HEALTH POLICY CHANGES
AND THEIR IMPACT ON
EQUITY OF HEALTH FINANCING IN INDIA

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[**Abstract**: *Catastrophic healthcare payments, horizontal inequity, and progressivity of out-of-pocket spending (OOPS) are three crucial issues in subject of health financing. In many countries, these issues have been addressed through health sector reforms. This study examines the impact of health policy changes on equity of financing among households by using four successive rounds of national sample survey (NSS) data on consumer expenditure in India. The horizontal and vertical redistributive effect of health care payment was measured by Wagstaff and AJL (Aronson, Johnson, and Lambert) decomposition method of redistributive effect (RE). This study shows vertical effect (V) of OOPS on income redistribution has increased by 15 per cent between 1994 and 2004, and then decreased by 80 per cent in 2012. Horizontal inequity (H) and re-ranking have fallen over the period. Also, RE decreased by 63 per cent between 2004 and 2012. The value of V is lowest in 2012. This implies that government-funded health care services have a higher impact on low income group and produce higher equity in OOPS. This study concludes that the health policy changes made by the Government of India, especially 2005 onwards, has had a positive impact on equity in out-of-pocket payment and income inequality.*]

Keywords*: Health Sector Reforms, Impact, Equity, India*

1. Introduction

In every society, there are three critical issues relating to health care financing—avoiding catastrophic payments, horizontal equity, and progressivity of out-of-pocket spending (OOPS). These issues are very crucial to India because health care expenditure, especially out-of-pocket expenditure, is very high (59%) (World Bank 2011). Sometimes, the cost of medical care is so high that many households are unable to recover it by their existing

resources. If medical expenditure exceeds 40 per cent of a household's non-food expenditure, such expenditure is defined as catastrophic (Kawabata and Carrin 2002; Xu *et al*. 2003, Karami *et al*. 2009).

Empirical evidence shows that 25 per cent of hospitalized Indians face catastrophic medical expenditure (Peters *et al*. 2002; Mondal *et al*. 2010). Also, Indian health care services are heterogeneous; there is wide variation in the utilization of health care services across states. The proportion of the population reporting a visit to an outpatient provider varied from as low as 4 per cent in Bihar to as high as 22 per cent in Kerala. Similarly, in the case of mean hospitalization care, inequality within an economic group is very prominent (O'Donnell *et al*. 2007; Kanjilal *et al*. 2007; Chowdhuri 2012; Ghosh 2012; Prinja 2012). Also, the payment structure for health care is inequitably distributed across socio-economic groups—poor people pay a higher proportion of their capacity to pay (CTP) than higher income groups (Peters *et al*. 2002). Therefore, vertical inequity in health care payment is also another crucial challenge that needs to be addressed in planning.

In many countries, these issues have already been addressed, and their government has set the target to enhance equity and fairness in health care financing through health sector reforms and taken initial measures to achieve these. Globally, there is enormous evidence that health sector reforms in any form such as conditional cash transfer (CCT) or universal health converge (UHC)—increased the accessibility of the health care services that ultimately reduce the risk of catastrophic health care payment. In Latin America, countries have improved the status of child nutrition and maternal health by introducing CCT. Mexico has reduced the number of households with catastrophic and impoverishing health spending significantly since it started its reform process (Knaul *et al*. 2006; Knaul *et al*. 2005). In Cuba, a government-run health system provides free UHC, which has significantly improved the quality of care (Ugalde and Homedes 2009). In Costa Rica, in contrast, there is a system of a single payer managed by the social security organization and financed by employers, employees and the government, which subsidizes care for the poor (Ugalde and Homedes 2009). Brazil and Colombia have pursued extensive reforms with significant improvements in earlier years but some mixed outcomes in the recent past (Esteves R 2012).

In Africa, Ghana has made significant progress in reducing OOPS after introducing a national health insurance scheme (under its UHC programme), and the volume of service received by the people has increased considerably (WHO 2011). Likewise, in South and South East Asia, Thailand, China and Sri Lanka have made significant progress in the health sector through reforms. After UHC was introduced in Thailand, the share of catastrophic OOPS for health decreased by 77.5 per cent for the poorest quintile and by 41 per cent for the richest quintile (Limwattananon *et al*. 2011). In China, health sector reforms reduced illness among children, improved self-assessed health, and increased visits to the doctor, all of which together and ultimately reduced the incidence of catastrophic health care spending (Gao *et al*. 2001, Wagstaff and Yu 2005; Lufa and Nan

2013). In Cambodia, health equity funds have been used to overcome the problems of access and user fees, which have improved outcomes for the poor (Bigdeli 2009).

