Health Expenditure Benefit Incidence: WHO International Classification of Diseases-wise Analysis of India

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Abstract

Fiscal policies and inequality' is an elusive area of research. This study examines disease-wise utilisation of publicly subsidised healthcare in India using benefit incidence analysis. Quite contrary to the earlier studies on benefit incidence analysis based on aggregate public health spending, our study attempts the *benefit capture* by mapping the classification of diseases extracted from the unit record data of the latest 75th National Sample Survey health rounds with the latest International Classification of Diseases (ICD)-11 of version 2024 produced by World Health Organisation (WHO). Our broad findings based on the WHO_ICD disease-specific benefit incidence analysis revealed that the public health subsidy appears to be pro-poor or progressive in distribution for WHO_ICD categories, however with evident gender differentials. The disaggregated benefit incidence analysis based on ICD also showed that there is no "elite capture" in the public health financing in India. This inference has policy implications for strengthening the role of fiscal policy in further ensuing equality and social justice in access and utilisation of health care in India.

Keywords: concentration curve; public healthcare; health inequality; benefit incidence analysis; gender

JEL Codes: H75, I14, I18

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1. Introduction

Fiscal policies and inequalities is an elusive area of research. The public expenditure benefit incidence analysis (BIA), is a relatively simple and practical method to identify how well public services are targeted to certain groups in the population, across gender, ethnicity, income quintiles and geographical units. BIA involves allocating *unit cost* according to individual utilization rates of public services. The studies on BIA revealed that a disproportionate share of the health budget benefits the elite in urban areas, or that the major part of education budget benefits schooling of boys rather than girls, which has important policy implications.

The public expenditure BIA helps in analyzing the distributional impacts of public expenditure, especially in social sector- viz, education and health sector. The behavioural approach to capture the distributional impacts of public spending – another methodology - is based on the notion that a rationed publicly provided good or service should be evaluated at the individual's own valuation of the good, which (Demery, 2000) called a 'virtual price'. Such prices will vary from individual to individual. This approach emphasizes the measurement of individual preferences for the publicly provided goods. The methodological complications in the valuation of revealed preferences based on the microeconomic theory and the paucity of unit record data related to the knowledge of the underlying demand functions of individuals or households led to less practicability of the behavioral approaches in estimating the distributional impact of public expenditure.

The benefit incidence analysis of public expenditure reveals the inequities in spending and the studies are broadly confined to education and health sectors (Filmer & Lant, 1998); (Castro-Leal, Dayton, Demery, & Mehra, 1999); (Demery, 2000); (Sahn & Younger, 2000); (Davoodi, Tiongson, & Asawanuchit, 2003); (Manasan, Cuenca, & Villanueva, 2007); (Lustig, 2015). In India, the existing studies on benefit incidence of public health spending reveals a high gender (male-female) and regional (rural-urban) differentials (see (Mahal, et al., 2001); (Chakraborty, Singh, & Jacob, 2013); (Bhadra, 2016). However, these studies have not attempted the epidemiological categorization of public health expenditure benefit incidence. In this chapter, quite different from the existing literature, a meticulous disaggregation of disease-specific public health expenditure benefit incidence - based on International Classification of Diseases (ICD) by World Health Organisation (WHO) - is attempted.

The International Classification of Diseases (ICD) is the international standard diagnostic classification for all general epidemiological and many health management purposes. It is a tool for systematic recording, analysis, interpretation and comparison of mortality and morbidity data. The ICD translates diagnoses of diseases and other health problems into an alphanumeric code, which allows storage, retrieval, and analysis of the data. According to an international treaty, the 'WHO Nomenclature Regulations', adopted by the World Health Assembly, all WHO Member States are expected to use the most current version of the ICD for reporting death and illness. In healthcare, the Benefit Incidence Analysis (BIA) is used to understand the distribution of the utilisation of healthcare, and whether public spending on health is well-targeted to the poor segment of population (McIntyre and Ataguba, 2011). Inherently, the differential between the demand for, and supply of healthcare affects its rate of utilisation (Yu *et al*., 2021). More specifically, the availability/unavailability of public health facility with presence/absence of disease-specific specialists in a locality (Barik and Thorat, 2015), and whether more than one doctor is available for each disease in a public health facility so as to people may "vote with their feet" to reveal their choices and preferences (Tiebout, 1956), play a paramount role in explaining the incidence of treatment seeking from public health institutions.

Essentially, utilisation of public health services depends on various 'non-price' factors, which cannot be captured through benefit incidence analysis (Arrow, 1963; Manasan *et al*., 2007). Individual income level and comparatively less availability of private health infrastructure in rural area may be explanatory reasons behind greater dependence on public health services. The situation is further compounded by the behavioural factor, as a key 'non-price' factor, of healthcare utilisation since non-treatment of some illness, and lack of knowledge and awareness about when to seek medical care tend to put up lower number of healthcare users (Banerjee *et al*., 2004; Sen, 2010). The behavioural differences bear far reaching consequences on the benefit incidence estimates, since hospital-based services generally cost comparatively more than the same being offered through primary and community health centres/clinics. An efficient programme can improve the behavioural pattern of non-treatment of ailments especially amongst the rural poor. Consequently, the numbers of accessibility will go up, which would in turn change the cumulative percent of consumption-based population quintiles. However, while the BIA is not sufficient to address many non-price factors and demand-supply incongruity-driven aspects of healthcare utilisation, but understandably, the BIA results informs the status quo of redistributive implications of fiscal policy (Essama-Nssah, 2008).

This paper analyses the benefit incidence in the health sector using the WHO International Classification of Disease (ICD) categorisation. The existing BIA analysis in the health sector is at the aggregate level, and is not analysed for ICD categories of incidence. The paper is structured as follows. Section 2 presents the analytical framework of benefit incidence and the empirical literature. Section 3 presents the results of disease-specific public health expenditure benefit incidence incorporating region-wise gender differentials across socio-economic classes. Section 4 concludes the study.

2. The Analytical Framework and the Empirical Literature

Against the rule-based fiscal framework across India (Fiscal Responsibility and Budget Management Act), there is a growing recognition for targeting, a tool to concentrate the benefits of public spending to the poorest segments of the population, thereby reducing or keeping constant the amount spent on merit goods. Coady, Grosh and Hoddinott (2004) interpreted targeting as a means of increasing the efficiency of the spending by increasing the benefits that the poor can get with a fixed program budget. Prima facie, a well-targeted program, will appear to be the one which achieves minimum leakage to the non-poor, so that any given resource transfer will have maximum impact on poor households (Mateus, 1983; Grosh, 1992). Cornia and Stewart (1993) pointed out that this may be incorrect for a number of reasons, including administrative and efficiency costs, political factors and other general equilibrium effects as well as the errors of targeting. Why the criterion of minimizing leakage may not be the right one lies in the existence of two errors - errors of omission of the poor from the scheme (type I), as well as errors of inclusion of the non-poor (type II). These errors, which co-exist with the targeting, cannot be captured through BIA.

The public provisioning of a service is regressive when benefits from the service are distributed less equally than either income or consumption. However, a rising trend from Q1 to Q5 (the quintile shares of benefit) cannot unambiguously be taken as evidence of regressivity. In this case additional information is needed on either the Lorenz curve of income or consumption or the income/consumption share of each quintile. Prima facie, the public spending is said to be regressive if spending on Q1 is less than spending on Q5 when each is expressed as fraction of income or consumption, or when the concentration curve for the benefits lies below the benchmark curve for income or consumption. The theoretical framework of benefit incidence has lacunae as the results of benefit incidence represents an "equilibrium" outcome of government and household decisions and does not specify a model underlying the behaviour of either government or households (see Davoodi et al., 2003 for details).

Further, it is important to mention one major limitation of BIA flagged by Lanjouw and Ravallion (1999) and Younger (2003). The authors argued that estimating average benefits for income/consumption expenditure groups can be misleading since the poorest segment may gain a larger share of marginal benefits due to the programme expansion through assigning priorities in budget for that particular sector, but its average benefit share may remain low. Therefore, the authors emphasised on estimating the marginal incidence of benefit by computing marginal odds-ratio than the average odds-ratio and comparing these two ratios to show the differentials in the benefit incidence. However, computing marginal incidence of public expenditure benefit in Indian context is difficult since data is not available regarding how much a local government spends on health and its temporal changes after the programme expansion.

Keeping these issues in consideration, therefore in this study, we implement a standard methodology to analyse the benefit incidence of public spending on merit goods by the Lorenz curve with various benchmark concentration curves (see Davoodi *et al*., 2003; O'Donnell *et al*., 2008). A concentration curve is plotted by the cumulative percent of benefits of subsidised government service of merit goods on the y-axis against the cumulative percent of sorted (in ascending order) per capita income/consumption expenditure based population groups (deciles or quintiles) on the x-axis. Now, at the outset, two lines need to be plotted as the 'point of reference' curves based on income/consumption expenditure for comparison - one is the 45 degree diagonal line and the other is Lorenz curve (Figure 1). The former curve represents equality in the distribution of benefits while the later curve signifies that if a benefit concentration curve lies in between the line of equality and Lorenz curve then public expenditure relating to income/consumption will be considered as progressive whereas if a benefit concentration curve lies below the Lorenz curve then public spending relating to income/consumption will be considered as regressive (pro-rich). In the figure, the only convex shaped curve that lies above the line of equality reveals that the benefits of public spending are pro-poor. The distribution of benefits cannot be considered as regressive until the convex curve shifts below the Lorenz curve.

