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Violence Against Women:
Evidence from India**

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Income Inequality and Violence Against Women: Evidence from India

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Abstract

Violence against women is a global social problem and could have severe health consequences on women and children. Though the literature is rich with studies on the determinants of violence against women, little attention has been given to the potential impact of income inequality on violence against women. This paper investigates the impact of income inequality, at the state level, on violence against women in India, where violence against women is one of the highest in the world. We use data on a nationally representative sample of 69,704 women from the third National Family Health Survey for India, conducted in 2005-06. We argue that income inequality increases the risk of experiencing violence by eroding social capital in the living community. To estimate the causal impact of economic inequality on violence against women and avoid endogeneity concern, we rely on an instrumental variable approach. As a first step, we use standard regression models and find that state income inequality increases intimate partner violence as well as violence by anyone other than her partner. When tackling the endogeneity issue, our findings suggest that income inequality increases the risk of violence by anyone other than the partner, but it did not increase the risk of spousal violence. The study's findings are robust to different regression techniques. Policies that reduce income inequality would help in reducing the level of violence against women.

Keywords: Income Inequality, Instrumental Variable, Violence Against Women, India

JEL Classification: I14, I15, and I18

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1. Introduction

More than one out of every three women worldwide has experienced either physical and/or sexual violence in their lifetime. Violence against women is a violation of the basic human rights and represents a major social problem in many countries. Recent research showed that violence against women has severe consequences on women's mental and physical health (Campbell et al., 2002; Golding, 1999; Kramer et al., 2004; Rodriguez et al., 1998; Sutherland et al., 1997). It could lead to depression, sleep difficulties, eating disorders and injuries, and increases the risk of homicide or suicide (Campbell et al., 2002; Coker et al., 2002). Violence against women is correlated with greater rates of infant and child mortality and morbidity (Rico et al., 2011). The impact of violence against women on economic development and poverty elimination has been found substantial (Duvvury et al., 2013). For example, Morocco lost an estimated 1.2% of GDP in productivity due to violence against women (Duvvury et al., 2009). The World Bank considers that both poverty alleviation and violence against women are connected. It stressed that to end poverty we should eliminate violence against women and girls.

Violence against women is a severe problem in India. According to the 2005-06 National Family Health Survey (NFHS-3), more than a third of women have experienced physical violence, and 9% have experienced sexual violence. Violence against women can have severe physical consequences, which undermines the country economic capacity. Based on NFHS-3 data, among all ever married who reported ever experiencing physical or sexual violence, 36 percent reported serious injuries. As expected, most women reported current or former husband as the person who inflicted violence.

The relationship between crimes and violent acts and contextual income inequality is well established in the criminology and sociology literature. Most of the literature on the effect of income inequality on crime and violent acts finds that the impact is positive (Blau & Blau, 1982; Demombynes & Özler, 2005; Ehrlich, 1973; Enamorado et al., 2016; Kelly, 2000). Despite that income inequality could be a key predictor of violence against women, less attention has been given to the potential impact of income inequality on violence against women in the current body of literature. We identified only one previous study that focuses exclusively on income distribution and IPV. Using standard regression methods, Sanz-Barbero et al. (2015) utilized cross-sectional data from Spain and found that contextual income inequality measured by the Gini coefficient at the regional level increase women's likelihood of violence. However, evaluating the causal impact

of contextual income inequality on violence against women is not a simple matter. Standard regression coefficients might capture mere correlation since reverse causality, and omitted bias are likely to be a concern here.

In the present study, we attempt to investigate the causal relationship between income inequality and violence against women inflicted by partner or anyone other than a partner. To the best of our knowledge, this study represents the first attempt to draw the causal inference and goes beyond simple regression models. We hypothesized that state-level variation in income inequality predicts violence against women independent of other individual and community characteristic.

