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Abstract

The rising healthcare cost in low-income countries (LIC) got sparked attention during the last decades. A large part of healthcare expenditure is Out of Pocket (OOP) paid by the households. The high cost of treatment was found to reduce essential household expenditure in low and middle-income countries. The burden of the high cost of illness resulting in their catastrophic health expenditure and affect health-seeking behavior with delayed treatment. This study has tried to understand how the hospitalization rate and health care spending are differential in the public and private healthcare facility, and with different types of morbidities. The nationwide survey NSS's 71st round data has been used for this study. Both Bivariate and multivariate analyses were used. The Oaxaca decomposition has been applied to explain the gap in the means of healthcare expenditure between public and private facilities. The result of this study reveals that that 62 % patient used private facilities, while only 38 % used public health services for inpatient care. The patients with diseases of the genitourinary system preferred more for the private facility (75 %) than the public facility (25 %) among all diseases. The results from the multilevel analysis that the Doctors fees (26.9 %, $p<0.001$), Bed charges (21.6, $p<0.001$), expenses on medicines (16.5%, $p<0.001$) are the significant contributors in explaining the difference in mean expenditure in private and public health facility center in India.

Keywords: Health expenditure, Out of Pocket (OOP), Public and Private Healthcare

JEL Classification: I13, H51

Introduction:

The rising healthcare cost in low income countries (LIC) got sparked attention during last decades. The large part of healthcare expenditure is Out of Pocket (OOP) which is paid by the household. The high cost of treatment found to reduce essential household expenditure in low and middle income countries (Dercon, Hoddinott & Woldehanna, 2005). Burden of high cost of illness results into their catastrophic health expenditure and affect health seeking behavior with delayed treatment (Leive and Xu, 2008). The WHO report shows that health expenditures are pushing about 100 million people per year into "extreme poverty," (those who live on USD 1.90 or less a day), and about 180 million per year into poverty (those who live on a USD 3.10 per day threshold) (WHO, 2017). Treatments of ill health leave double economic burden on household with high OOP expenditure of medical treatment and losses income due to inability to work (Leive and Xu, 2008). The per capita government expenditure on health in low income countries was around USD 10 (2% of GDP), while in low income countries it was USD 3026

(2/8% of GDP) in 2010 (WHS, 2013), showing higher variation cross the developing and developed countries.

In India, total expenditure on health accounts 4.0 % of GDP is less than half of the average of Orgnaisation for Economic Co-operation and Development (OECD) (9.3 %) average. The highest spending on health care among OECD countries is 16.9 % of its GDP in United States in 2012. India placed low ranks to the (OECD) average in terms of average healthcare expenditure per capita, with spending USD 157 only in 2012, compared to an OECD average USD 3484, public sector is the main sources of health financing in nearly all the OECD countries (OECD Statistics, 2018). Even public expenditure on health is lesser compared to similar placed of countries. Yet, in India, only 1/3 of health spending was financed by public sources in year 2012, which is 72% in OECD countries.

Notwithstanding unprecedented economic growth rate has been observed during the last decades, percentage share of public healthcare expenditure in Gross Domestic Product (GDP) remained constant (1.1 % of GDP), and share of public expenditure declined over the years. According to the World Bank, India has one of highest OOP healthcare expenditure in the world. As a result of low public financing, public healthcare facilities failed to provide expected quality of care in India (Bajpai 2014; Hammer et al., 2007). Indian health system is one of the most privatized in the world with 80 % OOP expenditure for outpatient and 60 % for inpatient care which results into OOP catastrophic expenditure (Sharma, 2015). A study based on NSS 71st round shows that overall the OOPE is significantly increased which is merely due to the high contribution of rising inpatient care cost and not due to rise outpatient care (Ravi et al., 2016).

Financial protection from cost of illness is a major function of healthcare system, India has one of the biggest private healthcare systems in the world where doctors in public sector are allowed to do private practice with no regularity of oversight to minimize potential conflict of interest (Rao, 2016). The current healthcare system dominant by private healthcare sector with low coverage of insurance to protect from health socks leads to catastrophic level of expenditure (Quintussi et al., 2015; Berman et al., 2010; Ladusingh & Pandey, 2013), which leads them to poverty (Berman et al., 2010; Garg & Karan, 2008; Bonu et al., 2009; Ghosh, 2011).

Recently growing debate on Universal Health Coverage (UHC) for over two decades and the growing trend towards government sponsored social health insurance schemes under which entire risk in borne by government. Under such schemes, government provides to the

implementing agency-an insurance company for the purpose of entire premier in one or two installments on behalf of the proposed target population. Substituting prevention with treatment is a costly and unsustainable option. Besides, such financing has also strengthened private hospitals without putting in place regulations to monitor them for quality and price. Recent evidence shows that despite of expansion of insurance coverage, there is no evidence of significant reduction of financial burden of healthcare and exposure to catastrophic healthcare expenditure (Ravi et al., 2016).