The public subsidy on health service received by an individual is defined as,

$$S_{hi} = U_{hi}C_{hi} - f_{hi} \qquad (1)$$

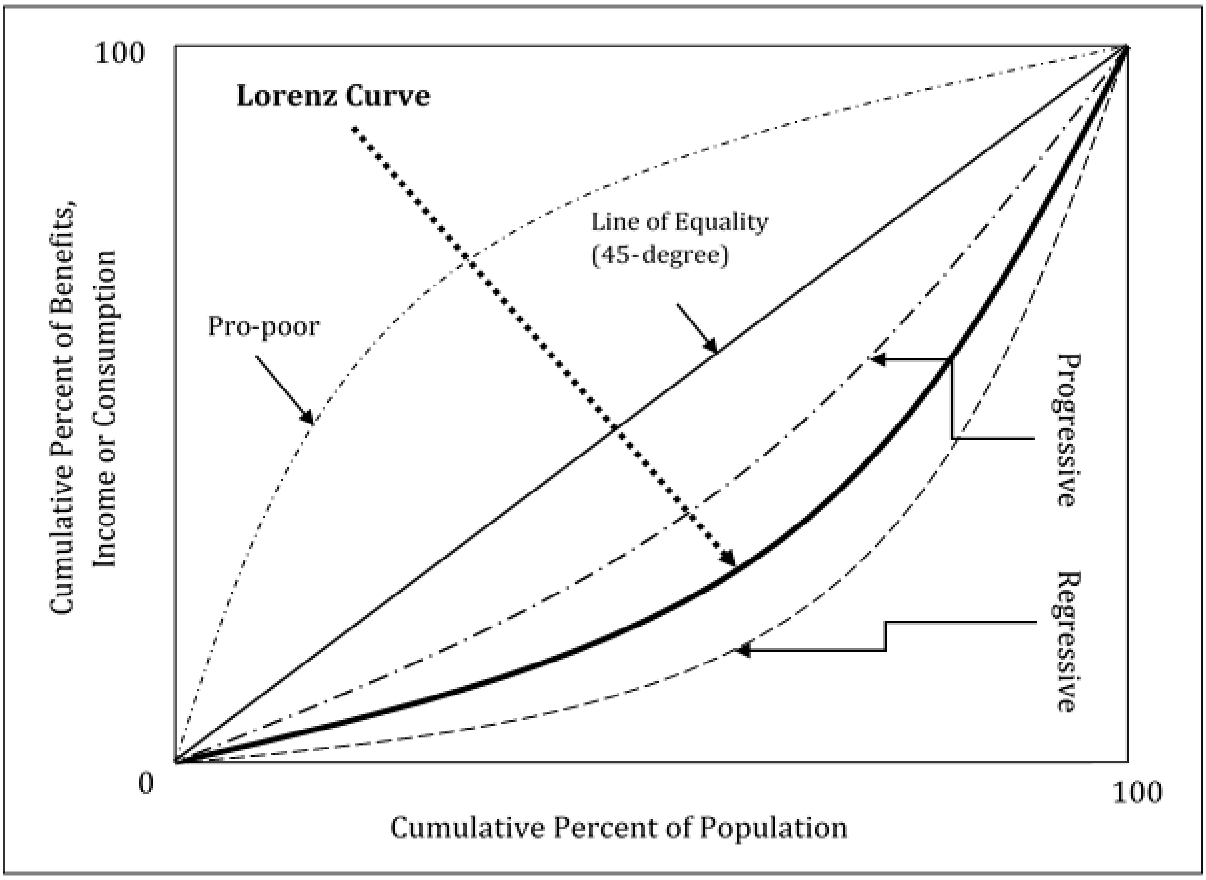
where S_{hi} indicates the quantity of health service h utilized by individual i, C_{hi} denotes the unit cost of providing h in the region j where i resides and f_{hi} indicates the amount paid for h by i.

The public spending benefit incidence across different socio-economic groups is defined as follows:

$$X_j \equiv \sum_i \frac{U_{ij}}{U_i} S_i \equiv \sum_i u_{ij} S_i \qquad (j = 1, 2, 3, 4, 5) \qquad (2)$$

The benefit incidence of public health spending accrued to group j is estimated by equation 1, where X_j is the benefit incidence from the total health spending enjoyed by income or consumption expenditure group j; U_{ij} represents the number of beneficiaries that utilise health service in level i from group j; U_i is the utilisation of service in level i by all income or consumption groups combined; S_i denotes net public spending on health level i; and u_{ij} represents share of group j of utilisation of service in level i. Index j ranges from 1 to 5 signifying the quintiles of socio-economic groups as poorest (Q1), poorer (Q2), poor (Q3), rich (Q4) and richest (Q5).

Figure 1: Public Spending Benefit Incidence: Lorenz and Concentration Curves



Source: Davoodi *et al*. (2003); O'Donnell *et al*. (2008).

The disease-specific utilisation of healthcare data has been obtained from the latest NSS round namely, 'Key Indicators of Social Consumption in India: Health' (75th round, July 2017 – June 2018). This round has randomly interviewed 1,13,823 households spread over rural and urban areas of every district in the country. The list of diseases covered in this round has been mapped with ICD-11 of version 2024 (see Table 1). The ICD is an internationally unified disease classification developed by the World Health Organization (WHO). The ICD taxonomy is done and being changed over time based on the changing pattern of "etiology, pathology, clinical manifestations, and anatomical location in a systematic fashion" of diseases (Yan *et al*., 2022). However, the mapping brings a point into attention that NSSO has not covered two important ICDs (ICD-11: Version 2024: XX: Developmental anomalies; and ICD-11: Version 2024: XXI: Symptoms, signs and abnormal clinical and laboratory findings, not elsewhere classified).

Table 1: Disease Mapping between NSS 75th Round (2017-18) and ICD-11 (2024)

ICD-11 Version: 2024	NSS: 75th Round (2018)
I. Certain infectious and parasitic diseases	Infection (Codes 01 to 12)
II. Neoplasms	Cancers (Code 13)
III. Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism	Blood diseases (Codes 14 and 15)
IV. Diseases of the immune system	Endocrine, metabolic, nutritional (Codes 16 to 19)
V. Endocrine, nutritional and metabolic diseases	
VI. Mental, behavioural or neuro-developmental disorders	Psychiatric and Neurological (Codes 20 to 26)
VII. Sleep-wake disorders	
VIII. Diseases of the nervous system	
IX. Diseases of the visual system	Eye (Codes 27 to 31)
X. Diseases of the ear and mastoid process	Ear (Codes 32 and 33)
XI. Diseases of the circulatory system	Cardio-vascular (Codes 34 and 35)
XII. Diseases of the respiratory system	Respiratory (Codes 36 to 38)
XIII. Diseases of the digestive system	Gastro-intestinal (Codes 39 to 42)
XIV. Diseases of the skin	Skin (Code 43)
XV. Diseases of the musculoskeletal system and connective tissue	Muscular-skeletal (Codes 44 and 45)
XVI. Diseases of the genitourinary system	Genito-urinary (Codes 46 to 48)
XVII. Conditions related to sexual health	Obstetric (Codes 49 to 51)
XVIII. Pregnancy, childbirth and the puerperium	
XIX. Certain conditions originating in the perinatal period	
XX. Developmental anomalies	NA
XXI. Symptoms, signs or clinical findings, not elsewhere classified	NA
XXII. Injury, poisoning and certain other consequences of external causes	Injuries (Codes 54, 55 and 58)
XXIII. External causes of morbidity and mortality	Injuries (Codes 52, 53, 56, 57, 59, 60, 87, 88, 89)

XXIV. Factors influencing health status and contact with health services	Out-patient

Source: 1) Key Indicators of Social Consumption in India: Health', NSS, 75th Round (July 2017 – June 2018);
2) ICD-11 2024, WHO.

2.1: The Empirical Literature

The BIA has enormously gained importance in 'health inequality' literature over last three decades (Younger, 2003) because of its appropriacy for the policy practitioners to understand the pattern of access to government subsidised health service by various socio-economic groups spread across different geographical locations in order to bring each individual in the social welfare function. Across the globe, an enormous amount of literature on benefit incidence of public health expenditure has evolved, which broadly shows that the public health spending is pro-poor in a few developing countries and progressive (but not pro-poor), but largely favored the better-off in a large number of developing countries (see Filmer *et al*., 1998; Castro-Leal *et al*., 1999; Demery, 2000; Sahn and Younger, 2000; Davoodi *et al*., 2003; O'Donnell et al., 2008; Lustig, 2015; Sambodo *et al*., 2021; Sheikh *et al*., 2023; Samba *et al*., 2024).

India shows quite similar results to the global studies on BIA. A number of studies in India analysed how the different socio-economic groups are accessing or being benefited from government subsidised health service delivery with the extent of gender differential across rural and urban areas. The studies have predominantly used previous three health rounds of National Sample Survey (NSS) of the Centre for Statistical Organisation (CSO), which are: 52nd round (July 1995-June 1996), 60th round (January-June 2004), and 71st round (January-June 2014) data. Of late, National Family Health Survey (NFHS) data has been used to analyse public health expenditure benefit incidence as well.

