 billion by 2030 in India.³

A reversal of social gradient in NCDs is seen in India, where lower educational, occupational and socioeconomic status (SES) have been found to be associated with the risk of chronic diseases, their risk factors^{4,5} and mortality.^{6,7} Further, the poorer population groups are most likely to be unable to cope with the costs of treatment for NCDs.⁸ The proportion of out-of-pocket (OOP) expenditures for NCDs rose from 31.6% in 1995 to 47.3% in 2004.² The odds of incurring catastrophic hospitalization expenditures are nearly 160% higher with cancer and 30% higher for cardiovascular diseases and injuries than for a communicable condition.⁹

An earlier analysis found that the rich have greater access to hospital services than the poor, particularly for more technically complex services.¹⁰ It has been reported that the poorest 20% population use only 10% of public subsidy while 33% is used by the richest quintile.¹¹ A study by Xavier *et al.* in 2008 indicates that hospital services, particularly in the public sector, are utilized more by the poor in India. However, wide state-specific differences exist. In terms of care for NCDs, the authors found that economically weaker sections had poor treatment outcomes of acute coronary syndrome, not because of the difference in risk factors but because of differences in treatments received.¹² The poor were less likely to receive evidence-based treatments due to issues of availability, accessibility and affordability; addressing these issues would go a long way in reducing mortality due to these diseases among the poor. However, this hospital-based study was unable to capture the unmet need for those who never accessed services. No study so far has specifically analysed hospital admissions for NCDs in India from an equity perspective.

We aimed to determine horizontal equity in access to inpatient

services for NCDs in India. Horizontal equity is examined in terms of utilization rates of NCD-related hospitalizations among different wealth quintiles. We also explore the question of vertical equity in OOP expenditure for NCD hospitalizations. Given the diversity in healthcare infrastructure across India, we also examined the inter-state variation. Finally, we analysed the determinants of utilization and OOP expenditure for NCD hospitalizations.

METHODS

Data source and description

We used data from the National Sample Survey 60th round on 'Morbidity and health care'. The survey covered data on self-reported morbidity, its types, utilization of healthcare services and expenditure of households for availing healthcare services. A total of 47 302 households in rural and 26 566 households in urban area were surveyed. Detailed household consumption expenditure was recorded, along with other sociodemographic information including caste, occupation, gender and education. Information on hospitalization was collected for every event of hospitalization of a member, whether living or deceased at the time of the survey over a period of 365 days preceding the date of enquiry. Hospitals included public facilities such as district hospitals, community health centres, primary health centres and urban dispensaries and those in private sector including private hospitals, nursing homes, etc. A total of 13 310 hospitalization cases were identified in public and private facilities situated in rural and urban areas.

We specifically analysed hospitalizations where the cause of admission was for heart disease, hypertension, bronchial asthma, neurological and psychiatric disorders, diabetes mellitus, fractures, poisoning and cancers/tumours. A total of 4392 NCD-related hospitalizations were analysed. The percentage of NCD hospitalizations varied from 0.5% in Odisha to 4.9% in Andhra Pradesh and Karnataka. We restricted our analysis to 14 large states so that we had adequate statistical power to comment on the state-level figures.

Total expenditure incurred for medical treatment received during the reference period (365 days) included expenditure on items such as admission fees, medications, oxygen, transfusions, materials for bandage and plasters, diagnostic imaging and investigations, and hotel charges. It also included all personnel charges (medical and paramedical staff), surgical operations and charges of ambulances and transportation.

Data analysis

Households were ranked according to their SES and grouped into five wealth quintiles (Q1 to Q5), ranging from the poorest to the richest. Monthly per capita consumption expenditure (MPCE) was computed to assess the SES. The MPCE was adjusted for age composition and household size according to the Organization for Economic Cooperation and Development (OECD) equivalence scale.¹³ Prevalence rate of NCD hospitalizations in respective wealth quintiles was computed. Similarly, economic burden due to hospitalization was calculated as average expenditure per episode, and OOP expenditure as a proportion of annual consumption expenditure. For both hospitalizations and OOP payments, analysis was done separately for rural and urban areas, and for public and private facilities, among respective wealth quintiles.

