Sweet Cash: Is Healthcare a Normal Good for Women in Developing Countries ?*

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Abstract

In this paper, we explore the little studied role of gender-based tastes and preferences in the empirical relationship between income and demand for health care. Based on a large body of evidence which suggests that the gender identity of the recipient of money can significantly influence allocation of resources within the household, we conjecture that an increase in women's income may have interesting and unconventional effects on demand for healthcare. Using data from a high-frequency large nationally representative household survey in India, we exploit exogenous variation in women's take-home salary incomes, generated by a change in the mandated rates of contribution to the employees' provident fund, to estimate impacts on health care spending. We find that an increase in take-home salary of women is associated with a decrease in overall spending on healthcare expenses such as consultations and medications. While this could potentially be explained by improved health outcomes of women, we control for health-status and compare healthcare utilization at the intensive margin, i.e., conditional on hospital visits for seeking treatment, and find a similar negative correlation. We achieve this by supplementing our primary analysis using administrative data on hospital electronic medical records from a leading chain of eye hospitals in India. Our results suggest that women's preferences for healthcare may be guided by various other factors, such as social and household norms, and therefore it is not obvious that estimated income elasticities of healthcare demand for women would always be positive, particularly in a developing country context.

Keywords: Health Expenditure, Cash in Hand, Gender Differences

JEL Codes: I11; I12; I14; I15

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1. Introduction

The relationship between income and health has been widely considered to be an important aspect in understanding human capital investments and economic development (Gallardo-Albarrán, 2018). A large empirical literature exists which attempts to estimate the income-elasticity of demand for health care (Dreger & Reimers, 2005; Magsi, Memon, Sabir, Magsi, & Anwar, 2021; Malecki & Jewell, 2003). While many of these studies conclude that health care is a luxury good with an income elasticity of more than one (Deering, 1981; Gerdtham, Søgaard, Andersson, & Jönsson, 1992; Newhouse, 1977), other studies conducted more recently and using larger datasets find this elasticity to be less than one, and therefore conclude that health care is a necessity (Blazquez-Fernandez, Cantarero, & Perez, 2014; Di Matteo, 2003; Freeman, 2003; Sen, 2005).

This ambiguity in income-elasticity of demand for healthcare is also aptly captured in the Preston curve which shows diminishing returns in the relationship between life expectancy and real per capita income and has also been puzzling social scientists lately during the Covid-19 pandemic (Deaton, 2003; Deaton & Schreyer, 2022; De Weerdt & Van Damme, 2021; Pardhan & Drydakis, 2021; Preston, 1975). Attempts to explain this divergence in the empirical relationship between income and demand for healthcare have focused largely on two aspects. First, income elasticity of health care is likely to be heterogenous depending on the level of development of the country being studied. Comparative studies of high-income, middle-income and low-income settings reveal that the estimated income elasticities are considerably different (Bastagli et al., 2016; Bustamante & Shimoga, 2018; Chauvet & Guillaumont, 2009; Di Matteo, 2003; Dubey et al., 2020; Farag et al., 2012). Second, the income elasticity is likely to vary depending on the level of analysis. For instance, the elasticity at national level could be very different from the elasticity when the unit of observation is an individual or a household (Diez-Roux, 1998; Forni, Lippi, et al., 1997; Getzen, 2000; Susser, 1994). Studies on the Preston curve also suggests that dynamics also play an important role (Deaton, 2003; Preston, 1975).

In this paper, we explore another possible source of heterogeneity in the estimates of income elasticity of demand for health care, i.e., gender-based taste and preferences for health care.

Our research question is centered around the idea of how demand for healthcare responds to changes in incomes of women in a developing country setting. To the best of our knowledge, this has not been studied in the literature.

This question is particularly important because Banerjee, Niehaus, and Suri (2019) show that gender identity of the recipient of money can significantly influence the allocation of monetary resources within a household. Major anti-poverty transfer programs in developing countries are targeted at women (Banerjee & Duflo, 2019), based on the premise that women's investment decisions and allocation of consumption expenditure appear to be more efficient (Goodman & Kaplan, 2019). Although, the willingness to spend on healthcare depends upon the access to quality services, opportunity cost for seeking treatment, the level of knowledge about the illness and household income (Ensor & Cooper, 2004; Gaarder, Glassman, & Todd, 2010), we are interested in understanding whether specific income shocks to women lead to familiar changes in demand for healthcare as established in the literature. Or might it be that women have different preferences when it comes to spending on health care which is predominantly a credence good.

Consequently, our study is motivated by this large literature on the targeting of conditional and unconditional cash and in-kind transfers in developing countries suggesting that transfers to women increases their assertiveness in household decision making dealing with expenditure allocations (Attanasio, Battistin, Fitzsimons, & Vera-Hernandez, 2005; Banerjee & Duflo, 2019; Gitter & Barham, 2008; Holvoet, 2005; Rubalcava, Teruel, & Thomas, 2009), has a positive impact on nutritional status of the household (Bouillon & Yáñez-Pagans, 2011; Hazarika & Guha-Khasnobis, 2008; Rubalcava et al., 2009; Yanez-Pagans, 2008), positively affects household human capital investment decisions (Cahyadi et al., 2020; Chatterjee & Poddar, 2021; Handa et al., 2015; Skoufias, Davis, & De La Vega, 2001; Standing, 2013), and has a negative impact on consumption of intoxicants (Doepke & Tertilt, 2019; Evans & Popova, 2017; Team, 2012).

The impact of such transfers on health care seems to be largely indicative of a positive relationship with the increase in income resulting in increased use of healthcare services and higher hospital visits as well as adoption of child and infant care facilities (Cahyadi et al., 2020;

Gertler, 2004; Maluccio, Flores, et al., 2005; Morris, Olinto, Flores, Nilson, & Figueiró, 2004; Pitt, Khandker, Chowdhury, & Millimet, 2003; Rivera, Sotres-Alvarez, Habicht, Shamah, & Villalpando, 2004; Thornton, 2008). In this vein, a positive impact of receiving transfers is also documented on health outcomes (Attanasio et al., 2005; Handa et al., 2015; Morris, Flores, Olinto, & Medina, 2004; Pin, Khandker, McKernan, & Latif, 1999; Thomas, 1994).

While this literature is very rich in analyzing the role of additional income on health through transfers received, the responses to transfer payments are usually distinct from shocks to earned income. For instance, Autor and Duggan (2007) show that the net impact of unanticipated increases in earned income depends on the relative strengths of income as well as substitution effects. Also, Baird, McIntosh, and Özler (2011) discuss the issues with unanticipated transfer payments and the corresponding general equilibrium effects on labor market choices. Against this backdrop, our paper adds to the literature by estimating the impacts of a direct increase in disposable incomes of women in formal employment on healthcare demand. Specifically, we exploit plausibly exogenous variation generated by a change in the rules of employee provident fund contributions, introduced by the Government of India, to find that women on average spend lesser on healthcare in response to an increase in their disposable incomes. While at face value this appears to be suggestive of healthcare not being perceived as a normal good by women owing to the negative income elasticity of demand, a closer analysis suggests that substitution between the various components of healthcare expenditure can explain the average effects.

In February 2018, the finance minister of India announced that the mandatory contribution of women workers joining formal employment would be slashed from 12% to 8% for the first three years on their employment, leading to an increased take-home salary for these women and consequently a higher disposable income compared to the counterfactual. Our identification strategy relies on the cross-sectional variation generated by women working in the formal employment sectors and the variation generated by the timing of the implementation of the policy in a quasi-experimental econometric setting. We use various alternative definitions of formal employment to identify women working in formal sectors to avoid issues of endogenous selection.

Using high-frequency data between 2016-2020 from a large nationally representative household survey in India, we find that in response to the policy, women tend to increase their expenditure on health enhancement activities which could potentially lead to better health outcomes. The overall negative expenditure is driven by significant reductions in spending on doctor consultations and medications. It is however difficult to distinguish between two competing channels through which these reduced form findings might operationalize. First, women may have better health in general with increases in income which in turn leads to a decline in health expenditure. Second, women may have a different taste for health care and prefer to allocate increases in their own incomes to other components in the household production function. Along these lines, we do also find significant changes in the overall composition of expenditure with increases in human capital investments and decreases in temptation consumption of the households such as recreation and restaurant dining.

