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ABSTRACT

Using data from NFHS-4, this study examines the progressiveness of out-of-pocket spending and health financing methods used in the case of institutional delivery in India. We used concentration indices to arrive at some intriguing results. Applying Multinomial Logit Model we focus on how various socio-economic factors play crucial role in making choice among alternative distress financing options. Unlike other studies, we find that as women get older, they often arrange for money by selling jewelries for health purpose. This is equally true for women with a secondary education. They also rely on other strategies like saving and selling. In case of different social division in Indian society, the SCs and the OBCs are found to be more susceptible to distress financing. In spite of some government initiatives like Janani Suraksha Yojana (JSY) the problem of out- of- pocket expenditure related distress has not been reduced substantially. In our opinion this is a policy failure. In order to address this problem a concerted effort from both demand and supply side should be made available.

Keywords: Out- of- pocket expenditure, distress financing, institutional delivery

JEL Classification: I10, I140, I150, I180

1. Introduction

The two essential points of the Millennium Development Goals (MDGs) that the UN announced was to increase births in institutional setting and to reduce catastrophic financing among many (UN Report, 2015; Mavalankar et al., 2008; de la Santé, 2010). Though India is now close to reaching the goal of universal institutional delivery (ID), increasing Out- of- Pocket expenditure (OOPE) is on the rise partly due to this increase of ID (NFHS- 4 and 5; Yadav et al., 2021). Given the low prevalence of family planning,- increase in utilization of private facilities even among the poorest (due to low availability and poor infrastructure of public health facilities, and sometimes due to an emergency), sky- rocketing of C- section deliveries and increase in expenditure even in public facilities made condition of the poorest gloomy even in case of normal deliveries (Banerjee et al., 2004; Reports of NFHS- 4 and 5; Skordis- Worrall et al., 2011; Peel et al., 2018, Bhatia et al., 2020; Mishra and Shyamala, 2021). As even the wealthier class sometimes has to take the route of distress financing, childbirth- a memory to be cherished for a lifetime is casting nightmare on the lives of many (mostly on the poorest) due to this increasing burden of OOPE (Nahar and Costello, 1998; Hoque et al., 2015; Yadav et al., 2021). For this rising of OOPE in general, among 21% of women in India who delivered their child at home without any medical care, 15.9 % cited too much cost of delivery to be the main reason for not delivering in a health facility. So, this increasing burden of OOPE is in turn hindering the rise in the use of institutional delivery for childbirth (NFHS- 4). As subsidy of JSY is barely able to subsidize the increasing cost and so to decline instances of catastrophic expenditure and distress financing (Leone et al., 2013; Mukherjee et al., 2013; Yadav et al., 2021) and given its poor targeting of its actual beneficiaries (Ali et al., 2020; Sengupta and Sinha, 2018) - it is necessary to check the correlates of distress financing in case of institutional delivery to prescribe policies

to reduce the same. After rigorous analysis of representative data for India (micro-data from NFHS- 4) using multinomial logistic regression and concentration index, we will report the crucial determinants and show how they affect women depending on various socio-economic factors. Most of the findings of this study are in sync with the already existing literature. Like previous studies, we find that distress financing events rise with increased delivery expenditure, caesarean births, and use of private facilities and fall with increased wealth, women's education, and age. However, unlike other studies, we find that in serious situations, a slight increase in women's education (not for the most educated) nudges them to sell their jewelry and resort to using money received from savings and selling for their health purpose. Though for other distress financing options in general, we find they are less likely to do those with increased education. This is also true when a woman gets older. With an increase in age, we find selling of jewelry increases, as women are better able to accumulate a significant amount of jewelry which they intend to use for their health purpose. In case of social class, while the percentage of borrowing and selling jewelry to meet OOPE is higher for the SC[1] class, the OBCs have also been found to rely on saving+ selling, which is a severe strategy. Despite the literature's mixed views on JSY's success, we believe it is a paralyzed policy that requires assistance from the user or the health facility of choice to indeed reduce distress financing incidents. The comparative study performed with the help of the Multinomial Logit Model will aid policymakers in determining where to intervene.

[1] Indian society reflects caste system where the entire population of India is divided among various castes and sub- castes depending on various concerns. Schedule Castes (SCs), Schedule Tribes (STs) and Other Backward Class (OBCs) are considered to be socially and economically backward. For some more details on this dimension one can check https://en.wikipedia.org/wiki/Category:Social_groups_of_India

2. Brief Literature Review

Various studies have documented how different demand and supply-side factors play a crucial role in the utilization of different maternal health care services (MHCs) as well as for institutional delivery (ID). Demand-side factors include woman's / family's level of education, age, household wealth, childhood place of living, birth order of child, women's economic status, castes and religions, and woman's resistance against domestic violence (Mohanty et al., 2019; Vellakkal et al., 2017). Supply-side factors include the presence of health facilities in the vicinity, population per hospital, road conditions, doctor-population ratio, absence of doctors, per-capita state health expenditure, and bribery and overall corruption level (Mohanty and Srivastava, 2013; Banerjee et al., 2004; Mauro, 1998; Navaneetham and Dharmalingam, 2002; Das, 2017). Besides this, one of the crucial factor determining intakes of institutional delivery is the out–of–pocket expenditure. Not only numerous studies (Borghi et al., 2004; Vellakkal et al., 2017; Nahar and Costello, 1998), but NFHS report (2015-16) also notes that, due to high and rising OOPE in general, 15.9% of mothers in India who had their child at home without any medical care, reported high delivery costs as the primary reason for not delivering in a health facility. As a result of high OOPE, several studies have documented that OOP expenditure for maternal care can be catastrophic, pushing poor families into income poverty (Skordis- Worrall et al., 2011; Mishra and Mohanty, 2019). It was found that women who delivered at private facilities incurred three times more cost than delivering in a public facility, but no significant intra- facility difference in cost was found between the low-performing states and the high-performing states (Mohanty et al., 2019). Not only families from the richer quintile were found to use private facilities over public facilities for a better quality of care, but poor women were also found to knock on the door of private providers sometimes, for which they have incurred

more expenses (Skordis- Worrall et al., 2011; Banerjee et al., 2004; Bonu et al., 2009; Nahar and Costello, 1988). Furthermore, given multiple times greater cost for caesarean delivery than normal delivery, an increasing trend for caesarean delivery has been observed, not only in private facilities, but also in public facilities (Mohanty and Srivastava, 2013; Mohanty et al., 2019); Sengupta et al., 2021). Among various treatment expenses, medicines and hospitalization costs were found to be the biggest drivers of OOP spending (Bonu et al., 2009). Other than this, different 'hidden costs' in public healthcare made OOPE for maternity care services unanticipated and the consequences were worse (Nahar and Costello, 1998). Tips for getting different services like ambulance ride and securing a bed in overcrowded hospitals were found to be normal in public facilities, and for the shortage of various services, many women were compelled to pay for drugs, syringes and saline, cotton pads, and tests that should have been provided for free (Issac et al., 2016). Given this, India in 2005 introduced Janani Suraksha Yojna (JSY) under the National Rural Health Mission (NRHM), to influence deliveries in institutional setting, which is also thought to have an impact on lowering instances of distress financing (Mishra and Mohanty, 2019). The financial benefit of JSY differed by state, as well as for rural and urban areas, and the states were classified as either High Performance or Low Performance states (Vellakkal, 2017; Rahaman and Pallikadavath, 2017; Sengupta and Sinha, 2018). Although this plan was originally intended to improve utilization of institutional delivery, it was later expanded to include home deliveries for which a monetary payment of 500 rupees was introduced, which was argued to have a negative impact on intake of institutional delivery (Sengupta and Sinha, 2018; Devadasan et al., 2008). Here, one thing to keep in mind is that the JSY pays an eligible woman a pre-determined monetary sum based on her location, not the real cost of delivery, which is often higher than the former (Rahaman and Pallikadavath, 2017; Mukherjee and Singh, 2018; Yadav et