In 1983, for the first time, the Government of India endorsed a National Health Policy (NHP) to achieve 'Health for All by 2000'. This was in response to the Declaration of Alma-Ata in 1978, adopted at the International Conference on Primary Health Care, which was the first to recognize the importance of health care and call upon the world community to protect and promote the health of all peoples. Until then, various committees had been appointed from time to time to recommend the design and formation of a health programme, but there was no formal health policy in India. The NHP was the first attempt at ensuring the universal provision of comprehensive primary health care (PHC), with special emphasis on prevention, promotion, and rehabilitation. It emphasizes access to health service, nutrition, prevention of food adulteration and maintenance of the quality of drugs, water supply and sanitation, environmental protection, immunization programmes, maternal and child health (MCH) services, school health programmes and occupational health services. For better planning, an effective health management information system (HMIS) has been recommended. This policy recommended that communities should be provided a PHC service that meets their actual need and priorities at a price they can afford.

Nineteen years after 1983, the Government of India passed the National Health Policy (NHP) 2002, which prioritizes equitable access to health services across the social and geographical expanse of India. It calls for decentralizing PHC services by upgrading the infrastructure of existing medical institutions. It also encourages the private sector in providing health care services to people who can afford to pay. The NHP emphasizes increasing aggregate public health investment, and tasked the Central government with increasing health expenditure to 2 per cent by 2012 from 0.9 per cent in 2008. It also increased the share of the Central grant to constitute at least 25 per cent of total health spending and increased the state health budget up to 8 per cent of the total state budget. However, public expenditure on health has not increased substantially, and gross inequity continues in the distribution of public health resources. Inequity reflects not only the widening gap in public spending between poor and rich states, but also in the substantial absorption of public subsidies by the richer people within a given state.[1]

Recently, India has addressed the question of health financing and its inequities and vulnerabilities systematically. First, the government has targeted an increase in health expenditure, from 1.4 per cent of GDP in 2013 to 2.5 per cent by 2017. Secondly, the Central government, as well as many state governments, have developed a comprehensive strategy to improve the health status of people, especially the poorest of the poor and those in greatest need. The National Rural Health Mission, Janani Suraksha Yojana, and Rogi Kalyan Samiti are three examples of mechanisms for this strategy, as is the Rashtriya Swasthya Bima Yojana, the Government of India's recently-implemented

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[1] As shown by a recent study, the richest quintile received about ₹3 of public health subsidy for every ₹1 received by the poorest quintile (Peters *et al*. 2002).

health insurance scheme for families below poverty line (BPL).[2] More recently, the government has proposed UHC to reduce inequity and improve fairness in health care spending.

But does the allocation of greater resources ensure better health for the poor and reduce the risk of OOPS? How have trends in OOPS impacted household-level health equity? Are state-level findings consistent with changes in health sector policy, especially on health coverage? The consequences of these changes in health systems for equity in terms of fairness of health care financing are hardly ever discussed or considered in planning. In India, there are studies only on OOPS, and some on OOPS and poverty, but there is no systematic analysis of trends over time on equity in financing at the household level. In this study, we examine the impact of health policy changes on equity of financing among households using four successive rounds of NSS data on consumer expenditure, and try to find out the factors of the equity of financing at the state level.

2. Materials and Methods

This study is based primarily on national-level household survey data conducted by the National Sample Survey Organization (NSSO). The NSSO, under the Ministry of Statistics and Programme Implementation, Government of India, has been conducting regular multi-subject integrated sample surveys since 1950. We have used four successive rounds of NSSO data (50th, 1993–94; 61st, 2004–05; 66th, 2009–10; and 68th, 2011–12) on consumer expenditure. In these rounds, the NSSO collected detailed information on the quantity and value of household consumption. To minimize recall errors, a detailed item classification was adopted in all consumption rounds, including 142 items of food, 15 items of energy (fuel, light, and household appliances), 28 items of clothing, bedding and footwear, 19 items of educational and medical expenses, 51 items of durable goods, and 89 other items. The schedule also collected socio-economic and demographic particulars of household members. Health expenditure included institutional and non-institutional medical care at the household level. *Table-1* describes the total sample size of the four rounds of survey mentioned above.

To find out the determinants of equity at the national as well as state level, we consider major macroeconomic variables, such as health expenditure, GDP, per capita gross state domestic product (GSDP), GDP growth rate, poverty ratio, income inequality, formal health coverage and the fund utilization capacity of the state. Recent data on these

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[2] The Government of India has proposed the Janani Suraksha Yojana, a centrally sponsored scheme that integrates cash assistance with delivery and post-delivery care, to promote the institutional delivery of babies and thereby decrease neonatal and maternal deaths. Rogi Kalyan Samiti, another centrally sponsored scheme under the National Rural Health Mission (a programme for improving health care delivery across rural India), provides the poor financial support for medical treatment.

macroeconomic indicators have been collected by reviewing secondary documents, such as Central and state government reports, budget documents, etc.