To explore the second channel further, we supplement our main analysis by collecting hospital-level administrative data on electronic medical records of all women visiting any of the centers of a leading chain of eye hospitals in India between 2016-2020 and perform a similar empirical exercise. The advantage of this administrative dataset is that it allows us to study expenditure at the intensive margin of healthcare. A woman is only part of this dataset if she had some adverse health condition and therefore visited the hospital. Among all these women we compare the difference in expense related outcomes before and after the policy for women employed in formal sector from those engaged in non-formal employment. This exercise essentially rules out the first channel discussed above, i.e., better health explains decline in health expenditure. Interestingly, we find that using this data set, we still get a negative impact on health care spending. This is suggestive evidence that women have different preferences when it comes to health care and a positive income shock does not necessarily translate into increased healthcare spending. The dataset also allows controlling for selection into adverse health care conditions. We use a dummy variable in our regressions indicating severity of the condition to address the issue of pre-existing health conditions confounding our estimates.

Using both set of results, from high frequency national data and a hospital system's administrative electronic medical record data, our paper makes three important contributions to the

literature. First, we are one of the first to try and explore the possibility of gender-based preference heterogeneity for health care and show that an increase in women's take-home salary income can be associated with a decline in expenditure on health care. This decline can partly be explained by improved health conditions of women as they seem to be spending more on health enhancements. However, this is unlikely to explain the entire mechanism because conditional on similar health outcomes and conditional on visiting a hospital for treatment, at the intensive margin of health care utilization, we still find a decline in expenditure associated with increased disposable incomes. This is suggestive evidence of a strong gender-based preference for health care which appears to be negatively correlated with income.

Second, while most of the studies on health care and income elasticity of demand focus on the extensive margin of health care access or health outcomes, our administrative data from hospital medical records allow us to study this behavior at the intensive margin. There is a growing recent literature which documents gender inequality at the intensive margin of health care, i.e., whether utilization expenditure is different for males and females, conditional on access to health care (Chatterjee, 2022; Dupas & Jain, 2021; Kapoor et al., 2019; Ray, Jayaraman, & Wang, 2014). However, whether income elasticity of demand for health care is different for women in response to income shocks to their earnings has not been explicitly studied in such a setting. We attempt to fill this void in the literature through our analysis.

Third, the relationship between income and health has largely been studied in the context of anti-poverty transfer programs. Our paper, on the other hand, approaches this relationship more directly through an increase in women's salary incomes. The existing literature establishes that income shocks to women leads to an overall improvement in family welfare through potential sharing of benefits within the household (Dooley, Lipman, & Stewart, 2005; Gaarder et al., 2010; Lundberg, Pollak, & Wales, 1997). If women are disproportionately expected to contribute to the household good in optimizing the household production in developing countries, then an increase in women's income may not have conventional effects on demand. Our results on a negative overall impact of increases in income on demand for healthcare provides novel evidence along these lines. Our findings can be motivated by the idea that women in developing countries are expected to change household monetary allocations towards other family

members' consumptions with increases in income, and therefore need to reduce spending on items otherwise perceived as normal goods, such as healthcare. In some sense therefore, we revisit the Preston curve in our examinations with a gender lens and add to the literature.

The rest of the paper is organized as follows. The institutional context has been provided in Section 2. Section 3 provides description of the economy wide and the hospital system data used in our study along with brief descriptive analysis. The empirical strategy followed for the economy wide survey data and the micro case are highlighted in Section 4. The findings have been discussed in section 5. Finally, section 6 concludes with the discussion.

2. Institutional Background: Income Transfer Programs

In developing countries, the imperfections in the market often leads to lack of credit, paucity of insurance protection and financial constraints (Banerjee, Duflo, Glennerster, & Kinnan, 2015; Banerjee et al., 2019). Subsequently, people are unable to afford and invest in integral goods such as healthcare, education and nutrition. To resolve this asymmetry of the market, policy makers across the world have come up with schemes that focus on expanding the budget constraint of the households. An expansion of the budget can be through cash transfer to households, in the form of vouchers, through deductions in tax or the widely run pension schemes. Currently, approximately 63 countries in the world have atleast one or the other form of transfer programs (Bastagli et al., 2016). These programs are known to build financial stability and improvise the mental health status of the household (Handa et al., 2015; Haushofer & Shapiro, 2013). However, generating enough revenues to sponsor anything close to universal and unconditional transfers is extremely difficult especially for developing countries (Gordon & Li, 2009). In such economies, the problem of ever-growing population and limited resources becomes a major constraint for implementing cash transfer programs. This requires policy makers to look for more than one way of raising income of the households while also making it cost effective for the economy.

Existing transfer programs are either conditional, targeted or operate for a very short period of time. For example- The famous Opportunidades Program (earlier Progresa) of Mexico aimed

at improving the health and educational outcomes for children from low-income households.[1] These households were given a sum of money conditional upon school attendance and regular appointments for preventive healthcare of the child. The aim of similar interventions is to target a subset of population and specific set of adults (recipient) in a household i.e. the beneficiaries of the policy. Through these programs, the policy makers try to induce a certain behaviour within the beneficiaries hoping for positive long-term consequences (Macours & Vakis, 2014). Ultimately, the effectiveness of any program depends on how the recipients utilise the additional resources and how their investment preferences are directed towards health, education and other relevant outcomes.

In India, the EPF Act of 1952 established the Employees Provident Fund Organization. This body administers a defined contribution to the employees provident fund for people employed across organisations in India. Contributions to the EPFO are collected from an individual's payroll, and are shared by the employer and employee. In simple terms, the contributions to the EPF are realised upon the termination of the service at an organization with an interest. It is a widely operated pension scheme across India, "at present it maintains 24.77 crore accounts (Annual Report 2019-20) pertaining to its members".[2]

On February 1, 2018, the Government of India announced the reduction in contribution to the employees' provident fund by new women workers joining the formal sector from the initial 12% to 8%.[3] The aim of this reduction was to increase the take-home-pay of women while encouraging an increase in labour market participation through the incentive. As per the rules, employees drawing less than Rs 15000 per month at the time of joining an organization had to become members of the EPF.[4] An employee drawing pay above the prescribed limit (at present Rs 15,000) could also become a member with permission of Assistant PF Commissioner, through mutual agreement between the employee and the employer. Thus, the policy intended to treat more or less the women workers employed in the formal sector in India. This EPF cut was applicable for the first three years of employment across all occupation class in the

[1] https://en.wikipedia.org/wiki/Oportunidades

[2] https://www.epfindia.gov.in/site_en/index.php

[3] https://economictimes.indiatimes.com/wealth/personal-finance-news/budget-2018-proposal-new-women-workers-take-home-pay-to-go-up-as-epf-contribution-capped-at-8/articleshow/62737570.cms

[4] Employee whose 'pay' was more than Rs. 15,000 per month at the time of joining was called non-eligible employee.

formal sector. Such a policy would have induced an increase in the income of families that had women working in the formal sector. This would expand the budget constraint of the households benefiting from this policy and allow for cash flows to be directed towards healthcare, education, family well-being or consumption of other goods and services.

3. Data

3.1. Economy-wide Data: Consumer Pyramid Household Survey

We obtain the data on monthly consumption expenditure of households across the Indian economy between Jan 2016 to Feb 2020 using Center for Monitoring Indian Economy's Consumer Pyramid Household Survey. CPHS is a rich dataset representative of 98.5% of the India's population geographically (Afridi, Mahajan, & Sangwan, 2022; Beyer, Franco-Bedoya, & Galdo, 2021; Gupta, Malani, & Woda, 2021; Vyas, 2020).[5] It covers more than 160,000 households spread across 28 states and 514 districts. The households are interviewed three times a year at the interval of four month (i.e. waves) and are required to report item-wise monthly expenditure on multiple categories of goods services.[6] Combining the data from each wave gives us a panel on monthly expenditure of households for these multiple categories.

The main outcome variable for our study is the monthly expenditure of households on total healthcare.[7] We delve deeper to understand the division of budget on healthcare by including dependent variables for monthly expenditure on medicines, doctor's consultation fees, medical tests, hospitalisation fees, contribution to insurance premium and health enhancement. To examine the income allocation decision of a household beyond healthcare, we look at the log of monthly expenditure on 15 other categories of goods and services including food, clothing, intoxicants, education etc.

[5]The CPHS uses a muti-stage survey design where towns and villages from the 2011 census form the primary sampling unit and households comprise the ultimate sampling unit. The districts and states are grouped into 110 homogeneous regions based on agro-climatic conditions, female literacy rate, number of households and the urbanization levels.

[6]The response rates between 2014 to 2019 in the CPHS varied between 80-87% (Sinha Roy & Van Der Weide, 2022)

[7]We convert all the dependent variables in our study into log-linear form obtained by taking their natural logarithm and adding one. This makes it convenient for us to analyse the percentage change in the outcome due to the effect of the policy

As a next step, we identify the beneficiary group that receives the treatment and the control group that does not receive the treatment in the CPHS data. The variables in the dataset capture information on demographic indicators of a household such as gender, age, occupation, education and family size. The survey procedure uses a grouping strategy for these variables. This facilitates easier classification of similar households into a group and also helps to understand the characteristics of an individual household as a unit. For example, using the gender group variable one can easily identify if a household has majority of female or male members at a point of time as explained in Table 1.