al., 2021). Despite this, and despite the harassment and delays experienced by patients, as reported by multiple studies, and its poor- targeting of its actual beneficiaries (Ali et al. 2020; Sengupta and Sinha 2018), JSY, mainly due to ASHA workers' effort, was still found to have a beneficial impact on the intake of different MHC services (Vellakkal et al., 2017). However, the issue of distress financing and catastrophic expenses as a result of high and rising OOPE remains unsolved (Leone et al., 2013; Mukherjee and Singh, 2018). Given the high rate of institutional delivery (NFHS 4 to 5, according to NFHS data; Mishra and Shyamala, 2021), instead of finding the determinants of institutional delivery again, our primary focus is to investigate the causes of incurring distress financing for child delivery. Studies documented that to meet OOPE, women, mostly from the poorer section, use savings certificates, sell property, take out loans, and utilize hybrid strategies, respectively (Mishra and Mohanty, 2019; Hoque et al., 2015). A concerted effort has been made in earlier studies to classify these methods that deal with the treatment costs, and then to amend and integrate new techniques in each categories. In other words, this effort in turn decided which of these strategies can be put into distress financing, and which into the coping strategies. As a result, we now see a clear divide between coping strategies and distress financing strategies. For example, most studies consider borrowing (with or without interest), sale of assets, jewelry, livestock, personal property, and utilization of hybrid strategies as distress financing strategies (Rahaman et al., 2013; Joe, 2015; Sauerborn et al., 1996), but very few consider the use of savings to cover health costs as distress financing (Tahsina et al., 2018; Mishra and Mohanty, 2019). Again, we have found there are differences of opinion among researchers regarding interest-free loans or assistance from relatives, that whether these could be assigned as distress financing techniques (Kastor and Mohanty, 2018; Pandey et al., 2016; Skarbinski, 2002). So for our research, we have designated each technique in our research based

on the general consensus of the previous studies. In addition to these, studies have shown how families have used a variety of strategies to deal with treatment costs, including reallocation of labor within the household for the sick member, cutting expenses to meet medical expenses, and saving money for critically ill members by neglecting their own/other members' health (Daivadanam et al., 2012; Karan et al., 2014). Although distress financing is more widespread among hospitalized patients, studies noted it can also happen for maternity health care seekers and for the outpatients too (Rahaman et al., 2013; John & Kumar, 2017; Mishra and Mohanty, 2019).

Most studies have used multivariate logit / probit regression to find different determinants of distress financing for different types of health ailments and also for maternal health care services. Some studies have homogenized all distress financing options to create a dependent variable to find determinants of distress financing, which is somewhat flawed[2] (As in Mishra and Mohanty, 2019; John and Kumar, 2017; Yadav et al., 2021). However, few studies also have used the Ordered logit / Multinomial logit specification to show how women choose the path of various distress financing instead of the base financing category, although the specification of dependent variables still remains questionable[3] in some cases (Basumatary and Srivastav, (2018), Tahsina et al., 2018).

So for our case, we used national data (NFHS-4) to examine the impact and progressiveness of OOP spending and its various components and also checked the concentration of the coping

[2] Because severity of financing strategies differ, and determinants of utilization of one strategy may differ from those of others. Borrowing and selling of property, for example, varies in their severity, as do their determinants.

[3] The ranking of the categories in the dependent variable by Basumatary and Srivastava (2018) did not take into account the severity of each method. Tahsina et al. (2018) used an ordinal logistic model, but we don't always have perfect strategy ordering (say, one strategy could be roughly equivalent to another strategy, such as borrowing and savings.)

techniques to find which financing strategies are concentrated among which wealth class. Along with this, we have used a multinomial logistic model to find how different socio-economic factors play role in choosing different distress financing strategies in case of institutional delivery.

3. Data description and Methodology

We have used the most recent unit-level data from NFHS-4 (accessed from the Demographic and Health Survey website) for our analysis. According to the DHS website, "The unit of analysis (case) in this file is the children of women born in the last 5 years (0- 59 months)". This data file contains information related to child and mother's health, different socio-economic indicators, OOP expenditure for child delivery and also the associated financing strategies. The data itself has wealth index generated by the PCA method, using different indicators of household wealth. However, it does not have information on household income or any member's income explicitly into it and also lacks information on consumption expenditure- making it impossible to carry on analysis of catastrophic expenditure happens due to increasing health payments. Despite this, given the NFHS data's international repute and comparability, this is the most dependable data source for our analysis which takes a large number (close to 61,000) of households from each state of India into consideration (Mishra and Mohanty, 2019). But, as NFHS started to collect data for OOP expenditure and different coping strategies only from NFHS- 4 (the latest issue to date, because NFHS-5 unit-level data has yet to be released), it is impossible to have pooled cross-section analysis for our research questions (Mishra and Mohanty, 2019).

After presenting concentration index scores for OOPE and its various components, we show the percentages of people doing each type of distress financing in detail. Next, we will bring the progressivity analysis for financing methods (using Concentration Index) to find which type of coping strategy/ distress financing strategy is progressive or regressive in nature. That is, which strategies are concentrated among the more affluent class vis- à- vis the poor class. The use of the concentration index is appropriate here compared to the 'Gini Index,' as the later does not take socio-economic dimension into its consideration (Wagstaff et al., 1991).

The concentration index is defined as twice the area between the concentration curve and the line of equality. When there is no inequality, the concentration index is zero. It takes a negative value when the curve lies above the line of equality, indicating a disproportionate concentration of the health variable among the poor and vice-versa (O'Donnell et al., 2007). The concentration index can be defined as:

$$C = \frac{2}{\mu} Cov(h, r)$$

Where, C= Concentration Index, h= health sector variable, μ= its mean, r= fractional rank of individual in the living standards distribution

Concentration index lies between -1 and 1. (O'Donnell et al., 2007)

Then, we will employ a Multinomial logistic regression to find what causes respondents to choose different distress financing options like: borrowing, selling of jewelry, selling of assets, utilizing savings and borrowing, using savings and selling (both assets and jewelry), and a mixed strategy (all other possible least used combinations) over a non- distressing strategy (here, savings as a base category). As could be seen from above, we clubbed some categories together

to capture the popular health financing strategies (distress financing strategies here) done by households (See Table 4.2 and 4.3). This study enables us to clearly see depending on what socio-economic conditions, women choose a distress financing option over a non- distressing one and are forced to shift to more severe strategies (i.e., the combination of strategies), making it an interesting analysis. This is in contrast to other studies which either homogenize all the financing categories to form a dependent distress financing variable (as in Mishra and Mohanty, 2019) or regress independently for each financing approach (as in Joe, 2015) to uncover the factors impacting distress financing. So, to fulfill our target, that is to find which strategy is chosen over what (base category), depending upon various socio-economic backgrounds of respondents- The multinomial Logit Model (MNL) is the best method to choose. This is for the following reasons. Although it is true that using multinomial logit model means satisfying to Independence of Irrelevant Alternatives (IIA) assumption, this assumption does not hold most of the time when we use discrete choice models (Kropko, 2008; Dow and Endersby, 2004). The famous example of Red bus- Blue bus greatly describes the scenario, where the inclusion of a third alternative (i.e., blue bus) faultily increases the total percentage of usage of bus over car usage when we conform to IIA property using multinomial logit model (Hoffman and Duncan, 1988). For this reason, some studies recommended using the Multinomial Probit model (MNP) over MNL (Alvarez and Nagler, 1998; Alvarez at al., 2000). But, despite MNL's shortcomings (inconsistent and biased) due to its fundamental assumption regarding IIA, the Multinomial Probit Model (MNP), which relaxes this assumption, is also not up to the mark (Kropko, 2008). According to Kropko (2008), MNL is better than MNP, due to the difficulty in calculation and the problem of converging in MNP, as well as due to its inefficient and faulty estimation. Considering this, he suggested using MNL over MNP, from the point of view of accuracy. Dow

and Endersby (2004) also criticized MNP for its weak identification property. They found MNL results to be more stable than MNP results using several countries' electoral data. To them, the seriousness put in the IIA theorem for not using MNL seemed unnecessary, as in most cases, MNP and MNL gave the same results, but things only got complicated when using MNP. Some studies also advocated for Nested logit models, Mixed logit models over MNL for the violation of the IIA property in case of discrete choice models (Hoffman and Duncan, 1988; Jones and Hensher, 2004). But, for our type of analysis, Nested logit is inappropriate as individuals rarely choose distress financing method sequentially (Bel and Paap, 2014). Also, Mixed logit is not appropriate as it contains a conditional part in it (multinomial+ conditional logit), which is absent here in our analysis. So, given this background, the regression equation for the Multinomial logit model is given below, with savings as the base strategy (coded as 1).

