Title: Gender Disparities in Health Care Financing Strategies for Inpatient Care in India

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Gender Disparities in Health-care Financing Strategies (HCFS) for In-patient Care in India

Abstract

Despite the presence of a vast literature on health-care financing strategies (HCFS) in low- and middle income countries, there is limited evidence of gender disparity in HCFS for in-patient care. Using data from a nationally representative large-scale population-based survey, We examined gender disparities in HCFS for in-patient care among adults aged 15 and above in Indianutrition and access to healthcare. Average health-care expenditure is lower for females in adult and older age groups, with disparity being highest in the adult age group. Females are also discriminated against more when health care has to be paid for by borrowing, sale of assets, or contributions from friends and relatives (distressed financing). Multinomial logit results show that the probability of distressed financing is less for females than for males (Borrowing: β=-0.26; p=0.001; selling assets/contribution from friends and relatives β=-0.24; p=0.001). Women in India have less access to in-patient care through distressed HCFS.

Keywords: Gender, health-care finance, distressed financing, India

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Background

Globally, women live longer than men because of the biological and behavioral advantages of being a female (Barford et al. 2006; Seifarth et al. 2012). Yet, in certain regions of Asia, the life expectancy gap for females versus males is nearly the same or marginally higher (Saikia et al. 2011; Canudas et al. 2015; United Nations 2015). The female advantage of life expectancy at birth also masks the disproportionate

number of female deaths in young and adult age groups in these regions (Sudha and Rajan 1999; Khanna et al. 2003; Anderson and Ray 2012; ORG 2014; Bongaarts and Guilmoto, 2015; Saikia et al. 2016). Contributors to poor health outcomes among females in the South Asia region include gender-based discrimination in breastfeeding, food allocation, immunization, access to health-care services, and finance for treatment (Gupta 1987; Rajeshwari 1996; Kurz and Johnson 1997; Pande 2003; Asfaw et al. 2007; Borooah 2004; Roy and Chaudhuri 2008; Singh 2012; Singh 2013; Song and Bian 2014). While we know a great deal about gender-based discrimination in the sectors mentioned, we know much less about how this practice influences the health expenditure and health-care financing strategies (HCFS) of households. This paper aims to examine gender disparity in HCFS for in-patient care in India, a South Asian country widely known for gender-based discrimination in abortion, nutrition, and access to health care (Arnold, Kishor, & Roy 2002; Guilmoto, Saikia, Tamrakar and Bora 2018).; Saikia, Moradhvaj and Bora; Fledderjohannet et al. 2014).

There are numerous studies addressing the health-care financing strategies of households in developing countries (Russell 1996; Sauerborn et al. 1996; Wilkes et al. 1997; Kabir et al. 2000; Skarbinski et al. 2002; Flores et al. 2008; Asfaw et al. 2010; Hoque et al. 2015). In general, in many low- and middle-income countries, people tend to meet the cost of individual health care from their own pockets, rather than from insurance or government-aided health schemes (Russell 1996; Van Doorslaer et al. 2005; O'Donnell 2008). Therefore, a financing strategy to cover the cost of illness is affected by a household's economic status and by the type, severity, and duration of the illness (Bonfrer and Gustafsson 2016). Households from developing countries use a wide range of strategies to be able to afford health-care services and manage the economic burden of health-care (Russell 1996; Hoque et al. 2015; Bonfrer and Gustafsson, 2016; Rahman et al. 2013; Joe 2014). One of the first strategies that families utilize to meet health care costs is to use currently available income/savings. It

is found that nearly half of total households deal with the financial cost of an illness through their available income or by using cash reserves (Russell 1996, Wilkes et al. 1997; Bonfrer and Gustafsson 2016; Sauerbor et al. 1996).

In situations with low income/savings and high out-of-pocket health-care expenditure, households are compelled to borrow, sell assets, and seek financial contributions or assistance from friends and relatives (not in the form of borrowing) in order to pay medical bills (Russell 1996; Wagstaff and Doorslaer 2003). Such out-of-pocket health-care payments are often known as "distressed health-care financing" or "hardship financing" (Joe 2014; Kruk et al. 2009; Leive and Xu 2008; Alamgir et al. 2010). Based on data from 40 low- and middle-income countries, Kruk et al. (2009) show that 26% of households borrow money and sell assets to meet health-care costs in those countries. The probability is higher among the poorest households and those with less insurance cover. A study based on 15 African countries shows that out-of-pocket health payments from borrowing and selling assets ranged from 23% of households in Zambia to a staggering 86% in Burkina Faso. Households with higher in-patient care expenses are more likely to borrow and deplete assets compared to those receiving out-patient care (Leive and Xu 2008). It is observed that high out-of-pocket expenditure (OOPE) pushes households towards impoverishment and curtails consumption of other basic needs (Russell 1996; Wagstaff and Doorslaer 2003).

Research findings reveal that out-of-pocket health-care expenditure in India is the highest in the world (WHO 2015). Almost 71% of health-care expenditure in India involves OOPE incurred by households (MoHFW, 2009). As such a large proportion of health-care expenditure (HCE) comes from households. The distribution of HCE depends on the household members involved in decision making for seeking treatments and is dependent on a number of factors including the perceived cost of illness, perceived severity of illness, etc. (Buor, D. 2005; Mojumdar, 2018; Begashaw and Tesfaye, 2016). In India, for in-patient care, 58% of households finance through borrowing, sale

of assets, and contributions from friends and relatives, accounting for a considerable 42% of the total share of OOPE payments. This percentage is higher in rural than in urban areas (Joe 2014). A small study conducted in the Indian state of Orissa showed that about 25% of households faced hardship in financing health-care expenditure during the 365 days preceding the survey. Around 40% of households experienced hardship in financing expenditure for hospitalization and 25% for out-patient or maternity care (Binnendijk et al. 2012).

Do health-care financing strategies differ systematically for men and women in India? A review of existing literature suggests that more attention has been given to gender disparity in health-care expenditure than to financing strategies (Asfaw et al. 2010; Saikia et al. 2016; Maharana and Ladusingh 2014). For example, recent studies in India show that HCE was systematically lower for women than for men across all socioeconomic subgroups, despite women suffering from a higher morbidity prevalence than men (Maharana and Ladusingh 2014; Batra et al. 2014; Saikia et al. 2016). A study on rural cancer patients in a public tertiary hospital in an eastern Indian state, shows that expenditure on female adults is significantly less than on male adults, and that about one-third of the difference can be drawn back to gender discrimination (Batra et al. 2014).