Indian health system has witnessed of large health care policy reforms over the last decade. India first National Health Policy (NHP) adopted in 1983 targeting to develop "universal comprehensive primary healthcare services which are relevant to the actual needs and priorities of community at a cost which can afford". The objectives of the NHP 1983 were to decentralize and de-professionalization of health services and community participation not succeed as expected. In order to overcome the short-come of NHP 1983, The Government of India drafted second NHP 2002, emphasized on accessibility and availability in current affordable healthcare system (MoHFW, 2002). This has tried to address polarize healthcare facilities in urban areas, there by leading to overcrowding at urban facilities, consequence of widening economic, gender and regional disparities (Duggal et al 2001, Sengupta and Nundy 2005). To trigger increase in service delivery outlet, government also encouraged private investment in health sector. Though, undesirable results rising healthcare cost and rising inequality and consumer exploitation associated with private healthcare services (Purohit 2001). In order to fulfill gap in infrastructure needs of different socio economic strata residing in rural and urban areas of the India, the government of India launched National Rural Health Mission (NRHM) (MoHFW, 2005) and National Urban Health Mission (NUHM) (MoHFW, 2013) and now commonly named as National Health Mission.

Over the decades, ratio of patients' care has declined at public health facility, due to limited resources at these facilities are forcing patient to access private facility thereby spend high OOP expenditure (Selvaraj & Karan, 2009). High OOP expenditure results often financial hardship especially the economically poor households (Bennendijk, 2014).

Healthcare system in India is highly privatized. Private health care continues to dominate on several specialized treatments for various illnesses. Meagre public health spending, poor access to and quality of public health care services and lack of specialized health care facilities and manpower have given a huge scope for private players to step-in and fill the gaps. However,

treatment costs of private health care in India are much higher than public health care. Not many studies have attempted to document this evidence and explain the factors contributing such difference across the private and public health care costs. Therefore, this study mainly works on twofold objectives: firstly, to document the empirical evidence of the difference in hospitalization rates and health care spending in public and private health care facilities and their regional variations. Secondly, to assess the factors contributing to the difference in hospitalization and health care costs between public and private health care facilities in India.

Data and Methods:

This study is based on 25th scheduled *"*Social Consumption: Health*"* of 71st round of the National Sample Survey Organization (NSSO) data. The NSSO is a nationwide, large-scale population-based survey data and collected by MoSPI, Government of India. 71st round was collected in 2014 between January to June and adopted a two-stage stratified random sampling design. The information was collected from 65,932 households and the sample sizes for male and female was 168,697 and 164,407 respectively (MoSPI, 2016).

For each individual of the households, the detail information about sex, age, morbidity status communicable and non-communicable disease, treatment status and hospitalization were recorded, and for each patient of the episode of ailments in last 356 days, treatment status, type of health care facility used, medical and non-medical health care expenditure, sources of healthcare finance to overcome hospitalization cost and duration of hospitalization were collected using a well structured questionnaire. The information on health care was collected separately for inpatients and outpatients. Details of ailments and hospitalization were collected in the reference period of last 365 days of date of survey. Health care expenditure information collected at disaggregated level that includes total amount spent on medicines cost, doctor's fee, diagnostic tests, other medical purposes (blood, oxygen, attendant charges, personal medical appliances, physiotherapy, etc.), patient bed, and transportation. This study used health care expenditure of hospitalization (medical and non-medical expense) for each hospitalized (inpatient care) patient. In the data set 42,869 patients used inpatient care (hospitalized cases), out of them, 18,508 visited public facilities and 24,361 visited private facilities.

Measures

In the data set, information on OOP healthcare expenditure for hospitalization was collected separately for each episode of hospitalization. Along with medical expenditure, other expenses

were recorded separately. Medical expenditure constituted by spending on medicine, patient bed for hospitalized treatment, diagnostic test, doctor fee. Other expenditure includes all spending related to the treatment of an ailment incurred by the households, but expenditure regarding medical treatment is excluded. Other medical cost included all transport cost paid by the households' connection with the treatment of patient, food and lodging expenditure of the escort(s) during last one year. The total expenditure constituted by sum of the medical and other expenditure. We have estimated average healthcare expenditure for public and private healthcare facilities separately. To estimate the effect of other predictor variable on OOP expenditure, we used a couple of demographic and socio-economic predictors viz. gender (male & female), age, type of residence (rural & urban), educational status of head of the household, religion (Non Muslim and Muslim), caste (Non Scheduled Tribes (ST)/Scheduled Castes (SC) and SC/ST, economic status of households and health care information namely, type of failities (public private), type of disease (datail information given in Appendix), episode of hospitalization, and duration of stay (days). The types of ailments (Diseases) has been classified in Non-communicable, and Comunicable & Other diseasses based on the classsification of The Global Burden of Disease. Nature of treatment for ailments as been catagorised in Public and Private facility.

Methodology:

Bivariate analysis used to describe characteristic of the study population of inpatient care. Descriptive statistics used to estimate average healthcare expenditure for public and private facilities.

Oaxaca Decomposition

To quantify the role of demographic, socio-economic and other health care variables in health care expenditure, we used decomposition technique propounded by Blinder (1973) and Oaxaca (1973). The core idea is to find out the inequality in health care expenditure which is assumed to be the consequence of the distribution of a set of the difference in the socio-economic and demographic factors. For example, disparity in health care expenditure in the results of difference in quality and type of healthcare facility, education, economic status and social factors such as caste and religion.