$$\log\left[\frac{P_{ij}}{P_{i1}}\right] = \alpha_j + \sum_{k=1}^{K} \beta_{kj} X_{ik} + \varepsilon_{ij}$$

Where, α represents the intercept and β is the vector of slopes, and X_{ik} is the matrix of all independent variables. The explanatory variables in the model can range from 1 to K, and a specific explanatory variable is represented by the letter ‘k’. The term ε_{ij} is the error term, which captures the unobserved effects and we assume it to be identically distributed. From the regression equation given above, we'll get separate equation for each distress financing strategy. The dependent variable (coping strategy, coded as ‘copestr') employed here will be used to report the log-odds opting a distress financing option (j = 2, 3, 4, 5, 6, 7) by the individuals (i = 1, 2,...) over savings (first category), as the base category. As the dependent variable has 7 categories, we will estimate (7-1) = 6 equations, as we have to put the base category’s (i.e., saving’s) co-

efficient (α_1 and β_1) equal to zero (Gujarati, 2011; Williams, 2021). So, the first regression equation (i.e., for borrowing), will start from co- efficient number 2. Below we show the category classification of strategies other than savings.

2 = borrowing (with/ without interest rate)

3 = selling of assets

4 = selling of jewelry

5 = utilizing savings and borrowing

6 = utilizing savings and selling (assets/jewelry)

7 = mixed strategy (to consider all possible least used combined strategies utilized by women, as also used by Basumatary and Srivastav, 2018).

But before starting our analysis, we will check whether an ordered specification of the dependent variable (coping strategy here) is appropriate, or unordered/ nominal specification fits it. Logically, as it is not specified whether borrowing done is with or without interest rate (making it tough to rank), it is safe to use multinomial logit model, as we cannot have an ordered dependent variable (Borghi et al., 2004; Yadav et al., 2021). But to be completely assured, we will check whether the proportional odds theorem holds, which is developed by McCullagh (1980). It is also called parallel regression assumption. This is because it checks/ assumes that, the coefficient of each independent variable is same for each level of the dependent variable. That is, the coefficient for each independent variable is same for the lowest category vs. all categories of the dependent variable (or, the odds are affected by independent variables in the same way), requiring one model (Agresti, 2002). The null hypothesis so is that all the

coefficients are same across models. This means if the Chi- square reported turns out to be insignificant or the null hypothesis is accepted, we have to take an ordered specification for our analysis. The ordinal model is a comparatively restrictive model, as for each independent variable, we get one odds ratio, as the difference between levels of the dependent variable is the same. The multinomial model, on the other hand, is less restrictive, generating relative odds ratios for each level of the dependent variable, leaving the base category. The regression equation for Proportional Odds model is given below:

$$logit[P(Y \leq j)] = \alpha_j - \beta^T X_i$$

Where j = 1,..., J-1 and i = 1,...,M

Let, J is the number of categories the dependent variable has, and M is the number of independent variables considered. The 'j' is the specific level a category of the dependent variable among the J number of categories (Say, borrowing=2 from total 7 categories of our dependent variable). And, 'i' is the one specific independent variable from the range of independent variables considered, i.e., M (McCullagh, 1980; towardsdatascience). It is worth noting that, here regression co- efficient β does not have subscript 'j', while α has that. This is because in comparison to a general linear logistic model [logit $[P(Y \leq j)] = \alpha_j - \beta_j^T x_i]$ where β retains the subscript 'j', in Proportional Odds model we check the null hypothesis whether the independent variables co- efficient (slope β) exerts same effect to the dependent variable (or the odds reported). So, the slopes (β) should not change with each independent variable, as they are all equal. But, as α is the intercept, it is allowed to change as it is not affecting the null hypothesis (McCaullagh, 1980).

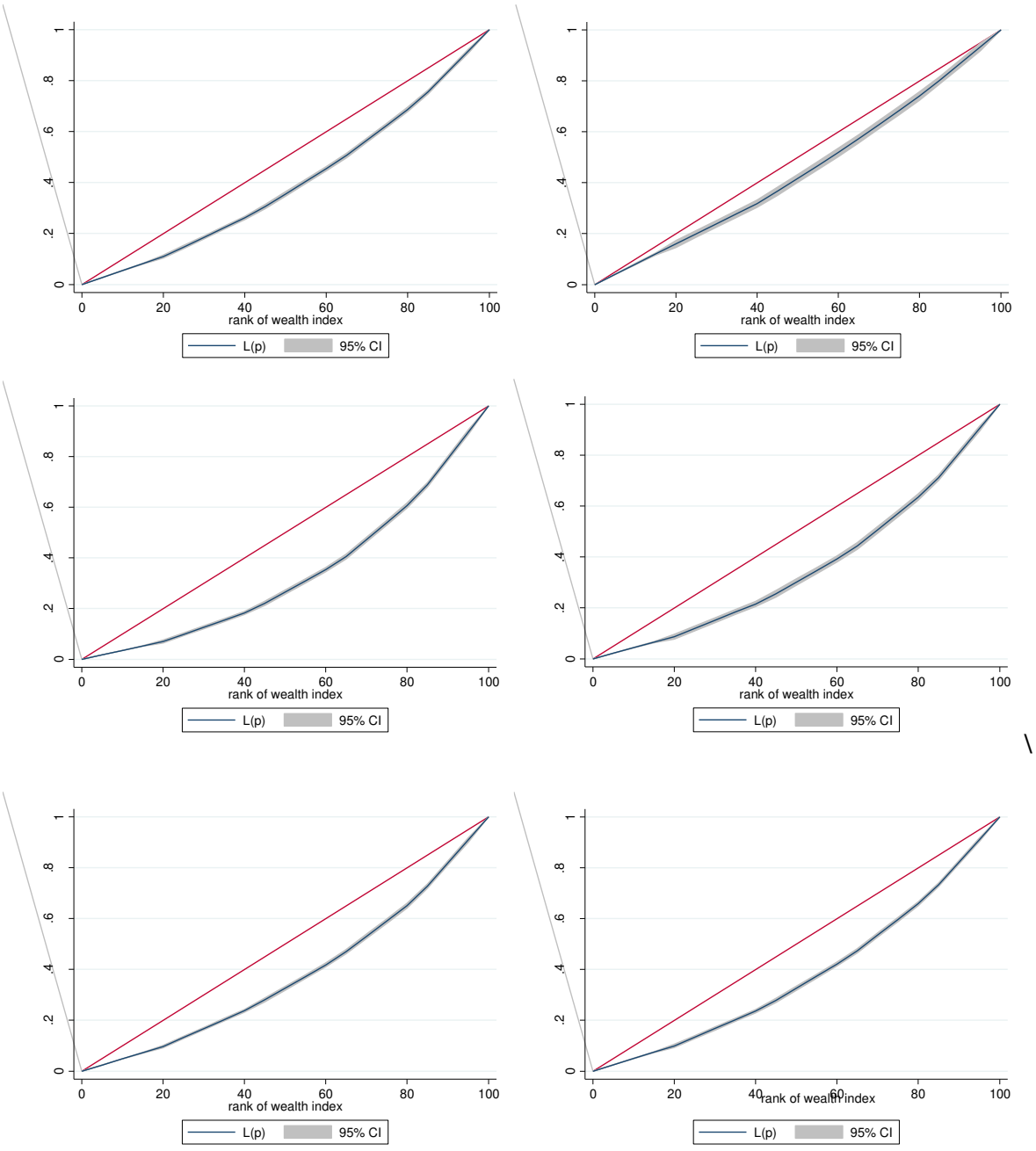
Now, if we obtain a significant chi-square value, we may say that the multinomial logistic model is appropriate for our research because it is less restrictive, as we reject the null hypothesis. Alternatively, if the null hypothesis is not rejected, then we will continue with the ordered specification. To carry out this in STATA, we will use 'omodel' command, where the entire logit model's regression specification is examined to see if the proportional odds assumption holds.