Table-1: Total Sample Size of the Four Rounds of NSSO Survey

Round No.	Year of survey	Households covered			Populations Covered		
		Rural	Urban	Total	Rural	Urban	Total
50th	1993-94	69491	46254	115745	358184	208981	567165
61st	2004-05	79298	45346	124644	403207	206529	609736
66th	2009-10	59117	41732	100849	287136	181408	468544
68th	2011-12	59695	41967	101662	285796	179164	464960

2.1 Analytical Methods

To measure the equity of health care financing within countries at different stages of development and health transition, the World Health Organization (WHO) developed an index of fairness of financial contribution (FFC) for the health system (Murray *et al*. 2000; WHO 2000; Xu *et al*. 2000). We used the FFC index to analyse changes over time within countries, such as the results of health sector reforms. It can be written as

$$FFC = 1 - 4\, \frac{\sum_{h=1}^{H} |HFC_h - \overline{HFC}|^3}{0.125\, H} \qquad \text{_____ (1)}$$

where,

$$HFC_h = \frac{Total\ health\ spending_h}{Capacity\ to\ pay_h} = \frac{HS_h}{(Exp + aTax - Food)_h} \qquad \text{_____ (2)}$$

HFCh is the health financing contribution, h indexes households, and H is the number of households. The FFC index value ranges from zero to one. A value of one indicates perfect equity, when everyone pays the same proportion of their CTP, and a value of less than one indicates inequality in health care payment as a proportion of CTP. The index reflects both horizontal and vertical inequity. However, this index cannot explain horizontal and vertical inequity clearly when different households pay differently (Wagstaff 2002). The value of the FFC index is less than one when households with similar CTP spend different proportions of their CTP on health care (horizontal inequity) or when households with different CTPs spend different proportions of their CTP on health care (vertical inequity), or there is a combination of the two. In other words, the value of the FFC index is different from one when the system is horizontally inequitable, or vertically inequitable, or both (Wagstaff and Doorslaer 2001; Wagstaff 2002).

To overcome this problem, it may be worth considering a concept in the literature on public finance: imposing a tax can generate horizontal and vertical redistribution (Aronson *et al*. 1994; Aronson and Lambert 1994). Horizontal redistribution means horizontal equity (which would have obtained if the tax rate is progressive), which reduces the pro-poor redistributive effect (RE) associated with a progressive tax and makes a regressive tax even more pro-rich. This is the Aronson, Johnson and Lambert (AJL) approach of measuring the RE of tax on household, and has been used in health

economics to measure the RE of health payment in several countries in the late 1990s (Wagstaff and Doorslaer 1997; Doorslaer *et al*. 1999). The AJL method of calculating the RE of health care payment can be written as

$$RE \equiv V - H - R \qquad \text{_____ (3)}$$
where,
$$V \equiv \left(\frac{g}{1-g}\right) K^* \qquad \text{_____ (4)}$$
$$H \equiv \sum \propto_x G_{F(X)} \qquad \text{_____ (5)}$$
$$R \equiv G_{X-P} - C_{X-P} \qquad \text{_____ (6)}$$
where,
  V = vertical redistribution,
  H = horizontal inequity,
  R = re-ranking,
  g = average tax rate,
  K^* = Kakwani's index computed on the assumption that at each income level everyone spends the same amount on health care, V is directly proportional to g and K , α_x is the product of the population share and post-payment income share of households with pre-payment income x, and GF(x) is the Gini coefficient for post-payment income for these households.

Recently, Wagstaff suggested an alternative approach of redistributive effect (RE) of health care payment when there is no horizontal inequity and re-ranking (Wagstaff 2002). Wagstaff also mentioned that in the FFC index (in equation 1), CTP ought to be defined as income less subsistence expenses (food, etc.) and for equity payment should be proportional to CTP. This has a serious limitation that after health care payment, the income distribution may be more unequal, and the disposable income of some households may be insufficient for food consumption. Wagstaff and Doorslear modified it and readjusted it by subsistence expenses (food, etc.) when there is no horizontal inequity or re-ranking (H=0, R=0). The Wagstaff–Doorslear approach for measuring RE of health care payment can be written as

$$RE = V = \frac{g}{(1-g)} K_P - \frac{gf}{(1-g)(1-f)} K_F \qquad \text{_____ (7)}$$
where,
  Kp = Kakwani index showing the progressivity of payments for payments on CTP,
  K_F= Kakwani index showing the progressivity of subsistence expenses (food, etc.) on pre-payment income,
  f = share of pre-payment income absorbed, and
  g = the average tax rate.

We have mentioned that the health care system in India is very heterogeneous, there is horizontal inequity in health care access, and that households fall into poverty after health care payment. Therefore, horizontal inequity and re-ranking may not be zero. By putting the value of V (Equation 7) in Equation 3, a combined index (assuming H ≠ 0 and R ≠ 0) for measuring RE can be written as:

$$RE = \left(\frac{g}{1-g}K_p - \frac{gf}{(1-g)(1-f)}\ K_f\right) - \sum_{i=1}^{n} \propto_x G_{F(X)} - G_{X-P} - C_{X-P} \underline{\hspace{3cm}} \quad (8)$$

The WHO's FFC index is computed on the same data to compare it with the approach of Aronson *et al.* (1994). The FFC index is straightforward to compute. The Aronson *et al.* decomposition is more involved. RE can be computed simply as the difference between Gpre and Gpost. In each case, the convenient covariance approach was used on household-level data (Wagstaff 2002). The out-of-pocket share g is computed simply as mean out-of-pocket payments divided by mean pre-payment income. To compute K (or more precisely the concentration index for OOPS (Cp) and CX-P), one has to decide on appropriate groups of pre-payment equals. All the variables in the equation have been computed using the ADePT health financing software of the World Bank.