Concentration index (CoI) was calculated to assess the extent of equity in the distribution of service utilization. The values of CoI ranged from +1 to -1; with a positive value suggesting pro-rich and a negative value suggesting a pro-poor distribution. Pro-

rich distribution implies that the outcome was found more in the richer sections of society and vice versa. CoI was estimated for NCD-related hospitalizations in public and private health facilities in urban and rural areas.¹⁴

Mean OOP expenditure incurred for hospitalization as a result of NCD was calculated across the wealth quintiles and statistical significance of this difference was analysed using one-way Anova. Association of SES with NCD hospitalization was analysed using logistic regression controlling for possible confounders such as age, sex, proportion of elderly population, doctor-population ratio, percentage of public expenditure on health, gross state domestic product per capita and literacy rate. Similarly, association of SES with total expenditure during hospitalization was analysed using linear regression. Apart from the confounders controlled for association of SES with hospitalization, other factors such as proportion of public expenditure on health in the state and state gross domestic product were also included in the linear regression model.

RESULTS

National level

At the national level, the overall NCD hospitalizations showed a pro-rich pattern (CoI 0.089; 0.072–0.105) suggesting that the rich utilize inpatient NCD care services more than the poor (Table I, Fig. 1). Private facilities were also found to have a pro-rich utilization pattern (CoI 0.174; 0.141–0.207). A similar pattern was observed when stratified into urban or rural private facilities, though the CoI was not significant ($p > 0.05$) for the rural private sector. Overall, in public facilities, the utilization was found to be pro-poor (CoI -0.041; -0.050 to -0.031). The pattern was consistent across rural and urban public facilities.

At the state level, overall NCD hospitalizations followed a pro-rich pattern in all the states. In Gujarat, Maharashtra and the southern states, the poor were found to use inpatient services for NCDs in public facilities to a greater extent than the wealthy, reflecting the pattern at the national level. This overall trend was also observed in rural and urban public facilities of these states (Figs 2 and 3, Table II). On the contrary, northern states included in the analysis showed a pro-rich pattern of utilization of public facilities for NCD care. CoIs for utilization of public facilities ranged from -0.024 (Maharashtra) to 0.165 (Odisha). On the other hand, the wealthy utilized inpatient NCD care in private facilities more compared with the poor across all the states studied. This pattern persisted across urban and rural strata

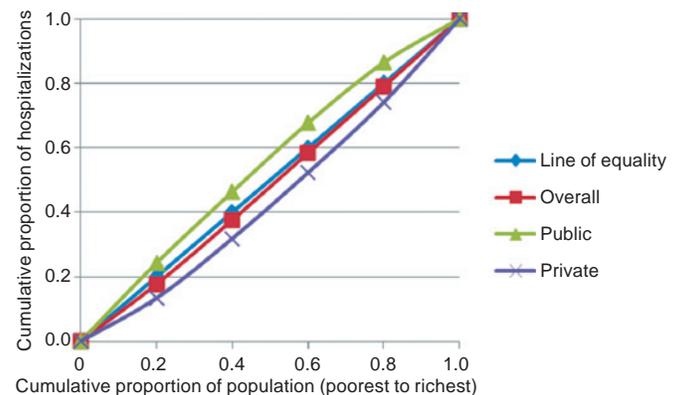


FIG 1. Overall, public and private sector inpatient care utilization for non-communicable diseases

TABLE I. Horizontal equity in inpatient service utilization for non-communicable diseases in hospitals, India, 2004–05