4. Results

First, using the formula for concentration index given in the methodology part, we will check whether different constituents of OOPE and the total OOPE are progressive or not. That is whether they are concentrated among the affluent section or the poorer section of the society. If a particular spending category becomes concentrated among a particular wealth class, it signifies that the particular wealth class spends the most in that category.

Table- 4.1: Concentration index and concentration curves for different constituents of OOPE in case of institutional delivery

Expenditures	***No. of obs.***	***Index value***	***Robust Std. Error***	***p- value***
Medicine	100539	.17990755	.01109713	0.0000
Transport	108693	.14669107	.02664703	0.0000
Hospital stay	104910	.3011748	.01128689	0.0000
Tests	101747	.24922099	.01480042	0.0000
Other	101525	.2370505	.01016546	0.0000
Total	88951	.22956819	.01079337	0.0000



As we can see from the above table, the richer paid more than the poor for each type of expenditure, so OOPE for each type of expenditure is progressive in nature. The richer population spent more on hospital stay, tests, other expenses, medicines, and transport (all statistically significant at 99% level). The total OOPE is also progressive, with an index value of

0.229, indicating that the richer paid more than the poorer in overall. The corresponding concentration curves are also given above with the table of concentration index. In each figure, the cumulative proportion of population ranked by wealth index is plotted against the cumulative proportion of each type of expenditure. All the concentration curves, as expected, fall below the Line of Equality (LoE), suggesting expenditures to be progressive. Though this progressiveness in OOPE is a desirable thing, it is important to note that even a small quantity of spending can lead to events of distress financing and catastrophic expenditure for those with limited financial resources (Mukherjee et al., 2013).

Next we will see percentages of doing each type of coping strategies.

Table 4.2: Percentage of women using each type of coping strategy

Coping strategy	*Percentage (yes)*	*Lin. Std. Err.*	*95% Conf. Interval*
Savings	76.01	.0025615	75.49967, 76.50381
Borrowing	23.13	.0024348	22.65569, 23.61014
Selling of property	03.47	.0011235	03.25815, 03.69881
Selling of jewelry	02.76	.0009001	02.58584, 02.93888
Savings+ borrowing	07.09	.0013879	06.82663, 07.37078
Savings+ selling (property/jewelry)	0. 027	.0000898	0.0142, 0.05192
Mixed strategy	0.837	.0005388	0.73811, 0.94985

The table above shows that most women have utilized savings to meet OOPE for child delivery. As utilizing savings means that the user does not have to repay as in the case of borrowing, and as it is easy to collect the money without much risking the future, this coping strategy became the first choice among women as in other studies. Next comes borrowing. As compared to other coping strategies (other than savings), the perceived risk is less for the future (perceived, as Damme et al. (2004) show how debt from borrowing led to the selling of other assets, so its risk may not be as low as expected), so it is the next popular one. After this comes the utilization of

saving along with borrowing. You can see it is a more popular strategy (7.09%) than selling of property (3.47%) and selling of jewelry (2.76%). This is because selling of assets and jewelry are severe kind of distress financing option where one loses his/ her assets but not in case of savings +borrowing (or, at least perceived risk is lower as per Sauerborn, 1996). For this, women take this way to meet their OOPE for child delivery. Another apparent cause can be the time, because in case of selling, one needs to be patient until his/her assets get sold (mainly in case of selling of property) to get money in hand. After these strategies, comes the mixed strategy, and then comes selling of assets/ jewelry along with utilization of savings. We find that women consciously rank all the strategies, and the most severe strategies like using savings+ selling, are reserved for the worst days.

Next we look at the percentage of women doing each coping strategy, broken down by wealth class.

Table 4.3: Percentage of women doing each coping strategy by wealth class.

Coping strategy	***Poorest***	***Poorer***	***Middle***	***Richer***	***Richest***
Savings	61.51 (.005206)	69.84 (.0048802)	75.02 (.0046319)	81.08 (.0049515)	90.03 (.0043114)
Borrowing	35.06 (.0049948)	28.25 (.0046918)	23.60 (.0043981)	19.07 (.0047479)	11.76 (.0047218)
Selling of property	03.75 (.0020634)	04.02 (.0020287)	03.93 (.002216)	03.70 (.0026513)	01.97 (.001788)
Selling of jewelry	02.25 (.0015139)	02.57 (.0015592)	03.30 (.0018832)	03.52 (.0020826)	01.99 (.0020593)
Savings+ borrowing	06.35 (.0024069)	07.34 (.0024455)	07.71 (.0026574)	07.76 (.003231)	06.12 (.0031024)
Savings+ selling (property/jewelry)	0.01113 (.0001113)	0.01335 (.0000816)	0.0305 (.0001593)	0.05582 (.0003528)	0.02001 (.0001239)
Mixed	0.9389 (.0010065)	0.82972 (.0008192)	0.86377 (.0009378)	01.01 (.0014539)	0.55387 (.0011426)

Note: Standard errors are given in parentheses

Here, at first, we find that utilization of savings goes up as we move from the lowest wealth class to higher wealth classes, may be due to the fact that availability of savings account and availability of money there increases when we go up to higher wealth classes. But in case of borrowing, this gets reversed. This is because money available in savings account are limited for lower-wealth people, and often they don't possess savings account, for which they must borrow, as it is perceived to be less harsh (Sauerborn, 1996). Also, with the increase in wealth class, women restrict themselves to borrow due to prejudice. For selling of property and selling of jewelry, difference in percentage is not much among different wealth classes, but former is higher in the poorer and middle wealth classes and later is higher in richer and middle wealth classes.

Now we will see the concentration index for each type of coping strategy to determine which coping strategies are progressive and which are regressive in nature.

Table 4.4: Concentration index for each type of coping strategies

Coping Strategy	***Index value***	***Robust Std. error***	***p- value***
Savings	.06985319	.00174299	0.0000
Borrowed	-.18728094	.0056028	0.0000
Sold property	-.09124638	.01510991	0.0000
Sold jewelry	.00843585	.01738754	0.6276
Both from savings and borrowed	-.00317336	.01031062	0.7583
Utilized saving+ sold property	.08310994	.05236109	0.1125
Both from savings+ selling of jewelry	.19298454	.03975966	0.0000
Both from Saving+ selling (assets/jewelry)	.17381851	.14532159	0.2317

Mixed	-.05508096	.03483648	0.1139
Other	-.22336449	.01669554	0.0000
Insurance+ other	.56284316	.40899866	0.1688
Insurance	.04451757	.03790426	0.2402

Note: Total no. of observations= 110119

As we know from the previous discussion, a CI with a negative value (close to -1) indicates a particular coping strategy is concentrated amongst the poor and vice- versa. So here what we can see is that, borrowing from friends, selling of property and the 'other methods' of coping strategies are statistically significantly concentrated amongst the poor. This means, to meet OOPE in case of child delivery, the poorer section of the society has to take severe financing strategies like selling of property. While, utilizing savings along with borrowing takes a negative value though, it is not statistically significant. Utilization of savings, which is only a coping strategy but not a distress financing one (according to studies, as it does not require repayment, gathering money is not cumbersome and has very few serious consequences afterwards) found to be concentrated among the richer section due to availability.

Now, before we apply the multinomial logit model to see how individuals choose different types of distress financing options over a non-distressing one based on their socioeconomic background, we must first confirm whether the nominal specification of the dependent variable or the ordered specification suits our needs, as described above in the methodology section. That is, whether a multinomial logit model or an ordered logit model is right for us, or stated otherwise, whether the application of multinomial model is accurate in this context. For this, we will check the Proportional Odds Theorem using our specification of dependent variable as

mentioned in the methodology part, and we will make a decision depending on the significance of the chi-square statistic.