However, there is limited evidence of gender disparity in health-care-financing strategies in South Asian countries. For instance, while addressing gender discrimination in HCFS among children under ten in India, Asfaw et al. (2010) found that girls have a lower chance of being hospitalized than boys when households face tight budget constraints. The probability of financing the hospitalization of boys through borrowing, sale of assets, and help from relatives, is much higher than it is for girls. Another recent study corroborated that there is a significant socioeconomic gradient in the distribution of distressed finanancing, with a huge disadvantage for marginalized sections, like females, the elderly, and backward caste groups (Joe 2014). Following these few studies, we aim to deepen our understanding of

persistent gender discrimination in health-care financing for adults in India using recently available nationally representative data from the National Sample Survey Organisation (NSSO). We focused on the information about sources of finance for in-patient care for adults aged 15 and above, as expenditure for in-patient care is substantially higher (about 25 times) than for out-patient care. We examined the association between various types of HCFS and the gender of the in-patients, while controlling the role of demographic, socioeconomic, and disease-related characteristics. Finally, we scrutinized the pattern of gender discrimination in HCFS in the adult age group, as well as the income status of households.

Methodology

Data source

In this study, we used data from the 25th schedule of the 71st round of the National Sample Survey Organisation (NSSO 2014). The NSSO is a nationally representative large-scale population-based survey organization under the Ministry of Statistics and Programme implementation (MoSPI) of the Government of India (GOI) since 1950. The NSSO collects data on various issues such as employment, migration, consumption expenditure, educational attainment, morbidity, etc. The 25th Schedule of the 71st round of the NSSO, known as "Social Consumption: Health," collected information on the demographic and socioeconomic conditions of the population surveyed, with an emphasis on health conditions, health-care access, and health-care financing. It thus gives detailed information about the prevalence of sickness insurance coverage, medical treatment, sources of health-care finance (HCF), as well as maternity care for in-patients in the year preceding the survey, and out-patient care during the previous 15 days. There were 65,932 households (Sample size: 168,697 males and 164,407 females) in the 71st round of the NSSO. Regarding the sources of HCF, the NSSO provides information separately for in-patient

and out-patient care. Thus our study population consists of adults aged 15 and above who were in-patients in the 365 days prior to the survey.

The sources of HCF for each in-patient case are listed as primary and secondary sources of financing. The various sources of HCF reported by households are listed as: (1) Current own income household savings, (2) borrowing money, (3) selling assets (sale of ornaments and other physical assets), and (4) financial contributions or assistance from friends and relatives (not in the form of borrowing).

The outcome variable in this study is the source of HCF for hospitalization for each individual. The sources of HCF for hospitalization are divided into four mutually exclusive categories namely, (1) using only current income/savings, (2) using only money from borrowing, (3) using money from selling assets and contributions from relatives/friends, and (4) using multiple sources like current income/savings, money from borrowing, selling assets/contributions from relatives and friends. A multiplicity of sources in the fourth category indicate that one single source was not enough to cover in-patient expenditure. We used relevant demographic and socioeconomic predictors, namely, gender (male and female), age, type of residence (rural and urban), educational status of head of the household, religion (Hindu, Muslim, and other), caste (other, other backward classes (OBC), scheduled tribes (ST), and scheduled castes (SC)), and the economic status of households (poorest, poorer, middle, richer and richest). These predictor variables are found to be relevant for determining health-care expenses and sources (Maharana and Ladusingh 2014; Song and Bian 2014; Saikia et al. 2016; Willis et al. 2009). We estimated the economic status of the household on the basis of its consumer expenditure. A household's usual consumer expenditure is the sum of the monetary values of all goods and services usually consumed by members of the household domestically during one month .

Besides demographic and socioeconomic indicators, the survey questionnaire included questions on health-care service utilization and cost. Interviewees were asked about the type of health-care facility used (public or private), the type of ailment (communicable, non-communicable, and other diseases), duration of stay at the hospital, doctors' fees, and transportation costs. These variables were controlled in the regression analysis, as they may determine the amount of expenditure and consequently the source of health-care finance.

We cross-tabulated the distribution of sources of HCF and the gender of the patient, to examine the gender differential in sources of HCF. Chi-square tests were conducted to examine the statistical significance of this difference. We carried out multinomial logit regression to examine the association between the gender of the in-patient and sources of health-care finance for in-patient care. Multinomial logit regression is a simple extension of binary logit regression that allows for more than two categories of the dependent or outcome variable. Multinomial logistic regression is used to predict categorical placement in or the probability of category membership on a dependent variable based on multiple independent variables.

Our dependent variable y_i is the source of finance that takes a value from 1 to 4; (y_i=1=income/savings [reference category], y_i=2=borrowing, y_i=3=sale of assets and contributions from relatives, and y_i=4=combination of current income/saving; borrowing; selling assets/contributions from relatives and friends). We calculated the predicted probablity of each category of dependent varaible using the appropriate mathematical relationship. We did the entire analysis on STATA version 13.0.

Results

Sample description of the in-patients

Table 1 presents the type of financing strategy used for inpatient care for each gender by demographic, socioeconomic, and health-care related characteristics. A total of 34,843 adult people received in-patient care in the year leading up to the survey. Table 1 shows that there is a systematic variation in the different financing strategies, between males and females irrespective of background characteristics. The percentage of females hospitalized with income or savings as health care finance is higher than that of males (51.02% vs 45.73%). The percentage of males hospitalized with distressed financing is higher than that of females irrespective of background characteristics. The application of the Chi-square test confirms the statistical significance of these results. We also observe a similar pattern in HCF when gender interacts with age and place of residence.

[Table 1]

As level of education increases, the percentage share of HCF through current income or savings increases as well. While there is no substantial difference in the HCF pattern between in-patients belonging to the Hindu and Muslim religions, the percentage of distressed financing is less among in-patients belonging to other religions. As the economic status of the household increases, the percentage share of income or savings rises as HCF increases. The percentage shares of distressed HCF are high for non-communicable diseases and private health care facilities. Mean transportation cost and doctors' fees are high in all types of distressed HCF.

Descriptive results

[Figure 1]

In Figure 1, panel 1 shows the overall expenditure of in-patients by gender for individuals aged 15 and above. The in-patient HCE for males is substantially higher than that of females (Rs. 26,224 for males versus Rs. 17,827 for females). Panel 2 shows the average

expenditure by gender for two broad age groups. The difference in the average expenditure for males and females in the 15-59 age group is lower than the difference in the 60 and above age groups. Panel 3 shows the average health-care expenditure for males and females by type of illness. It is evident that in-patient health expenditure is higher among males than females irrespective of the type of disease. Panel 4 further shows that average expenditure is higher for males than females when the duration of hospitalization is the same.

Results of multinomial logistic regression analysis

Table 2 presents the results of multinomial logistic regression, examining the association between gender and sources of HCF, after adjusting for the role of demographic, socioeconomic and other health-related characteristics.