Using the 52nd round data, Mahal *et al.* (2001) found that publicly financed curative healthcare services are skewed towards the richer segment of population than the poorer segment, and private curative healthcare services are even more skewed towards the better-off vis-a-vis worse-off consumption quintiles. Chakraborty *et al.* (2013), using the 60th round of NSS data, analysed public health expenditure benefit incidence across States in order to track the gender and regional differentials across socio-economic classes, and found a mixed scenario. The authors found that in some States, benefits from public health spending accrue to the most disadvantaged (poorest) populations as compared to the wealthier populations whereas better-off populations utilize public healthcare more than worse-off populations in some States. Bowser *et al*. (2019) examined benefit incidence of public spending on inpatient, outpatient, and deliveries for Indian States using the 71st round of NSS data, and found that public inpatient healthcare spending largely fails to show pro-poorness while some progress was seen for the utilisation of public outpatient healthcare. Fairly similar to the findings of Bowser *et al*., Bose and Banerjee (2019) found that non-communicable disease-led public inpatient healthcare services are mostly utilised by the wealthier segment of elderly population. BIA study, using NFHS-4 (2015-16) data, found that utilisation of benefits of institutional delivery from public health centres emerged to be pro-poor (Mohanty *et al*., 2020).

This chronological literature review of India suggests that the benefit incidence of public health expenditure has not changed much in the last 20 years from 1995-96 (NSS 52nd round) to 2014-15 (NSS 71st round). Except for a few sporadic cases, it fairly shows pro-richness, or progressive (but not pro-poor). This however raises concerns about the effectiveness of fiscal policies to address its inequality effect, and political priority as well (Costa-Font and Parmar, 2017). It is useful to restate the issue as Costa-Font and Parmar see it, that "the development of institutions of self-governance are argued to strengthen the agency relationship between political incumbents and constituents in the delivery of essential public services. This effect is particularly important in guaranteeing access to health care among more vulnerable populations whose specific preferences and needs are not always accounted for by electoral processes. Electoral processes often aggregate preferences in a crude way, and it is not uncommon that political priorities do not align with the preferences and needs of neglected population groups."

It has also been observed from the chronological literature review that the public health expenditure benefit incidence has been extensively studied in Indian context. What is lacking, however, in the sphere of BIA literature in Indian context, is the analysis of disease-specific public health expenditure benefit incidence. This study, therefore, seeks to examine who benefits from health sector public subsidy by mapping the classification of diseases provided by the latest 75th NSS health round with the International Classification of Diseases (ICD). This analysis also aims to reflect how the targeting has changed, in particular, whether the targeting has improved.

3. Analysing the Public Health Expenditure Benefit Incidence

As discussed above, we have used concentration curves to show how the benefits of public health spending reaches the poor and decipher whether any region-based gender differentials exist. Figures 2-18 present the disease-specific public health expenditure benefit incidence by mapping the classification of diseases provided by the 75th NSS health round with the ICD-11 of version 2024. The corresponding Tables 2-18 present the percentage shares of region-based gender distribution across quintiles in healthcare utilisation of those diseases.

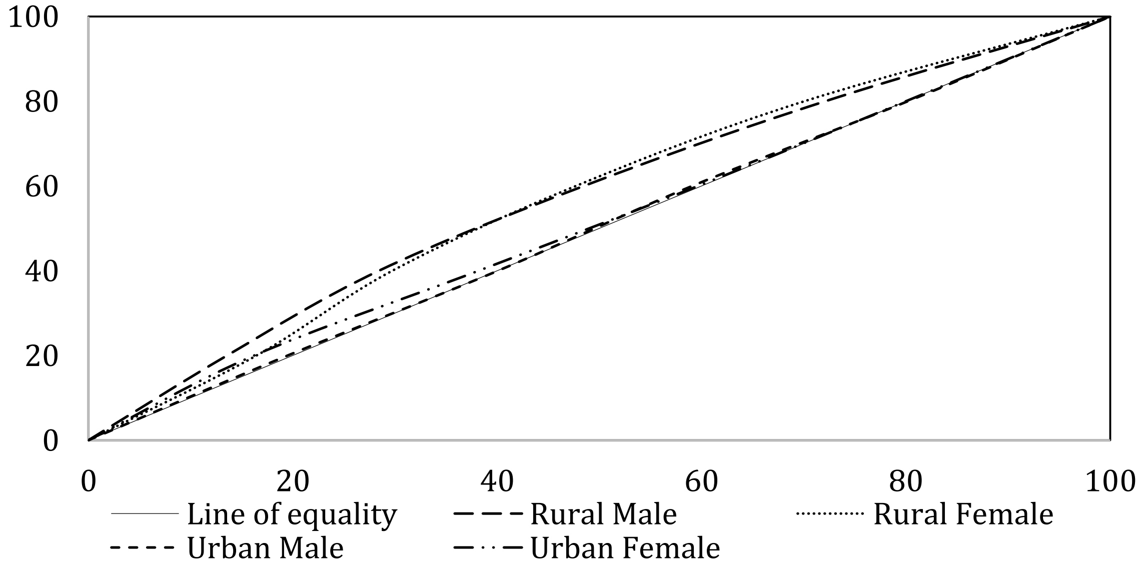
Overall, the concentration curves in our analysis broadly reveal that the targeting of public spending is pro-poor for most of the diseases, except onditions related to sexual health (ICD-XVII), Pregnancy, childbirth and the puerperium (ICD-XVIII), and Certain conditions originating in the perinatal period (ICD-XIX) (Figure 15) and Injury, poisoning and certain other consequences of external causes (ICD-XXII) (Figure 16). Besides, these curves show a moderately varied level of unequal access to disease-wise healthcare by region-wise male and female (rural male, rural female, urban male, urban female) of various socio-economic groups. Rates of access to public healthcare in case of almost all the diseases covered in this study are higher for the worse-off than for the better-off segment. The existence of quality private health service provisioning but with significantly higher cost differentials from public healthcare may be one of the reasons for not only the poor segments but also the richer segments to opt for public healthcare even though, of late, researchers argued that there has been a spurt in the average cost of inpatient care at the government hospitals and a decline in reliance on them (Mohapatra, 2019; Chauhan *et al*., 2022).

Similar to the benefit incidence of most of the disease-wise curative healthcare as inpatient care, the utilisation of preventive healthcare as outpatient care shows pro-poorness for rural male, rural female, urban male and urban female across all the quintiles as well. Region-based (rural and urban) gender differentials in healthcare utilisation show a varied pattern across diseases. In case of conditions related to sexual health, pregnancy, childbirth and the puerperium, and certain conditions originating in the perinatal period the public health subsidy appears to be pro-poor in distribution for rural male and female whereas public health expenditure benefit incidence appears to show pro-richness (Figure 15). A noteworthy gender differential in utilisation of public health subsidy for urban areas has been observed for injury, poisoning and certain other consequences of external causes, where urban female reveals progressive in nature while urban male shows pro-richness (Figure 16). Similar sort of gender differential in utilisation of public health subsidy for urban areas has been observed for the diseases of the ear and mastoid process, where urban male reveals pro-poor distribution while urban female shows pro-rich benefit incidence.

The concentration curves of these diseases, by and large, revealed a relative preference of the population across all the quintiles for public health services rather than private sector services, especially in rural areas. This behavioral pattern may be due to either the lack of adequate private provisioning of the private inpatient health-care system in rural areas or the lack of a “voting with feet” option to purchase health-care services from private providers of health-care due to cost, particularly when poor households face health costs that imply financial catastrophe. Nonetheless, a pro-poor pattern of health spending has been observed for urban areas in most of these diseases while pro-richness or progressivity in utilisation of public healthcare spending has been observed for only a few diseases.

The figures 2 -18 reveals the disease-specific benefit incidence basede concentration curves. The tables 2-18 revals the quintile-wise gender and geographic disaggregation of unit utilised of benefit incidence. The specific concentration curves and disaggregated inferences in tables 2-18 are not separately explained as it is becoming repetitive , and therefore the inferences are clubbed together with aberations in trends, as mentionedabove.

Figure 2: Region-based Gender Differentials in Healthcare Benefit Incidence: Certain infectious and parasitic diseases (ICD-I)



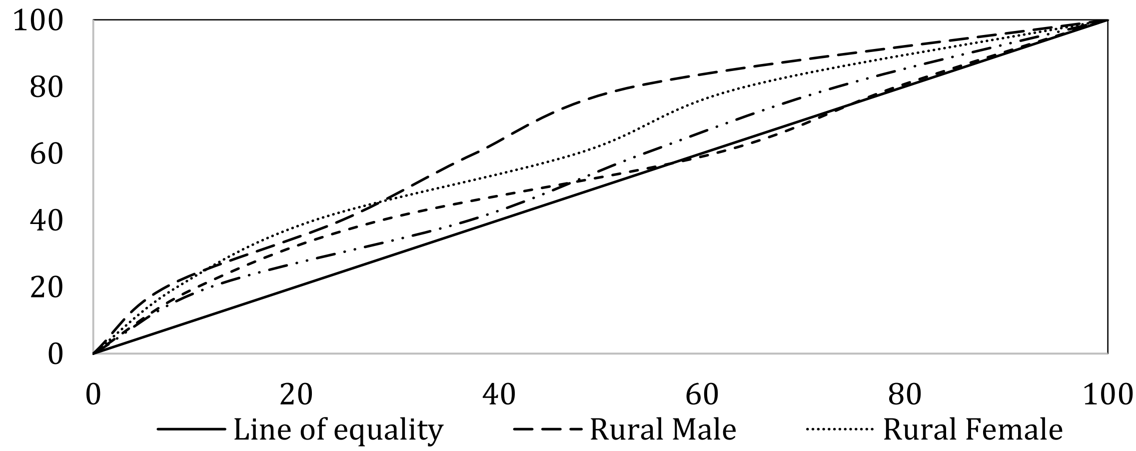
Source: NSSO Unit Level Data, 75th Round, 2017-18.