Table 4.5: Checking the proportional odds theorem

VARIABLES	COPESTR
Totoop	5.79e-06***
	(5.34e-07)
Windex	-0.375***
	(0.00953)
Resid	0.0119
	(0.0251)
Age	-0.0113***
	(0.00254)
Education	-0.0255***
	(0.00624)
Caste	0.0457***
	(0.00842)
Bord	0.0203*
	(0.0111)
Caesarean	0.533***
	(0.0253)
JSY	-0.0716***
	(0.0238)
Hosp	0.371***
	(0.0264)
_cut1	0.373***
	(0.0782)
_cut2	1.254***
	(0.0785)
_cut3	1.559***
	(0.0788)
_cut4	1.770***
	(0.0791)
_cut5	3.629***
	(0.0861)
_cut6	4.309***
	(0.0935)
Observations	54,838

*Note: ***p<0.01, **p<0.05, *p<0.10*

Approximate likelihood-ratio test of proportionality of odds across response categories:

Chi^2(50) = 1729.54; Prob > chi^2 = 0.0000

The likelihood test here shows that we will violate the proportional odds assumption, if we use an ordered specification for the dependent variable. As according to the report, using the same co- efficient for different models is not a wise decision; a less restrictive model like multinomial logit model will fit here.

Given this, now we will see the output from the multinomial logit model (marginal effects) in the next table with coping strategies (copestr) being the dependent variable and total OOPE, wealth index, place of residence, respondent's age, respondent's education, caste, delivery type, birth order, JSY and delivery place being the independent variables. We will also discuss its various implications on the next page.

Table 4.6: Marginal effects of the covariates from the multinomial logit model

VARIABLES	(1) Savings[rc]	(2) borrowing	(3) soldproperty	(4) soldjewel	(5) savborr	(6) savsell	(7) mixed
Totoop (0-999[rc])							
1000-4999		.0411***	.0008	.0053***	.0161***	.0014*	.0034***
		(.0042)	(.0024)	(.0013)	(.0029)	(.0009)	(.0009)
5000-9999		.0488***	.0125**	.0149***	.0336***	.0037*	.0075***
		(.0067)	(.0042)	(.0025)	(.0051)	(.0014)	(.0016)
10000-14999		.0699***	.0051	.0218***	.0404***	.0066***	.0083***
		(.0105)	(.0050)	(.0046)	(.0068)	(.0024)	(.0025)
15000+		.0919***	.0006	.0410***	.0570***	.0123**	.0215***
		(.0122)	(.0053)	(.0062)	(.0083)	(.0041)	(.0056)
Windex (Poorest[rc])							
Poorer		-.0730***	.0006	-.0019	.0013	-.0005	-.0005
		(.0075)	(.0035)	(.0027)	(.0039)	(.0012)	(.0014)

Middle	-.1298***	-.0009	-.0009	-.0015	-.0010	-.0021
	(.0082)	(.0036)	(.0026)	(.0047)	(.0012)	(.0014)
Richer	-.1754***	-.0020	-.0068**	-.0112**	-.0005	-.0025*
	(.0090)	(.0042)	(.0027)	(.0047)	(.0014)	(.0015)
Richest	-.2247***	-.0183***	- .0145***	-.0228***	-.0026**	-.0050***
	(.0091)	(.0040)	(.0027)	(.0053)	(.0013)	(.0014)
Resid (Rural[rc])						
Urban	.0143**	-.0026	.0043**	.0033	-.0002	-.0008
	(.0072)	(.0038)	(.0019)	(.0039)	(.0008)	(.0007)
Age (15-24[rc])						
25-34	-.0086*	.0028	.0041**	-.0064**	.0017	-.0005
	(.0048)	(.0025)	(.0014)	(.0032)	(.0007)	(.0008)
35-49	-.0197*	.0019	.0076**	-.0112**	.0006	.0004
	(.0074)	(.0045)	(.0033)	(.0048)	(.0011)	(.0018)
Education (Illiterate[rc])						
primary	-.0177***	-.0015	.0033	-.0028	.0011	.0003
	(.0066)	(.0035)	(.0023)	(.0053)	(.0010)	(.0014)
secondary	-.0380***	.0002	.0030*	-.0147***	.0024***	-.0019**
	(.0054)	(.0029)	(.0018)	(.0044)	(.0007)	(.0010)
higher	-.0801***	-.0051	-.0008	-.0331***	.0020*	-.0014
	(.0081)	(.0043)	(.0024)	(0055)	(.0011)	(.0014)
Caste (General[rc])						
SC	.0385***	-.0014	.0110***	.0038	.0017	.0004
	(.0066)	(.0035)	(.0020)	(.0045)	(.0012)	(.0010)
ST	.0151*	-.0009	.0070*	-.0040	.0004	-.0002
	(.0080)	(.0043)	(.0026)	(.0046)	(.0011)	(.0012)
OBC	.0327***	-.0036	.0101***	.0031	.0019***	.0009
	(.0057)	(.0033)	(.0017)	(.0036)	(.0007)	(.0009)
Bord (birth order=1[rc])						
2	.0088*	-.0024	.0035**	-.0058**	.0008	.0005
	(.0046)	(.0031)	(.0017)	(.0027)	(.0007)	(.0007)
3	.0074	.0002	.0008	-.0006	-.0005	.0005
	(.0059)	(.0041)	(.0022)	(.0040)	(.0008)	(.0010)
4	.0067	-.0108**	-.0050**	-.0010	-.0009	.0009
	(.0075)	(.0042)	(.0023)	(.0054)	(.0011)	(.0014)
5+	.0252***	-.0124***	-.0063**	.0049	-.0010	.0002
	(.0087)	(.0042)	(.0023)	(.0063)	(.0013)	(.0018)
Caesarean (No[rc])						
Yes	.0322***	.0065**	.0075***	.0253***	.0008	.0047***
	(.0064)	(.0034)	(.0020)	(.0040)	(.0010)	(.0013)
JSY (No[rc])						
Yes	.0077*	-.0056**	-.0062***	.0044	-.0011	-.0001

	(.0046)	(.0025)	(.0015)	(.0033)	(.0010)	(.001)
Hosp (Public[rc])						
Private	-.0081	-.0062*	-.0064***	.0259***	.0017	-.0003
	(.0065)	(.0037)	(.0017)	(.0046)	(.0013)	(.0012)
Observations	80155	80155	80155	80155	80155	80155

*Note: rc= reference category; standard errors are within parentheses; ***p<0.01, **p<0.05, *p<0.10; F- Value= 24.41[***]; Pseudo R- Square*=0.0606

Here we see our model fits significantly better than an empty model with a highly significant F-value (p- value= 0.000). Starting with total OOPE (totoop), we have taken the lowest OOP expenditure class (0-999) as the reference category. Holding other variables constant at their respective means, the probability of choosing selling jewelry, utilization of savings and borrowing, utilization of saving and selling (property/jewelry), borrowing, and mixed strategy over the base category (savings) increased significantly as OOPE increased compared to the base OOPE.

Next, we come to the wealth index (windex). As this is also a categorical variable, the base chosen here is the poorest class. Here in most cases, we find that the probability of choosing any distress financing strategy over savings declined significantly (in percentage points) with an increase in the wealth of the household. That is, as we move from the lowest level of wealth (i.e., the poorest) to the highest wealth level, the probability of choosing any distress financing methods over savings eventually lowers. For example, the percentage point of choosing borrowing to meet OOPE over savings declines significantly as we move from the lowest wealth quintile to the highest (-.07, -.13,-.18,-.22). The percentage point value here compares all wealth classes to the poorest (i.e., poorest vs. poorer, poorest vs. middle...) to illustrate the probability of choosing borrowing (say) as a financing strategy over savings.

Residence (resid) is a binary variable. Here, the base category is the rural residence. As we move from rural to the urban population, only the probabilities of choosing borrowing and, selling jewelry over savings increase significantly by about 1.4% and 0.43%, respectively, and for other financing methods, it was found to be insignificant. Borrowing from friends/society or from a variety of sources becomes one of the most common ways to meet OOPE for the urban population since they have a large number of connections. Also, as urban inhabitants are likely to earn more than their rural counterparts, the amount of jewelry in women's hands is expected to be higher. As a result, jewelry is used in times of necessity.

Respondent's age (Age) is a categorical variable, and it was found to impact choices of financing strategies importantly. First, we find that in comparison to the reference category (15-24), as age increases, instances of borrowing and saving+ borrowing decline significantly. This is evident from the literature as older women tend to do less distress financing (Mukherjee et al., 2013; Mishra and Mohanty, 2019). But, we also find that with an increase in age, in comparison to the base category, selling of jewelry increases for each age class. This could be due to many reasons. This may indicate that with an increase in age, her family becomes reluctant to do distress financing for her health forcing them to take this route to finance her health (Yadav et al., 2021). Furthermore, as it is possible that as women get older, they are better able to accumulate a substantial amount of jewelry, they are likely to spend (against holding it) for her health purpose, when it is a necessity. This is evident from the results above, as the probability of selling jewelry increases marginally more (.0076 vs. .0041 percentage points) for the 35-49 age group (comparatively older) than the 25-34 group, compared to the base age.