The foremost finding of this analysis is that the probability of hospitalization is lower among females, with respect to all sources of HCF, relative to income/savings, even after controlling for the role of demographic, socioeconomic and health-related variables. For example, the probability of using distressed financing is lower for females than for males (borrowing: β=-0.26; p=0.001; selling assets and contributions from friends and relatives β=-0.24; p=0.001). The probability of using HCF from multiple sources is also lower for females than for males (β=-0.10; p=0.001).

Table 2 shows that the probability of using distressed sources for HCF decreases among inpatients aged 60 and above. This implies that households avoid using distressed resources to provide in-patient care for older age groups. Rural Indian households are more likely to pay in-patient care costs through borrowing, sale of assets, and contributions from friends and relatives compared to their urban counterparts. The education level of the head of the household has a significant effect on sources of finance for health-care. Lack of formal

education of the household head is consistently shown to have higher chances of meeting HCF from borrowing, selling assets, or a combination of all these sources, whereas an educated head of household has a lower chance of borrowing, selling assets, and asking for contributions rather than using current income/savings.

Another finding from Table 2 is that all the marginalized sections of the Indian population meet their HCF through sources other than income/savings. For instance, in-patients belonging to deprived castes such as SC/ST, individuals tend to finance in-patient care from borrowing, sale of assets, and contributions from relatives, rather than using income/savings. Likewise, poorer households are more likely to borrow for in-patient care than richer households. Households with higher dependency ratios are more likely to finance in-patient care through sale of assets and contributions from friends than from income/savings.

The amount of HCE, and consequently HCF, may vary according to the types of diseases suffered by the in-patients. Patients hospitalized for the treatment of non-communicable and other diseases, have a greater chance of borrowing and selling assets than those undergoing treatment for communicable diseases. Longer periods of hospitalization lead to borrowing and sale of assets, alongside seeking help from friends and relatives. Patients using a private facility have a greater chance of resorting to distressed financing than paying through current income/savings, compared to those using a public facility. As the doctors' fees and transportation costs increase, the chances of using distressed resources for HCF also increase.

[Table 2]

Gender disparity in the predicted probability of HCF by age groups

Figure 2 explains gender disparity in the probability of hospitalization using different sources of financing according to the age of the in-patients. Among females, the probability of paying for hospitalization using current income/savings is higher across all age groups compared to other sources. During old age, income/savings is the most-used source compared to during adulthood where a combination of sources of HCF (income/savings/borrowing/selling) is also significant.

[Figure 2]

It is important to note that as age increases, the probability of using "borrowing" as a source of HCF decreases continuously for both genders, yet the gap between the genders is notable. Similarly, females have a lower chance of paying for hospitalization through the sale of assets and contributions from relatives. In contrast, the chance of borrowing for men's health care increases with the onset of adulthood, and declines once a man becomes old.

Gender disparity in the predicted probability of HCF by household income status

Does the gender differential in hospitalization decrease as household income status changes from low-income to high-income groups? For this, we estimated the predicted probabilities of receiving in-patient care, using different sources of HCF according to income groups, following multinomial logistic regression analysis. The results are presented in Figure 3 below.

[Figure 3]

Figure 3 (Income/savings) shows that the probability of using "income/savings," as an exclusive source of HCF, increases as household income status changes from the low- to the high-income group. Here, too, we observe that use of "income/savings" as a source of HCF is

higher for females than for males. In contrast, the probability of borrowing for all patients is higher among poor households than rich households (Figure 3, Borrowing). At the same time, the probability of using "borrowing" as an exclusive source of HCF for females is substantially lower than for males belonging to poor households. This gap diminishes as the income of the household rises. The probability of using HCF from "selling assets" for males is high when household income is either high or low. At the same time, the probability of using HCF as "selling assets" is always lower for females than males.

Finally, addressing HCF through a combination of all the above-mentioned (i.e., income/savings, borrowing, selling assets, and contributions from family/friends) is also higher among male in-patients than female in-patients (Figure 3, Income/savings, borrowing, sale of assets/ contributions from friends/relatives). Moreover, in using a combination of different sources of HCF, the gender gap remains constant across the various income groups of households.

Discussion and conclusion

Previous research has demonstrated that one in four households in developing countries resort to hardship financing by borrowing and selling assets to meet health-care costs (Kruk et al. 2009). Often, large health-care costs have long-term adverse economic and social consequences for households in developing countries (Russell 1996; Wagstaff and Doorslaer 2003; Leive and Xu 2008). With India being a poor country, the percentage of OOPE is as high as 89% (the World Bank, 2017). A recent study records that 47, 19, and 7% of rural Indian households, with in-patient care, have used borrowing, contributions from friends and relatives, and sale of assets, respectively, to finance out-of-pocket expenditure for in-patient care (Joe 2015).

In such cases of distress financing of health-care, is distress financing of households unbiased toward the gender of in-patients? Although there are numerous studies by health economists on OOPE, as well as sources of health financing and related consequences in developing countries, a discussion on gender disparity in OOPE has not been highlighted. Demographers, public-health researchers, and other social scientists have successfully underscored gender disparity in various health outcomes (Saikia et al. 2016; Pande 2003; Roy and Chaudhuri 2008; Gupta 1987; Rajeshwari 1996; Arnold, Choe and Roy 1998; United Nations 2011). Much less attention has however been paid to gender-based discrimination in health-care costs and related sources of finance. This study is an attempt to bridge this gap, where we emphasise gender disparity in health input in the subcontinent, rather than health outcomes. Due to rising life expectancy, this kind of study is crucial to understanding the overall well-being of women, as well as rising HCE and distressed HCF.

To examine gender disparities in households' HCF strategies in terms of paying for in-patient care in India, we analyzed gender discrimination according to sources of health-care finance among hospitalized patients in India. We found that the percentage of female hospitalization using lower HCF sources such as borrowing, sale of assets, and contributions from relatives, is lower than that for males. Multinomial logistic regression shows that these results are valid, even after controlling for demographic, socioeconomic, and other variables. We also found that distressed sources of HCF are used for adult males, indicating the presence of a strong preference for the health of male adults rather than the health of female adults. With an increase in household income, the chance of using income as a source for HCF increases. As the income of a household increases, gender disparity in using "borrowing" as an HCF strategy also diminishes.

Consistent with previous studies, this study also finds that average HCE is lower among women than men, despite women suffering from a higher incidence and prevalence of morbidity (Maharana and Ladusingh 2014; Batra et al. 2014; Saikia et al. 2016). Asfaw (2010) found that compared to non-hospitalized children under the age of 10, the probability of paying for hospitalization by using any means of HCF (say, income/borrowing/selling assets and a combination of all sources) is always higher for males than females. Unlike Asfaw (2010), we restricted our present analysis to in-patients of adult age. This study demonstrates a new aspect of gender discrimination in the financial strategies of households for hospitalization in India. For females, the probability of receiving in-patient care, in the event of resorting to distressed financial resources is most likely to decrease, while controlling for all other variables.