Table 2: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Certain infectious and parasitic diseases (ICD-I)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	13.57	16.46	19.51	16.22
Q2	14.85	13.28	20.57	21.96
Q3	20.05	17.96	19.00	21.48
Q4	23.62	22.36	21.10	20.34
Q5	27.89	29.94	19.81	20.00
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 3: Region-based Gender Differentials in Healthcare Benefit Incidence: Neoplasms (ICD-II)



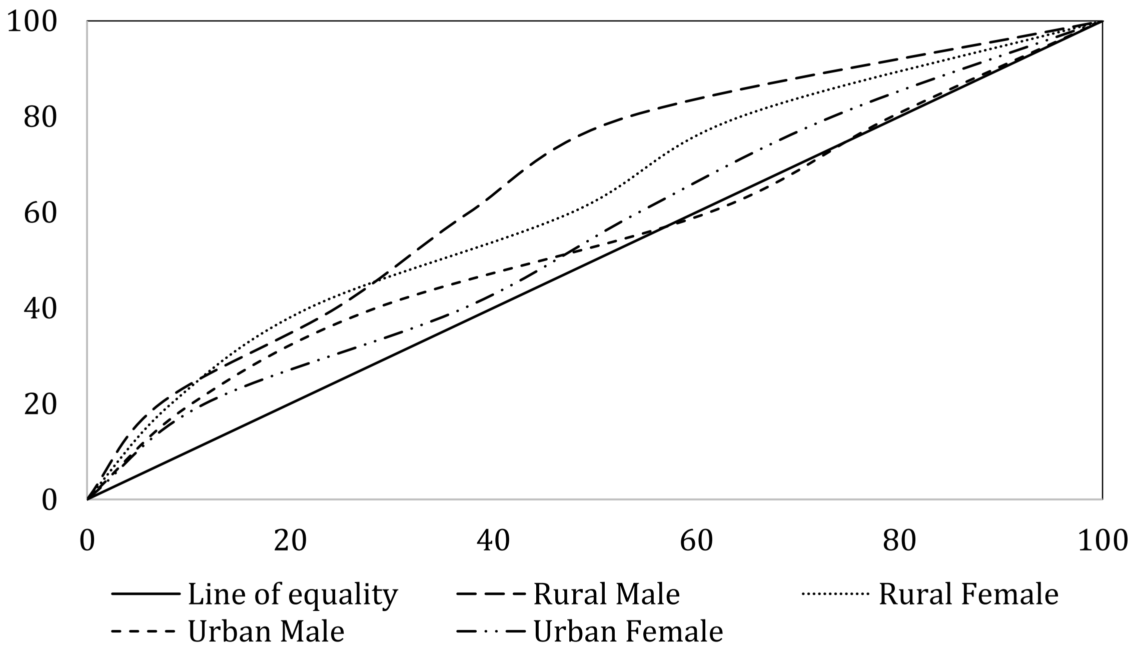
Source: Same as Figure 2.

Table 3: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Neoplasms (ICD-II)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	7.20	8.30	10.30	11.61
Q2	17.33	13.54	18.16	25.54
Q3	13.11	25.92	32.82	17.19
Q4	15.69	16.61	17.97	19.08
Q5	46.66	35.63	20.75	26.58
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 4: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (ICD-III)



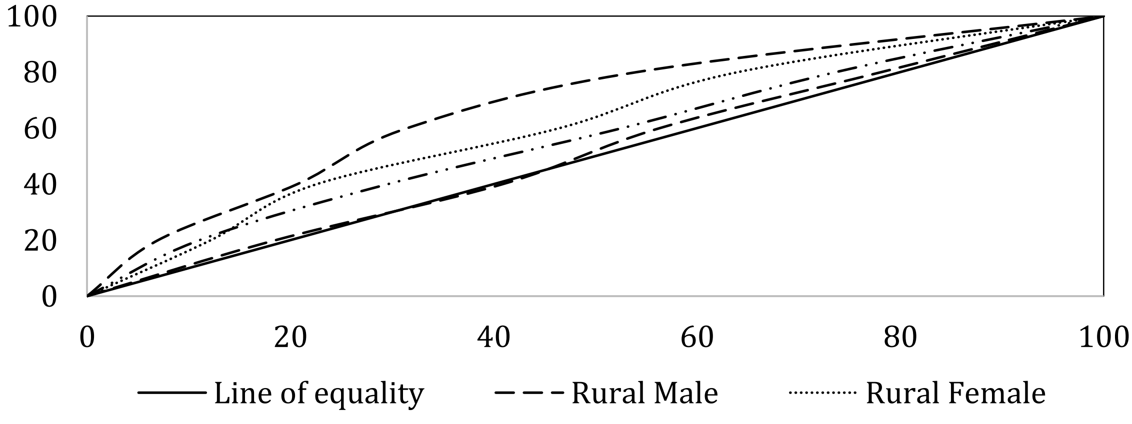
Source: Same as Figure 2.

Table 4: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the blood and blood-forming organs and certain disorders involving the immune mechanism (ICD-III)

Quintiles	**Rural Male**	**Rural Female**	**Urban Male**	**Urban Female**
Q1	7.20	8.30	10.30	11.61
Q2	17.33	13.54	18.16	25.54
Q3	13.11	25.92	32.82	17.19
Q4	15.69	16.61	17.97	19.08
Q5	46.66	35.63	20.75	26.58
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 5: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the Immune System (ICD-IV), and Endocrine, nutritional and metabolic diseases (ICD-V)



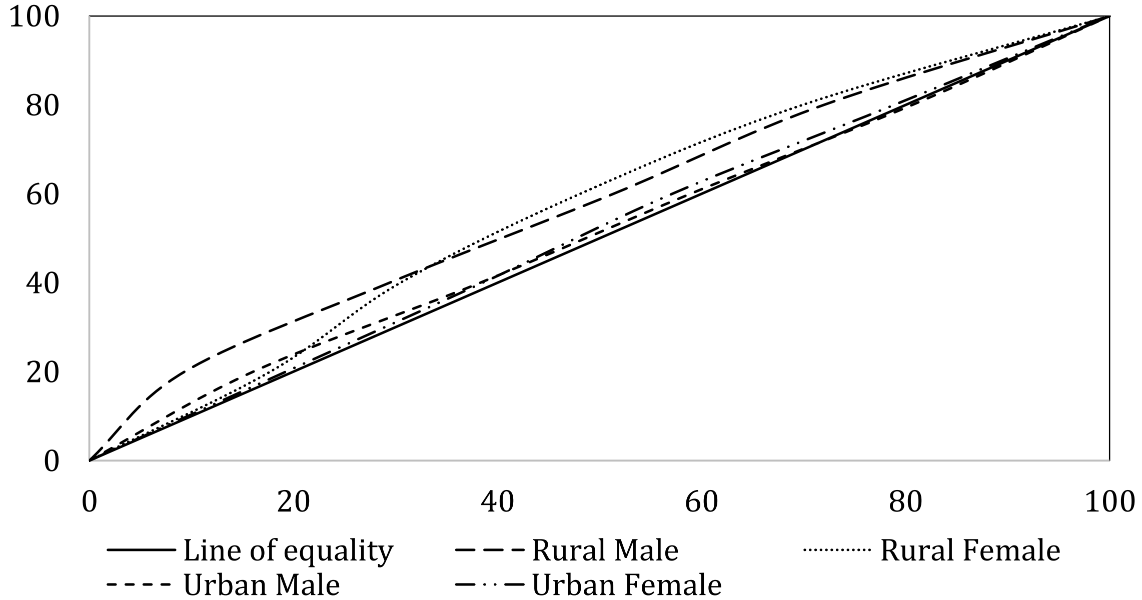
Source: Same as Figure 2.

Table 5: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the Immune System (ICD-IV), and Endocrine, nutritional and metabolic diseases (ICD-V)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	**6.99**	**12.18**	**18.56**	**11.07**
Q2	**13.70**	**10.42**	**22.34**	**18.53**
Q3	**10.82**	**23.88**	**15.45**	**23.03**
Q4	**22.58**	**17.55**	**21.79**	**21.04**
Q5	**45.91**	**35.96**	**21.86**	**26.33**
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 1

Figure 6: Region-based Gender Differentials in Healthcare Benefit Incidence: Mental, behavioural or neuro-developmental disorders (ICD-VI), Sleep-wake disorders (ICD-VII), and Diseases of the nervous system (ICD-VIII)



Source: Same as Figure 2.