Mathematical equation of Oaxaca decomposition can be explained as below.

Equation

The equation of the Blinder-Oaxaca decomposition for linear model extended by Jann, B. (2008), and expressed as

$$R=E\,(Y_A)\,-\,E\,(YB)$$

Given are two groups, A and B; an outcome variable, Y; and a set of predictors. Where E(Y) denotes the expected value of the outcome variable, is accounted for by group differences in the predictors.

$$R = E\,(Y_A) - E\,(Y_B) = E\,(X_A)^{'}\,\beta_A - E\,(X_B)^{'}\,\beta B \qquad (1)$$

Because

$$E(Y_\ell) = E(X^{'}_\ell\,\beta_\ell + \epsilon_\ell\,) = E(X^{'}_\ell\,\beta_\ell) + E(\epsilon_\ell) = E(X_\ell)^{'}\beta_\ell$$

where $E(\beta_\ell) = \beta_\ell$ and $E(\epsilon_\ell) = 0$ by assumption.

To identify the contribution of group differences in predictors to the overall outcome difference, (1) can be rearranged, for example, as follows (see Winsborough and Dickinson, 1971; Jones and Kelley, 1984; Daymont and Andrisani, 1984).

$$R = \{E(X_A) - E(X_B)\}^{'}\,\beta_B + E(X_B)^{'}\,(\beta_A - \beta_B) + \{E(X_A) - E(X_B)^{'}\,(\beta_A - \beta_B) \qquad (2)$$

This is a "threefold" decomposition; that is, the outcome difference is divided into three components:

$$R = E + C + I$$

The first component,

$$E = \{E\,(X_A) - E\,(X_B)\}^{'}\beta_B$$

amounts to the part of the differential that is due to group differences in the predictors (the "endowments effect").

The second component,

$$C = E\,(X_B)^{'}\,(\beta_A - \beta_B)$$

measures the contribution of differences in the coefficients (including differences in the intercept). And the third component,

$$I = \{E(X_A) - E(X_B)\}' (\beta_A - \beta_B)$$

is an interaction term accounting for the fact that differences in endowments and coefficients exist simultaneously between the two groups?

The decomposition shown in (2) is formulated from the viewpoint of group B. That is, the group differences in the predictors are weighted by the coefficients of group B to determine the endowments effect (E). The E component measures the expected change in group B's mean outcome if group B had group A's predictor levels. Similarly, for the C component (the "coefficients effect"), the differences in coefficients are weighted by group B's predictor levels. That is, the C component measures the expected change in group B's mean outcome if group B had group A's coefficients.

Results:

Choice of use healthcare cervices

Table 1 shows that about 62 % patient used private facilities, while only 38 % of them accessed public health services for inpatient care. The percentage among the public healthcare service users is higher for pregnancy related complications (52%), disease of respiratory system (42%), infectious and parasitic diseases (42%) and for Injury, poisoning and certain other consequences of external causes (42%). The private facilities is preferred for diseases of the genitourinary system (75%). Similarly, for diseases of the ear and mastoid process is 69 %, for the blood and blood-forming organs and certain disorders involving the immune mechanism (67%), for Diseases of the digestive system (67%) used private health facilities.

Further to examine average cost of hospitalization it has classified by type of disease has been estimated separately for public and private healthcare services. The average cost hospitalization in private hospital is 3.6 times (INR 7733.9) in public hospitals and (INR 28124.2) in private hospitals) higher than that of public healthcare services. Average cost of hospitalization is reported higher for treatment of Neo-plasms diseases (INR 29065.5) in public and (INR 84320.7) in private. The average cost of the circulatory diseases is much higher in private hospitals (INR 46235.8) than public hospitals (INR 13283.0). Similarly, hospitalization cost is

higher for Injury, poisoning and certain other consequences of external causes (INR 10178.3) in public and (INR 39160.2) in private, for Mental and behavioral disorders (INR 9447.7) in public (INR 37311.8) in Private, for diseases of the genitourinary system (INR 11884.6) in public and (INR 32159.1) in private.

Interstate variation in use type of healthcare services and OOP expenditure

Table 2 shows the distribution of type of healthcare facility used for inpatient during last 365 by state and union territories of India. The interstate expenditure has been observed by type of facility accessed by patients for inaction care. Likewise, some state shows high proportion of patient preferred public facilities such as Jammu & Kashmir, Himachal Pradesh, Arunachal Pradesh, Manipur, Tripura, Assam, Odisha, Contrast, some states show high percent of patient preferred private facilities Punjab, Haryana, Maharashtra, Andhra Pradesh, Karnataka, Kerala, Tamil Nadu and Uttar Pradesh.

Further, OOP expenditure for hospitalization shows significant variation across the states and union territories of India. However, OOP expenditure in public services users is lesser compared to those used private healthcare facility for inpatient care in India. Average OOP expenditure in public healthcare users is reported higher in Himachal Pradesh (INR 18845.7), Punjab (INR 14715.0), Goa (INR 13294.7) and Uttar Pradesh (INR 12973.8). While some states like Tamil Nadu (INR 2415.7), Telangana (INR 4684.0), Kerala (INR 4556.9), Uttaranchal (INR 5070.5), Andhra Pradesh (INR 5400.5), Karnataka (INR 5752.9) show lower OOP expenditure for inpatient care in public hospitals. Further, OOP expenditure in private facilities is higher in Assam (INR 57854.4), Goa (INR 52636.8), Jammu & Kashmir (INR 45936.5), all union territories (INR 48989.7), Tripura (INR 40694.0), Odisha (INR 36098.5), West Bengal (INR 37633.8), and Punjab (INR 37257.7). Whereas as states like Jharkhand, Arunachal Pradesh, Nagaland, Bihar and Gujarat reported less OOP expenditure for private healthcare users compare to other states.