There may be two reasons why females in India are facing discrimination in accessing distressed HCF. First, as 60% of rural households in India use distressed means of health-care financing to avail themselves of in-patient care (Joe 2014), households may make a trade-off between a breadwinner and a caregiver. Only 27% of Indian women are engaged in paid jobs, and the rest are involved in unpaid household chores and care-giving, that is, non-economic activities (The World Bank 2017). Since household chores and care-giving do not yield direct economic benefits, the relative importance of women's health is underestimated. Second, a discriminatory attitude toward the health of women in India has existed for generations due to social hierarchy and deep-rooted patriarchal structures. Just like sex-selective abortion, discriminatory food allocation, or access to health, the present evidence on HCF strategies may be yet another manifestation of centuries-old gender discrimination in India.

This study has a few limitations. The healthcare expenditure for inpatient care was collected one year before the survey; therefore, there is a possibility of recall bias in the expenditure data. However, this recall bias should affect both male and female health expenditure data and hence our results on gender difference might not be affected considerably. Secondly, by analyzing gender disparity in morbidity related expenditure, we are documenting only one part of the discrimination that women may face in the process of health-seeking behavior. In reality, women may face sequential discrimination at the stage of health care, for instance, in terms of a decision to access health care facilities as an out-patient, to continue the treatment as an in-patient and finally in terms of the duration of in-patient care. This can be analyzed in future studies. Lastly, it may be possible that there is a systematic difference in delaying treatment by gender, which finally leads to gender differences in health care expenditure. Due to the unavailability of this information in our data, we could not test this hypothesis. Yet, studies based on South Asian countries including India found that females either receive less care, or experience more delays in treatment than men (Costa et al 2017; Gosoniu et al 2008; Rivera-Franco and Leon-Rodriguez 2018).

Policy implications

Our results suggest that decreasing the financial burden of catastrophic health expenditure problems, for example, in cases of hospitalization and in-patient care, can help decrease gender disparity in health-care utilization. To ensure gender equality in accessing health care, there is an urgent need to introduce gender inclusive social health security and micro-insurance schemes in India. However, the most important strategy to reduce gender-based discrimination in health-care, is to empower women by engaging them in economic activities.

Abbreviations

HCFS: health-care financing strategies, HCF: health-care finance, OOPE: out-of-pocket expenditure, HCE: health-care expenditure, SC: scheduled caste, ST: scheduled tribe, OBC: other backward classes

References

Alamgir, N. I., Naheed, A., and Luby, S. P. (2010). Coping strategies for financial burdens in families with childhood pneumonia in Bangladesh. *BMC public health*, 10(1), 622.

Anderson, S., and Ray, D. (2012). The age distribution of missing women in India. *Economic and Political Weekly*, 6;47(47-48):87-95.

Arnold, F., Choe, M. K., and Roy, T. K. (1998). Son preference, the family-building process and child mortality in India. *Population studies*, 52(3), 301-315.

Asfaw, A., Klasen, S., and Lamanna, F. (2007). *Intra-household gender disparities in children's medical care before death in India*. Institute for the Study of Labor (IZA) Discussion Paper; 2007,(2586)

Asfaw, A., Lamanna, F., and Klasen, S. (2010). Gender gap in parents' financing strategy for hospitalization of their children: evidence from India. *Health economics*, 19(3), 265-279.

Barford, A., Dorling, D., Smith, G. D., and Shaw, M. (2006). Life expectancy: women now on top everywhere: during 2006, even in the poorest countries, women can expect to outlive men. *BMJ: British Medical Journal*, 332(7545), 808.

Batra, A., Gupta, I., and Mukhopadhyay, A. (2014). *Does discrimination drive gender differences in health expenditure on adults: evidence from Cancer patients in rural India*. Indian Statistical Institute Discussion Paper, (14-03).

Begashaw, B., & Tesfaye, T. (2016). Healthcare Utilization among Urban and Rural Households in Esera District: Comparative Cross-sectional Study. Am J Public Heal Res, 4, 56-61

Binnendijk, E., Koren, R., and Dror, D. M. (2012). Hardship financing of health-care among rural poor in Orissa, India. *BMC health services research*, 12(1), 23.

Bonfrer, I., and Gustafsson-Wright, E. (2016). Health shocks, coping strategies and foregone health-care among agricultural households in Kenya. *Global public health*, 1-22.

Bongaarts, J., and Guilmoto, C. Z. (2015). How many more missing women? Excess female mortality and prenatal sex selection, 1970–2050. *Population and Development Review*, 41(2), 241-269.

Borooah, V. K. (2004). Gender bias among children in India in their diet and immunisation against disease. *Social science and medicine*, 58(9), 1719-1731.

Buor, D. (2005). Determinants of utilisation of health services by women in rural and urban areas in Ghana. GeoJournal, 61(1), 89-102.

Canudas-Romo, V., Saikia, N., and Diamond-Smith, N. (2015). The contribution of age-specific mortality towards male and female life expectancy differentials in India and selected States, 1970-2013. *Asia-Pacific Population Journal*, 30(2).

Costa, J. C., Wehrmeister, F. C., Barros, A. J., & Victora, C. G. (2017). Gender bias in careseeking practices in 57 low–and middle–income countries. *Journal of global health*, *7*(1).

Fledderjohann, J., Agrawal, S., Vellakkal, S., Basu, S., Campbell, O., Doyle, P., ... & Stuckler, D. (2014). Do girls have a nutritional disadvantage compared with boys? Statistical models of breastfeeding and food consumption inequalities among Indian siblings. PloS one, 9(9), e107172.

Flores, G., Krishnakumar, J., O'Donnell, O., and Van Doorslaer, E. (2008). Coping with health-care costs: implications for the measurement of catastrophic expenditures and poverty. *Health economics*, 17(12), 1393-1412.

Gosoniu, G. D., Ganapathy, S., Kemp, J., Auer, C., Somma, D., Karim, F., & Weiss, M. G. (2008). Gender and socio-cultural determinants of delay to diagnosis of TB in Bangladesh, India and Malawi [Special section on gender and TB]. The International Journal of Tuberculosis and Lung Disease, 12(7), 848-855)

Guilmoto, C. Z., Saikia, N., Tamrakar, V., & Bora, J. K. (2018). Excess under-5 female mortality across India: a spatial analysis using 2011 census data. *The Lancet Global Health*, *6*(6), e650-e658.

Gupta, M. D. (1987). Selective discrimination against female children in rural Punjab, India. *Population and development review*, 77-100.

Hoque, M. E., Dasgupta, S. K., Naznin, E., and Al Mamun, A. (2015). Household coping strategies for delivery and related healt-care cost: findings from rural Bangladesh. *Tropical Medicine and International Health*, 20(10), 1368-1375.