States	Concentration index								
	Overall	Lower limit	Upper limit	Public	Lower limit	Upper limit	Private	Lower limit	Upper limit
Punjab	0.095*	0.072	0.118	0.095*	0.073	0.117	0.095*	0.069	0.121
Haryana	0.119*	0.087	0.152	0.018*	0.008	0.028	0.173*	0.128	0.217
Rajasthan	0.121*	0.101	0.140	0.110*	0.092	0.128	0.139*	0.113	0.165
Uttar Pradesh	0.157*	0.129	0.185	0.086*	0.059	0.114	0.192*	0.160	0.223
Bihar	0.142*	0.117	0.167	0.115*	0.088	0.142	0.150*	0.123	0.178
West Bengal	0.146*	0.114	0.178	0.053*	0.038	0.068	0.368*	0.264	0.473
Odisha	0.185*	0.156	0.214	0.165*	0.132	0.199	0.252*	0.209	0.294
Madhya Pradesh	0.175*	0.141	0.209	0.028*	0.016	0.039	0.311*	0.253	0.369
Gujarat	0.036*	0.020	0.051	-0.153*	-0.206	-0.100	0.128*	0.086	0.170
Maharashtra	0.100*	0.074	0.125	-0.024*	-0.040	-0.007	0.147*	0.107	0.187
Andhra Pradesh	0.142*	0.113	0.170	-0.043*	-0.067	-0.019	0.224*	0.174	0.274
Karnataka	0.117*	0.088	0.147	-0.072*	-0.092	-0.052	0.200*	0.153	0.247
Kerala	0.030*	0.022	0.039	-0.118*	-0.172	-0.063	0.106*	0.066	0.146
Tamil Nadu	0.075*	0.057	0.092	-0.144*	-0.176	-0.112	0.232*	0.179	0.285
Overall (14 states)	0.089*	0.072	0.105	-0.041*	-0.050	-0.031	0.174*	0.141	0.207

* Significant at 5% level of significance

(Figs 2 and 3). CoIs for utilization of private facilities ranged from 0.066 (Kerala) to 0.473 (West Bengal).

OOP expenditure for NCD hospitalizations

Overall, the OOP costs for NCD hospitalization in India was

₹11 327.82 in the public sector and ₹21 917.91 in private facilities. The mean OOP expenditure for inpatient services for NCDs was higher for the rich in both public and private facilities (Table III). Overall, the richer quintiles spent 3.1 times and 2.79 times higher than the poorer quintiles in the public and private sectors, respectively.

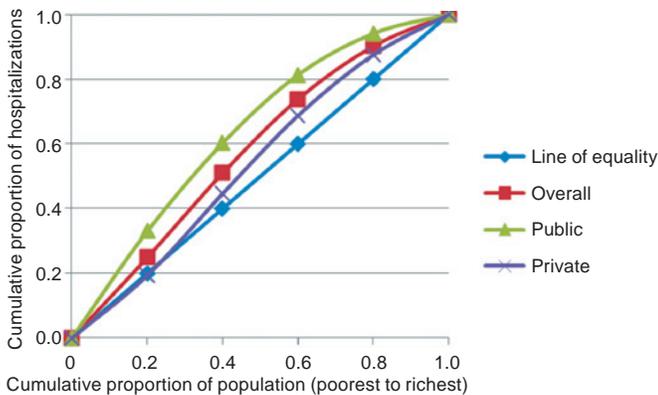


FIG 2. Overall, public and private sector inpatient care utilization for non-communicable diseases—rural sector

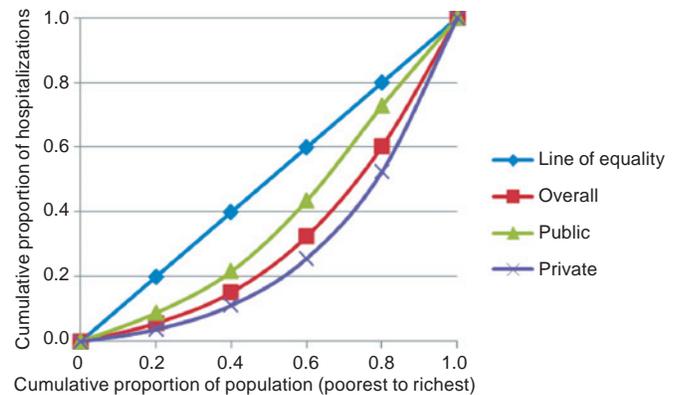


FIG 3. Overall public and private sector out-of-pocket expenditure on inpatient care for non-communicable diseases—urban sector

Table II. Horizontal equity in inpatient service utilization for non-communicable diseases in rural and urban sector hospitals, India, 2004–05