The OOP healthcare expenditure for inpatient care desegregated by main purpose of expenditure by Medical and Non-Medical purposes can be explained by differentials in charges for doctor fee, Diagnostic charges, Bed charges, Medicine cost, expenses on medicine, transportation cost, other non-medical expenditure.

Table 3 show average OOP expenditure for medical and nonmedical purposes disaggregated purposes of expenditure by public and private healthcare facilities for inpatient care in India.

OOP healthcare expenditure is much higher for private users compared to those treated in public hospitals. The OOP expenditure incurred for doctor fee, medicine costs and other medical items for inpatient care is invariably higher in private facilities than public facilities. The average cost of doctor fee INR 536 in public facilities and INR 4753 in private facilities. This is clear indicates that doctor fee in private facilities is much higher. The average cost of diagnostic test is INR 687.0 for those used public facilities as against INR 2438.3 for those who used private facilities. Average bed charge in is INR 215.2 and INR 2915.5 public and private facilities respectively. Costs on medicine is INR 2435.2 in public facilities and INR 5581.3 in private facilities. Total medical expenditure for inpatient care in public and private facilities are INR 6119.8 and INR 25849.6 respectively. However, In India, there is no standardization of paid doctor fee, diagnostic fee and other service charge, medicine and appliances. As a consequence, healthcare expenses in private hospitals are exorbitant.

Decomposition results:

Further to explain the outsized difference of OOP expenditure between public and private facilities, we have applied Oaxaca decomposition. Table 4 present results of Oaxaca decomposition to quantify the contribution of demographic and socio economic characteristics, healthcare and purpose of medical and non-medical expenditure variables in differences in OOP expenditure by public and private facilities. Model 1 shows contribution of socioeconomic characteristics such as sex, place of residence, income, education, social group, religion, marital status, household size and type of disease and health expenditure reimbursement status in explaining public-private OOP expenditure differences. Decomposition results reveal that the predictor controlled in Model I explain only 21 % difference in public-private OOP expenditure. Further, economic status of the patient and reimbursement status of healthcare expenditure contributing more towards widening the public-private OOP expenditure. Model II includes health care variables such as type of disease, reimbursement status and OOP expenditure for purpose of doctor fee, diagnostic charge, bed charge, medical expense, transportation and other non-medical expenses. Model II revels that only healthcare variables and heads of OOP expenditure explain 63% difference in public-private OOP expenditure. However, doctor fee (26.9 %, $p<0.00$), bad charge (21.6 %, $p<0.00$), medicine expenditure (16.5 %, $p<0.00$), other non-medical expenditure (9.5 %, $p<0.000$) are significantly contributing more to increase difference in public-private OOP expenditure for inpatient care in India. Further Model III shows the contribution of together demographic, socio economic and healthcare variables in public-private OOP expenditure

differences for hospitalization. Model III explain, 62 % difference in public-private healthcare expenditure. While doctor fee (27.61 p<0.000), bad charge (13.2 %, p<0.000), expense on medicine (11.8 %, p<0.000), other non-medical expense (10.9 %, p<0.000), transportation cost (7.5 %, p<0.000), diagnostic charge (6.3 %, p<0.01) are contributing more to increase difference in public-private OOP expenditure for hospitalization, whereas demographic and socio economic factors are have lesser effect on increase the difference.

Discussion

This study confirms that the difference in mean expenditure on hospitalization is existed between public and private health facility center in all states and at the national level also. Also, it varies with different types of ailments. Some ailments like pregnancy related complications (52%), disease of respiratory system (42%), infectious and parasitic diseases (42%) and for Injury, poisoning and certain other consequences of external causes (42%) are treated more in public health facility than private facility. And, the private facilities is preferred for diseases of the genitourinary system (75%) and diseases of the ear and mastoid process (69 %). The difference in mean expenditure in public and private is much higher in non-communicable diseases than communicable diseases. The average cost hospitalization in private hospital is 3.6 times (INR 7733.9) in public hospitals and (INR 28124.2) in private hospitals) higher than that of public healthcare services. The OOP expenditure incurred for doctor fee, medicine costs and other medical items for inpatient care is invariably higher in private facilities than public facilities. The total medical expenditure for inpatient care in public and private facilities are INR 6119.8 and INR 25849.6 respectively. The doctor's fees, bed charges, expenses on medicines are major contributing factors which explain the major gap of the mean expenditure between public and private health facility center.