To find out the major determinants of equity of financing, we developed a regressions model where the dependent variable is RE and the independent variables are health expenditure (Central and state) (he), per capita state domestic product (psdp), growth rate of per capita state domestic product (gr), state-level poverty ratio (pov), state Gini coefficient (gc), state health coverage (shc)[3], and the state's capacity of fund utilization for health (cfu).[4] Here, we develop panel data for all the variables—selected on a priori economic judgement—for two periods, 2005 and 2010, across 28 states in India. We estimate the equation using pooled cross-section time series data, fixed effect estimates, and the generalized linear model (GLM), which bypasses the need to transform the relevant variables into logarithmic form. To capture state-specific effects, we measure Equation 9 by fixed effect estimates, as Indian states are heterogeneous in terms of health services and infrastructure. We also allow for time effect in the sense that equity can change over time, because of many factors. Some of these factors are introduction of health insurance, technological changes, government intervention, and other external

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[3] The Central government has several health insurance schemes: Central Government Health Scheme (CGHS), Employees' State Insurance Scheme (ESI), and Rashtriya Swastha Bima Yojana (National Health Insurance Scheme), for example. Many state governments run additional health insurance schemes for state residents. Here, we use the state level dummy variable on state health insurance coverage scheme.

[4] Poor governance hinders some state governments in India from using funds allocated for health properly. Therefore, the capacity of fund utilization is a partial indication of the quality of the state's governance, which might influence the enhancement of equity. We also use the state-level dummy on the capacity of fund utilization.

effects such as good or bad governance. We have used td as time dummy, where td=1 for time period 2010, and 0 otherwise. The regression equation can be written as:

$$RE_{it} = \beta_1 + \beta_2\, He_{2it} + \beta_3\, psdp_{3it} + \beta_4\, grpsdp_{4it} + \beta_5\, pov_{5it} + \beta_6\, gc_{6it} + \beta_7\, sHc_{7it} + \beta_8\, cfu_{8it} + \alpha_1\, td_{1it} + \cup_{it} \underline{\hspace{3cm}} (9)$$

where,

$i(state) = 1,2, \ldots \ldots, 28$ and $t(time) = 1,2$

3. Results

It has been seen that OOPS on health care in terms of household non-food expenditure has declined substantially since 1993 (NSS 50th round), but it still is more than 10 per cent of household non-food expenditure, and has increased in recent years for the lowest income group (*Figure-1*). Higher amounts are being spent on drugs and medicines and diagnostics than on other components of health care expenditure, and this constitutes the high level of OOPS; also, this OOPS has increased over the years (*Figure-2*). For outpatient care, drugs and diagnostics make up more than 70 per cent of the total OOPS. Also the OOPS for drug and medicine has increased over the years. For inpatient care, medicine and hospitalization charges make up 70 per cent of the total expenditure.

Figure-1: Out-of-pocket Expenditure for Health to Non-food Expenditure by Households
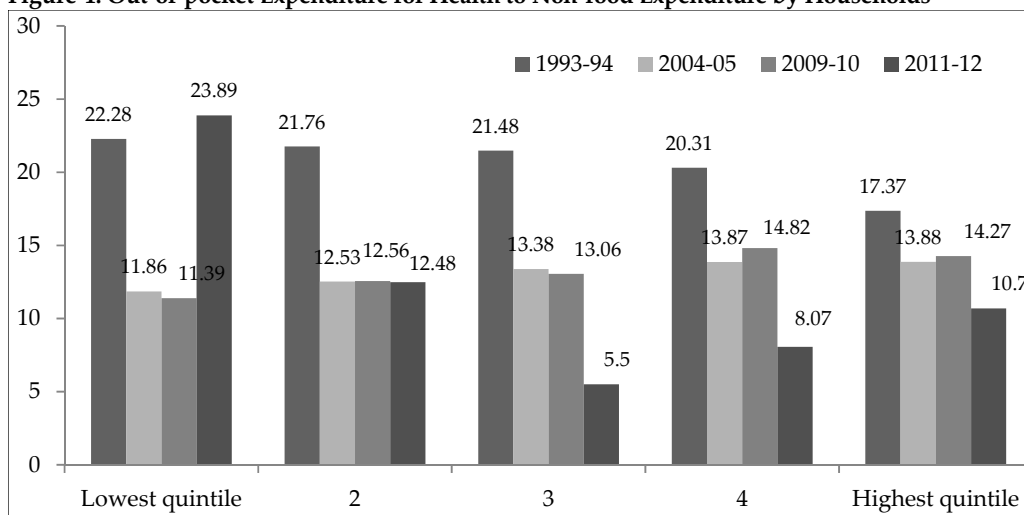
Using the WHO's FFC index, the values of FFC for out-of-pocket payment in years 1993–94, 2004–05, 2009–10, and 2011–12 are 0.8851, 0.8834, 0.8729, and 0.8512, respectively(*Table-2*). This indicates that Indian health care payment structure produce lesser fairness of out-of-pocket payment for health care. One possible reason may be that the lowest income group pays more than higher income groups (*Figure-1*).