The link between violence against women and income inequality might not be very clear. Consequently, we propose that the level of social capital-defined as degree of social trust among citizens, norms of reciprocity, civic engagement and the existence of robust social bonds that promotes cooperation for mutual benefits (Coleman & Coleman, 1994; Putnam et al., 1994)- as a potential mechanism through which income inequality affect the extent of violence against women. Our premise is built on the existing large body of literature, which suggests that the increased income inequality leads to deterioration of social capital and social cohesion, see for example (Gold et al., 2002; Kawachi & Kennedy, 1997, 1999; Kawachi et al., 1999; Kennedy et al., 1998). Kawachi and Kennedy (1997) pointed out that income inequality disrupts social fabric that may lead to social conflict and low level of trust between citizens. They empirically examined their hypothesis and found that states which characterized by large disparities in wealth are likely to endure a high level of mistrust between citizens of the society (Kawachi & Kennedy, 1997). The hypothesis has been further examined in other studies, which asserts the significance of their findings, for example, Gold et al. (2002).

On another front, a growing number of studies have analyzed how social capital in neighborhoods can influence intimate partner violence (IPV) (Browning, 2002; DeKeseredy et al., 2003). These studies hypothesized that high level of social capital, reflected by active community participation and social networks within communities, allows the creation of strong social ties, social cohesion and collective efficacy- neighborhood cohesion and informal social control capacity- within societies that increase the community's capacity to act to regulate its members, which in turn can have a protective effect. Likewise, Browning (2002) suggested that collective efficacy encourages women to share its conflict with other sources of support. The negative relationship has been established between social capital and collective efficacy, and violence and

crimes (Kawachi et al., 1999). Regarding IPV, significant negative relationship between IPV prevalence and social capital, usually measured by neighborhood collective efficacy, have been suggested at (Browning, 2002; Caetano et al., 2010; DeKeseredy et al., 2003; Kirst et al., 2015; O'campo et al., 1995; Wright & Benson, 2011). By connecting the studies on income inequality and social capital with studies on social capital and IPV, one can safely argue that increased income inequality affect IPV through its negative impact on social capital. Women can seek help from the community to end the violence they have experienced. However, if the community is poor in social capital because of income inequality has eroded it. Seeking help to end violence might not be feasible.

This study adds to the extant literature by investigating the relationship between the violence against women and contextual income inequality in India, a country with high prevalence of violence against women and substantial income inequality. We focus the attention on India, as it is one of the largest developing countries, and the literature on IPV determinants are mainly focusing on developed countries particularly the US. In addition, violence against women in India is one of the highest in the world, 35%, which roughly corresponds to 175 million women in 2005. Also, the disparities in violence against women vary across states, as well as the level of wealth inequality, are substantial. Thus, the country gives us large heterogeneity across regions to examine the effect of contextual income inequality on the individual risk of experiencing IPV.

We add to the literature by implementing an original identification strategy based on an instrumental variable approach to estimate the causal impact of income inequality on the risk of IPV. Following Leigh (2006), we instrument income inequality, measured by the Gini coefficient, by mature cohort size relative to adult population (ratio of population 40 to 59 years old to the population 15 to 69 years old). Leigh has assumed that fat cohorts are likely to receive low rewards. Consequently, if these fat cohorts happen to be the mature cohorts who at the top age-earning curve, income inequality tend to get smaller. On the contrary, if youth or old adults make the majority of the population, income inequality would increase. Our study contributes to the existing literature in two respects. This is the first attempt to provide a causal estimate of the effect of income inequality. Additionally, it highlights a theoretical linkage on how income inequality affects violence against women.

The study is structured as follows: Section 2 presents the data and the econometric methodology. Section 3 presents the empirical results. Section 4 discusses the findings of the study

in the light of the literature, and section 5 concludes the paper.

2. Data and Methodology

2.1 Sample Description

We use data from the third National Family Health Survey (NFHS-3) for India, conducted in 2005-06. The NFHS is part of Demographic and Health Survey, which are international surveys conducted in 86 developing countries. The NFHS is sponsored by the U.S Agency for International Development. The NFHS, a nationally representative household survey, provides data on a wide range of population and health indicators. The NFHS-3 was designed to be representative of the entire country and reflect the situation of all ever-married women in India. The NFHS-3 sample consists of 124,385 women between age 15 to 49 (reproductive age) from 109,041 households that were interviewed throughout India. The sample covers 99% of India's population living in all 29 states. The sample also allows for estimates of most key indicators at the state level. The NFHS has a complex design. It involves stratification based on the level of urbanization and region. It involves clustering, where the selected villages are the clusters for rural areas, and the selected districts/towns are the clusters for urban areas. The complex survey design has been considered in the descriptive and regression analysis.