Joe, W. (2014). Distressed financing of household out-of-pocket health-care payments in India: incidence and correlates. *Health policy and planning*, 30(6), 728-741.

Kabir, M. A., Rahman, A., Salway, S., and Pryer, J. (2000). Sickness among the urban poor: a barrier to livelihood security. *Journal of international development*, 12(5), 707.

Khanna, R., Kumar, A., Vaghela, J. F., Sreenivas, V., and Puliyel, J. M. (2003). Community based retrospective study of sex in infant mortality in India. *Bmj*, 327(7407), 126.

Kruk ME, Goldmann E, Galea S. Borrowing and selling to pay for healthcare in low-and middle-income countries. *Health Affairs*. 2009 Jul 1;28(4):1056-66.

Kurz, K. M., and Johnson-Welch, C. (1997). *Gender differences among children 0–5 years: an opportunity for child survival interventions*. A review paper prepared for the BASICS project. USAID/BASICS II, Arlington, VA.

Leive, A., and Xu, K. (2008). Coping with out-of-pocket health payments: empirical evidence from 15 African countries. *Bulletin of the World Health Organization*, 86(11), 849-856C.

Maharana, B., and Ladusingh, L. (2014). Gender disparity in health and food expenditure in India among elderly. *International Journal of Population Research*, 2014.

Ministry of Health and Family Welfare (MoHFW). (2009). *Annual Report to the people on health*. Ministry of Health and Family Welfare. Government of India, New Delhi.

Mojumdar, S. K. (2018). Determinants of Health Service Utilization by Urban Households in India: A Multivariate Analysis of NSS Case-level Data. Journal of Health Management, 20(2), 105-121.

O'Donnell, O., Van Doorslaer, E., Rannan-Eliya, R. P., Somanathan, A., Adhikari, S. R., Akkazieva, B., ... and Huq, M. N. (2008). Who pays for health-care in Asia?. *Journal of health economics*, 27(2), 460-475.

Office of the registrar general (ORG). (2014). *Sample registration system statistical report 2013*. Ministry of home affairs government of India, report no. 1 of 2014. Available: http://www.censusindia.gov.in/vital_statistics/SRS_Reports_2013.html

Pande, R. P. (2003). Selective gender differences in childhood nutrition and immunization in rural India: the role of siblings. *Demography,* 40(3), 395-418.

Rahman, M. M., Gilmour, S., Saito, E., Sultana, P., and Shibuya, K. (2013). *Self-reported illness and household strategies for coping with health-care payments in Bangladesh*. Bulletin of the World Health Organization, 91(6), 449-458.

Rajeshwari. (1996). Gender bias in utilisation of health-care facilities in rural Haryana. *Economic and Political Weekly*, 489-494.

Rivera-Franco, M. M., & Leon-Rodriguez, E. (2018). Delays in breast cancer detection and treatment in developing countries. Breast cancer: basic and clinical research, 12, 1178223417752677

Roy, K., and Chaudhuri, A. (2008). Influence of socioeconomic status, wealth and financial empowerment on gender differences in health and health-care utilization in later life: evidence from India. *Social science and medicine*, 66(9), 1951-1962.

Russell, S. (1996). Ability to pay for health-care: concepts and evidence. *Health policy and planning*, 11(3), 219-237.

Saikia N., Tamrakar V., Bora JK. (2016). *Geographical patterning of excess female infant and child deaths in Indian Districts: Evidence from the Census 2011*. Population Association of America Annual Meeting; 2016

Saikia, N., Jasilionis, D., Ram, F., and Shkolnikov, V. M. (2011). Trends and geographic differentials in mortality under age 60 in India. *Population studies*, 65(1), 73-89.

Saikia, N., Moradhvaj and Bora, J. K. (2016). Gender Difference in Health-Care Expenditure: Evidence from India Human Development Survey. *PloS one*, 11(7), e0158332.

Sauerborn, R., Adams, A., and Hien, M. (1996). Household strategies to cope with the economic costs of illness. *Social science and medicine*, 43(3), 291-301.

Sauerborn, R., Berman, P., and Nougtara, A. (1996). Age bias, but no gender bias, in the intrahousehold resource allocation for health-care in rural Burkina Faso. *Health Transition Review*, 131-145.

Seifarth, J. E., McGowan, C. L., and Milne, K. J. (2012). Sex and life expectancy. *Gender medicine*, 9(6), 390-401.

Singh, A. (2012). Gender based within-household inequality in childhood immunization in India: changes over time and across regions. *PloS one*, 7(4), e35045.

Singh, P. K. (2013). Trends in child immunization across geographical regions in India: focus on urban-rural and gender differentials. *PloS one*, 8(9), e73102.

Skarbinski, J., Walker, H. K., Baker, L. C., Kobaladze, A., Kirtava, Z., and Raffin, T. A. (2002). The burden of out-of-pocket payments for health-care in Tbilisi, Republic of Georgia. *Jama*, 287(8), 1043-1049.

Song, Y., and Bian, Y. (2014). Gender differences in the use of health-care in China: cross-sectional analysis. *International journal for equity in health*, 13(1), 8.

Sudha, S. S. I. R., and Rajan, S. I. (1999). Female demographic disadvantage in India 1981–1991: Sex selective abortions and female infanticide. *Development and change*, 30(3), 585-618.

The World Bank. (2017). Labor force participation rate, female (% of female population ages 15+). Available at: http://data.worldbank.org/indicator/SL.TLF.CACT.FE.ZS.

The World Bank. (2017). *Out-of-pocket health expenditure (% of private expenditure on health)*. Available at: http://data.worldbank.org/indicator/SH.XPD.OOPC.ZS

United Nations. (2011). *Sex Differentials in Childhood Mortality. Department of Economic and Social Affairs*, Population Division, United Nations publication, St/Esa/Ser.A/314)

United Nations. (2015). *Population Division World Population Prospects: The 2015 Revision, DVD Edition*. Department of Economic and Social Affairs.

Van Doorslaer, E., O'Donnell, O., Rannan-Eliya, R. P., Somanathan, A., Adhikari, S. R., Akkazieva, B., ... and Ibragimova, S. (2005). *Paying out-of-pocket for health-care in Asia: Catastrophic and poverty impact*. Erasmus University, Rotterdam and IPS, Colombo.

Wagstaff, A., and Doorslaer, E. V. (2003). Catastrophe and impoverishment in paying for health care: with applications to Vietnam 1993–1998. *Health economics*, 12(11), 921-933.

Wilkes, A., Hao, Y., Bloom, G., and Xingyuan, G. (1997). *Coping with the costs of severe illness in rural China*. IDS Working Paper 58. Institute of Development Studies. Brighton. 1997.

Willis, J. R., Kumar, V., Mohanty, S., Singh, P., Singh, V., Baqui, A. H., ... and Darmstadt, G. L. (2009). Gender differences in perception and care-seeking for illness of newborns in rural Uttar Pradesh, India. *Journal of health, population, and nutrition*, 27(1), 62.