In case of education (Education, a categorical variable), we find the probability of borrowing decreases significantly for all educational levels in comparison to the illiterates, though the

percentage point fall is greatest for the most educated, followed by those with lesser educational levels. The probability of saving+ borrowing also declines with an increase in education, starting from the secondary educated, and the reduction in percentage increases with the rise in education. This is intriguing since, for both borrowing and saving+ borrowing, as education level grows, prejudice rises, reducing the willingness to borrow or use any hybrid borrowing approach. In the case of selling jewelry, we find that only the secondary educated have a higher probability of doing so in times of need, indicating that given their education level, which is neither very high nor very low, they are highly likely to have a significant amount of jewelry in their store that they wish/are forced to spend in times of need. In the case of mixed methods, we find that only the secondary educated used it significantly less. Next, the probability of saving+ selling was found to decline with the increase in education starting from the secondary educated, indicating that although educated women use this strategy in times of need (as the probability of earning rises with education, so the probability of affording severe strategies rises, as per Skordis- Worrall et al., 2011), there is a slight decline in using this method with an increase in education.

In case of 'caste', we have taken the general category as the reference category. For the SC category, the probabilities of choosing different distress financing options like borrowing, and selling jewelry over savings increases significantly compared to the general category. It is also worth noting that, given the availability and the ability to afford various financing strategies (borrowing and selling jewelry), the percentage points for women in the SC category are higher than those for women in the ST and OBC categories. For the OBC category too, many instances of distress financing (borrowing, selling jewelry and saving+ selling) increase significantly over savings compared to the general category. It's worth mentioning that the likelihood of using

saving+ selling to fund OOPE, which we consider a severe strategy, grows significantly just for the OBC category. For ST vs. general category, we only find the probabilities of borrowing, and selling jewelry increases over savings, although percentage points are lesser than the other social categories. This could be due to their financial situation, as they are less able to borrow money when they need it and are also unable to sell the requisite amount of jewelry to fulfill OOPE because it is not available in their store. This could partly explain why, the ST population avail less ID, as lack of funds both from income and from the coping strategies are less available to them.

When it comes to birth order (bord, a categorical variable), we can observe that the likelihood of borrowing, and selling jewelry grows for the second child, although saving+ borrowing reduces over savings, compared to the first child. In case of birth order 4 and 5 and above, we find selling of property and jewelry significantly decreases over savings (percentage point declines more for birth order 5+ than 4 than 2). But also, for birth order 5+, we find the probability of borrowing increases over savings in comparison to the first child. This is evident from other studies too, where it was found that with increasing no. of child or birth order, family of a woman tend to spend less on medical and non-medical expenses, prefers delivery in public settings, and utilizes JSY subsidy more (Yadav et al., 2021). But for Birth order 5 or more, instances of borrowing increases, reflecting that when it is absolutely necessary, the maximum extent a family can go is up to borrowing, as a woman's family is unwilling to take a severe distress finance route for situations like giving birth to a child, limiting obtaining funds from other sources.

Moving on to the issue of 'mode of delivery,' we discover that as we move from normal delivery to caesarean delivery, the probabilities of choosing almost all distress finance options grow dramatically (over savings) compared to normal delivery. This is expected, as caesarean births

are more expensive than normal births. The percentage point number is highest for borrowing, followed by saving+ borrowing, selling jewelry, and selling of property.

In case of 'JSY', as we move from women who did not avail JSY subsidy to those who availed JSY subsidy, the percentage point of selling of jewelry declined most significantly, followed by selling of property over savings, indicating its virtuous effect. One important thing to note here is that the probability of selling of jewelry declined the most. We have shown before that when health spending is high enough, women's usage of this technique grows with their age. As a result, the JSY subsidy could assist such women in reducing the use of this method by covering the OOPE. However, interestingly, we also find that the probability of utilizing borrowing is higher for those who got the JSY subsidy than those who did not. This is due to its low amount of subsidy (in comparison to the actual cost in both public and private facilities), for which the families have to make- up the excess amount of expenditure through borrowing (Leone et al., 2012, Mukherjee et al., 2014). However, for other instances of distress financing (particularly, severe strategies), JSY recipients (compared to non- JSY women) were not found to be considerably less likely to employ those financing techniques over savings.

Now for the choice of delivery place (captured by the variable 'hosp'), we found women who used private facilities over public facilities to deliver, the probability of choosing savings+ borrowing significantly increased over savings. However, we also discovered that, in order to meet expenses, women who utilized public facilities, sold more property and jewelry than those who chose private facilities. This could be because, as Rahaman and Pallikadavath (2017) points out, public institutions, particularly district hospitals, are costly too (and this cost is increasing, as mentioned by Mishra and Shyamala (2021)). And given a huge percentage of women from the lower two wealth classes (49%) who mostly utilize its services, ability to pay could be a factor in

the rise in distress financing (Mukherjee et al., 2013). Also as it is likely that selling property and jewels could return less money than the hybrid strategies and, as the amount needed for treatment in private facilities is much higher, those strategies are ineffective in private facilities, but due to the lower cost in public facilities, remains useful.

Table- 4.7: Descriptive statistics

	Percentage (%)	***Lin. Std. Err.***	***95% Conf. Int.***	
Wealth Index				
Poorest	26.5	0.001	26.3	26.6
Poorer	23.7	0.001	23.5	23.8
Middle	19.9	0.001	19.8	20.1
Richer	16.5	0.001	16.4	16.7
Richest	13.4	0.001	13.3	13.5
Social class				
General	18.1	0.001	18.0	18.3
SC	19.8	0.001	19.6	19.9
ST	21.0	0.001	20.9	21.2
OBC	41.0	0.001	40.8	41.2
Child wanted/not wanted				
wanted then	89.7	0.001	89.6	89.9
wanted later	04.9	0.000	04.8	05.0
wanted no more	05.3	0.000	05.3	05.4
Complication				
No complication	60.2	0.001	60.0	60.4
Daylight vision difficulty	02.9	0.000	02.9	03.0
Breech presentation	02.0	0.000	01.9	02.0
Prolonged labor	11.4	0.001	11.3	11.5
Excessive bleeding	23.5	0.001	22.3	23.6
Mode of delivery				
normal	86.3	0.001	86.1	86.4
caesarean	13.7	0.001	13.6	13.9
Mode of delivery				
Normal				
poorest	96.3	0.001	96.2	96.5
poorer	92.2	0.001	92.0	92.4
middle	84.9	0.002	84.6	85.2
richer	77.6	0.002	77.2	78.0
richest	68.6	0.002	68.1	69.0
Caesarean				
poorest	03.7	0.001	03.5	03.8

poorer	07.8	0.001	07.6	08.0
middle	15.1	0.002	14.8	15.4
richer	22.4	0.002	22.0	22.8
richest	31.4	0.002	31.0	31.9
JSY by Wealth Class				
poorest	58.3	0.005	57.4	59.2
poorer	47.6	0.005	46.7	48.5
middle	35.8	0.004	35.0	36.6
richer	26.1	0.004	25.3	26.9
richest	15.0	0.004	14.2	15.7
Hospital choice				
Public	73.1	0.001	72.9	73.3
Private	26.9	0.001	26.7	27.1
Hospital Choice				
Public				
poorest	89.5	0.002	89.1	89.8
poorer	84.6	0.002	84.3	84.9
middle	76.2	0.002	75.8	76.6
richer	63.7	0.002	63.2	64.1
richest	44.3	0.003	43.7	44.8
Private				
poorest	10.5	0.002	03.5	03.8
poorer	15.4	0.002	07.6	08.0
middle	23.8	0.002	14.8	15.4
richer	36.3	0.002	22.0	22.8
richest	55.7	0.003	31.0	31.9
ID by residence (yes)				
rural				
poorest	68.6	0.004	67.9	69.3
poorer	77.5	0.003	76.8	78.1
middle	83.0	0.003	82.4	83.7
richer	85.6	0.004	84.8	86.3
richest	87.3	0.005	86.3	88.3
urban				
poorest	73.2	0.018	69.6	76.6
poorer	80.0	0.010	78.0	81.8
middle	83.9	0.007	82.4	85.2
richer	85.8	0.007	84.2	87.1
richest	89.3	0.005	88.4	90.2