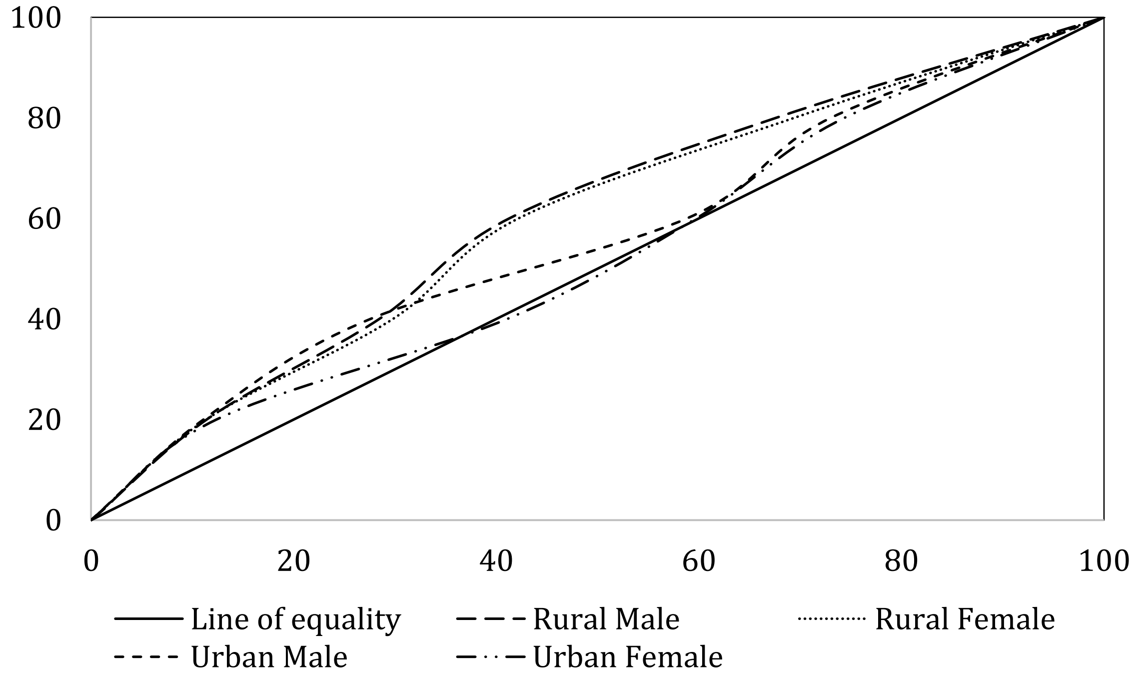
Table 6: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Mental, behavioural or neuro-developmental disorders (ICD-VI), Sleep-wake disorders (ICD-VII), and Diseases of the nervous system (ICD-VIII)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	9.34	17.73	16.06	19.27
Q2	20.08	12.75	22.24	19.28
Q3	21.94	17.60	20.60	18.58

Q4	20.62	21.80	21.74	21.75
Q5	28.02	30.11	19.36	21.13
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 7: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the Visual System (ICD-IX)



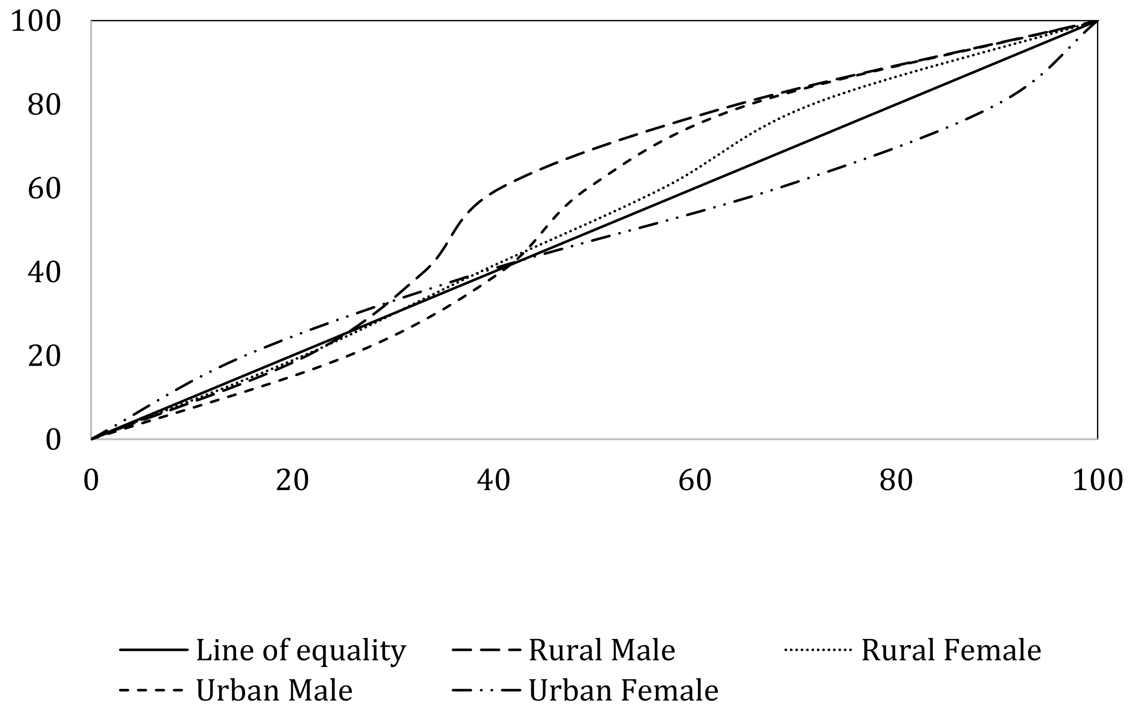
Source: Same as Figure 2.

Table 7: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the Visual System (ICD-IX)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	**11.41**	**11.36**	**11.10**	**12.37**
Q2	**17.04**	**18.44**	**16.47**	**28.71**
Q3	**12.83**	**12.39**	**31.24**	**18.66**
Q4	**26.33**	**27.23**	**14.21**	**14.64**
Q5	**32.39**	**30.59**	**26.98**	**25.63**
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 8: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the ear and mastoid process (ICD-X)



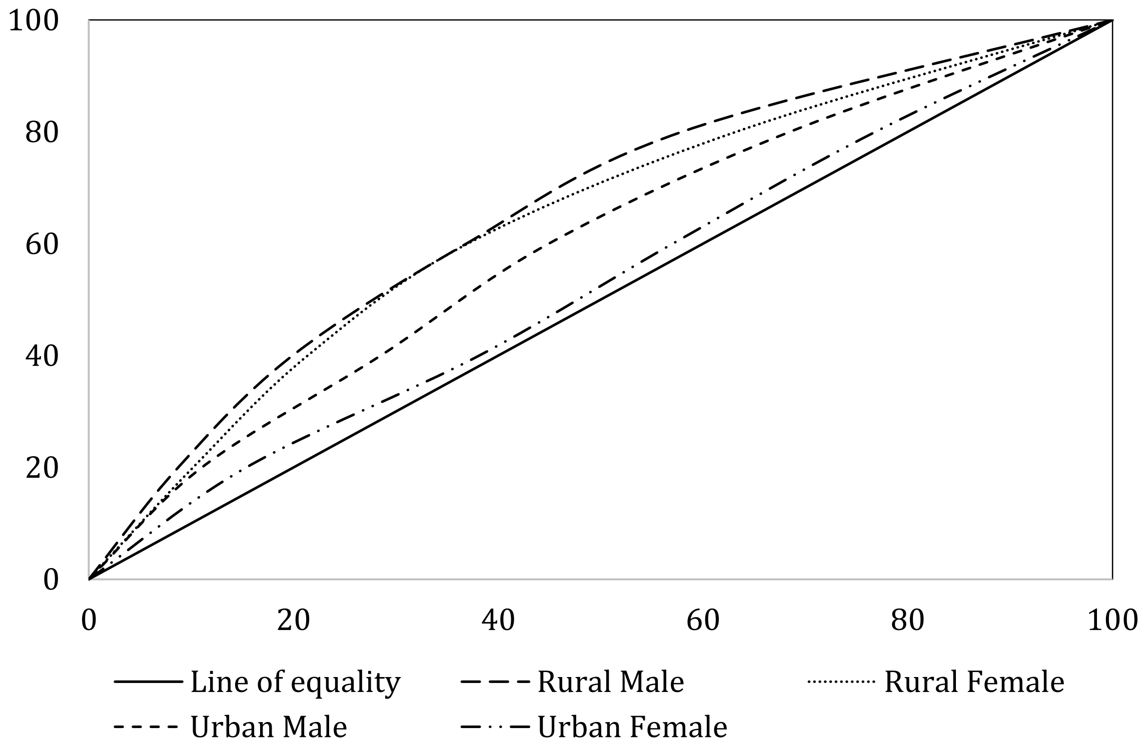
Source: Same as Figure 2.