World Health Organization (WHO). (2015) *World Health Statistics Report*. Geneva: World Health Organization. Available at: http://www.who.int/gho/publications/world_health_statistics/2015/en/

Table 1. Mean and percentage distribution of type of healthcare financing strategy used for in-patient care for each gender by demographic, socioeconomic, and health-care related characteristics, India, 2014. (n= 34,843)

Background characteristics	Male				Female			
	Income/savings	Borrowing	Sale of assets/ contributions from friends and relatives	Income/savings, borrowing, sale of assets/ contributions from friends/relatives	Income/savings	Borrowing	Sale of assets/ contributions from friends and relatives	Income/savings, borrowing, sale of assets/ contributions from friends/relatives
Age group (in years)								
15-59	43.48(41.72-45.25)	9.23(8.22-10.35)	4.19(3.28-5.34)	43.1(41.29-44.93)	49.6(47.83-51.38)	7.13(6.21-8.17)	2.93(2.36-3.62)	40.34(38.61-42.09)
60 above	50.92(48.13-53.7)	5.63(4.83-6.56)	4.01(2.68-5.95)	39.44(36.58-42.38)	55.3(51.82-58.72)	6.24(4.85-8.01)	2.33(1.79-3.04)	36.12(32.81-39.58)
Type of residence								
Urban	52.86(50.6-55.11)	6.98(6.11-7.96)	4.35(3.09-6.09)	35.8(33.61-38.06)	60.9(58.55-63.19)	5.51(4.72-6.43)	2.52(1.77-3.57)	31.08(28.9-33.33)
Rural	41.71(39.79-43.65)	8.79(7.73-9.98)	4.01(3.08-5.22)	45.49(43.46-47.53)	45.78(43.72-47.85)	7.65(6.55-8.92)	2.92(2.38-3.58)	43.65(41.61-45.71)
Education of the household head								
No education®	37.77(35.11-40.5)	11.59(9.91-13.51)	3.81(3.03-4.8)	46.83(44.05-49.64)	43.5(40.42-46.63)	10.27(8.47-12.39)	2.65(1.89-3.7)	43.59(40.46-46.76)
Up to primary	44.15(41.44-46.9)	8.75(7.54-10.14)	5.19(3.21-8.28)	41.91(39.22-44.64)	47.6(44.91-50.31)	5.31(4.41-6.38)	3.62(2.44-5.34)	43.47(40.74-46.24)
Up to secondary	42.51(38.67-46.45)	7.62(5.46-10.53)	3.97(2.97-5.29)	45.9(41.6-50.26)	51.23(47.69-54.74)	6.23(4.99-7.76)	3.25(2.45-4.3)	39.29(35.91-42.78)
Up to higher secondary	53.95(50.37-57.49)	4.94(3.94-6.18)	3.84(2.12-6.85)	37.27(33.73-40.95)	58.47(54.82-62.04)	5.94(4.07-8.59)	1.8(1.29-2.52)	33.79(30.47-37.28)
Graduate and above	65.91(61.29-70.25)	2.68(1.84-3.87)	2.9(2.11-3.97)	28.51(24.28-33.16)	71.41(66.6-75.78)	2.66(1.71-4.13)	2.2(1.48-3.25)	23.73(19.7-28.29)

Religion								
Hindu®	45.35(43.7-47)	8.34(7.47-9.31)	4.21(3.29-5.38)	42.09(40.38-43.83)	51.21(49.38-53.03)	7.04(6.14-8.06)	2.82(2.29-3.47)	38.93(37.15-40.73)
Muslim	44.91(40.69-49.2)	7.25(5.7-9.18)	3.79(2.61-5.47)	44.05(39.83-48.36)	47.33(43.6-51.09)	6.39(4.63-8.75)	2.77(1.91-4)	43.5(39.78-47.31)
Others	52.26(46.83-57.65)	7.27(5.08-10.3)	3.83(2.55-5.73)	36.63(31.58-41.99)	55.96(50.69-61.09)	6.32(4.19-9.43)	2.26(1.43-3.56)	35.46(30.52-40.73)
Caste								
SC/ST®	39.1(36.08-42.2)	9.86(8.08-11.98)	3.35(2.71-4.15)	47.69(44.33-51.07)	47.2(43.93-50.48)	6.86(5.32-8.81)	3.34(2.28-4.85)	42.6(39.31-45.97)
OBC	44.01(41.78-46.26)	9.23(8.04-10.57)	3.86(2.77-5.36)	42.9(40.59-45.26)	48.66(46.16-51.17)	8.68(7.34-10.24)	2.21(1.6-3.05)	40.44(38.04-42.89)
General	53.16(50.64-55.66)	5.34(4.45-6.39)	5.1(3.46-7.48)	36.4(34.06-38.8)	57.92(55.46-60.34)	4.24(3.44-5.21)	3.16(2.56-3.9)	34.68(32.35-37.08)
Economic status								
Poorest®	37.85(34.73-41.08)	9.72(7.75-12.12)	4.77(3.77-6.02)	47.66(44.24-51.11)	43.19(39.72-46.74)	6.59(5.35-8.09)	2.63(2.01-3.44)	47.58(43.96-51.23)
Poorer	42.18(38.86-45.56)	9.73(7.7-12.23)	3.3(2.52-4.31)	44.79(41.42-48.21)	45.82(42.31-49.36)	7.57(6.06-9.42)	4.94(3.21-7.55)	41.67(38.28-45.15)
Middle	45.27(42.14-48.44)	9.25(7.85-10.86)	3.35(2.53-4.43)	42.13(38.94-45.39)	49.63(46.23-53.05)	9.38(7-12.46)	2.18(1.54-3.07)	38.81(35.59-42.12)
Richer	44.47(40.92-48.09)	7.61(6.21-9.3)	6(3.17-11.08)	41.91(38.08-45.84)	53.02(49.75-56.27)	6.3(5.11-7.75)	2.1(1.58-2.8)	38.57(35.37-41.87)
Richest	59.7(56.46-62.85)	4.07(3.23-5.12)	3.32(2.09-5.24)	32.91(29.84-36.14)	64.93(61.34-68.35)	4.35(3.07-6.14)	2.11(1.6-2.78)	28.61(25.43-32.02)
Dependency ratio	0.57(0.56-0.58)	0.52(0.49-0.55)	0.8(0.71-0.88)	0.56(0.55-0.58)	0.65(0.64-0.66)	0.57(0.53-0.61)	0.61(0.56-0.66)	0.64(0.62-0.65)
Type of diseases								
Communicable	55.78(52-59.49)	8.2(6.03-11.06)	1.91(1.37-2.66)	34.11(30.67-37.73)	55.18(52.22-58.1)	5.67(4.32-7.39)	2.15(1.4-3.29)	37.01(34.1-40.01)
Non-communicable	44.2(42.29-46.13)	8.1(7.29-8.99)	4.67(3.56-6.11)	43.03(40.97-45.11)	50.52(48.24-52.8)	6.85(5.84-8.02)	2.68(2.1-3.42)	39.94(37.76-42.17)
Others	42.37(39.54-45.26)	8.18(6.57-10.14)	4.45(2.97-6.61)	45(42.09-47.93)	45.91(42.56-49.29)	9.07(7.06-11.58)	4.07(2.97-5.56)	40.96(37.82-44.17)
Type of health facility								
Public	51.51(49.01-54)	7.46(6.24-8.89)	2.99(2.42-3.7)	38.04(35.54-40.6)	57.51(55.18-59.81)	4.54(3.86-5.32)	3.08(2.32-4.08)	34.87(32.63-37.18)
Private	42.12(40.31-43.95)	8.56(7.62-9.6)	4.85(3.68-6.38)	44.47(42.54-46.41)	46.83(44.7-48.98)	8.44(7.25-9.8)	2.59(2.06-3.24)	42.14(40.05-44.26)
Duration of stay (no. of days)	6.10(5.92-6.29)	8.77(8.16-9.38)	11(10.01-11.99)	9.97(9.58-10.36)	5.01(4.88-5.14)	8.06(7.29-8.82)	8.05(7.28-8.83)	7.87(7.58-8.15)