States	Concentration index											
	Rural public sector			Urban public sector			Rural private sector			Urban private sector		
	Overall	LL	UL	Overall	LL	UL	Overall	LL	UL	Overall	LL	UL
Punjab	0.00	-0.01	0.02	0.22*	0.16	0.28	0.15	-0.15	0.46	0.03*	0.01	0.04
Haryana	-0.04*	-0.05	-0.04	0.16*	0.12	0.20	0.14	-0.14	0.42	0.18*	0.14	0.22
Rajasthan	0.11*	0.09	0.14	-0.07*	-0.09	-0.04	0.15	-0.15	0.45	0.07*	0.04	0.09
Uttar Pradesh	0.08*	0.06	0.10	0.09*	0.05	0.13	0.19	-0.18	0.56	0.17*	0.13	0.21
Bihar	0.10*	0.09	0.12	-0.02	-0.06	0.03	0.17	-0.16	0.51	0.16*	0.10	0.22
West Bengal	0.06*	0.04	0.07	0.01	-0.01	0.03	0.32	-0.30	0.94	0.35*	0.23	0.48
Odisha	0.14*	0.12	0.16	0.18*	0.10	0.26	0.28	-0.26	0.81	0.26*	0.21	0.31
Madhya Pradesh	0.04*	0.03	0.04	-0.03	-0.05	0.00	0.27	-0.26	0.80	0.24*	0.17	0.31
Gujarat	-0.28*	-0.32	-0.24	-0.168	-0.24	-0.07	0.13	-0.13	0.39	0.12*	0.08	0.16
Maharashtra	-0.10*	-0.11	-0.08	-0.13*	-0.18	-0.08	0.16	-0.16	0.48	0.16*	0.10	0.21
Andhra Pradesh	0.02*	0.00	0.05	-0.16*	-0.20	-0.13	0.23	-0.22	0.68	0.25*	0.18	0.31
Karnataka	0.00	-0.04	0.03	-0.11*	-0.15	-0.07	0.17	-0.16	0.50	0.20*	0.14	0.26
Kerala	-0.08*	-0.12	-0.04	-0.18*	-0.25	-0.10	0.06	-0.05	0.16	0.17*	0.12	0.22
Tamil Nadu	-0.09*	-0.10	-0.08	-0.19*	-0.25	-0.14	0.23	-0.22	0.67	0.19*	0.14	0.25
Overall (14 states)	-0.08*	-0.09	-0.07	-0.10*	-0.13	-0.06	0.14	-0.13	0.40	0.15*	0.11	0.20

* Significant at 5% level of significance LL lower limit UL upper limit

Logistic regression revealed that belonging to a richer quintile, older age and male sex of the individual in addition to higher proportion of elderly population, higher doctor–population ratio, and lower literacy rate were significant predictors of NCD hospitalization (Table IV). Linear regression showed that, overall, belonging to a richer quintile, increasing age, high doctor–population ratio and low proportion of public expenditure on health were significant predictors of the total expenditure during an NCD hospitalization (Table V).

DISCUSSION

The rising burden of NCDs in developing countries has adverse effects at the household, healthcare system and macroeconomic

level.¹⁵ India spends 48% of its total health expenditure on NCDs.¹⁶ Not only are the poor more afflicted than the rich by NCDs, but the outcome of NCDs is also unfavourable for the poor due to differential access to and affordability of treatment. Hence, the course of disease in the poor is different and they experience higher mortality compared to their richer counterparts.^{12,17} Thus, NCDs are exacerbating health inequities between the rich and the poor.

Our study analysed a nationally representative sample of households to understand utilization patterns and expenditure incurred on inpatient services for NCDs through an equity lens. The utilization of inpatient services for NCDs was found to be equitable in the public sector in both rural and urban areas. In the

TABLE III. State-wise mean expenditure on hospitalization for non-communicable diseases across quintiles in public and private sectors