Table 8: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the ear and mastoid process (ICD-X)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	21.48	21.13	25.60	15.31
Q2	11.59	17.52	15.13	23.64
Q3	7.60	18.17	8.63	29.33
Q4	23.56	14.82	16.10	21.72
Q5	35.76	28.36	34.54	10.00
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 9: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the circulatory system (ICD-XI)



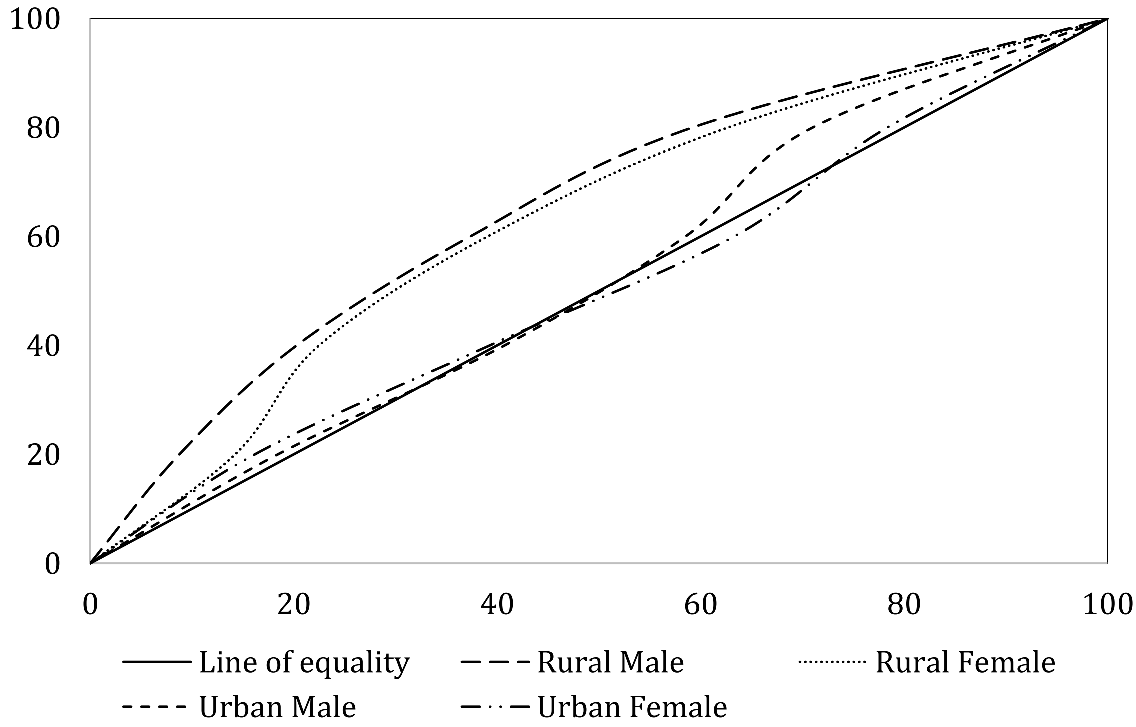
Source: Same as Figure 2.

Table 9: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the circulatory system (ICD-XI)

Quintiles	**Rural Male**	**Rural Female**	**Urban Male**	**Urban Female**
Q1	8.74	10.19	11.05	15.39
Q2	11.17	11.19	17.47	22.75
Q3	16.97	15.63	16.41	18.90
Q4	21.07	26.22	23.56	19.80
Q5	42.06	36.77	31.51	23.16
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 10: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the respiratory system (ICD-XII)



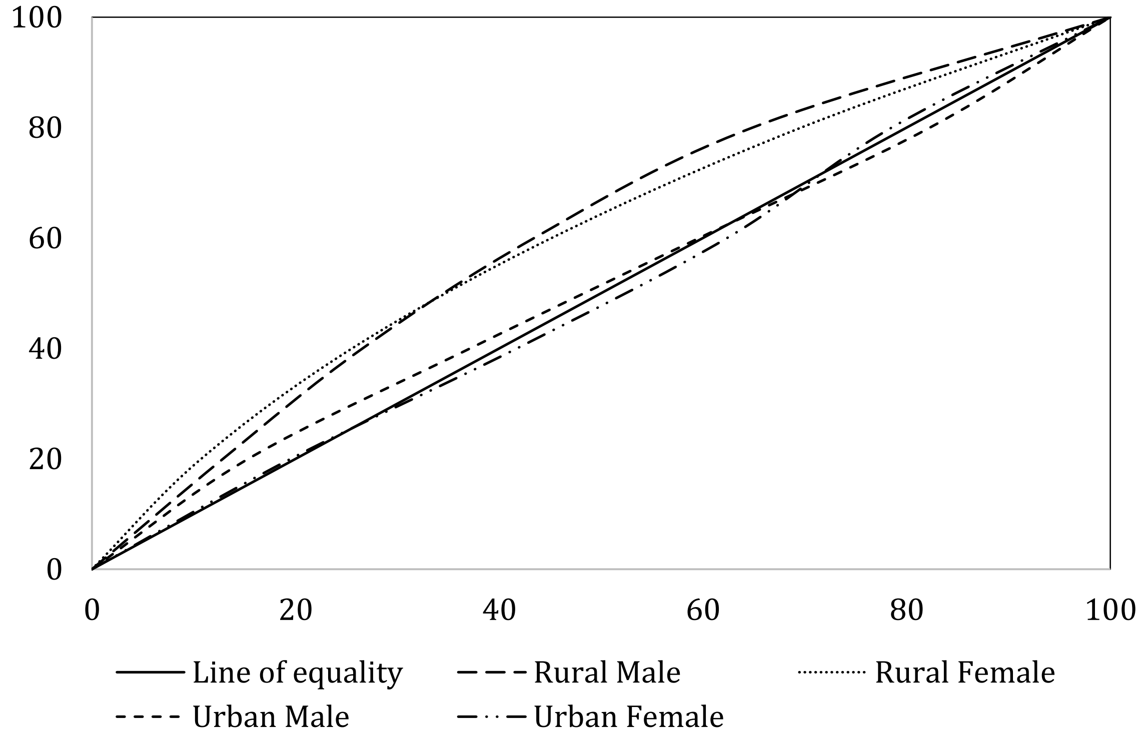
Source: Same as Figure 2.

Table 10: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the respiratory system (ICD-XII)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	8.77	14.25	18.45	16.18
Q2	11.53	8.25	22.29	23.10
Q3	17.06	16.57	17.78	24.02
Q4	21.83	23.62	12.50	15.06
Q5	40.81	37.32	28.98	21.65
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 11: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the digestive system (ICD-XIII)



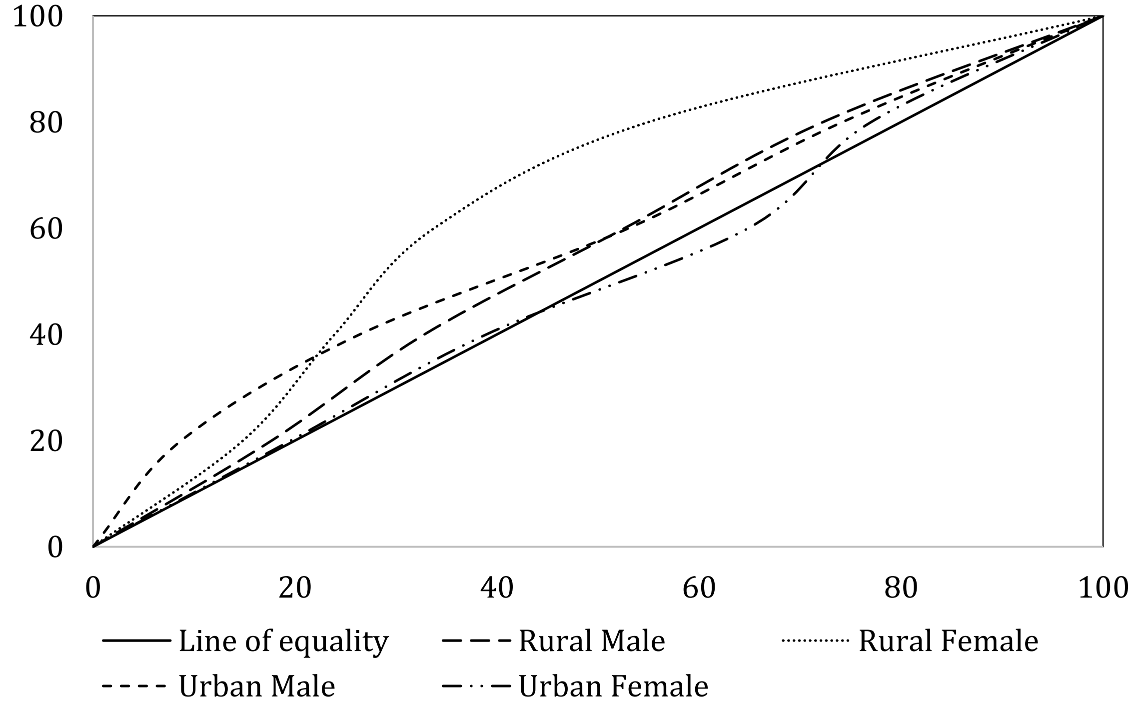
Source: Same as Figure 2.