The ratio of patients' care has declined at public health facility (Selvaraj & Karan, 2009) and, our study also found that majority of ailments has been treated in private facility. The low level of public health spending, poor access to and quality of public health care services and lack of specialized health care facilities and manpower have given a huge scope for private players to step-in and fill the gaps. At overall, the mean expenditure for treatment of ailments is much higher in private than public facility. And, it also has increasing pattern. Another studies found that the Out-of-pocket payment for inpatient care has increasing with the time period (Raban,

Dandona, & Dandona, 2013, Kumar, 2015). This study reveals that the share of expenditure at private facility is much higher than public health expenditure.

The expenditure on health in public or private facility centre majorly explained in "Endowment factors" or "fees and medicine factors". The lower level of health expenditure in public facility and higher level in private facility are due to endowment factors or fees and medicines factors. The public health facility is funded and governed by government where it has given land, infrastructure, and human capital; and in contrast the private health facility is managed by the private sectors only, the land, capital, and human capital are paid by themselves. The various health schemes also implemented through the public health facility centre. The states like Tami Nadu, Rajasthan are providing free medicines and diagnosis facility in public hospitals. This type of facilities helps to minimize the health expenditure. The private health facility centres are also getting subsidies from government in terms of purchasing land, some relief from taxes on medical tools and machines (Kumar, 2015). After all these, the doctor's fees, bed charges, expenses on medicines are major contributing factors which explain the major gap of the mean expenditure between public and private health facility center.

The type of health facility is varying in urban and rural and semi urban, socio-economic groups. KPMG in 2010 pointed out the under development of infrastructure in rural and semi urban areas e.g. inefficiencies in the public healthcare system, the lack of investment incentives for private sector investment, lack of a quality human resource pool, and supply & distribution infrastructure (KPMG, 2010).

To control and minimize the huge level of health expenditure in India, the governments/stakeholder should focus on public health facility center towards proving 'Health for all' without compromising the quality of service and without any biased on the ground of economic, socio-religious identity of the individuals.

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References

Bajpai, V. (2014). The challenges confronting public hospitals in India, their origins, and possible solutions. *Advances in Public Health*, *2014*.

Berman, P., Ahuja, R., & Bhandari, L. (2010). The impoverishing effect of healthcare payments in India: new methodology and findings. *Economic and Political Weekly*, 65-71.

Binnendijk, H. (2014). Designing Community-Based Health Insurance among Rural Poor in India: A novel time-and cost-effective method for data sourcing. https://repub.eur.nl/pub/50282/

Blinder, A. S. (1973). Wage discrimination: reduced form and structural estimates. *Journal of Human resources*, 436-455.

Bonu, S., Bhushan, I., Rani, M., & Anderson, I. (2009). Incidence and correlates of 'catastrophic'maternal health care expenditure in India. *Health policy and planning*, *24*(6), 445-456.

Daymont, T. N., & Andrisani, P. J. (1984). Job preferences, college major, and the gender gap in earnings. *Journal of Human Resources*, 408-428.

Dercon, S., Hoddinott, J., & Woldehanna, T. (2005). Shocks and consumption in 15 Ethiopian villages, 1999-2004. *Journal of African economies*, *14*(4), 559.

Duggal, A. R., Srivastava, A. M., Davenport, J. M., Soules, T. F., & Beers, W. W. (2001). *U.S. Patent No. 6,294,800*. Washington, DC: U.S. Patent and Trademark Office.

Garg, C. C., & Karan, A. K. (2008). Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. *Health policy and planning*, *24*(2), 116-128.

Ghosh, S. (2011). Catastrophic payments and impoverishment due to out-of-pocket health spending. *Economic and Political Weekly*, 63-70.

Hammer, J., Aiyar, Y., & Samji, S. (2007). Understanding government failure in public health services. *Economic and Political Weekly*, 4049-4057.

Jann, B. (2008). The Blinder-Oaxaca decomposition for linear regression models. *The Stata Journal*, *8*(4), 453-479.

Jones, F. L., & Kelley, J. (1984). Decomposing differences between groups: A cautionary note on measuring discrimination. *Sociological Methods & Research*, *12*(3), 323-343.

KPMG (2010). Health Care: Reaching out to the masses. Pan IIT Conclave 2010. Available from http://www.kpmg.com/IN/en/Pages/default.aspx. Accessed 5 July 2014.

Kumar, Shailender. 2015. PRIVATE SECTOR IN HEALTHCARE DELIVERY MARKET IN INDIA: Structure, Growth and Implications. Working paper 185, Institute for Studies in Industrial Development (ISID).

Ladusingh, L., & Pandey, A. (2013). High inpatient care cost of dying in India. *Journal of Public Health*, *21*(5), 435-443.

Leive, A., & Xu, K. (2008). Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization*, *86*, 849-856C.

Mohanty, S. K., & Srivastava, A. (2012). Out-of-pocket expenditure on institutional delivery in India. *Health policy and planning*, *28*(3), 247-262.