Given our policy intervention was directed at female workers employed in the formal sector, we work with the sample of households which have more female members than male members (female majority + female dominant + only female). There is evidence in the literature that households are non-unitary and that small transfers to women may often "be appropriated by men and diverted to other purposes" (Banerjee & Duflo, 2019; Chiappori & Mazzocco, 2017; De Mel, McKenzie, & Woodruff, 2009). Thus, we use the only the sample of female households in our study to capture the true nature of decision making of women in a household. To further classify this sample of female households into the treatment and control group, we assign a dummy variable equal to one if the occupation group of a household falls under the formal sector in the period before the policy shock. The household becomes a beneficiary of the policy if it had maximum members working in the formal sector without any dynamic shifts in the pre-shock period. The dummy for treatment takes a value of zero if a household has maximum number of members in the non-formal sector in the pre-shock period. The distribution of our sample into the occupations groups has been presented in Table 2.

Past work have indicated some limitations with the panel structure of the CPHS dataset (Sinha Roy & Van Der Weide, 2022; Somanchi, 2021). There is regular attrition in the sample, a large number of households drop out and new households are added frequently to maintain the sample size. The dataset is suggested to be under-representative of women and children while over-representative of well-educated households in the later waves. To avoid sample selection bias, we follow only those households in the panel for which we have response beginning from Jan 2016. We do not consider households added in a later wave throughout the analysis.

3.2. Hospital System Micro Data: EyeSmart

To further analyze the micro level health expenditure by females in a hospital system, and to examine how women spend on health conditional on they accessing healthcare, we refer to the administrative electronic medical records of patients visiting the LV Prasad Eye Institute (LVPEI) between Jan 2016 to Feb 2020 (we stop the sample here to avoid contamination from Covid-19 effects). LVPEI has a wide network of hospitals in the form of primary, secondary and tertiary centers across four states of India.[8] It witnesses an influx of patients for eye-care from all socio-economic backgrounds due to its pyramid structure. It's zero-cost services encourage visit from economically disadvantaged sections while exclusive treatments, speciality packages and world-renowned doctors attracts the better-off sections. This widely representative dataset of a hospital system consists of 0.5 million medical records across 23 centers.

We have in our data the information on expenditure of an individual in a particular month at a center for eye investigation and surgical treatment. These remain the main outcome variables for our analysis at the hospital level. We compute an additional DV, measuring the out of pocket expenditure of the patients. Out of pocket expenditure is the difference between the surgery amount and the financial assistance received by a patient.[9] The amounts have been adjusted for inflation using the monthly consumer prize index and converted to log.

We are also able to identify the gender, age, marital status, occupation, disease condition and measure of visual acuity of a patient from the dataset.[10] Given the policy intervention is directed towards female in the formal sector, we only analyse the sample of 0.2 million female patients visiting the center between Jan 16 to Feb 2020. About 75% of the females in our sample are married and are 51 year old on an average. A female is classified as an employee of the formal sector if she is employed in government or private service.[11] Thus, she is referred as a beneficiary of the policy in our study as these females are eligible for the EPF reduction.

[8] Primary centers are located in rural settings and provide basic, secondary centers are and tertiary centers cater to the metropolitan cities and provide advanced surgeries

[9] Financial assistance is the insurance received by the patients through a government scheme, private services or an employer

[10] The measure of visual acuity is the ability of the eye to distinguish shapes, numbers, objects from a certain distance

[11] About 3.12% of females visiting the center are employed in the formal sector and unfortunately we can't identify when they started working in this sample, and therefore our reduced form regression coefficients are likely to be underestimates. Consequently, we expect the actual effect sizes to be larger in magnitude.

3.3. Descriptive Analysis

3.3.1. Descriptive for CPHS data

Table 3 presents the summary statistics of the main outcome variables for the subset of our sample from the economy wide CPHS data. The average total expenditure of households during our period of study was INR 372 (1 USD = INR 69.51 on an average during the period of our sample) with a high deviation. This indicates that while some households spent as high as INR 0.5 million on healthcare, other households did not allocate any income towards health. Figure 1 and Figure 2 plots the expenditure distribution on total healthcare by beneficiary households across India before and after the policy announcement of reduction in EPF contribution from 12% to 8%.

Table 3 provides further information on the six sub-categories of health indicators. It is observable that households in our sample prioritised expenditure on health enhancement through means such as gym subscriptions, nutritionist consultation etc. As a next step, we report the mean and other relevant statistics for expenditure on fifteen other categories of goods and services. On an average households spend the maximum amount of there income on the consumption of food items followed by expenses for power and fuel. The miscellaneous category has a mean value of INR 1333 which includes expenditure on festivals, marriages, vacations etc. by the female households.

3.3.2. Descriptive for Hospital System Data

We present the difference-in-differences of raw means for the three main outcome variables of the hospital system micro data, as highlighted in Table 4. The estimate for investigation amount observes an increase in the mean value whereas the average value of surgery amount and out of pocket expenditure declines. This indicates that females employed in the formal sector spent INR 1311 less on surgical treatments post an increase in income as compared to women in the non-formal sector, when visiting the eye hospital. Additionally for this sample, the out of pocket expenditure decreased INR Rs 1729 after the policy shock. In order to check the significance of difference in the means, we conducted a simple t-test and obtained

the p-values. As indicated, the estimates are significant for all three outcome variables. These preliminary results indicate a negative effect of the income shock, however, to draw a strong causal inference we need to include fixed effects, controls and perform robustness checks

4. Empirical Specification

4.1. Empirical Specification for the Economy Wide Case

The eligibility rules for acquiring benefits from the employee provident fund enable us to identify a quasi-experimental design for our study. As per the policy rules, females employed in the formal sector were eligible for a reduction in the contribution to EPF from 12% to 8% thus increasing their take-home pay. For policy schemes such as these, an eligibility rule can exclude non-beneficiaries but cannot force the eligible individuals into taking the benefit (Chatterjee & Poddar, 2021). Thus, our estimates identify the intention-to-treat (ITT) or the changes in the outcome of being offered the treatment. Such a strategy is used in case of imperfect compliance where all those randomized out do not get the treatment; while those randomized in can choose not to take the treatment (Angrist, Imbens, & Rubin, 1996; Duflo, Glennerster, & Kremer, 2007). We identify the female households exposed to the treatment post-Feb'2018 by observing the occupation group that the household belongs to in the period before the policy shock.

Using a difference-in-differences framework, we study the causal relationship between additional income and changes in a household's monthly expenditure by using the following regression specification:

$$\mathbf{y_{hm}} = \beta_0 + \beta_1\, \mathbf{Beneficiary_h} + \beta_2\, \mathbf{Post\ Feb'18_m} + \beta_3\, \mathbf{Beneficiary_h} \times \mathbf{Post\ Feb'18_m} + \theta_{hm} + \delta_m + \gamma_h + \epsilon_{hm} \tag{1}$$

where y_{hm} is the outcome variable observed at the household-month level. It represents the expenditure of a household in a month on healthcare and other goods & services (in log). $Beneficiary_h$ equals one when a female household has been predominantly classified into the

occupation group of formal sector pre-Feb'18 and zero if a female household has been predominantly classified into the occupation group of non-formal sector pre-Feb'18. $Post\ Feb'18_m$ is a dummy which takes value one if the month-year is after February 2018, zero otherwise. δ_m and γ_h are fixed effects controlling for monthly and household level differences. The fixed effects prevent confounding of the results from seasonal variations in the expenditure of a household.Standard errors are clustered at the household level.

Some household characteristics can affect the decision of a household to allocate income to the consumption of various goods and services. For example, a household dominated by older members is more likely to spend on medicines, hospital bills and doctor's consultations etc. as compared to households that have a majority of younger members. Similarly, the education level of the family members can play a significant role in the financial decisions taken in a household. We deal with the confounding effect of these household characteristics by introducing controls for age, education and household size. It is captured by θ_{hm}. It ensures that our results indeed capture the net effect of the policy shock.

The main coefficient of interest in this specification is β_3. It captures the effect of the reduction in the contribution to employees' provident fund on the beneficiary household's decision to allocate income that comes from the increment in take-home pay. In other words, it measures the change in monthly expenditure on healthcare and other goods & services by households that receive an additional income post-Feb'2018 as compared to households that do not receive the income benefit. β_1 measures the difference between the average outcomes of the beneficiary and the non-beneficiary households. β_2 captures any permanent difference in expenditure(outcomes) between the two periods i.e. pre and post-Feb '18.