Table-2 also shows the values of the components of the AJL decomposition of redistributive effect. The Kakwani index (assuming horizontal inequity) increased between 1993–94 and 2004–05, but suddenly decreased by 92 per cent between 2004–05 and 2009–10, and then increased. The vertical effect of OOPS had a positive impact between 1993–94 and 2004–05, but had a negative impact between 2004–05 and 2009–10 and again a positive change in 2011-12. Horizontal inequality increased in 2009–10 but decreased by 72 per cent in 2012.

Figure-2: Out-of-pocket Payment for Medical Care by Type of Treatment
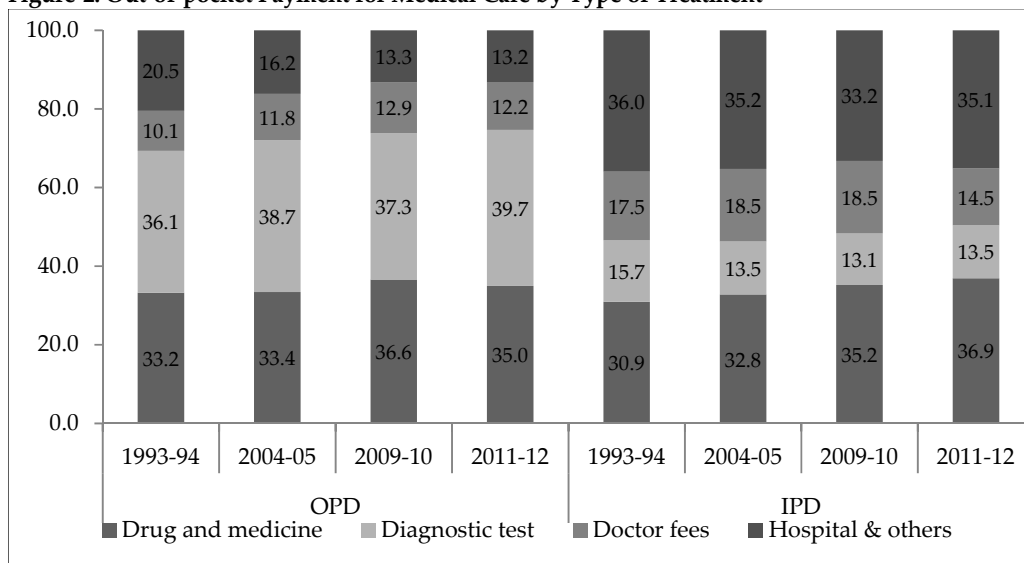
The RE of health care payment in 1993–94, 2004–05, 2009–10, and 2011–12 was 0.0034, 0.0045, 0.0047, and 0.0017 respectively. The redistribution effect increased over the initial 15 years but fell by 64 per cent in 2011–12. The reduction in pro-rich redistribution was due in part to a reduction in the overall share of pre-payment income absorbed by out-of-pocket payments—from 1.7 per cent of pre-payment income in 2009 to 0.38 per cent in 2012, a reduction of 84 per cent during the period. This is presumably a reflection of higher user fees at public facilities.

The Indian health care system is very heterogeneous in nature, because Indian states are diversified in terms of health care finance, health care infrastructure, morbidity patterns, health seeking behaviour, utilization of health care, etc. Also, under the Constitution of India, health is a state subject. Therefore, many policy interventions can be meaningfully identified and effectively implemented only at the state level, and any generalization of an 'Indian' experience may not be meaningful. Instead, it would be more meaningful if we examine all Indian states.

The overall rate of change of FFC index is negative, and the FFC declined between 2005 and 2010, and also during 2010–12. Only a few smaller states like Goa, Manipur, and

Mizoram showed a positive change between 2005 and 2012. Some other states like Punjab, Chandigarh, Himachal Pradesh, Jharkhand, Tripura and some North East Indian states experienced better FFC between 2010 and 2012. The value of the FFC index improved in some major states like Delhi, West Bengal, and Odisha between 2005 and 2010, although their fairness declined later.