MoHFW (2002), National Health Policy 2002. Ministry of Health and Family Welfare, Government of India. https://www.nhp.gov.in/sites/default/files/pdf/NationaL_Health_Pollicy.pdf

MoHFW (2005). National Rural Health Mission. Ministry of Health and Family Welfare, Government of India. http://www.nipccd-earchive.wcd.nic.in/sites/default/files/PDF/NRHM%20-%20Framework%20for%20Implementation%20-%20%202005-MOHFW.pdf

MoHFW (2012). National Urban Health Mission Framework for Implementation. Ministry of Health and Family Welfare, Government of India. http://nhm.gov.in/nhm/nuhm.html

MoSPI, 2016. National Sample Survey Organisation, Social Consumption: Health; NSS 71st Round (January-June 2014). 2016, New Delhi: Ministry of Statistics and Programme Implementation, Government of India, [http://microdata.gov.in/nada43/index.php/catalog/135/related_materials]

Oaxaca, R. (1973). Male-female wage differentials in urban labor markets. *International economic review*, 693-709.

OECD Statistics. (2018). OECD Health Statistics 2018 is available at www.oecd.org/health/healthdata.

Purohit, B. C. (2001). Private initiatives and policy options: recent health system experience in India. *Health policy and planning*, *16*(1), 87-97.

Quintussi, M., Van de Poel, E., Panda, P., & Rutten, F. (2015). Economic consequences of ill-health for households in northern rural India. *BMC health services research*, *15*(1), 179.

Raban, M. Z., Dandona, R., & Dandona, L. (2013). Variations in catastrophic health expenditure estimates from household surveys in India. *Bulletin of the World Health Organization*, *91*, 726-735.

Rao, K. S. (2016). *Do We Care?: India's Health System*. Oxford University Press.

Ravi, S., Ahluwalia, R., & Bergkvist, S. (2016). Health and Morbidity in India (2004-2014). *Brookings India*.

Selvaraj, S., & Karan, A. K. (2009). Deepening health insecurity in India: evidence from national sample surveys since 1980s. *Economic and Political Weekly*, 55-60.

Sengupta, A., & Nundy, S. (2005). The private health sector in India. https://www.bmj.com/content/331/7526/1157.short

Sharma D 2015Concern over private sector tilt in India's new health policy

Winsborough, H. H., & Dickinson, P. (1971). Components of negro-white income differences. *Age*, *25*(34), 35-44.

World Health Organization. (2017). Tracking universal health coverage: 2017 global monitoring report.

World Health Statistics. (2013). World Health Statistics 2013. *World Health Organization, Geneva, 2013. https://www.who.int/gho/publications/world_health_statistics/EN_WHS2013_Full.pdf*

Table 1: Mean expenditure (in INR) during hospitalization by type of facility and nature of ailments in India

Diseases	Public Hospital (18,508)					Private Hospital (24,361)				
	n	%	Mean	[95% CI]		n	%	Mean	[95% CI]	
Non-communicable diseases				LL	UL				LL	UL
Diseases of the digestive system	1,893	33.5	6815	5881	7749	2,972	66.5	26016	24507	27525
Diseases of the circulatory	1,450	36.6	13283	11245	15321	2,236	63.4	46236	42551	49921
Diseases of the genitourinary system	905	25	11885	10198	13571	1,967	75	32159	28209	36109
Mental and behavioural disorders	1,132	39.1	9448	8509	10387	1,532	60.9	37312	33883	40740
Diseases of the respiratory system	1,021	42.4	6231	5551	6911	1,191	57.6	20560	18419	22701
Diseases of the musculoskeletal system and connective tissue	793	32.3	10038	7874	12202	1,186	67.7	31220	28222	34218
Diseases of the eye and adnexa	615	35.1	2651	2235	3067	978	64.9	15156	14064	16248
Endocrine, nutritional and metabolic diseases	476	34.9	6223	5085	7361	758	65.1	21024	18842	23205
Neo-plasms	489	39.9	29066	24295	33836	690	60.1	84321	71450	97192
Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	353	33.4	6357	2239	10474	510	66.6	19390	17178	21602
Diseases of the skin and subcutaneous tissue	177	36.7	4463	3181	5745	226	63.3	16561	13597	19524
Diseases of the ear and mastoid process	69	30.9	8397	5788	11007	114	69.1	21124	17473	24775
Communicable and Other diseases										
Certain infectious and parasitic diseases	5,510	41.8	4089	3639	4539	5,580	58.2	13152	12606	13698
Injury, poisoning and certain other consequences of external causes	2,601	41.5	10178	8696	11661	3,433	58.5	39160	36485	41835
Pregnancy, childbirth and the puerperium	1,024	52.3	3761	3401	4121	988	47.7	23224	20798	25650
Total		38.4	7734	7353	8115		61.6	28124	27325	28923

Note: LL: Lower Limit, UL: Upper Limit, CI: Confidence Interval

Table 2: Mean expenditure (in INR) during hospitalization by type of facility across the states in India.