As we can see from the table above, roughly 26% of the women in the sample are poorest, 24% are poorer, 20% are middle, 16% are richer, and 13% are from the richest family. In terms of social class, the majority of women belong to the OBC, followed by the ST and SC, with the general class accounting for the smallest number. About 89% of the children born were wanted,

and 60% of pregnancies were uncomplicated. Also, 86% of deliveries were normal, and the poorest primarily relied on normal delivery. But, the opposite was true for the wealthiest class. In the case of JSY, the bottom wealth classes mostly got its benefit in comparison to the wealthier class. However, when we filter its benefit just for institutional delivery, we discover that the percentages of those receiving it fall throughout the wealth spectrum. Next, when it comes to hospital choice, we discover that public facilities are more commonly used than private facilities. The bottom wealth classes are the most users of it, whereas the more affluent class preferred private facilities. Here, the high percentage of sampled women from the lowest socioeconomic class contributes to a higher rate of public facility use. For institutional delivery, its incidence was dominant in urban areas than rural areas. But, its utilization was found to be higher among the wealthier class in both places.

5. Conclusion

This study attempted to fill a crucial gap in the literature on the consequences of out–of–pocket spending for institutional delivery. Research on distress financing as a result of out-of-pocket spending on institutional delivery has received little attention, as the majority of studies focus on boosting institutional delivery, while some only focus on the OOP expenditure and its determinants and stop there without looking into its actual implications, and some focus on catastrophic expenditure which is somewhat restrictive in nature (as it considers only income and decline in consumption due to health expenditure). Though in our study, we have found that OOP expenditure is progressive in nature, and given public facility's (mostly used, see Table 4.7) delivery cost for all wealth classes are comparatively low, low capacity to pay is what makes the situation problematic (Mukherjee et al., 2013). Otherwise, we would not have found a considerable percentage of women doing distress financing for institutional delivery and some of

these strategies to be significantly concentrated among the lower wealth classes. Unlike other studies on distress financing, using a multinomial logistic framework, we attempted to demonstrate how women choose various distress financing strategies and are forced to advance to severe financing techniques in contrast to a base category, which is a coping approach, but not a distress financing strategy. Like other studies, we find that with an increase in wealth, age, education, and order of birth, distress financing events decline. Whereas on the other hand, as out- of –pocket expenses rises, and delivery in private facilities and through caesarean mode rises, the probability of distress financing events also rises as well. But unlike other studies, we find that as women get older, they use the money they receive from selling their jewelry to pay for their health care when alternative sources are unavailable or when they are in a dire need. This is equally true for women with a secondary education, who in addition to this, also rely on saving and selling to meet OOPE. In case of choice of health facilities, strikingly, we notice that women who use public facilities sell more jewelry and property to cover their delivery costs than those using private facilities. This is primarily because a large percentage of women (73%) use public facilities, and given that 49 percent of women belong to the lower two economic strata, the cost of delivery in public facilities, although comparatively lower (except district hospitals, as noted by Rahaman and Pallikadavath (2017)), overwhelms them. In case of JSY, we find the subsidy amount provided turns out to be insufficient, as we can see it leads to increase in borrowing. It happens as people get tempted thinking that the JSY subsidy is able to cover all the costs of delivery in health facilities, but then the low amount of subsidy becomes insufficient to cover the hospital charges. Actually, the JSY's low subsidy amount is helpful when the cost of delivery in any institution is low (mostly in public facilities), which makes it some kind of paralyzed policy that is unable to help its beneficiary completely on its own. It requires

assistance from the facilities chosen in the form of a reduced bill from these facilities, or from its (JSY) beneficiary in the form of lower delivery costs by choosing an inferior facility or by collecting the excess amount from elsewhere (other financing methods), which JSY's low subsidy amount cannot cover. But we must also simultaneously recognize that, despite its low subsidy amount, JSY is able to lower instances of selling jewelry and property and steers women toward less severe methods such as borrowing, which helps to reduce the use of comparatively more severe techniques. However, in order to alleviate instances of severe strategies to a further level, and because even borrowing could have considerable serious future repercussions (Damme et al., 2004), we would obviously recommend increasing the subsidy amount as suggested by other studies, keeping in mind the continuous increase in OOPE (NFHS Reports, 4 and 5). However, as it is difficult to increase this subsidy for everyone, and because the policy prescription will likely fail if a universal rise in subsidy is offered, we would urge that subsidy be given solely to those who belong in the lowest socio-economic classes[4]. But, we do not suggest giving subsidies only for the public facility users, as one could think in this way, seeing the higher utilization of these facilities by the lower economic class. This is because there are still areas where public facilities are not available, or some are available with insufficient infrastructure, with lack of health personnel, and in some places these facilities are too risky[5] to use (Banerjee et al., 2004; Skordis- Worrall, 2011). So, in these situations, women have to choose private facilities for institutional delivery (Skordis- Worrall, 2011). Given these two, a portion of the overall subsidy amount given in a year might be conserved if it is solely given to the lower wealth classes (as done in high-performance states) and to the lower social classes

[4] Poorest, poorer, OBC, ST, and SC

[5] Due to inhuman and careless treatment from public facility doctors and nurses

(specifically to the OBCs and STs), regardless of the health facility utilized, in order to enhance the overall subsidy amount for the needy, reducing events of distress financing for them. However, to encourage institutional delivery in India, so as to decline maternal and neonatal mortality rate, we recommend continuing ASHA workers support to all, in terms of educating mothers, encouraging them, and assisting them in times of need. The rate of institutional delivery will then also remain unhampered and may even increase (for the lower wealth class), as the higher wealth class will always opt for a safer mode of delivery.

References

Agresti. (2002). Categorical Data Analysis, Second Edition. Wiley Series in Probability and Statistics

Ali, B., Dhillon, P., & Mohanty, S. K. (2019): Inequalities in the utilization of maternal health care in the pre-and post-National Health Mission periods in India. *J Biosoc Sci*, *52*(2), pp 198-212.

Alvarez, R. M., and Nagler, J. (1998). When politics and models collide: Estimating models of multiparty elections. *American Journal of Political Science*, 55-96.

Alvarez, R. M., Nagler, J., and Bowler, S. (2000). Issues, economics, and the dynamics of multiparty elections: The British 1987 general election. *American Political Science Review*, *94*(1), pp. 131-149.

Banerjee, A., Deaton, A., & Duflo, E. (2004): Wealth, health, and health services in rural Rajasthan. *American Economic Review*, *94*(2), pp 326-330.

Basic Concepts of Multinomial Logistic Regression. from https://www.real-statistics.com/multinomial-ordinal-logistic-regression/basic-concepts-of-multinomial-logistic-regression-basic-concept/ (accessed August, 2021)

Basumatary, J., & Srivastav, N.(2018): Household's Coping Mechanisms of Out-of-Pocket Expenditure on Health Care: a Case Study of Assam, India. *IOSR Journal of Humanitiesand Social Science, 23(1), version 9,* pp 70- 84.

Bel, K., and Paap, R. (2014). *A multivariate model for multinomial choices* (No. EI 2014-26).

Bhatia, J. C. and Cleland, J. (1995). Determinants of maternal care in a region of South India. *Health Transition Review*, Vol. 5, pp. 127- 142.

Borghi, J., Ensor, T., Neupane, B. D., and Tiwari, S. (2004). Coping with the burden of the costs of maternal health. *Nepal Safer Mother Proj Part HMGN Safe Mother Programme Publ Place Publ*.

Category of Social groups in India, accessed from https://en.wikipedia.org/wiki/Category:Social_groups_of_India

Daivadanam, M., Thankappan, K. R., Sarma, P. S., & Harikrishnan, S. (2012): Catastrophic health expenditure & coping strategies associated with acute coronary syndrome in Kerala, India. *The Indian journal of medical research*, *136*(4), pp 585- 592.