States	Public					Private				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Punjab	6916 (3773.2)	15 445 (17 692.5)	12453 (13021.7)	12420 (12663.9)	21736 (50846.8)	9862 (8971.9)	8746 (10926.3)	14588 (27943.3)	17381 (30419.5)	37755 (103762.4)
Haryana	5453 (5830.1)*	4417 (4262.3)	7955 (12619.9)	19455 (41326)	38503 (88515)	5524 (3134.1)*	10869 (8771.1)	10501 (9359.5)	12928 (13833.1)	22032 (33084.5)
Rajasthan	7439 (9972.3)*	7168 (8523.3)	9074 (14395.1)	10438 (19571.1)	12788 (21740.6)	13581 (11846.9)	14784 (17474)	13894 (14992.1)	17118 (31470.1)	16352 (21636)
Uttar Pradesh	8055 (11845.4)*	8380 (14604.9)	10655 (21148.3)	12987 (23426.6)	21879 (47771.6)	9505 (12443.5)*	12919 (21681.6)	12743 (17188.4)	14777 (19390.4)	20623 (36883.3)
Bihar	6097 (8600)*	8363 (14119.3)	12160 (37755.2)	15663 (38992)	24005 (30134.5)	7309 (10510.7)*	8434 (22290.2)	14738 (37341.3)	14839 (21102.3)	22684 (34579.7)
West Bengal	3371 (5895.2)*	3057 (4066.1)	4816 (10063.7)	9867 (33543.3)	9877 (19985.4)	10582 (14681.7)*	10155 (12325.2)	13532 (13374)	17723 (31163.8)	28921 (55655.3)
Odisha	4458 (7644.5)*	5487 (9923.3)	8118 (11056)	10142 (15718.7)	9830 (19744.5)	10639 (14556.3)*	12006 (14505.4)	18283 (18928.3)	19079 (29212)	22157 (27974.6)
Madhya Pradesh	4165 (5849.7)*	6306 (10884)	6082 (18222.4)	10084 (21080.1)	5743 (6755.9)	7181 (9521.7)*	8528 (11365.2)	12963 (21745.7)	18117 (34080.8)	21693 (37632.6)
Gujarat	4765 (7197.6)	5067 (7656.5)	3696 (5470.5)	5687 (10616.2)	12246 (44944.2)	6787 (7963.3)*	7642 (7766.9)	6585 (8148.6)	11420 (18510.3)	21236 (62035.4)
Maharashtra	4080 (17441.2)*	2922 (5866.8)	7500 (19269.1)	9693 (27225)	6064 (11103.9)	9521 (19534.9)*	10521 (19416.9)	11344 (17106.9)	14289 (27908.5)	23074 (49007.2)
Andhra Pradesh	2362 (4931.6)*	6017 (13337.6)	5443 (18059.8)	3652 (8425.1)	9223 (17089.5)	6906 (7437)*	8635 (13516.5)	8819 (11274.6)	12703 (22134.1)	21113 (37920.7)
Karnataka	1582 (2005.8)*	3077 (6178.8)	3081 (4295)	3354 (3785.5)	9327 (21267.9)	7546 (8465.3)*	9599 (16290.6)	9864 (16079.9)	10081 (17082.8)	21109 (34531.8)
Kerala	4411 (7828.4)	5859 (15643.4)	5238 (9880.4)	6579 (15496.3)	8076 (23117.7)	8674 (10928.3)	9593 (18889.1)	10535 (27298.7)	10245 (18229.2)	13612 (22818.7)
Tamil Nadu	1604 (6167.6)*	1843 (4058.2)	2274 (6982.1)	5368 (24340)	5281 (11336.3)	5427 (8021.7)*	8810 (12158)	11609 (18573.8)	17268 (37661.4)	29750 (62971.1)
All India	4197 (8549.6)*	5134 (10160.8)	6502 (15342.4)	9106 (3811.9)	13016 (34608.6)	8225 (11851)*	10220 (17854.4)	11671 (19893.5)	14239 (25384.1)	22974 (50489.1)

* Indicates significant difference across the quintile groups at p<0.05 significance level

TABLE IV. Determinants of non-communicable disease hospitalization using binary logistic regression

Characteristic	B	Standard error	Wald	Significance	Adjusted OR	95% CI for Exp (B)	
						Lower	Upper
Q1* (reference value)	—	—	250.379	0.000	—	—	—
Q2	0.124	0.023	30.378	0.000	1.132	1.083	1.184
Q3	0.189	0.023	70.538	0.000	1.209	1.156	1.263
Q4	0.258	0.023	125.832	0.000	1.294	1.237	1.353
Q5	0.344	0.023	219.241	0.000	1.411	1.348	1.477
Elderly	0.098	0.011	85.512	0.000	1.103	1.081	1.127
Doctor–population ratio	–0.009	0.004	3.875	0.049	0.991	0.983	1.000
Literacy	–0.009	0.002	17.453	0.000	0.991	0.987	0.995
Age	0.022	0.000	4473	0.000	1.022	1.021	1.023
Sex (male)	–0.112	0.014	64.044	0.000	0.894	0.870	0.919