Given our identification strategy relies on exploiting the eligibility rule in assignment to treatment, as a next step it would be useful to analyse the pre-trend for the main outcome of interest i.e. the health expenditure for the treatment and the control group. Currently, our control group comprises of female households whose occupation group was centrally defined as non-formal. However, the best bet for a valid counterfactual would have been to observe the outcomes for the beneficiary households in the absence of treatment, post the policy announcement. Given that is not possible in reality, an analysis of the trajectory of the outcomes for the

beneficiary and the non-beneficiary household can give us the confidence in selection of the appropriate control group. We estimate the pre-trends using the following regression specification:

$$\mathbf{y_{hm}} = \beta_0 + \beta_1 \, \mathbf{Beneficiary_h} + \beta_2 \, \mathbf{Post\ Feb'18_m} + \sum_{\mathbf{m=Jan'16}}^{\mathbf{Feb'20}} \beta_{\mathbf{y}}(\mathbf{Beneficiary_h} \times \mathbf{Month_m}) + \theta_{hm} + \delta_m + \gamma_h + \epsilon_{hm} \tag{2}$$

where, $Month_m$ ranges from January 2016 to February 2020. Rest of the specification follows the baseline estimation strategy. We plot the coefficient for expenditure on health outcome (in log) for each month from Jan'2016 to Feb'20 in Figure 3. The plot shows insignificant coefficient for health expenditure before 2018. This implies that prior to exposure to treatment, the outcome for beneficiary and the non-beneficiary group followed parallel trends. We also observe that post an increase in income, the beneficiary households spent significantly less on healthcare.

4.2. Empirical Specification for the Micro Case

Our next step is to analyze the effect of an increase in disposable income on expenditure by females in a hospital system. The estimates are drawn using the following regression specification:

$$\mathbf{y_{imc}} = \beta_0 + \beta_1 \, \mathbf{Beneficiary_i} + \beta_2 \, \mathbf{Post\ Feb'18_m} + \beta_3 \, \mathbf{Beneficiary_i} \times \mathbf{Post\ Feb'18_m} + \theta_m + \delta_s + \gamma_c + \nu_{imc} + \epsilon_{imc} \tag{3}$$

where y_{imc} is the outcome variable observed at the individual-month-centre level. It represents the expenditure of a female patient in a month at a hospital on surgical treatment and eye investigation. The out-of-pocket expenditure (in log) has been included as the third depen-

dent variable. $Beneficiary_i$ equals one when a female visiting the hospital is an employee of the formal sector and zero otherwise. $PostFeb'18_m$ is a dummy which takes value one if the month-year is after February 2018, zero otherwise. , θ_m, δ_s and γ_c are fixed effects for time, state of residence and the centre of the hospital visited. ν_{imc} corresponds to a vector of controls for age, marital status, paying category, hospital location, hospital centre category, dummies for disease condition and dummies for the measurement of visual acuity.

The specification also includes the dummies for eye conditions to ensure that the change in expenditure is not due to the severity of the disease but due to the effect of the policy itself. The coefficient of interest i.e. β_3 captures the difference in the average expenditure of eligible females as compared to non-eligible females post-Feb '18 who visit the hospital. Using this as the baseline equation, we estimate the change in outcomes across the sample of females that are married and for the sample of females that have some form of insurance protection. This allows us to check for heterogeneity in health expenditure at a hospital that can occur within socio-demographic and financial groups. We also estimate the expenditure across multiple surgery types.

5. Findings

5.1. Macro Economy Wide Finding

5.1.1. Impact of Additional Income on Health Expenditure

Table 5 gives the baseline estimates from the Equation 1 for our main dependent variable i.e. total health expenditure. It reports the coefficient for the effect of EPF cut on the monthly expenditure of households that receive an additional income as compared to the non-beneficiary households. In other words, it shows the change in monthly health expenditure of female households with members largely employed in the formal sector. Column (1) provides the estimates from OLS regression. Fixed effects to capture variations for time and household have been introduced in Column (2). Column (3) includes controls for age group, education group and household size and finally, Column (4) captures the benchmark results. The coefficient

of interest $Post\ Feb'18 \times Beneficiary_h$ remains negative and significant in all four columns. We see a 11.6% decrease in the monthly expenditure of beneficiary households on total health expenditure post an increase in take-home pay.[12]

As a next step, we expand the analysis by breaking down health expenditure into multiple categories. Table 6 includes the estimates for the change in expenditure on medicine, doctor's consultation fees, medical tests, hospitalisation fees, contribution to insurance premiums and health enhancement. The estimate in column (1) for expenditure on medicine is negative and significant, it shows a 9.1% decrease in the monthly expenditure of beneficiary households as compared to non-beneficiary households post-Feb'18. We observe a 10.2% decrease in expenditure on doctor's consultation while an insignificant decrease of 0.7% on medical tests. We also find a positive and significant increase of 6.7% in expenditure on health enhancement by the female households that receive additional income. The interaction term for $Post\ Feb'18 \times Beneficiary_h$ remains insignificant for expenditure on insurance premiums.

Broadly our findings suggest that female households that receive additional income do not prioritize health expenses when the income is not conditional to be spent upon a specific outcome. They do not spend additionally on the purchase of medicines, tests or doctor's consultations. We explore these results further by looking at the case of change in expenditure by females in a hospital system. From these results we can infer that females reflect precautionary behaviour by allocating income towards the health enhancement of the household i.e. visits to the gym or hire nutritionists rather than increasing health expenditure in general.

5.1.2. Impact of Additional Income on Other Expenditure

In this section, we report our findings on the impact of policy shock on income allocation decision of beneficiary households towards other goods and services. In other words, we are estimating the change in the monthly expenditure of beneficiary households on food, clothing, communication, intoxicants etc. as compared to non-beneficiary households, post-Feb'2018. The results have been highlighted in Table 7. The estimates are obtained using the baseline

[12] We estimate the expenditure on health outcomes by varying the classification of occupation group into the formal and non-formal sector. In this variation, the non-industrial technical employees and qualified self-employed professionals are considered a part of the non-formal sector. Table A1 in the appendix highlights the results for this estimation. The coefficient of interest remains negative and significant ($Beta$=-0.126)

specification Equation 1 with fixed effects and controls.

The estimates indicate that female beneficiary households spend more on basic food items (such as milk, eggs, and vegetables) and power and fuel (petrol, diesel, electricity etc.) and purchase of appliances as compared to non-beneficiary households. However, the coefficient for expenditure on food and appliances is not significant. The estimates show an increase in expenditure on education (school fees, school transport, professional education, books) by 8.2%. It echoes the findings of past works (Baird et al., 2011; Benhassine, Devoto, Duflo, Dupas, & Pouliquen, 2015; Chatterjee & Poddar, 2021) which suggest that transfers increase investments in education even when they are not conditional on attending school. We also see that beneficiary households allocate income towards purchasing clothes, footwear, jewelry (Beta= 0.086) and beauty products, cosmetics, toiletries, parlours etc. (Beta = 0.021), as indicated by the positive and significant coefficient for each item. There is a reduction in expenditure by these households on recreation, restaurant visits, transportation and communication. Finally, our findings are in line with existing evidence (Doepke & Tertilt, 2019; Evans & Popova, 2017; Team, 2012), as we find a negative and no significant effect of an increase in take-home pay on expenditure on intoxicants (alcohol, tobacco).

5.1.3. Heterogeneity Groups

In this section, we identify the potential threats to our identification strategy. We deal with the limitations by reporting validation results for these heterogeneities. We account for two caveats in our study of the economy-wide data and try to address these issues.

First, our period of the analysis is restricted to the pre-pandemic period only i.e. from January 2016 to February 2020. We argue that the budgetary decisions of a household may get confounded by the onset of the pandemic. However, the reduction in the contribution towards the employee provident fund was applicable for the first three years across all formal sectors. To address this concern regarding the duration of treatment, we estimate Equation 1 by extending the period of our analysis till March 2021.[13] The results for health outcomes are presented in Table 8. Our findings are similar to the benchmark estimates, it suggests that post an increase in

[13] In India the financial year is from April to March

the budget of beneficiary households, the monthly expenditure on total health, medicines and doctor's consultation declined significantly as compared to non-beneficiary households. The stronger negative coefficient ($beta$= -0.121) in Column (4) represents the bias as compared to the benchmark coefficient ($beta$= -0.116).