Table 11: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the digestive system (ICD-XIII)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	12.87	10.72	15.35	19.52
Q2	13.70	14.82	21.78	22.21
Q3	16.85	19.60	22.49	20.64
Q4	21.45	24.51	22.66	16.16
Q5	35.13	30.36	17.71	21.47
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 12: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the skin (ICD-XIV)



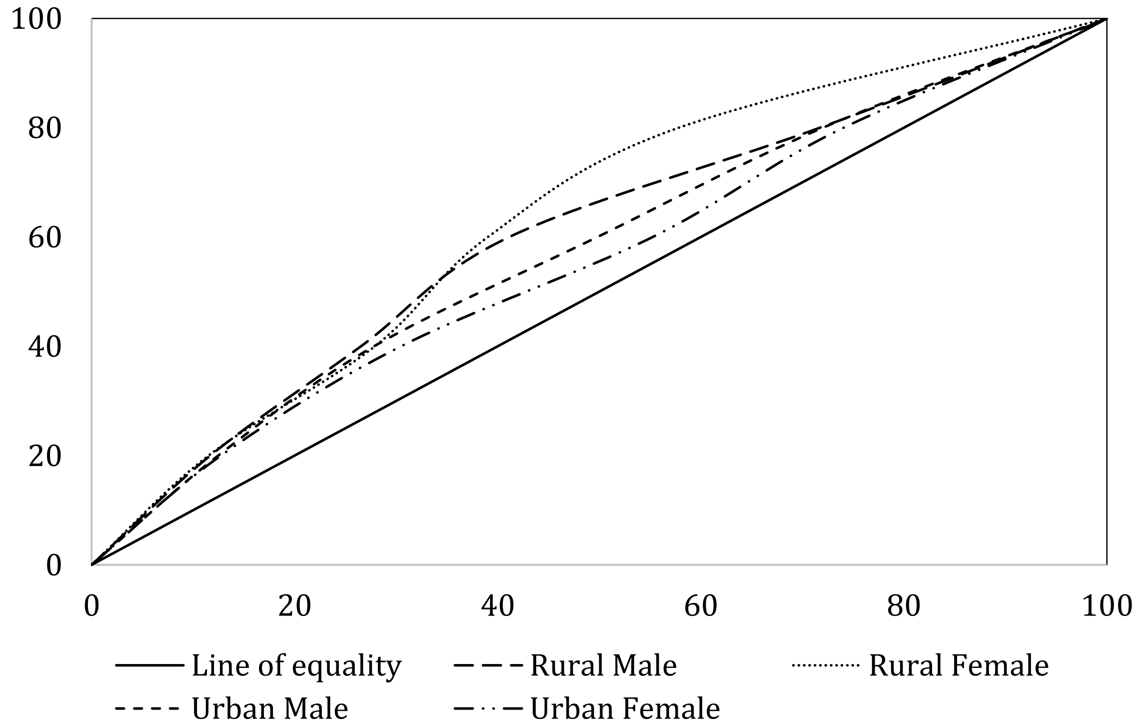
Source: Same as Figure 2.

Table 12: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the skin (ICD-XIV)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	17.70	14.86	8.75	19.58
Q2	15.12	9.07	17.67	19.37
Q3	19.81	9.86	26.62	25.93
Q4	19.67	21.23	21.17	12.16
Q5	27.71	44.99	25.79	22.95
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 13: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the musculoskeletal system and connective tissue (ICD-XV)



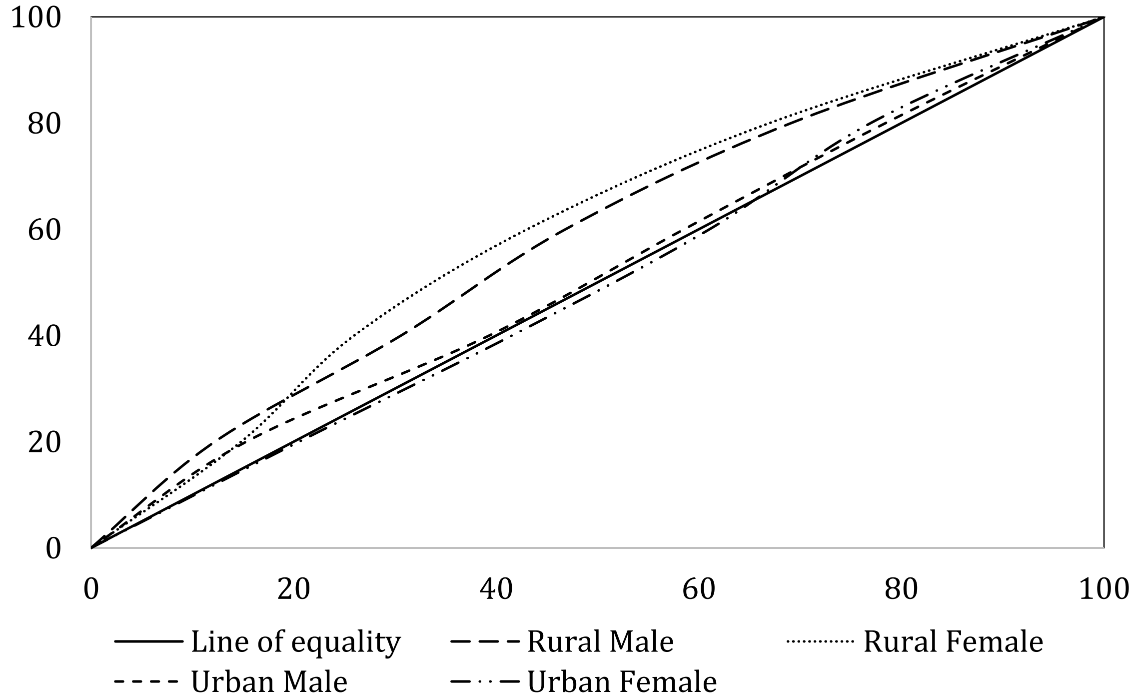
Source: Same as Figure 2.

Table 13: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the musculoskeletal system and connective tissue (ICD-XV)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	11.69	11.52	12.47	12.74
Q2	14.84	16.38	15.34	17.73
Q3	14.60	11.12	22.00	24.79
Q4	30.59	18.79	22.21	18.80
Q5	28.28	42.18	27.98	25.94
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 14: Region-based Gender Differentials in Healthcare Benefit Incidence: Diseases of the genitourinary system (ICD-XVI)



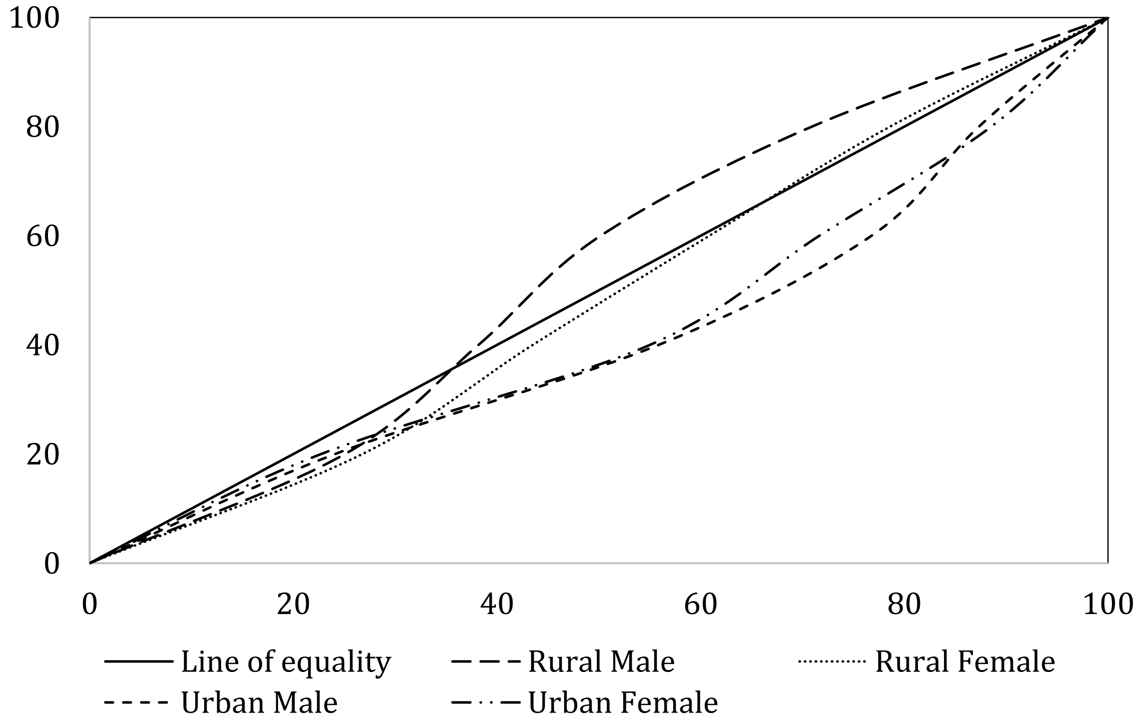
Source: Same as Figure 2.

Table 14: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Diseases of the genitourinary system (ICD-XVI)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	12.22	14.82	15.32	20.53
Q2	18.38	11.16	23.99	21.03
Q3	16.23	17.08	19.23	19.50
Q4	22.28	23.92	19.89	15.91
Q5	30.88	33.02	21.56	23.04
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 15: Region-based Gender Differentials in Healthcare Benefit Incidence: Conditions related to sexual health (ICD-XVII), Pregnancy, childbirth and the puerperium (ICD-XVIII), and Certain conditions originating in the perinatal period (ICD-XIX)