* Q wealth quintile

TABLE V. Factors affecting the total expenditure during hospitalization using linear regression

Characteristic	Unstandardized coefficients		T	Significance
	B	Standard error		
Wealth quintile	2239.770	91.544	24.466	0.000
Age	98.710	8.226	12.000	0.000
Sex	-244.195	317.391	-0.769	0.442
Elderly	-73.765	187.437	-0.394	0.694
Doctor-population ratio	348.864	77.659	4.492	0.000
Literacy	-55.667	36.439	-1.528	0.127
Proportion of public expenditure on health	-24.711	5.920	-4.174	0.000
Gross state domestic product per capita	0.014	0.013	1.082	0.279

private sector the utilization patterns favoured the rich, both in urban and rural areas. The overall mean OOP expenditure on inpatient services for NCDs was higher in the private sector compared with public facilities across all areas, with the richer quintile uniformly spending more than poorer quintiles. The range of expenditure in the private sector (₹14 749) was significantly higher than within the public sector (₹8819). This could be due to the largely heterogeneous private sector ranging from single practitioners to multispecialty corporate hospitals.¹⁸ This highlights the need to regulate the private sector; the Clinical Establishment bill is an effort in that direction.

The pro-poor trend of utilization of inpatient care for NCD in public sector may be an outcome of the subsidies offered by the government in the public sector. In the private sector, however, there was inequity in the utilization of inpatient services for NCDs with the pattern of utilization being pro-rich, slightly more pronounced in the urban than rural areas. One reason for this pattern could be the profile and range of services available in the private sector, which are also quite different from that in the public sector.¹⁹ Another reason could be the higher concentration of private sector hospitals in the urban sector.²⁰ The choice of services varies between the rich and the poor as a function of awareness, access and affordability. Hence, the pro-rich utilization of the private sector could also be due to the greater awareness among the rich and literate population about the latest treatment options available for NCDs compounded by their higher cost. Similar pattern was observed in our previous analysis for all diseases, where the poor utilized inpatient services at public hospitals at a slightly higher rate than the rich, suggesting potentially more equitable use than the private sector. In some states the rich were also utilizing the public sector more than the poor. This trend was earlier documented by Mahal *et al.*, e.g. in Punjab, 66% of the bed days utilized by people below the poverty line were in the private sector.¹¹

The mean OOP expenditure was found to be more in the private than in the public sector both in rural and urban areas. Even within the public sector a wide variation in expenditure was noted across the states. This could be attributed to the capacity of health system in providing such care itself in the first place, and once it had the capacity in terms of human resources and logistics then it exposes the huge scope of impoverishment even at public facilities due to inadequate medicines and other supplies for which patients have to pay. The profile of the private sector, which is a highly heterogeneous group,¹⁸ could be different in urban and rural areas, accounting for the difference in their clientele, type and cost of services. The rural private set-up might not offer a different set of services compared to the rural public sector whereas this differential is quite marked in urban areas.

In the public sector, the Q5/Q1 ratio was found to be higher in rural areas while in the private sector, the ratio was almost equal in urban and rural areas. This may be because of the utilization of public sector differently in rural and urban areas. In rural areas where there is limited access to advanced, complex, state-of-the-art care, the rich also, within certain limits, may utilize the curative services for NCD care from the public sector itself. Such reasons have been found to play a role in determining the differences between the rural rich and the urban poor/rich in utilization of maternity care.²¹ On the other hand, in urban areas with better access to complex, expensive, tertiary level care, the rich utilized the private sector to avail these services. The utilization of the public sector in urban areas was more by the poor, which is more likely for primary or secondary level care that costs much less than tertiary level care in the private sector.¹¹ Hence, as described above in the utilization pattern, this could also be due to the higher concentration of private sector hospitals in the urban sector which are utilized more by the rich; hence the higher Q5/ Q1 ratio.