Damme, W. V., Leemput, L. V., Por, I., Hardeman, W., & Meessen, B. (2004): Out-of-pocket health expenditure and debt in poor households: evidence from Cambodia. *Tropical Medicine & International Health*, *9*(2), pp 273-280.

de la Santé, O. M. (2010). Health System Financing. The Path to Universal Coverage. *en ligne: http://www. who. int/whr/2010/whr10_en. pdf*.

Devadasan, N., Elias, M. A., John, D., Grahacharya, S., & Ralte, L. (2008): A conditional cash assistance programme for promoting institutional deliveries among the poor in India: process evaluation results. *Reducing financial barriers to obstetric care in low-income countries. Studies in HSO&P,* pp 257- 273

Dow, J. K., & Endersby, J. W. (2004): Multinomial probit and multinomial logit: a comparison of choice models for voting research. *Electoral studies*, *23*(1), pp 107-122.

Garg, C. C., & Karan, A. K. (2009): Reducing out-of-pocket expenditures to reduce poverty: a disaggregated analysis at rural-urban and state level in India. *Health policy and planning*, *24*(2), pp 116-128.

Hoffman, S. D., and Duncan, G. J. (1988). A comparison of choice-based multinomial and nested logit models: the family structure and welfare use decisions of divorced or separated women. *The Journal of Human Resources*, *23*(4), pp. 550-562.

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

International Institute of Population Sciences (2020), 'State-level Fact Sheets on NFHS-5 2019-20'

Issac, A., Chatterjee, S., Srivastava, A., & Bhattacharyya, S. (2016): Out of pocket expenditure to deliver at public health facilities in India: a cross sectional analysis. *Reproductive health*, *13*(1), pp 1-9.

Joe, W. (2015): Distressed financing of household out-of-pocket health care payments in India: incidence and correlates. *Health policy and planning*, *30*(6), pp 728-741.

John, D., & Kumar, V. (2017): Exposure to hardship financing for healthcare among rural poor in Chhattisgarh, India. *Journal of Health Management*, *19*(3), pp 387-400.

Jones, S., and Hensher, D. A. (2004). Predicting firm financial distress: A mixed logit model. *The accounting review*, *79*(4), 1011-1038.

Karan, A., Engelgau, M., & Mahal, A. (2014): The household-level economic burden of heart disease in I ndia. *Tropical Medicine & International Health*, *19*(5), pp 581-591.

Kastor, A., and Mohanty, S. K. (2018): Disease-specific out-of-pocket and catastrophic health expenditure on hospitalization in India: do Indian households face distress health financing?. *PloS one*, *13*(5), p.e0196106.

Kropko, J. (2008). *Choosing between multinomial logit and multinomial probit models for analysis of unordered choice data* (Doctoral dissertation, The University of North Carolina at Chapel Hill).

Mauro, P. (1998). Corruption and the composition of government expenditure. *Journal of Public economics*, *69*(2), 263-279.McIntyre et al. 2006

Mavalankar, D., Vora, K., and Prakasamma, M. (2008). Achieving millennium development goal 5: is India serious?. Bulletin of World HealthOrganisation, 86(4), 243-244.

McCullagh, P. (1980). Regression models for ordinal data. *Journal of the Royal Statistical Society: Series B (Methodological)*, *42*(2), pp. 109-127.

Mishra, P.S. and Shyamala, T.S.(2021). The escalating financial burden of child births. Ideas for India

Mishra, S., & Mohanty, S. K. (2019): Out-of-pocket expenditure and distress financing on institutional delivery in India. *International journal for equity in health*, *18*(1), pp 1- 15.

Mohanty, S. K., & Kastor, A. (2017): Out-of-pocket expenditure and catastrophic health spending on maternal care in public and private health centres in India: a comparative study of pre and post national health mission period. *Health economics review*, *7*(1), pp 1- 15.

Mohanty, S. K., & Srivastava, A. (2013): Out-of-pocket expenditure on institutional delivery in India. *Health policy and planning*, *28*(3), pp 247-262.

Mohanty, S. K., and Srivastava, A. (2013). Cost and utilisation of hospital based delivery care in empowered action group (EAG) states of India. *Maternal and child health journal*, *17*(8), 1441-1451.

Mohanty, S. K., Panda, B. K., Khan, P. K., & Behera, P. (2019): Out-of-pocket expenditure and correlates of caesarean births in public and private health centres in India. *Social Science & Medicine*, *224*, pp 45-57.

Mukherjee, S., and Singh, A. (2018). Has the Janani Suraksha Yojana (a conditional maternity benefit transfer scheme) succeeded in reducing the economic burden of maternity in rural India? Evidence from the Varanasi district of Uttar Pradesh. *Journal of public health research*, *7*(1).

Mukherjee, S., Singh, A., and Chandra, R. (2013). Maternity or catastrophe: a study of household expenditure on maternal health care in India.

Multinomial Logit Models- Overview, by Richard Williams (2021). from https://www3.nd.edu/~rwilliam/stats3/Mlogit1.pdf (accessed August, 2021)

Nahar, S., & Costello, A. (1998): The hidden cost of 'free'maternity care in Dhaka, Bangladesh. *Health policy and planning*, *13*(4), pp 417-422.

Navaneetham, K., and Dharmalingam, A. (2002). Utilization of maternal health care services in Southern India. *Social science and medicine*, *55*(10), 1849-1869.

NFHS- 4 India Report from http://rchiips.org/nfhs/pdf/nfhs4/india.pdf (Accessed February 1, 2020)

Ordinal logistic regression| An overview and implementation in R, by Akanksha Rawat (2018). from https://towardsdatascience.com/implementing-and-interpreting-ordinal-logistic-regression-1ee699274cf5 (accessed August, 2021)

Pandey, P., Singh, S. K., & Mohan, U. (2016): Prevalence of distressed financing among elderly in a North Indian district. *Community & Family Medicine*, *2*(02), pp 48- 52.

Peel, A., Bhartia, A., Spicer, N., and Gautham, M. (2018). 'If I do 10–15 normal deliveries in a month I hardly ever sleep at home.'A qualitative study of health providers' reasons for high rates of caesarean deliveries in private sector maternity care in Delhi, India. *BMC pregnancy and childbirth*, *18*(1), 1-11.

Rahman, M. M., & Pallikadavath, S. (2018): How much do conditional cash transfers increase the utilization of maternal and child health care services? New evidence from Janani Suraksha Yojana in India. *Economics & Human Biology*, *31*, pp 164-183.

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

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

Sengupta, N., & Sinha, A. (2018): Is India's Safe Motherhood Scheme Leading to Better Child Health Care Practices?. *Global Social Welfare*, *5*(1), pp 49-58.

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

Skordis- Worrall, J., Pace, N., Bapat, U., Das, S., More, N. S., Joshi, W., Pulkki- Brannstrom, AM & Osrin, D. (2011): Maternal and neonatal health expenditure in Mumbai slums (India): A cross sectional study. *BMC Public Health, 11* (1), pp 1- 12.

Tahsina, T., Ali, N. B., Siddique, M. A. B., Ahmed, S., Rahman, M., Islam, S., ... & Arifeen, S. E. (2018): Determinants of hardship financing in coping with out of pocket payment for care seeking of under five children in selected rural areas of Bangladesh. *PloS one*, *13*(5), p.e0196237.

UN. Final list of proposed Sustainable Development Goal indicators. Rep
Inter-Agency Expert Gr Sustain Dev Goal Indic [Internet]. 2015;Annex IV.Available from: https://sustainabledevelopment.un.org/content/documents/11803Official-List-of-Proposed-SDG-Indicators.pdf
Unit level data for NFHS- 4 accessed from DHS website https://www.dhsprogram.com/data/dataset/India_Standard-DHS_2015.cfm?flag=0 (on April1, 2020)

Wagstaff, A., Paci, P., & Van Doorslaer, E. (1991): On the measurement of inequalities in health. *Social science & medicine*, *33*(5), pp 545-557.

Yadav, J., John, D., Menon, G. R., and Allarakha, S. (2021). Out-of-Pocket Payments for Delivery Care in India: Do Households face Hardship Financing?. *Journal of Health Management*, *23*(2), 197-225.