Transportation cost (proxy of distance) *	557(533-582)	996(889-1103)	1593(1324-1862)	1073(1024-1122)	459(438-479)	701(633-770)	1194(1028-1359)	834(802-866)
Doctor fee*	4907(4490-5323)	6607(5592-7623)	12208(7421-16995)	9304(8490-10117)	3292(3039-3545)	5725(4509-6940)	5666(4617-6715)	5707(5252-6162)
Total	45.73(44.25-47.23)	8.14(7.38-8.96)	4.14(3.35-5.09)	41.99(40.46-43.54)	51.02(49.43-52.61)	6.91(6.12-7.79)	2.78(2.33-3.32)	39.29(37.74-40.86)

Note: Confidence interval (95%) in parentheses, *expenditure expressed in Indian rupees (Rs.); 1US$=61.4 INR in 2014

Table 2. Results of multinomial logistic regression: Predictors of source of health-care financing for hospitalization, India, 2014

Background characteristics	Borrowing	Sale of assets and contributions from relatives	Income/savings, borrowing, contributions from relatives
Age group (in years)			
15-59			
60 and Above	-0.35***(-0.47--0.23)	-0.36***(-0.50--0.21)	-0.26***(-0.32--0.20)
Gender			
Male®			
Female	**-0.26***(-0.36--0.17)**	**-0.24***(-0.36--0.12)**	**-0.10***(-0.15--0.05)**
Type of residence			
Urban®			
Rural	0.08 (-0.02-0.18)	0.02(-0.10-0.15)	0.18***(0.13-0.24)
Education of the household head			
No education®			
Up to primary	-0.50***(-0.62--0.38)	-0.12(-0.28-0.04)	-0.15***(-0.21--0.08)
Up to secondary	-0.61***(-0.75--0.46)	0.02(-0.16-0.20)	-0.19***(-0.27--0.11)
Up to higher secondary	-1.00***(-1.15--0.86)	-0.35***(-0.54--0.17)	-0.44***(-0.51--0.37)
Graduate and above	-1.44***(-1.68--1.21)	-0.31**(-0.54--0.07)	-0.73***(-0.83--0.63)
Religion			
Hindu®			
Muslim	-0.09(-0.24-0.06)	0.26***(0.08-0.44)	0.25***(0.18-0.32)
Others	-0.34***(-0.55--0.13)	0.47***(0.28-0.65)	0.10**(0.01-0.18)
Caste			
SC/ST®			
OBC	0.13**(0.01-0.25)	-0.34***(-0.49--0.18)	-0.12***(-0.19--0.06)
General	-0.49***(-0.63--0.35)	-0.22***(-0.37--0.06)	-0.37***(-0.43--0.30)
Economic status of household head			
Poorest®			
Poorer	-0.12*(-0.26-0.02)	-0.15*(-0.32-0.02)	-0.22***(-0.29--0.14)
Middle	-0.21***(-0.35--0.08)	-0.54***(-0.73--0.36)	-0.37***(-0.45--0.30)
Richer	-0.45***(-0.60--0.30)	-0.59***(-0.78--0.40)	-0.57***(-0.65--0.49)
Richest	-1.02***(-1.19--0.84)	-0.90***(-1.11--0.70)	-0.94***(-1.03--0.86)
Dependency ratio	-0.07*(-0.15-0.01)	0.09*(-0.01-0.19)	0.04**(0.00-0.08)
Type of disease			
Communicable®			
Non-communicable	0.36***(0.23-0.49)	0.33***(0.17-0.49)	0.32***(0.25-0.38)
Others	0.32***(0.17-0.46)	0.42***(0.24-0.60)	0.35***(0.28-0.42)

Type of health-care facility			
Public ®			
Private	0.60***(0.48-0.72)	0.3229***(0.18-0.47)	0.38***(0.32-0.45)
Duration of stay	0.03***(0.03-0.04)	0.0373***(0.03-0.04)	0.03***(0.03-0.04)
Transportation cost	0.14***(0.11-0.16)	0.1327***(0.10-0.16)	0.20***(0.19-0.21)
Doctor fees	0.05***(0.04-0.07)	0.0055(-0.01-0.02)	0.06***(0.05-0.07)
Constant	-2.44***(-2.71--2.18)	-3.0119***(-3.34--2.68)	-1.39***(-1.52--1.25)

Note: Finance using income/savings is reference category; Confidence interval (95%) in parentheses, Significance Level: ***significant at 1 %, **significant at 5 %, *significant at 10 %; ® is reference category of independent variables

Figures:

Figure 1. Gender disparity in health-care expenditure among in-patients in India, 2014