State/ Union Territories	Public Hospital						Private Hospital					
	n	%	Mean	Std. Err.	[95% CI]		n	%	Mean	Std. Err.	[95% CI]	
					LL	UL					LL	UL
Jammu & Kashmir	626	92.2	8963	719	7551	10374	71	7.8	45937	6878	32219	59654
Himachal Pradesh	478	75.5	18846	2093	14733	22958	172	24.5	33947	5202	23679	44216
Punjab	250	29.6	14715	1642	11480	17950	750	70.4	37258	3936	29531	44985
Uttaranchal	167	47.6	5071	559	3966	6175	186	52.4	25059	3279	18589	31529
Haryana	310	27	13726	2163	9471	17981	675	73	31800	2078	27720	35881
Rajasthan	1,031	54.3	6791	553	5705	7877	879	45.7	27804	1679	24508	31100
Uttar Pradesh	1,468	29.7	12974	976	11059	14889	3,508	70.3	29211	1050	27153	31270
Bihar	675	42.2	8545	1055	6473	10617	1,127	57.8	19976	1044	17927	22024
Sikkim	214	68	5988	428	5143	6832	110	32	29426	2617	24239	34613
Arunachal Pradesh	279	88.4	7268	592	6102	8433	38	11.6	18029	3431	11077	24980
Nagaland	187	64.1	4543	322	3907	5178	107	35.9	21553	4774	12088	31018
Manipur	613	85.9	8765	495	7793	9738	112	14.1	20343	2652	15089	25598
Mizoram	301	73.4	8111	1553	5055	11166	109	26.6	31569	4549	22552	40586
Tripura	827	92.4	6009	1210	3635	8384	85	7.6	40694	8314	24161	57227
Meghalaya	247	76.9	4583	985	2642	6523	102	23.1	24872	2994	18933	30811
Assam	791	81.8	8038	725	6615	9461	234	18.2	57854	8925	40271	75438
West Bengal	2,145	68.9	8708	784	7170	10245	1,243	31.1	37634	2044	33624	41644
Jharkhand	298	35.2	7220	2650	2004	12435	512	64.8	16729	1234	14305	19153
Odisha	1,129	76.8	8074	405	7279	8869	406	23.2	36099	3249	29711	42486
Chhattisgarh	325	45	5649	499	4667	6632	368	55	25277	2669	20029	30525
Madhya Pradesh	1,093	49.6	7866	1065	5777	9956	1,209	50.4	29944	3432	23211	36677

Gujarat	494	23.4	8103	1265	5617	10588	1,565	76.6	21290	1031	19267	23313
Maharashtra	780	19.5	6296	573	5171	7421	2,924	80.5	30668	1148	28416	32919
Andhra Pradesh	386	22.3	5401	690	4044	6757	1,420	77.7	25226	1695	21901	28550
Karnataka	470	23.6	5753	446	4876	6630	1,634	76.4	23315	1101	21156	25475
Goa	78	59.6	13295	6010	1328	25262	56	40.4	52637	10593	31408	73866
Kerala	789	34.1	4557	330	3910	5204	1,603	65.9	25701	1455	22848	28555
Tamil Nadu	1,012	34.6	2416	148	2126	2706	1,806	65.4	29684	1245	27242	32126
Telangana	223	25.8	4684	637	3430	5939	689	74.2	28064	3095	21988	34140
UTs	822	50	10556	1378	7853	13259	661	50	48990	3769	41596	56384
India	18508	38.4	7734	194	7353	8115	24361	61.6	28124	408	27325	28923

Note: LL: Lower Limit, UP: Upper Limit UTs: Union Territories, CI: Confidence Interval

Table3: Nature of health care spending (in INR) per hospitalization cases.

Variable	Public				Private			
	Mean	Std. Err.	[95% CI]		Mean	Std. Err.	[95% CI]	
			LL	UL			LL	UL
Package Component	1320	108	1108	1532	8309	299	7723	8894
Non-package component								
Doctor's fee	536	49	440	633	4753	100	4558	4948
Diagnostic charges	687	33	845	972	2438	41	2217	2379
Bed charges	215	14	188	242	2916	58	2802	3029
Expenses on Medicine	2435	62	2314	2556	5581	105	5376	5787
Other Medical expenses	926	67	794	1058	1853	51	1753	1953
Medical expenditure*	6120	185	5757	6483	25850	395	25076	26623
Transportation cost	519	9	502	536	721	10	702	741
Other non-medical expenditure	1095	17	1062	1127	1553	21	1511	1595
Total Expenditure	7734	194	7353	8115	28124	408	27325	28923

Note: LL: Lower Limit, UP: Upper Limit *: Medical expenditure consisting of Package component, and Non-component (Doctor's fee, Diagnostic charges, Bed charges, Expenses on medicines and other medical expenses), CI: Confidence Interval.

Table 4: Contribution of predictor variables to the explained difference of the health expenditure in public and private hospitals in India on the regression based decomposition analysis.