Table-2: FFC and Decomposition of Redistributive Impact of Out-of-pocket Payment

Quintiles of per capita consumption, gross	NSS50	NSS61	NSS66	NSS68	Percentage Change		
	'93-'94	'04- '05	'09-'10	'11-'12	(NSS61-NSS50)	(NSS66-NSS61)	(NSS68-NSS66)
Lowest quintile	2.8	1.2	1.8	0.5	-57.1	50.0	-72.2
2	5.4	3.0	4.2	1.4	-44.4	40.0	-66.7
3	7.6	7.8	8.4	2.3	2.6	7.7	-72.6
4	13.1	18.6	16.3	7.4	42.0	-12.4	-54.6
Highest quintile	71.1	69.3	69.3	88.4	-2.5	0.0	27.6
FFC	0.8851	0.8834	0.8729	0.8512	-0.2	-1.2	-2.5
Payments as fraction of Income (g)	0.0171	0.0199	0.0234	0.0038	16.4	17.6	-83.8
Kakwani index assuming horizontal equity (K_e)	0.0228	0.3112	0.2633	0.2729	1264.9	-15.4	3.6
Vertical effect (V)	0.0004	0.0063	0.0063	0.0010	1475.0	0.0	-84.1
Horizontal inequality (H)	0.0024	0.0010	0.0010	0.0007	-141.7	00.0	-30.0
Re-ranking (R)	0.0006	0.0009	0.0006	0.0000	50.00	-33.33	-100
Total redistributive effect (RE = V - H - R)	0.0034	0.0045	0.0047	0.0017	32.4	4.4	-63.8
V / RE	0.1182	1.4171	1.3298	0.6069	1098.9	-6.2	-54.4
H / RE	0.7110	0.2183	0.2115	0.3816	-130.7	-3.1	-280.4
R / RE	0.1708	0.1988	0.1142	0.0116	-216.4	-42.6	-110.2

Source: Author's Calculation.

Table-3 shows the values of the component of the AJL decomposition of redistributive effect. Out-of-pocket expenditure exerted a dis-equalizing effect on income distribution in both 2005 and 2010. In many states, the impact was disproportionately high. The magnitude of RE was not very high but has increased to a certain extent. States like Jammu and Kashmir, Gujarat, Manipur, Mizoram, and Punjab experienced larger positive changes. However, other states like Haryana, Nagaland, Arunachal Pradesh, and Assam showed a dramatic fall in RE of out-of-pocket payment for health care. Overall, during 2005 to 2010, there was a high impact of RE for out-of-pocket payment in India. This happened because of change in vertical redistribution (V) and changes in horizontal inequity and re-ranking (H+R). The Kakwani index in both years was positive, but declined dramatically in 2010. This means that health care payment structure was less progressive in 2010 than in 2005. The reduction of pro-poor redistribution was due to an increase in the overall share of pre-payment income absorbed by out-of-pocket payment. The other determinants of RE during this period are vertical effect (V), horizontal inequity, and re-ranking (H+R). Most Indian states faced the impact of large vertical income redistribution during this period. Many states such as Jammu and Kashmir, Gujarat, Manipur, and Arunachal Pradesh, and the union territory of Chandigarh faced

the impact of high vertical redistribution, whereas horizontal inequity and re-ranking have had less impact.

Table-3: Percentage Changes of FFC, V, H, R and RE of Out-of-pocket Payment across the States during 2005 to 2010