Another cause of concern with our identification strategy can be the selection of the heterogeneous sample of households with more female than male members. We would expect larger effects on households that have only female members. Such households will reflect the true nature of the decision on budgetary allocation by females. We change our sample of assessment by defining the treatment group as the households with only female members that had a maximum of members employed in the formal sector throughout the pre-period. Table 9 highlights the estimates from the difference-in-differences framework for this specification. The coefficient of interest estimated using the baseline equation is in Column (4). Our finding suggests that the beneficiary households spend 37.4% less on total health expenditure post an increase in income as compared to non-beneficiary households. Again, the magnitude of the effect is stronger for only female households as compared to our baseline sample. However, both of the heterogeneity checks are in line with the benchmark findings.[14]

5.1.4. Robustness Checks

A possible concern with our findings can be that the reduction in expenditure on healthcare by beneficiary households may not be due to the receipt of additional income per se. Our strategy is based on identifying the households that have female members (Only + Majority + Dominant). It is based on the hypotheses that the outcomes for the beneficiary households will not be significantly different from zero as compared to non-beneficiary households for this sample as an effect of the policy shock. However, it can be argued that the intervention may not be affecting the targeted group (i.e. households with more female members) and its choices, rather the change in outcomes was a consequence of some other reason. To check whether our strategy captures the true effect of intervention, we set the target group as the sample of households with more male members (Only + Majority + Dominant). As part of this

[14]Refer to Table A2, Table A3 and Table A4 in the appendix for estimates on expenditure on other health outcomes and goods & services respectively

falsification exercise, we estimate the results using the baseline specification i.e. Equation 1 for this cohort.

We use a difference-in-differences framework where we compare households with male members that were in the formal sector in the pre-period to the male households with members in the non-formal sector. The findings from this exercise have been presented in Table 10. The coefficient of interest is given in Column (4) which includes the fixed effects and controls for household characteristics such as age, education and number of members. The value of beta is close to zero, insignificant and negative. This shows that the policy did not have an effect on the sample of male households i.e. the group that was not targeted. Thus, we can infer that our identification strategy captures the true effect of the income shock on the consumption expenditure for the beneficiary households.

5.2. Micro Case Eyesmart Findings

5.2.1. Impact of Additional Income on Expenditure in Hospital System

We have shown that at the economy level, households with more female members spend significantly less on health outcomes when they receive additional income. As a next step, we analyse the income allocation at the individual level in a hospital system. This micro-level analysis gives us an understanding of the budgetary decision that a female makes in consideration of her healthcare. Here, we look at the specific case of eye treatments that a female seeks at a private healthcare facility when she receives additional income.

Table 11 gives the estimates from the regression specification i.e. Equation 3 for the three main outcome variables- investigation amount, surgical amount and out-of-pocket expenditure (in log). The results for the difference in differences framework are estimated at the individual-month-centre level with fixed effects and controls. Our findings indicate that female beneficiary visiting the eye hospital spend significantly less on surgical treatments as compared to female non-beneficiaries ($beta$= -0.431). The out-of-pocket expenditure for the treated group declines by 49.3% post an increase in take-home pay. As indicated in Column (1), the coefficient of expenditure on eye investigation is positive but insignificant ($beta$= 0.069). These results are in line with our economy-wide findings suggesting that females receiving additional income

spend less on healthcare as compared to non-beneficiary females and even when they have had to actually access healthcare as manifest in their hospital visits.[15]

5.2.2. Heterogeneity Groups

In this section, we study the heterogeneity in expenditure by females in the hospital system based on demographic and financial characteristics. We also analyse the difference in expenditure across multiple surgical treatments. The idea for the later in particular is that, more inelastic surgical treatment areas (acute care for example) will exhibit a different elasticity of health expenses with respect to income compared to more elastic surgical treatment areas (optional treatments for example).

First, we estimate the baseline regression for the sample of married females as indicated in Table 12. We find a decrease of 77% in expenditure on surgical treatments and 87.7% on out-of-pocket expenditure post-Feb'18, for beneficiary married females as compared to non-beneficiary married females. Our results suggest that the marital status of a female leads to a stronger negative impact on healthcare expenditure which can mean that the additional income is being allocated elsewhere. These findings are in line with Mondal and Dubey (2020) who also find that there exists a large gender gap in hospital expenses,especially in the case of currently married females. This suggests that married females might be contributing the additional income towards family welfare which has also been echoed in past works (Doepke & Tertilt, 2019).

As a next step, we estimate Equation 3 for the sample of females visiting the hospital who have some form of medical insurance. Our treatment group includes females employed in the formal sector who have insurance protection and the control group includes females employed in the formal sector who have insurance protection and the control group includes females employed in the non-formal sector who have insurance. The results from this estimation have been presented in Table 13. We observe a positive and significant coefficient for expenditure on eye investigation and out-of-pocket expenditure. The coefficient for expenditure on surgery

[15] As a part of robustness check, we estimated the results for the hospital system micro case using Coarsened Exact Matching, the coefficient for expenditure on surgery and OOP remains negative and significant. Results are available on request.

remains insignificant. This shows that the additional income leads to an increase in expenditure by female beneficiaries with insurance protection. This suggests the prevalence of weak insurance infrastructure in developing countries is accompanied by a high out of pocket expenditure. Next, we look at the effect of an increase in take-home pay on expenditure in a hospital system for the cohort of married females with insurance protection. As highlighted in Table 14, we do not observe any significant difference in outcomes for surgery and OOP between the beneficiary and the non-beneficiary group post the policy shock. The intuition here potentially is that while married females without insurance protection may be letting go of health expenses, insurance availability mitigates this effect for those who have insurance and are married.

Finally, Table 15 highlights the heterogeneity in expenditure across eleven types of surgery. We observe that the coefficient of interest is negative and significant for cataract, occuloplasty and retinal surgery (doctors at LVPEI point out the elective nature of these surgeries to us, highlighting how patients may defer care here in contrast to acute care, especially if they are expensive and patients are paying instead of non-paying patients). This also suggests that female beneficiaries spend less on expensive surgeries post an increase in income as compared to non-beneficiaries. Our results resonate with the findings of Dupas and Jain (2021) who also suggest that women spend significantly less on expensive healthcare procedures.

6. Discussion

While the existing literature on income elasticity of demand for healthcare overwhelmingly concludes that healthcare is a normal good with positive elasticities and depending on the context can be classified as necessary goods or luxury goods based on the magnitude of the estimated elasticity, we provide novel evidence in this paper that the relation between income and health may depend on gender identity. We show that an increase in women's take-home salary does not necessarily translate into increased healthcare spending, suggesting that healthcare products and services are non-normal goods for women., in a developing country context.

We exploit an exogenous shock to women's take-home salary incomes generated by an institutional change in the mandated rates of employees' contribution to the provident fund

for women. Using household survey data as well as administrative data on hospital electronic medical records, we are able to show that the potential increase in women's disposable incomes owing to the higher take-home salaries is correlated with lower healthcare expenses. While the obvious channel for this result could be that women have better health outcomes due to higher income, our hospital data allow us to control for pre-existing health conditions and compare expenditure at the intensive margin of healthcare utilization. Specifically, a woman is only a part of this administrative dataset if she had some health condition for which she sought treatment at the hospital. We find that our results hold even in this situation suggesting that the selection into better health outcomes do not necessarily drive our average estimates.

We conjecture that women's preferences in developing countries for household budget allocations are strongly driven by social and cultural norms. A marginal increase in income of a male member in the household is not necessarily treated in the same way as a marginal increase in income of the female member. For instance, the female member may be expected to disproportionately contribute to the household public good, relative to the male. Ironically, this may also include contributing to the health care expenses on family members rather than the individual herself. We find some suggestive evidence along these lines where we show that composition of spending within the household is impacted by this income shock. Women seem to be spending more on health enhancements and education of their children. Since the simple correlation between health care spending and income does not account for potential substitution between components of healthcare spending; at face value it appears that healthcare demand responds non-normally to income shocks for women, although certain components of health care spending may still increase. Overall, our results suggest revisiting some of the established evidence on targeting income or cash transfer to women, keeping in mind that the nature of income transfers, along with context may determine the welfare effects of such income effects on healthcare expenses of women in developing countries like India. Absent such nuance, policy makers may end up unintendedly creasing adverse welfare effects that will potentially impact established findings in global health and development economics.