Variables	Model 1			Model 2			Model 3		
	% Contribution to the explained difference	[95% CI]		% Contribution to the explained difference	[95% CI]		% Contribution to the explained difference	[95% CI]	
		LL	UL		LL	UL		LL	UL
Elder Age Group	2.86*	0.46	4.58	-	-	-	0.38	-0.06	0.72
Sex	2.18	-0.10	3.81	-	-	-	0.01	-0.38	0.30
Rural	4.40	-0.90	8.19				2.17**	0.94	3.10
Poor	26.95***	20.79	31.36	-	-	-	1.74	-0.06	3.10
Education less than secondary	15.74***	11.04	19.09	-	-	-	2.33**	0.77	3.51
SC/ST	8.93**	3.44	12.85	-	-	-	1.14	-0.62	2.47
Muslim	0.06	-0.59	0.52	-	-	-	0.01	-0.17	0.15
Currently Married	0.08	-2.68	2.04	-	-	-	0.01	-0.40	0.32
Household Size	0.11	-0.64	0.65	-	-	-	0.04	-0.19	0.21
Times Visit to the hospitalization	-0.29	-1.38	0.50	-	-	-	-0.06	-0.26	0.10
Non-Communicable Diseases	3.01**	0.83	4.58	0.29	-0.05	0.54	0.23	-0.21	0.55
Amount Reimbursed#	35.95***	31.72	38.97	9.52***	7.29	11.21	9.93***	7.57	11.73
Duration of stay at hospital	-	-	-	-1.30	-3.87	0.64	-1.25	-4.22	1.01
Doctor's fee	-	-	-	26.87***	24.18	28.91	27.61***	25.97	28.86
Diagnostic Charges	-	-	-	4.60*	0.06	8.05	6.34**	2.10	9.56
Bed charges	-	-	-	21.56***	16.17	25.64	13.21***	5.97	18.71
Expenses on Medicine	-	-	-	16.53***	12.78	19.38	11.81***	7.52	15.07

Other Medical expenses	-	-	-	5.91**	2.49	8.51	5.91**	1.77	9.05
Transportation cost	-	-	-	6.53***	4.82	7.82	7.53***	5.41	9.15
Other Non-medical expenses	-	-	-	9.49***	7.36	11.11	10.91***	8.44	12.78
Group:1 (Private Hospital)	26276.2	24932.2	27620.3	28121.1	26594.4	29647.8	26272.9	24960.1	27585.8
Group:2 (Public Hospitals)	7008.9	6305.5	7712.3	7733.9	6926.1	8541.6	7008.9	6260.2	7757.6
Difference	19267.3	17750.3	20784.3	20387.2	18660.0	22114.4	19264.0	17752.7	20775.4
Explained	3984.3	3319.6	4649.0	12912.7	11140.3	14685.2	11875.6	10247.1	13504.2
Percent explained (%)	20.7			63.3			61.6		
Unexplained	15283.0	13812.2	16753.8	7474.5	5981.8	8967.2	7388.4	5822.6	8954.2
Percent unexplained (%)	79.3			36.7			38.4		

Note: LL: Lower Limit, UL: Upper Limit, ***: p<0.001, **:p<0.01, p<0.05, #: Total amount reimbursed by medical insurance company or employer (Rs.), CI: Confidence Interval..

Appendix:

Appendix 1: Distribution of hospitalization cases across public and private hospitals by background characteristics.

	Public Hospital				Private Hospital			
			95% CI				95% CI	
Variables	**n**	**%**	**LL**	**UL**	**n**	**%**	**LL**	**UL**
Sex								
Male	9,368	37.5	37.5	37.6	12,644	62.5	62.4	62.5
Female	9,140	35.9	35.8	35.9	11,717	64.1	64.1	64.2
Age								
0-59	14,646	39.2	39.2	39.2	18,694	60.8	60.8	60.8
60+	3,862	35.9	35.8	35.9	5,666	64.1	64.1	64.2
Place of residence								
Urban	7,571	32.0	32.0	32.1	12,259	68.0	67.9	68.0
Rural	10,937	41.9	41.9	41.9	12,102	58.1	58.1	58.1
Social Group								
Non-SC/ST group	11,720	33.9	33.8	33.9	19,291	66.1	66.1	66.2
SC/ST	6,788	52.1	52.0	52.1	5,070	47.9	47.9	48.0
Religion								
Non-Muslim religion	13,223	37.8	37.8	37.8	17,634	62.2	62.2	62.2
Muslim	4,120	38.6	38.6	38.7	5,479	61.4	61.3	61.4
Household Size								
Less than 4	8,194	38.8	38.8	38.9	10,451	61.2	61.1	61.2
More than 5	10,314	38.1	38.1	38.1	13,910	61.9	61.9	61.9
Education								
Higher secondary and above	3,346	27.9	27.9	28.0	7,003	72.1	72.0	72.1
Less than higher secondary	13,997	41.0	41.0	41.0	16,110	59.0	59.0	59.0
Marital Status								
Currently not married	6,966	38.1	38.0	38.1	8,864	61.9	61.9	62.0
currently married	10,377	38.0	38.0	38.0	14,249	62.0	62.0	62.0
Wealth Quintile								
Non-poor	8,837	29.7	29.6	29.7	16,233	70.3	70.3	70.4
Poor	9,670	50.3	50.2	50.3	8,124	49.7	49.7	49.8
Times Hospitalised								
One time	16,262	38.1	38.1	38.1	21,404	61.9	61.9	61.9
More than Two Times	1,081	37.1	37.1	37.2	1,709	62.9	62.8	62.9
Diseases								
Communicable and others	9,179	39.8	39.8	39.8	11,172	60.2	60.2	60.2
Non-communicable	9,329	37.2	37.2	37.2	13,189	62.8	62.8	62.8

Region								
Southern states	10,346	29.7	29.7	29.8	24.13	70.3	70.2	70.3
Other states	32,523	43.1	43.1	43.1	75.87	56.9	56.9	56.9
Total	18,508	43.2	42.7	43.6	24361	56.8	56.4	57.3

Note: LL: Lower Limit, UL: Upper Limit, *: Private-Public, CI: Confidence Interval.