Due to security precautions, NFHS-3 interviewed only 69,704 ever-married women on IPV. Since NFHS-3 requires privacy, only one woman in each household was interviewed for the domestic violence module to keep information confidential. We restrict our analysis to the women who have experienced violence in the last 12 months preceding the survey since wealth inequality is indicative of current conditions.

2.2 Outcome and Control Variables

The NFHS-3 contains detailed information on different forms of IPV experienced by the interviewed women and their help-seeking behavior. The collection of valid and reliable information on IPV is a challenging task due to the sensitivity of the topic, and the safety concerns of the interviewed women. NFHS-3 took certain measures to address these concerns. This includes using a module of questions known to increase the validity of domestic violence data, providing specialized training for the interviewers, in addition to other measures. To investigate the extent to which Indian women experience intimate partner physical or sexual violence, the following set of yes or no questions was used in the interview.

"Does/Did your last husband ever do any of the following things: slap you? Twist your arm or pull your hair? Push you, shake you, or throw something at you? Punch you with his fist or with something that could hurt you? Kick you, drag you or beat you up? Try to choke you or burn you on purpose? Threaten or attack you with a knife, gun, or any other weapons? Physically force you to have sexual intercourse with him even when you did not want to? Force you to perform any sexual acts you did not want to?" In addition, the interviewed women were asked: *"In the last 12 months, has anyone other than your current/last husband hit, slapped, kicked, or done anything else to hurt you physically?"*

In the present study, we focus on two outcome variables, two binary variables, that summarize IPV and violence against women by other than a partner. The first outcome is a binary variable of whether a woman experienced any different forms of spousal violence in the 12 months preceding the survey. It would equal one if women answered with a yes in the spousal violence questions (Lenze & Klasen, 2017). The second measure is a binary variable of whether a woman experienced physical violence by anyone other than the current/last husband in the 12 months preceding survey.

The NFHS-3 has no data on household income or expenditure. Instead, it collected detailed information on dwelling and household characteristics and households' assets ownership. The NFHS-3 team has used this information to develop a measure of economic status, namely wealth index. The wealth index is generated through principal components analysis, which yields a score for every household reflecting the economic affluence and this score can be used to rank population from richest to poorest.

The key control variable of interest is the degree of inequality in the wealth distribution. We measure the distribution of wealth across households in a given state by the Gini coefficient. The Gini coefficient is calculated from the wealth index score. It varies between zero (perfect equality) and 100 (extreme inequality).

2.3 Estimation Strategy

We examined the impact of contextual income inequality on violence against women with standard linear probability model (LPM) as a first step. To account for the multi-level nature of the study's hypothesis, we use a standard LPM with cluster-robust standard errors at the state level as shown in equation (1). We prefer the LPM over multi-level (hierarchical) modeling since the estimated parameters of the state-level variables will not be reliable when the number of clusters, Indian

states, is small (less than 30) (Bryan & Jenkins, 2013).

$$Y = \beta_0 + \sum \beta_i X_i + \mu \text{Gini}_i + \varepsilon \quad (1)$$

Where Y is a measure of violence against women and X is a vector of individual and household level characteristics. Several individual control variables are included in our model. We control for women's education as well as husband's education, employment status of women and men, religion, caste/tribe, place of residence, whether husband drinks alcohol and type of caste or tribe of the household head. To control for difference in economic well-being, we add the wealth index that based on household's ownership of assets to our model. The above model can also be viewed as fixed effect model since it controls for urban-rural residence which made up the 29 states.