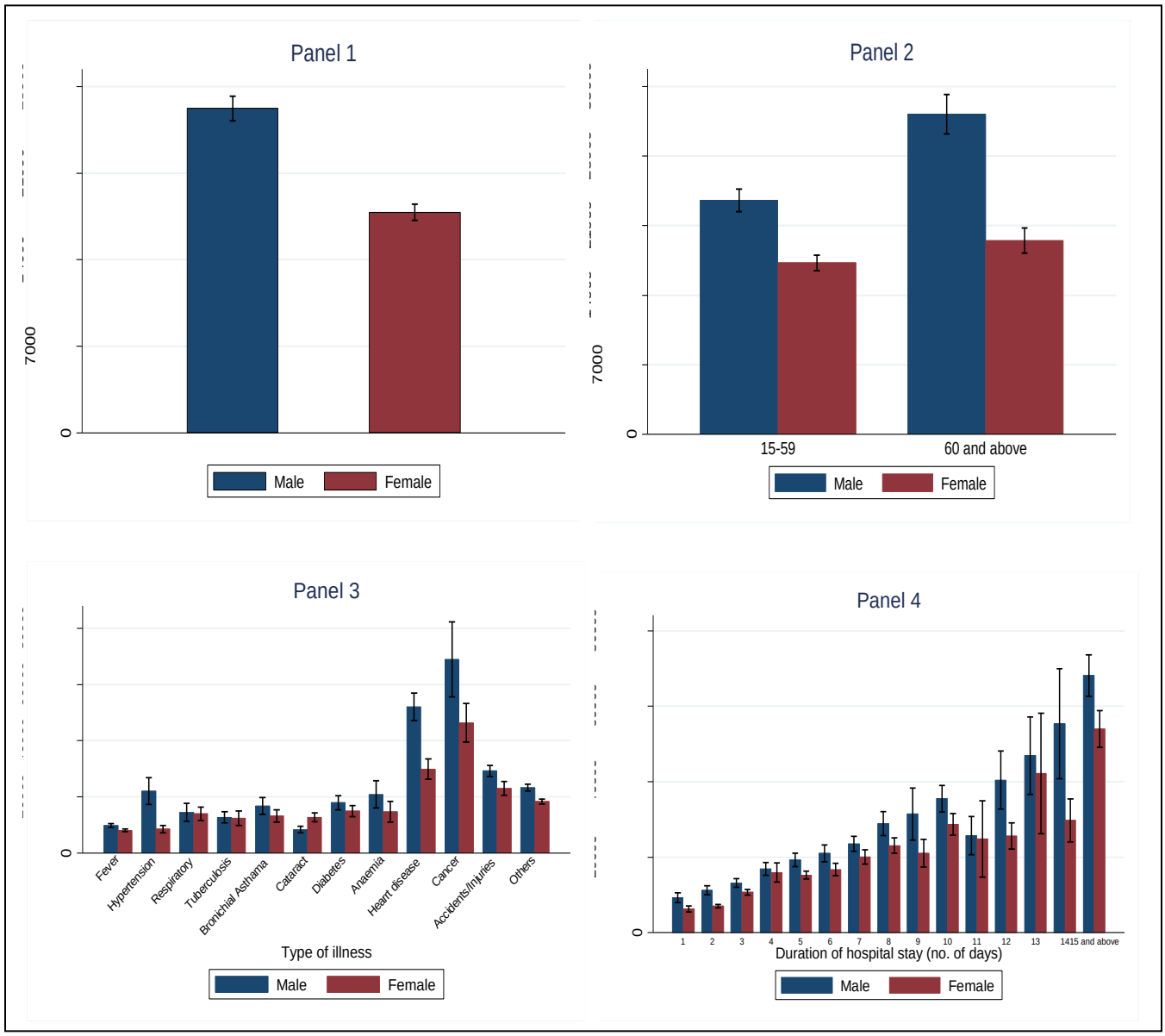

Figure 2. Gender difference in sources of health-care finance by age group of the patient, India, 2014

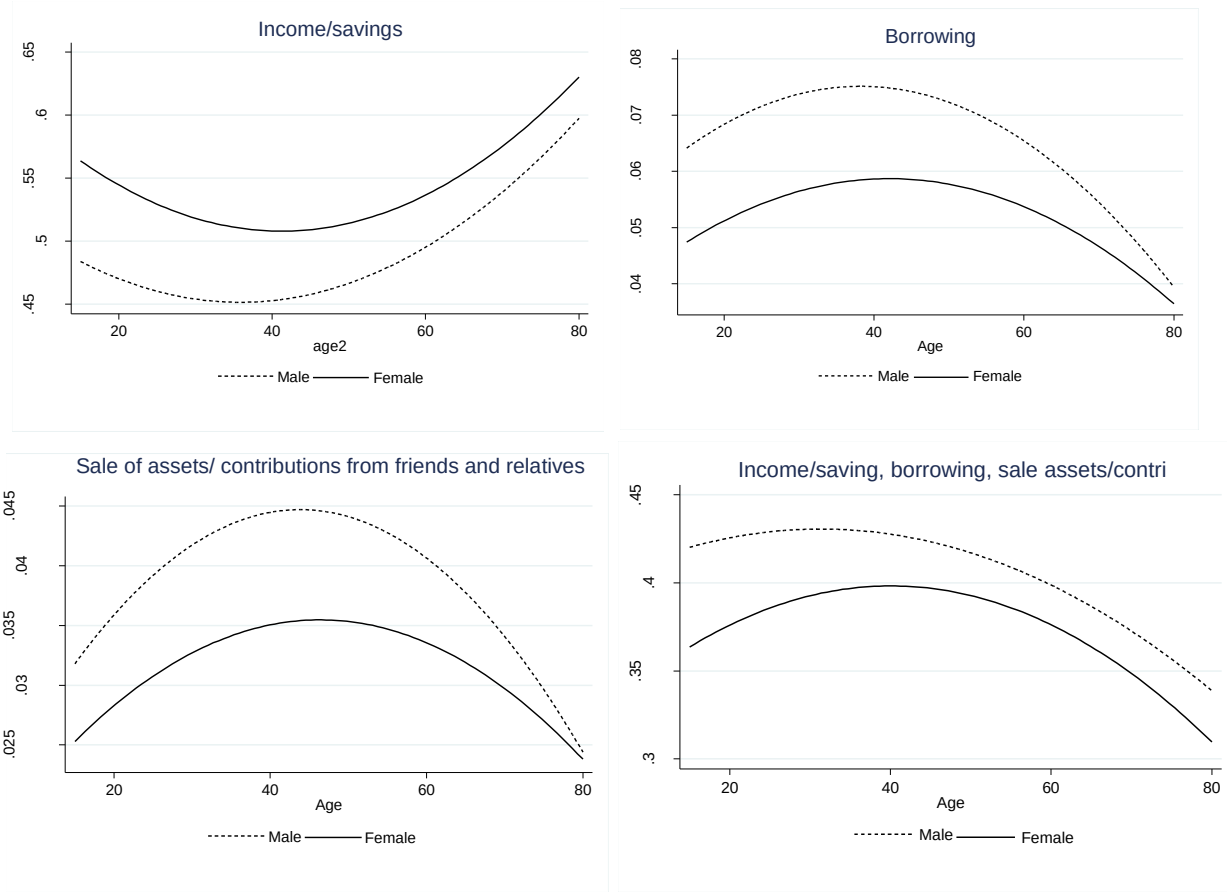

Figure 3. Predicted probabilities of hospitalization by source of HCF according to gender and household income, India