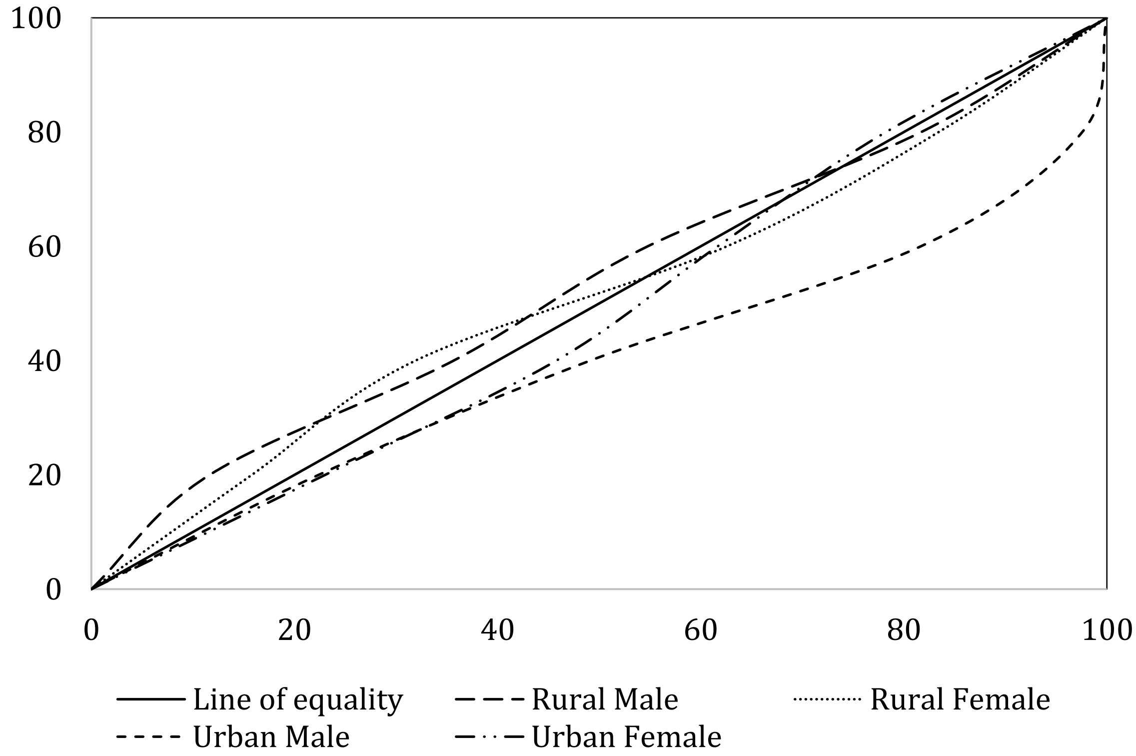
Source: Same as Figure 2.

Table 15: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Conditions related to sexual health (ICD-XVII), Pregnancy, childbirth and the puerperium (ICD-XVIII), and Certain conditions originating in the perinatal period (ICD-XIX)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	25.06	26.78	24.09	22.72
Q2	13.12	16.73	31.77	32.29
Q3	12.00	17.34	20.91	16.64
Q4	20.74	17.75	10.55	16.88
Q5	29.08	21.41	12.67	11.46
Total	100	100	100	100

Source: Same as Figure 2

Figure 16: Region-based Gender Differentials in Healthcare Benefit Incidence: Injury, poisoning and certain other consequences of external causes (ICD-XXII)



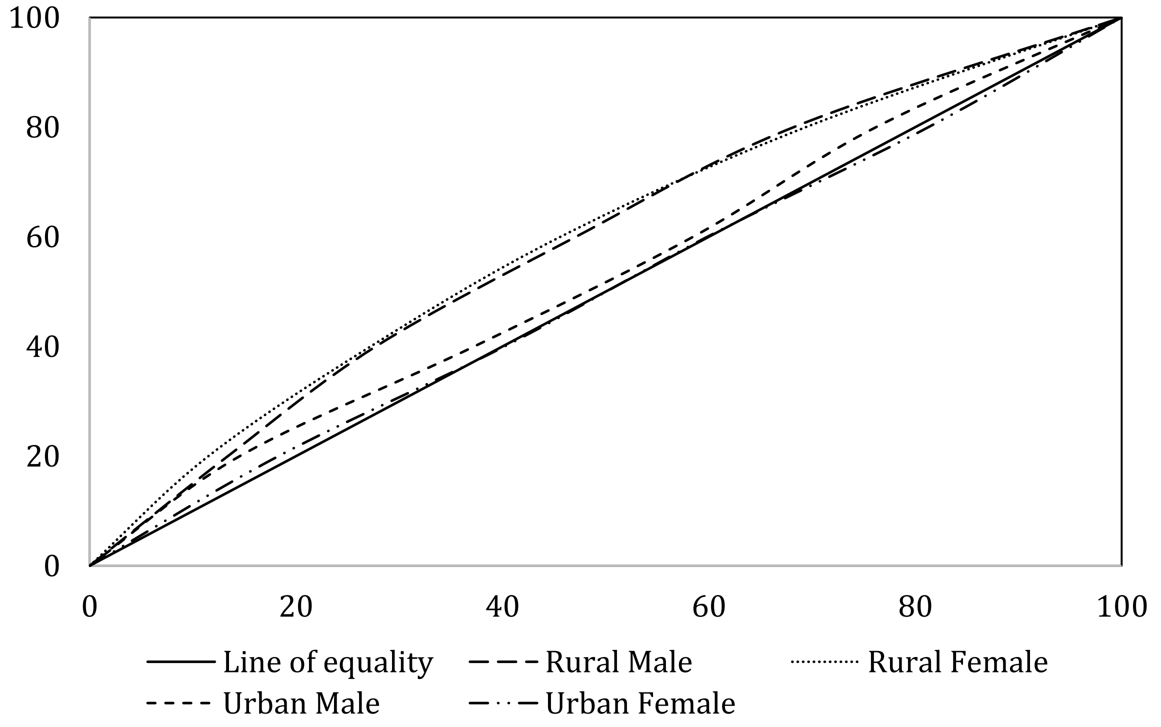
Source: Same as Figure 2.

Table 16: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Injury, poisoning and certain other consequences of external causes (ICD-XXII)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	11.65	15.80	22.38	23.02
Q2	24.02	16.11	26.73	22.76
Q3	19.10	30.66	32.55	15.88
Q4	26.93	20.85	15.90	16.56
Q5	18.29	16.57	2.44	21.76
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 17: Region-based Gender Differentials in Healthcare Benefit Incidence: External causes of morbidity and mortality (ICD-XXIII)



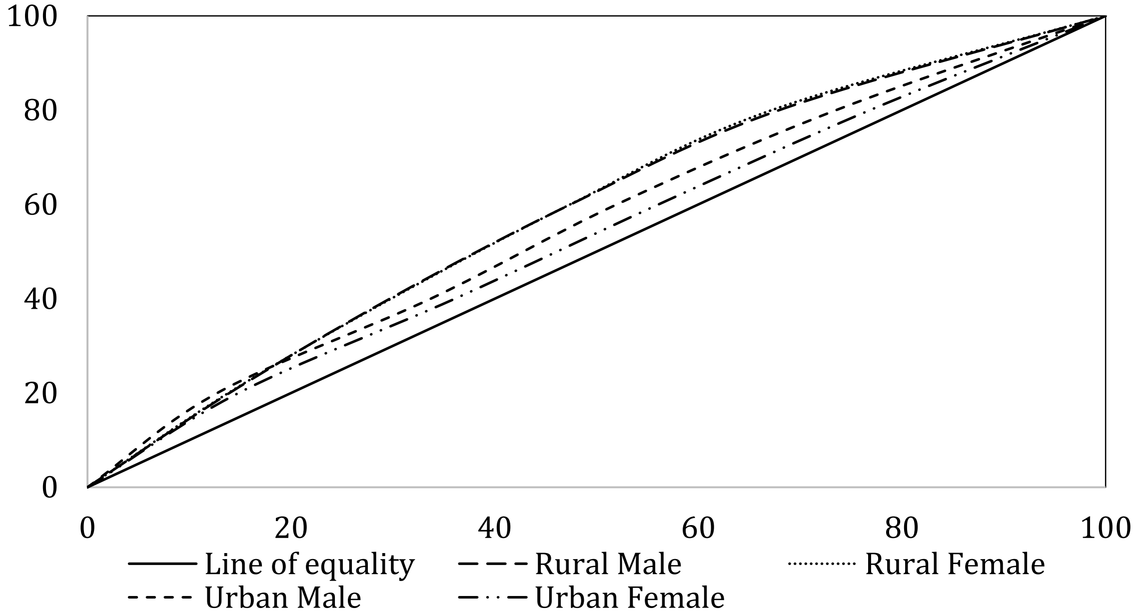
Source: Same as Figure 2.

Table 17: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: External causes of morbidity and mortality (ICD-XXIII)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	13.40	11.51	14.55	18.30
Q2	14.33	15.71	22.71	21.90
Q3	19.38	18.40	21.21	19.65
Q4	21.11	23.78	17.73	21.43
Q5	31.78	30.60	23.80	18.72
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

Figure 18: Region-based Gender Differentials in Healthcare Benefit Incidence: Factors influencing health status and contact with health services (ICD-XXIV)



Source: Same as Figure 2.

Table 18: Region-based Gender Distribution (in percent) across Quintiles in Healthcare Utilisation: Factors influencing health status and contact with health services (ICD-XXIV)

Quintiles	Rural Male	Rural Female	Urban Male	Urban Female
Q1	13.94	13.83	12.75	14.84
Q2	15.75	15.99	20.96	21.24
Q3	17.75	17.58	18.27	20.00
Q4	20.48	19.78	21.53	20.76
Q5	32.08	32.82	26.49	23.16
Total	**100**	**100**	**100**	**100**

Source: Same as Figure 2

4 Conclusion

The paper analyses the utilisation of publicly subsidised healthcare through mapping the WHO international classification of diseases (ICD) obtained from the unit record data of the latest 75th NSS health round with the latest ICD-11 of version 2024. Broadly, our findings of disease-specific BIA elucidate that public health financing in India is not skewed to the rich. The public health subsidy appears to be pro-poor or progressive in distribution with evident gender differentials in public healthcare utilisation in India.

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