	FFC		V		H		R		RE	
	'05-'10	'10-'12	'05-'10	'10-'12	'05-'10	'10-'12	'05-'10	'10-'12	'05-'10	'10-'12
Andhra P.	2.2	-2.5	5.5	-100.0	-37.5	-20.0	20.0	-88.9	9.4	-117.1
Arunachal P.	-6.1	6.3	42.9	-30.0	200.0	-100.0	1400.0	-100.0	-350.0	-170.0
Assam	-0.3	-2.1	-82.4	33.3	100.0	-100.0	-50.0	-100.0	-116.7	-250.0
Bihar	-1.9	-5.7	20.0	-72.2	50.0	-66.7	0.0	-100.0	10.0	-72.7
Jharkhand	-2.3	1.4	-70.6	20.0	100.0	-100.0	0.0	-100.0	-127.3	-300.0
Delhi	1.4	-7.3	-25.0	-166.7	NA	0.0	NA	-50.0	-75.0	-500.0
Goa	1.4	4.4	-38.3	-88.0	120.0	-100.0	100.0	-100.0	-75.8	-68.8
Gujarat	2.4	-4.8	166.0	-97.0	-10.0	-88.9	116.7	-100.0	250.0	-96.9
Haryana	10.1	-2.7	117.2	-103.2	-33.3	-66.7	-17.4	-110.5	-1366.7	-105.3
Himachal P.	-1.5	5.1	53.2	-98.6	41.7	-88.2	-4.2	-100.0	190.9	-103.1
Jammu Kashmir	-3.3	-4.1	1850.0	-98.3	700.0	-87.5	700.0	-87.5	2425.0	-100.0
Chhattisgarh	6.1	-3.5	0.0	-103.0	-33.3	-75.0	-33.3	-133.3	9.8	-101.8
Karnataka	-7.2	-1.9	9.4	-97.1	75.0	-71.4	-14.3	-100.0	4.8	-104.5
Kerala	0.6	-4.5	-11.1	-113.6	7.1	-60.0	-5.7	-121.2	-30.6	-172.0
Madhya P.	3.0	-3.7	-53.1	-97.4	20.0	-83.3	-37.5	-100.0	-59.7	-100.0
Maharashtra	-4.1	-1.8	-25.3	-100.0	18.2	-69.2	17.6	-110.0	-51.1	-108.7
Manipur	0.5	0.5	133.3	-100.0	-33.3	-100.0	-33.3	-100.0	466.7	-100.0
Meghalaya	0.6	-0.3	-58.8	-57.1	0.0	-100.0	-50.0	-100.0	-57.1	-50.0
Mizoram	0.4	0.1	0.0	-100.0	0.0	-100.0	-100.0	NA	100.0	-150.0
Nagaland	0.1	-0.1	-200.0	-133.3	-100.0	NA	NA	NA	-175.0	-133.3
Orissa	4.7	-7.8	-15.9	-89.2	0.0	-83.3	-57.1	-66.7	0.0	-96.0
Pondicherry	-7.9	7.4	-77.7	-112.0	100.0	-50.0	128.6	-93.8	-99.0	-900.0
Punjab	-10.6	0.7	88.5	-98.0	87.5	-86.7	116.7	-73.1	79.7	-106.6
Rajasthan	-2.3	0.1	5.0	-101.6	16.7	-71.4	-14.3	-100.0	12.8	-106.8
Sikkim	-0.1	0.1	-150.0	0.0	NA	NA	NA	NA	-150.0	0.0
Tamil Nadu	-3.4	-5.4	42.6	-98.7	100.0	-50.0	33.3	-106.3	42.1	-103.7
Tripura	-7.0	7.2	7.5	-88.4	166.7	-100.0	325.0	-100.0	-45.5	-72.2
Uttar P.	-3.7	-8.7	-13.8	-92.8	8.3	-76.9	5.6	-94.7	-26.0	-100.0
Uttaranchal	-6.7	6.3	10.3	-109.4	0.0	-80.0	7.1	-100.0	44.4	-130.8
West Bengal	3.2	-11.9	17.4	-92.6	25.0	-70.0	-13.3	-92.3	23.4	-96.6
A & N Islands	-3.3	6.5	58.5	-92.3	0.0	-100.0	400.0	-100.0	35.1	-90.0
Chandigarh	-0.5	1.2	2350.0	-85.7	200.0	-66.7	100.0	-100.0	-1300.0	-80.6
D & N Haveli	0.4	-13.9	-100.0	NA	-100.0	NA	NA	NA	-100.0	NA
Daman & Diu	-2.2	-5.5	-150.0	133.3	-100.0	NA	-66.7	-100.0	NA	100.0
Lakshadweep	14.4	-14.5	-195.6	-102.3	-44.4	-80.0	-41.7	-96.4	-136.1	-109.4
India	**-1.2**	**-3.1**	**0.0**	**-84.1**	**0.0**	**-170.0**	**-33.3**	**-100.0**	**4.4**	**-63.8**

Source: Author's calculation

However, in 2010 and 2012, the value of RE declined across all the states, because the Kakwani index of health care payment indicates progressivity in the health care payment structure. In addition, the value of vertical effect (V) declined during this period, and the greater intensity in the decline of RE may be attributed to this decline.

To find out the major determinants of inequity of health care financing, we developed a regressions model where the dependent variable is RE and the independent variables are health expenditure (he), poverty ratio (pov), Gini coefficient (gc),vertical and horizontal inequity for health care payment, and time dummy (year =1, 0 otherwise). We estimate the equation by both ordinary least square (OLS) and fixed effect models, examine all these variables, and confirm that the fixed effect model is more relevant to this than the random effect model, because the value of chi-square is high (13.03) and the p-value of chi-square is very low (0.2218). This model assists in controlling for unobserved heterogeneity when it is constant over time and correlated with independent variables.

Apart from horizontal and vertical inequity, the other determinants of RE are poverty ratio, public health expenditure (Central as well as state), and time dummy (*Table-4*). The health care payment structure was more equitable in 2010 than earlier. Income inequality (state Gini coefficient) also has a negative correlation with RE. Utilization of fund as a percentage of total funds released for health has a positive correlation with RE. However, when we control these variables for the state-specific effect, the results change a little. This means that the state-level intervention for any health programme is an important factor of health outcome, including equity, in health care finance.

Table-4: Determinants of Re-distributive Effect: Regression Results

Redistributive effect	OLS		Fixed effect	
	Coefficient	t-values	Coefficient	t-values
Poverty	.29124*	5.53	.67451*	4.56
Gini coefficient	-.30587	-1.19	.52798	0.69
Health expenditure	.052956**	1.94	-.61416	-1.51
vertical inequity	1.57137*	24.92	1.5167*	13.12
Horizontal inequity	-.65489*	-9.33	-.59767*	-3.66
Time Dummy(2010=1, 0 otherwise)	.13998**	1.89	.65096*	2.33
Constant	-4.56632	-6.07	5.61149	0.89
Total observations=58, Number of group=33	R2=0.9468		R2=0.9466	

* Indicates significant at 1 %, ** Indicates significant at 5 % level
Source: Author's Calculation.