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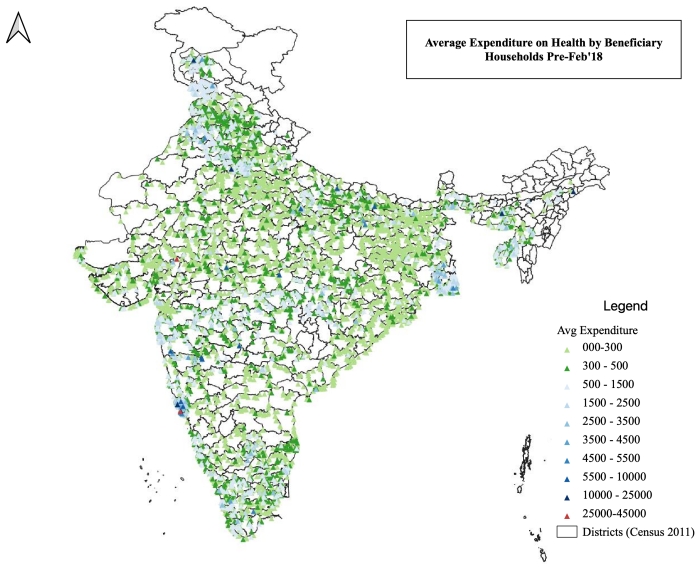

Figure 1: Expenditure Distribution on Health by Beneficiary Households Across India The map represents the average expenditure by beneficiary female households across India before the policy announcement of EPF reduction in Feb 2018

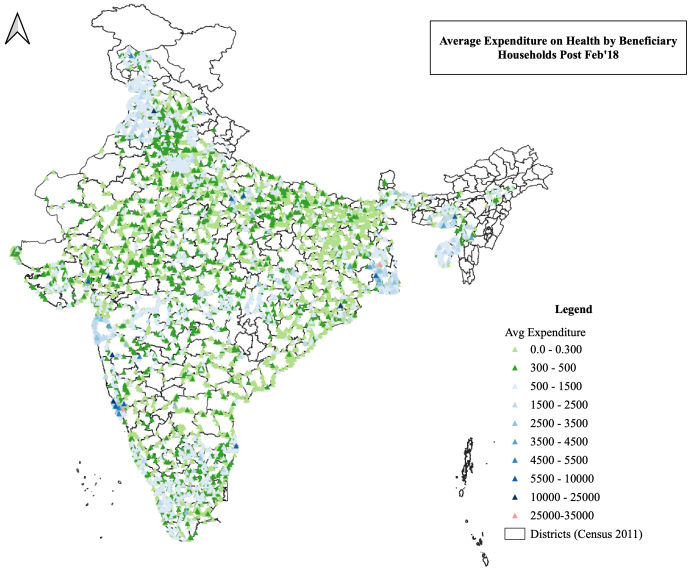

Figure 2: Expenditure Distribution on Health by Beneficiary Households Across India The map represents the average expenditure by beneficiary female households across India after the policy announcement of EPF reduction in Feb 2018

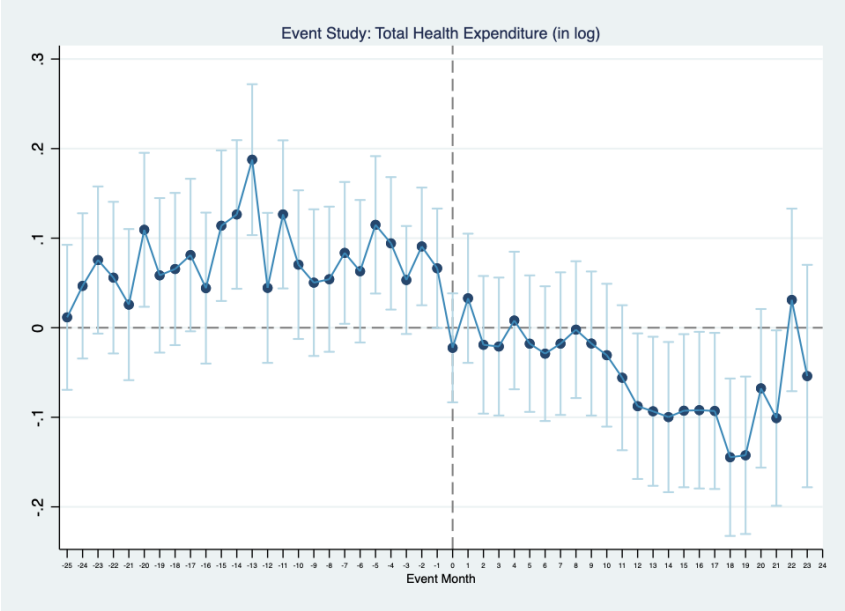

Figure 3: Event Study Estimates: Expenditure on Healthcare The figure plots the point estimates for the expenditure on healthcare for the entire span of our study period. The coefficients have been estimated using the specification including fixed effects and controls. The vertical light blue lines indicate the 95% confidence intervals. The x axis plots the distance in months from the month of the policy announcement i.e. Feb'18

Table 1: Classification of Economy Wide Data by Gender Group

HH Group	Gender Groups	Definition
Female Households	Female Dominated	The number of females is more than males but not more than twice
	Female Majority	The number of females are twice the number of males in the household
	Only Female	Does not have any male members
Male Households	Male Dominated	The number of males is more than females but not more than twice
	Male Majority	The number of males are twice the number of females in the household
	Only Male	Does not have any female members
	Balanced Gender	The number of male and female members is equal

Notes: The table represents the classification of the gender groups for the households in our sample.

Table 2: Classification of Economy Wide Data by Occupation Group

Classification of Occupation Group into Formal and Non-Formal Sector	
Occupation Group	Percentage of the sample
Formal Sector	**36.68**
Business & Salaried Employees	1.58
Industrial Workers	3.67
Legislators/Social Workers/Activists	0.03
Managers/Supervisors	0.46
Non-industrial Technical Employees	1.64
Organised Farmers	2.71
Qualified Self-employed Professionals	0.41
Wage Labourers	14.38
White-collar Clerical Employees	5.92
White-collar Professional Employees	6.91
Non- Formal Sector	**63.32**
Agricultural Labourers	6.76
Entrepreneurs	8.38
Home-based Workers	1.19
Miscellaneous	5.83
Retired/Aged	7.5
Self-employed Entrepreneurs	13.63
Small Traders/Hawkers	3.47
Small/Marginal Farmers	9.5
Support Staff	6.03

Notes: This table includes the summary on distribution of the macro economy wide sample into occupation groups

Table 3: Descriptive Statistics: Main Outcome Variables

Average Monthly Expenditure in INR				
DV (Avg Exp)	Mean	Std. Dev	Min	Max
Health Outcomes				
Total Health	372.22	2336.46	0.00	535150
Medicines	166.91	511.79	0.00	150000
Doctors fees	21.32	128.73	0.00	50000
Medical test	8.81	204.30	0.00	30000
Hospitalisation Fees	28.68	2166.32	0.00	500000
Insurance Premium	7.50	167.95	0.00	25000
Health Enhancement	138.98	180.54	0.00	8150
Other Outcomes				
Food	5060.50	2230.41	0.00	56448
Other Food	16.01	51.68	0.00	1880
Intoxicants	311.03	405.33	0.00	22140
Clothing & Footwear	145.03	1961.52	0.00	360008
Appliances	145.03	873.11	0.00	112500
Restaurants	217.47	353.07	0.00	33000
Recreation	83.30	289.37	0.00	23000
Bills & Rent	108.71	440.23	0.00	100000
Power & Fuel	1752.19	1515.40	0.00	31410
Transport	319.40	1040.38	0.00	100000
Communication	484.63	363.91	0.00	11650
Education	588.95	1749.04	0.00	500000
Hygiene & Beauty	495.94	446.94	0.00	82126
Misc	1333.80	3456.96	0.00	701250
All EMI	325.44	1777.66	0.00	503500

Notes: The table represents the summary statistics for the main outcome variables used in the Macro Case.

Table 4: Descriptives in Difference-in-Differences Framework

Exp. on Investigation	Pre	Post	Difference	
Formal Sector	469.69	535.27	First Difference	65.58
Non-Formal Sector	96.99	112.00	Second Difference	15.01
	Difference in Differences (t=5.19, p=0.000)			50.57
Exp on Surgery Amount	Pre	Post	Difference	
Formal Sector	26227.53	25454.34	First Difference	-773.19
Non-Formal Sector	7298.72	7836.73	Second Difference	538.01
	Difference in Differences (t=3.65, p=0.000)			-1311.20
Out of Pocket Exp.	Pre	Post	Difference	
Formal Sector	24043.88	22585.77	First Difference	-1458.11
Non-Formal Sector	6445.24	6717.04	Second Difference	271.81
	Difference in Differences (t=5.16, p=0.000)			-1729.92

Notes: The table represents the summary statistics from simple difference-in-differences framework for three main outcome variables for the Micro Case.