To overcome the issue of endogeneity, omitted bias and reverse causality, we implement the following two-stage model least squares (2SLS) as shown in equations (2) and (3).

$$Y = \beta_0 + \beta_1 \text{Gini} + \beta_2 X + \varepsilon \quad (2)$$

$$\text{Gini Coefficient} = \Pi_0 + \Pi_1 Z_1 + \Pi_2 Z_2 + v \quad (3)$$

Where Y is a measure of violence against women. X is a vector of individual and household characteristics. z_1 is the exogenous instrumental variable (IV), and z_2 is a vector of control variables, and v and ε are the error terms which accounts for the remaining unexplained variation. As previously discussed, the contextual income inequality is instrumented by the mature cohort size. A valid Gini coefficient IV must be strongly associated with the Gini coefficient (e.g. the endogenous variable) and exogenous in the basic model. The intuition behind choosing mature cohorts size as an IV is the following. Income inequality is likely to be relatively small in states where mature cohorts size is fat, under the assumption that fat cohorts get less rewards, and vice versa. Previous research has suggested that mature cohorts size and income inequality are strongly correlated (Leigh, 2006). The size of mature cohorts does not directly affect violence against women; thus, the exogeneity assumption is satisfied. Since our outcome variable is a binary variable, we estimate the impact of income inequality via two-stage least squares linear probability model as well as IV-Probit for robustness check.

3. Results

Insert Table 1 here

Table 1 presents the mean of all variables used in the analyses and shows that 35.1% of the women reported being exposed to physical violence, 10% were exposed to sexual violence. 40.6% of the women and 18% are with no education. 42.8% of women and 98.8% of men were employed in the last 12 months preceding the survey interview. 60.5% of the households have a nuclear structure. The majority of the women in our sample are Hindu (82%), 13% are Muslims, 3% are Christian, and 2% are Sikh. 54% of the women in our sample live in rural areas. 19% of the sample live in a scheduled caste, 8% in scheduled tribes and 40% belong to other backward classes. Statistics show that 35% of the women in our sample reported that they did experience some form of violence. By state, women's experience of physical violence in the last 12 months preceding the survey ranges from a low of 6 percent in Jammu and Kashmir to a high of 37 percent in Bihar (see Figure 1). Table 2 displays the proportion of women who have experienced physical violence in the last 12 months by background characteristics. The table suggests women with no or primary education are more likely to experience violence compared to secondary or higher (24 vs. 12 percent). The prevalence of the experience of physical violence declines strongly with higher economic status. Rural women are more likely than urban women to experience violence. Employed women have a higher prevalence of violence than unemployed ones. Middle age women have a higher risk of experiencing physical violence compared to young or elderly women.

Insert Figure 1 here

Insert Table 2 here

Figure 2 presents the Gini coefficient for each state, which reflects the level of concentration of wealth, with zero being an equal distribution and 100 a totally unequal distribution. An examination of the Gini coefficients in Figure 1 indicates that stark variation in wealth inequality across India. The Gini coefficient values range between 48.2 and 15 where inequality in the distribution of wealth is greatest in Jharkhand.

Insert Table 3 here

The NFHS-3 collected data on the person committing physical violence against women. Table 3 presents the different types of persons who inflicted violence on women over the 12 months

preceding the survey. Most of the women have cited husbands as the person who committed violence followed by the mother or stepmother. About two percent have cited mother-in-law as the perpetrator. None have reported violence in by employer and someone at work.

The NFHS-3 has data on forms of spousal violence experienced by married women. Figure 3 shows forms of IPV experienced by married women. It shows that slapping is the most commonly reported act of physical violence, about 34%, while 15% was having hair pulled or arms twisted. About 2% of the interviewed women reported that their husbands tried to choke or burn them on purpose.