4. Discussions and Conclusions

The NHP 1983 attempted to synthesize the recommendations of the earlier Bhore Committee (1946), Mudaliar Committee (1962), and Srivastava Committees (1975, 1976) with the vision of providing basic medicine, medical training, and medical education as part of social justice. In 2002, India made another change to its health policy by strengthening the health system and providing additional financial resources for health.

In 2005, India made a major change to its health system by implementing the NRHM, which aimed to enhance equity in the access to public health services and to increase health outcome by reducing IMR and MMR. Apart from the NRHM, India has implemented a health insurance scheme (RSBY), which provides direct cash transfers to the poor to protect them from catastrophic OOPS. However, even after implementing these programmes, India is still far behind its goal of enhancing equity in health care financing. The OOPS for health care has declined, but the level of expenditure, particularly in low-income households, is still very high—they spend nearly 24 per cent of their non-food expenditure, but the high-income group spends 10.7 per cent. Therefore, some inequity persists among the various socio-economic groups.

Out-of-pocket expenditure declined between 1993 and 2009, but increased suddenly between 2009 and 2012 for low-income groups. The main reason for increasing health care expenditure might be the introduction of user charges in public facilities (Pinja 2012). Another reason of high medical cost is the higher cost of medicines and diagnostic tests, even in government hospitals. In case of inpatient care, hospitalization and medical charges, which were already very high, have increased over time. Hospitalization charges have increased because user fees have been introduced in government facilities. User fees persuade people to reduce their utilization of public hospitals and increase their utilization of private hospitals, which ultimately increases the cost of medical care. As a result, the Indian health care payment structure is moving towards less fairness in the out-of-pocket payment component. However, the value of the FFC index cannot explain the reason for these changes, as it is blind to who (poor or rich) pay more as a share of their income (Wagstaff 2009). In other words, this index cannot explain whether the FFC is falling due to the horizontal redistributive effect of health financing or vertical redistributive effect of health financing.

The vertical effect (V) of health care payment on income redistribution increased from 0.0004 in 1993-94 to 0.0063 in 2004–05, and then decreased to 0.0010 in 2012. The higher value of V may be due to the greater value of g (the share of pre-payment income absorbed by health care payment) or the lower value of K (Kakwani index). However, K showed a higher value in 2004–05. This means that the health care payment structure was more progressive during this period but became somewhat less progressive later on. Thus, as the value of g increases, the vertical effect of health care on income redistribution increases in the corresponding year. This means that although the progressive health care payment structure could have exerted an equalizing effect of income redistribution, the disproportionately higher proportion of health care payment (g) exerted the dis-equalizing effect. The value of vertical effect fell to 0.0010 in 2012 due to the greater progressivity of health care payment as well as the lower fraction of income absorbed by health care payment (g).

On the other hand, horizontal inequity (H) and also re-ranking fell over the period. Horizontal difference (sum of H and R) is the inequity in post-payment income within a group. It always makes the post-payment income redistribution more unequal than in the absence of horizontal inequity. Reduction in horizontal difference over time implies

higher unequal distribution of income due to health care payment, which has a greater impact on RE, that also fell to 0.0017 in 2012. The main determinant of RE is V, and its value was also lowest in 2012. This implies that poor people are paying a lower share than earlier as compared to high-income groups. One interpretation of this phenomenon is that government-funded health care services have a higher impact on the low-income group, or that government-sponsored health programmes (NRHM, RSBY, etc.) produce higher equity in OOPS on health.

However, the redistributive impact of health care payment was not uniformly distributed across states. States like Jammu and Kashmir, Gujarat, Manipur, Mizoram and Punjab experienced a higher impact than states like Haryana, Nagaland, Arunachal Pradesh, and Assam, because of state-level heterogeneity in health care infrastructure, health financing, morbidity pattern, and other macroeconomic state-level factors. Apart from horizontal and vertical difference, rate of poverty, per capita state GSDP, and public health expenditure (State and Central) are the major factors of health inequity. Economically developed states like Haryana and Delhi and the union territory of Chandigarh are performing well. All North Indian states, and union territories like Lakshadweep and Pondicherry, are also performing well. These states are also better off in terms of human development index and other health indicators, which is consistent with these results.

This study concludes that, overall, changes made by the Government of India to its health policy, especially 2005 onwards, has had a positive impact on equity in out-of-pocket payment and income inequality (but not on poverty). Over the period, the share of pre-payment income absorbed by OOPS fell to some extent and increased the progressivity of payment structure. Over the same period, horizontal differences (H+R) have also fallen (but only a very small percentage). Thus, these were even more important sources of RE in recent years than earlier.

These results can help shape national health policy. The introduction of new health policies, especially the implementation of the NRHM in 2005, RSBY, direct cash transfer policy (such as RKS), and state-level health insurance schemes particularly for the poor, would increase the utilization of public health facilities and also reduce out-of-pocket payment. The high cost of medicines and diagnostic tests is still the killing field. A CCT policy can help reduce out-of-pocket payment of medicines and medical tests. The national health insurance scheme for the poor (RSBY) remains small-scale; its expansion can produce better results and that, in turn, can be expected to reduce inequity in out-of-pocket payments and make it more progressive.

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