Table 5: Change in Health Expenditure

	(1)	(2)	(3)	(4)
DV (in log)	**Total Health Expenditure**			
Post Feb'18 x Beneficiary HH	-0.146***	-0.125***	-0.140***	-0.116***
	[0.011]	[0.020]	[0.010]	[0.020]
Observations	470,092	469,652	470,092	469,652
R-squared	0.030	0.396	0.083	0.401
Controls	No	No	Yes	Yes
Fixed Effects	No	Yes	No	Yes

Notes: The dependent variable in all columns is log of expenditure on healthcare. Column (1) gives the estimates from OLS regression, column (2) includes fixed effects for time and household and column (3) includes the controls for age, education and household size. Column (4) gives the main results from our specification. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. We find a decrease of 11.6% on total health expenditure.

Table 6: Change in Expenditure on Associated Health Related Variables

	(1)	(2)	(3)	(4)	(5)	(6)
DV (in log)	Medicines	Doctors fees	Medical test	Hosp. fees	Ins. Premium	Health Enh
Post Feb'18 x Beneficiary HH	-0.091**	-0.102***	-0.007	0.011*	0.007	0.067***
	[0.037]	[0.018]	[0.008]	[0.006]	[0.007]	[0.020]
Observations	469,652	469,652	469,652	469,652	469,652	469,652
R-squared	0.360	0.245	0.291	0.289	0.285	0.539
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes in each column. The estimation includes fixed effects for time and household and controls for age, education and household size. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. We observe a decrease on expenditure on medicine (9%) and doctor's consultation fees (10%). This decline can partly be explained by improved health conditions of women as they seem to be spending more on health enhancements.

Table 7: Change in Expenditure on Other Goods and Services

Change in Expenditure on Other Goods and Services					
	(1)	(2)	(3)	(4)	(5)
DV (in log)	Food	Other Food	Intoxicants	Cloth_Footwear	Appliances
Post Feb'18 x Beneficiary HH	0.002	-0.039*	-0.006	0.086***	0.025
	[0.005]	[0.024]	[0.038]	[0.028]	[0.026]
Observations	469,652	469,652	469,652	469,652	469,652
R-squared	0.704	0.418	0.539	0.276	0.270
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Restaurants	Recreation	Bills_Rent	Power_Fuel	Transport
Post Feb'18 x Beneficiary HH	-0.212***	-0.044*	-0.100***	0.047***	-0.315***
	[0.038]	[0.026]	[0.026]	[0.012]	[0.033]
Observations	469,652	469,652	469,652	469,652	469,652
R-squared	0.433	0.310	0.592	0.448	0.340
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Comm_Info	Education	Hyg_Beauty	Misc	All_EMI
Post Feb'18 x Beneficiary HH	-0.086***	0.082**	0.021**	-0.039***	-0.107***
	[0.013]	[0.037]	[0.009]	[0.010]	[0.041]
Observations	469,652	469,652	469,652	469,652	469,652
R-squared	0.584	0.558	0.588	0.555	0.428
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes in each column. The estimation includes fixed effects for time and household and controls for age, education and household size. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. We find significant changes in the overall composition of expenditure with increases in human capital investments and decreases in temptation consumption of the households such as recreation and restaurant dining

Table 8: Heterogeneity Check: Extended Time Period for Economy Wide Data

Extended Time Period: Jan'2016- Mar'2021				
	(1)	(2)	(3)	(4)
DV (in log)	Health Expenditure			
Post Feb'18 x Beneficiary HH	-0.181***	-0.133***	-0.164***	-0.121***
	[0.010]	[0.021]	[0.010]	[0.020]
Observations	553,395	552,956	553,395	552,956
R-squared	0.016	0.362	0.065	0.367
Controls	No	No	Yes	Yes
Fixed Effects	No	Yes	No	Yes

Notes: The dependent variable in all columns is log of expenditure on healthcare. Column (1) gives the estimates from OLS regression, column (2) includes fixed effects for time and household and column (3) includes the controls for age, education and household size. Column (4) gives the main results from our specification. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. The estimates in column (4) are in line with the benchmark finding.

Table 9: Heterogeneity Check: Alternate Sample for Economy Wide Data

Alternate Sample: Households with only female members				
	(1)	(2)	(3)	(4)
DV (in log)	Health Expenditure			
Post Feb'18 x Beneficiary HH	-0.246***	-0.435***	-0.306***	-0.374**
	[0.074]	[0.158]	[0.073]	[0.151]
Observations	58,985	58,928	58,985	58,928
R-squared	0.036	0.368	0.083	0.372
Controls	No	No	Yes	Yes
Fixed Effects	No	Yes	No	Yes

Notes: The dependent variable in all columns is log of expenditure on healthcare. Column (1) gives the estimates from OLS regression, column (2) includes fixed effects for time and household and column (3) includes the controls for age, education and household size. Column (4) gives the main results from our specification. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. We find a decrease in total health expenditure of 37%.

Table 10: Robustness Check: Falsification Test for Economy Wide Data

Falsification Test: Households with male members (only + majority + dominant)				
	(1)	(2)	(3)	(4)
DV (in log)	Health Expenditure			
Post Feb'18 x Beneficiary HH	-0.002	-0.004	0.002	-0.001
	[0.008]	[0.015]	[0.008]	[0.015]
Observations	617,846	616,941	617,846	616,941
R-squared	0.026	0.330	0.036	0.331
Controls	No	No	Yes	Yes
Fixed Effects	No	Yes	No	Yes

Notes: The dependent variable in all columns is log of expenditure on healthcare. Column (1) gives the estimates from OLS regression, column (2) includes fixed effects for time and household and column (3) includes the controls for age, education and household size. Column (4) gives the main results from our specification. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. The value of beta is close to zero, insignificant and negative. This shows that the policy did not have an effect on the sample of male households i.e. the group that was not targeted.

Table 11: Change in Eye-Care Associated Other Expense Variables

	(1)	(2)	(3)
DV (in log)	Investigation Amt.	Surgery Amt.	Out of Pocket Exp.
Post Feb'18	0.273***	0.163	-0.139
	(0.0506)	(0.124)	(0.133)
Beneficiary	0.618***	2.139***	2.023***
	(0.0764)	(0.154)	(0.167)
Post Feb'18 x Beneficiary	0.0690	-0.431***	-0.493***
	(0.0855)	(0.135)	(0.178)
Observations	223,106	223,106	223,106
R-squared	0.273	0.486	0.445
Controls	Yes	Yes	Yes
FE	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time, state of residence and center of the hospital along with a set of controls. Standard errors are clustered at district level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. Our findings indicate that female beneficiary visiting the eye hospital spend significantly less on surgical treatments as compared to female non-beneficiaries. The out-of-pocket expenditure for the treated group declines by 49.3% post an increase in take-home pay.

Table 12: Heterogeneity Check: Married Sample for LVPEI Micro Case Data

	(1)	(2)	(3)
DV (in log)	Investigation Amt.	Surgery Amt.	Out of Pocket Exp.
Post Feb'18	0.322***	0.192	-0.0691
	(0.0629)	(0.137)	(0.151)
Beneficiary	0.752***	2.729***	2.665***
	(0.0836)	(0.237)	(0.179)
Post Feb'18 x Beneficiary	-0.119	-0.773***	-0.877***
	(0.0808)	(0.172)	(0.228)
Observations	168,491	168,491	168,491
R-squared	0.219	0.489	0.443
Controls	Yes	Yes	Yes
FE	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time, state of residence and center of the hospital along with a set of controls. Standard errors are clustered at district level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. The negative coefficient for all three outcomes suggest that the marital status of a female leads to a stronger negative impact on healthcare expenditure which can mean that the additional income is being allocated elsewhere.

Table 13: Heterogeneity Check: Insurance Group for LVPEI Micro Case Data

	(1)	(2)	(3)
DV (in log)	Investigation Amt.	Surgery Amt.	Out of Pocket Exp.
Post Feb'18	0.392**	-0.321***	-0.121
	(0.190)	(0.0822)	(0.652)
Beneficiary	-0.244	0.0847	-0.244
	(0.165)	(0.0632)	(0.348)
Post Feb'18 x Beneficiary	0.624***	0.0920	0.618**
	(0.180)	(0.0787)	(0.280)
Observations	11,963	11,963	11,963
R-squared	0.187	0.334	0.146
Controls	Yes	Yes	Yes
FE	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time, state of residence and center of the hospital along with a set of controls. Standard errors are clustered at district level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively.t. We find positive and significant coefficient in column(1) and (3), which shows that additional income leads to an increase in expenditure by female beneficiaries with insurance protection. This suggests the prevalence of weak insurance infrastructure in developing countries is accompanied by a high out of pocket expenditure.