The higher OOP expenditure among the rich could be a function of the type and cost of services that the rich avail for NCDs. This could also be explained by our results which show the utilization of private services to be more by the rich and the cost of services under the private sector is higher than that in the public sector. Such a finding could be due to the fact that the poor cannot even afford smaller costs and thus the care for NCD remains an unmet need, or that a treatment which would be administered in a hospital in the ideal way is preferred in outpatient settings by the poor due to financial constraints. This was in contrast to what Chuma *et al.*²² observed in Kenya where the poorest quintiles were observed to spend more than the richest quintiles on NCD care. Shobhana *et al.*²³ and Ramachandran *et al.*²⁴ have also reported similar findings with reference to diabetes care with the poorer quintiles spending a greater proportion of the household income as compared to their richer counterparts.

One major implication of our paper is that given that the utilization of the public sector for NCDs is more by the poor, this trend has to be encouraged by provision of appropriate technology, essential logistics, drugs and the introduction of an effective package of these interventions in the public sector. It has been documented that low cost and highly effective interventions are available for prevention and treatment of NCDs, which may be within the reach of the poor. Other factors affecting utilization of inpatient care for NCDs as identified by the results of our logistic regression were demand side factors such as the proportion of the elderly in the population, literacy rate and supply side factors such as the doctor-population ratio. These factors have to be addressed by interventions targeting NCD prevention and control. India has a national programme addressing chronic diseases named 'National

programme for prevention and control of cancer, diabetes, CVD and stroke' (NPCDCS), which has been expanded to cover cancer as well in 100 districts and upscaled to cover the entire country under the 12th Five-Year Plan. The programme targets both prevention and treatment of NCDs with more stress on the former. While control of risk factors, early diagnosis and treatment of NCDs is the prime focus there are also provisions under this programme for upgradation of medical college hospitals and district hospitals for inpatient service delivery for NCDs. Facilities for provision of NCD preventive and curative services are generally poor at all levels of the healthcare system because of poor health system response to meet the challenge of NCDs. Little progress has been made in this direction to strengthen inpatient care for NCDs with no medical college and only 100 district hospitals upgraded as of March 2012.²⁵ Given the high hospitalization rates for NCDs and the high catastrophic expenditure that the household incurs, there is a need to focus more on health system strengthening especially provision of trained human resources, essential drugs and technology under this programme alongside efforts to strengthen preventive and outpatient services.

However, just availability of inpatient services does not improve utilization unless these are also made financially accessible. Among the major challenges in the NCD scenario is the need to address the impact of NCDs on domestic economies.²⁶ One such attempt to reduce the adverse financial impact of ill-health on households in India has been the *Rashtriya Swasthya Bima Yojana* (RSBY), a health insurance scheme launched by the Ministry of Labour and Employment for families below the poverty line. The benefit package, though designed to include pre-existing ailments in the beneficiaries, does not cover outpatient department (OPD) consultations and medications unless they involve hospitalization. Given that most NCDs require regular follow-up in OPDs and medication prescribed in an OPD setting and that the major share of OOP expenditure on NCDs is on medication,¹⁶ this is an issue that has to be addressed to make NCD care more accessible to the poorer sections of society. Further, RSBY has empanelled more private than public facilities as of date,²⁷ which also needs to change given that it is the public facilities that are utilized more by the poor for NCD care.

A limitation of our study was that we have not classified and analysed the exact nature of the treatment that was utilized. This could have been important as Xavier *et al.* have reported that the use of key treatments differed by socioeconomic status accounting for differences in mortality.¹² This could have helped us substantiate our study findings better. We have reported interstate variations in the utilization of and expenditure on inpatient services for NCDs but have refrained from exploring reasons for the difference given sample size limitations of the study. We have calculated the OOP as a proportion of the MPCE and not the annual household income, which would have enabled us to classify the expenditure as catastrophic and otherwise.

Conclusion

With the rapidly progressing epidemiological transition and the reversing social gradient, it is essential that we are prepared to protect the vulnerable poor from facing adverse outcomes of NCDs. Overall, the utilization of the public sector for inpatient care services for NCDs was found to be equitable. This is a good opportunity to make these services more affordable and accessible to the poor by introducing tailor-made provisions into existing programmes.

Conflicts of interest. None declared

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