Table 14: Heterogeneity Check: Married Sample with Insurance for LVPEI Micro Case Data

	(1)	(2)	(3)
DV (in log)	Investigation Amt.	Surgery Amt.	Out of Pocket Exp.
Post Feb'18	0.502**	-0.342***	-0.280
	(0.209)	(0.0822)	(0.700)
Beneficiary	-0.270	0.138*	-0.0145
	(0.183)	(0.0731)	(0.535)
Post Feb'18 x Beneficiary	0.394*	0.00423	-0.0911
	(0.214)	(0.0921)	(0.606)
Observations	9,775	9,775	9,775
R-squared	0.153	0.304	0.135
Controls	Yes	Yes	Yes
FE	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time, state of residence and center of the hospital along with a set of controls. Standard errors are clustered at district level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. The positive coefficient in column (1) and (2) indicates that while married females without insurance protection may be letting go of health expenses, insurance availability mitigates this effect for those who have insurance and are married.

Table 15: Heterogeneity Check: Change in Expenditure across Surgery Types in LVPEI

	(1)	(2)	(3)	(4)	(5)
DV (in log)	Anterior Segment	Cataract	Cornea	Glaucoma	Occular Surface
Post Feb'18	-0.964	0.525***	-0.994	0.447	-0.739*
	(0.594)	(0.111)	(0.721)	(0.916)	(0.438)
Formal Sector	2.024*	2.717***	1.514***	2.715***	2.512***
	(1.115)	(0.358)	(0.556)	(0.548)	(0.677)
Post Feb'18 x Beneficiary	0.927	-0.403*	1.341	-0.882	-0.792
	(1.683)	(0.233)	(0.847)	(0.647)	(0.798)
Observations	2,936	130,234	5,133	3,115	11,014
R-squared	0.511	0.546	0.313	0.356	0.649
Controls	Yes	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes	Yes
DV (in log)	Occuloplasty	Refractive Surgery	Retinal	Strabismus	Trauma
Post Feb'18	0.630	-0.551***	-0.372	0.214	0.451
	(0.427)	(0.190)	(0.332)	(0.735)	(0.987)
Beneficiary	3.446***	0.473***	2.192***	1.228**	-1.358
	(0.350)	(0.0771)	(0.289)	(0.548)	(0.869)
Post Feb'18 x Beneficiary	-1.286***	-0.0767	-0.475**	-0.229	1.400
	(0.352)	(0.0990)	(0.234)	(0.716)	(0.914)
Observations	16,077	6,693	25,400	3,061	899
R-squared	0.423	0.084	0.316	0.303	0.695
Controls	Yes	Yes	Yes	Yes	Yes
FE	Yes	Yes	Yes	Yes	Yes

Notes: The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time, state of residence and center of the hospital along with a set of controls. Standard errors are clustered at district level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. We observe that the coefficient of interest is negative and significant for cataract, occuloplasty and retinal surgery. This suggests that female beneficiaries spend less on expensive surgeries post an increase in income as compared to non-beneficiaries.

Table A1: Change in Health Expenditure: Variation in Classification of Occupation Group

	(1)	(2)	(3)	(4)
DV (in log)	**Total Health Expenditure**			
Post Feb'18 x Beneficiary HH	-0.147***	-0.133***	-0.143***	-0.126***
	[0.011]	[0.020]	[0.011]	[0.020]
Observations	491,398	490,956	491,398	490,956
R-squared	0.029	0.397	0.085	0.402
Controls	No	No	Yes	Yes
Fixed Effects	No	Yes	No	Yes

Notes: We estimate the expenditure on health outcomes by varying the classification of occupation group into the formal and non-formal sector. In this variation, the non-industrial technical employees and qualified self-employed professionals are considered a part of the non-formal sector.The dependent variable in all columns is log of expenditure on healthcare. Column (1) gives the estimates from OLS regression, column (2) includes fixed effects for time and household and column (3) includes the controls for age, education and household size. Column (4) gives the main results from our specification. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively.

Table A2: Heterogeneity Check: Change in Expenditure on Other Health Related Expenses in CPHS Economy Wide Case

Expenditure on Other Health Outcomes: Extended Time Period						
	(1)	(2)	(3)	(4)	(5)	(6)
DV (in log)	Medicines	Doctors fees	Medical test	Hosp. fees	Ins. Premium	Health Enh
Post Feb'18 x Beneficiary HH	-0.088**	-0.104***	-0.004	0.008	0.005	0.044**
	[0.037]	[0.016]	[0.007]	[0.006]	[0.006]	[0.020]
Observations	552,956	552,956	552,956	552,956	552,956	552,956
R-squared	0.337	0.224	0.264	0.258	0.256	0.514
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes
Expenditure on Other Health Outcomes: Households with only female members						
	(1)	(2)	(3)	(4)	(5)	(6)
DV (in log)	Medicines	Doctors fees	Medical test	Hosp. fees	Ins. Premium	Health Enh
Post Feb'18 x Beneficiary HH	-0.485**	-0.415***	-0.076	0.060	0.072*	0.333**
	[0.190]	[0.099]	[0.055]	[0.038]	[0.040]	[0.133]
Observations	58,928	58,928	58,928	58,928	58,928	58,928
R-squared	0.390	0.231	0.264	0.180	0.176	0.490
Controls	Yes	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes	Yes

Notes: We estimate the change in other health associated outcomes as part of the heterogeneity check for extended time period and the sample of households with only female members.The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time and household and controls for age, education and household size. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively. The estimates are in line with our benchmark findings as we observe a decline in expenditure on medicines and doctor's consultation as well as an increase in allocation of additional income towards health enhancement.

Table A3: Heterogeneity Check for Extended Time Period: Change in Expenditure on Other Goods and Services

Expenditure on Other Goods and Services: Extended Time Period					
	(1)	(2)	(3)	(4)	(5)
DV (in log)	Food	Other Food	Intoxicants	Cloth_Footwear	Appliances
Post Feb'18 x Beneficiary HH	0.000	-0.037	-0.060	0.074***	0.019
	[0.005]	[0.023]	[0.038]	[0.028]	[0.025]
Observations	552,956	552,956	552,956	552,956	552,956
R-squared	0.687	0.401	0.517	0.278	0.250
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Restaurants	Recreation	Bills_Rent	Power_Fuel	Transport
Post Feb'18 x Beneficiary HH	-0.233***	-0.087***	-0.098***	0.062***	-0.328***
	[0.038]	[0.025]	[0.026]	[0.012]	[0.031]
Observations	552,956	552,956	552,956	552,956	552,956
R-squared	0.405	0.292	0.574	0.424	0.374
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Comm_Info	Education	Hyg_Beauty	Misc	All_EMI
Post Feb'18 x Beneficiary HH	-0.087***	-0.016	0.024**	-0.031***	-0.088**
	[0.013]	[0.036]	[0.010]	[0.010]	[0.036]
Observations	552,956	552,956	552,956	552,956	552,956
R-squared	0.532	0.530	0.532	0.522	0.396
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: We estimate the results by extending the time period of our analysis till March 2021. The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time and household and controls for age, education and household size. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively.

Table A4: Heterogeneity Check for Alternate Sample: Change in Expenditure on Other Goods and Services

Expenditure on Other Goods and Services: Households with Only Female Members					
	(1)	(2)	(3)	(4)	(5)
DV (in log)	Food	Other Food	Intoxicants	Cloth_Footwear	Appliances
Post Feb'18 x Beneficiary HH	0.022	-0.217**	0.172	0.189	0.203
	[0.025]	[0.110]	[0.158]	[0.130]	[0.142]
Observations	58,928	58,928	58,928	58,928	58,928
R-squared	0.633	0.423	0.401	0.236	0.259
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Restaurants	Recreation	Bills_Rent	Power_Fuel	Transport
Post Feb'18 x Beneficiary HH	-0.172	-0.178	-0.248**	0.226***	-0.371**
	[0.208]	[0.135]	[0.120]	[0.075]	[0.163]
Observations	58,928	58,928	58,928	58,928	58,928
R-squared	0.432	0.317	0.579	0.267	0.342
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes
DV (in log)	Comm_Info	Education	Hyg_Beauty	Misc	All_EMI
Post Feb'18 x Beneficiary HH	-0.140	0.121	0.060	-0.062	0.147
	[0.088]	[0.153]	[0.055]	[0.052]	[0.175]
Observations	58,928	58,928	58,928	58,928	58,928
R-squared	0.639	0.593	0.498	0.523	0.350
Controls	Yes	Yes	Yes	Yes	Yes
Fixed Effects	Yes	Yes	Yes	Yes	Yes

Notes: We estimate the results for the sample of households with only female members. The dependent variables are log of the outcomes given in each column. The estimation includes includes fixed effects for time and household and controls for age, education and household size. Standard errors are clustered at household level.'***','**','*' indicate significance at the 1%, 5% and 10% respectively.