3.1 Standard linear probability model Estimates

Insert Table 4 here

In Table 4, we present results from the simple LPM models that do not account for reverse causality and omitted bias. Regardless of the type of perpetrator of the violence, the results of the LPM models suggest a statistically significant positive association between income inequality and violence against women. More specifically, the probability that a woman experiences some sort of IPV will increase by 0.00257 when the Gini coefficient increases by one unit. In addition, the LPM results show stark a socio-economic gradient in violence against women. Women from households with higher economic status, as measured by the wealth index, have a lower probability of experience violence, compared to women from poorest families. Likewise, partner's education level, as well as a woman's level of education has, in general, a substantial significant negative association with the probability of experience violence. We also found statistically significant evidence that the type of religion influences the likelihood of experiencing violence. Compared to Hindu, violence against women is higher among Muslims, and lower among Buddhist and Jewish. Women living in rural areas and scheduled tribe have a lower probability of experience violence. The coefficients for women's employment status were not significant indicating women who were not employed in the 12 months preceding the survey did not face a higher probability of experiencing violence compared to employed. Interestingly, the coefficient for women's employment status was negative for spousal violence model indicating women face lower odds of experiencing violence inside the house. However, the coefficient was positive for the model examining violence by anyone other than a partner,

reflecting it might encounter higher odds of experiencing violence outside the house or maybe workplace. Partner drinking alcohol is associated with violence against women.

Overall the results from the two simple LPM models are consistent with most findings in the literature on the effect of income inequality on violent acts.

3.2 Instrumental Variable Estimation

As previously discussed in the introduction, income inequality is likely to be endogenous because of possible omitted bias and reverse causality. Therefore, we estimate an IV 2SLS and IV probit, as a robustness check, in which Gini coefficient is instrumented by the size of mature cohorts' size. Results from 2SLS and IV-Probit are presented in Tables 5 and 6.

Insert Table 5 here

Insert Table 6 here

The test of endogeneity was performed to determine whether the state income inequality and mature cohort size are endogenous, and we could just perform standard regression models. The test yield that the two variables are endogenous, and we reject the null hypothesis that the two variables are exogenous. Table 5 shows the results for the 2SLS. As expected, the first stage of the IV regression suggested that the mature cohort size reduces the extent of income inequality within a given state. The impact is strong and statistically significant at 5% level of significance. An increase in the size of mature cohort size by one percent decreases the Gini coefficient by - 1.32, and the partial R-square is 0.10. Thus, the instrumental variable effect is in line with the theoretical predictions. In the second stage of the IV estimation, the coefficient of the state income inequality on IPV turns out to be small and insignificant. However, the coefficient sign remained in the expected direction. Therefore, the significant effect of income inequality on IPV that found in the naïve LPM model that did not account for endogeneity was mainly driven by omitted bias and reverse causality. These results are also confirmed in the IV-Probit model. Our results suggest that income inequality appears to have no causal effect on IPV.

Interestingly, we found different results when it comes to the effect of income inequality on violence by other than the partner in the last 12 months preceding the survey. Our results show that higher wealth inequality increases the probability of experiencing violence. For each additional unit increase in the Gini coefficient, the probability of experiencing violence increase

by other than partner increases by 0.00149. This indicates that if a woman migrates from Delhi where wealth inequality is relatively low (Gini coefficient=15) to Jharkhand where wealth inequality is the highest (Gini coefficient=48); the risk of experiencing violence by other than partner increase by 5 percent, even though her own wealth did not change. Likewise, the IV- Probit findings confirm these results. Unlike the results of IPV model, the results violence against women by other partner were robust and remained significant in the three models and after controlling for individual and household characteristics. Therefore, the risk of violence against women is not only determined by the level of absolute wealth, but also by the level of wealth distribution in the community.

As for the other covariates, like the basic model, we find that a husband's and wife's education, husband's employment status, living in rural areas, being from non-scheduled caste, and the economic status of a household to be protective factors for violence. Employment status did not affect the risk of violence, which is line with the recent literature (Lenze & Klasen, 2017). However, this variable is likely to be biased, as spousal violence could drive women to join the labor market and become more independent. Scheduled caste women are more likely to encounter IPV compared to another caste/tribe. Results yield drinking alcohol increases the odds of spousal violence.

4. Conclusion

Violence against women is a global social problem and could have severe health consequences on women and children. Several factors have been suggested in the literature to predict violence against women. These include a lower level of education, husband's use of alcohol or drug, witnessing family violence, and weak or no legal sanctions for domestic violence. Little attention has been given to the role of economic inequality on violence against women. In the present study, we examined the causal effect of the state economic inequality on the individual risk of experiencing violence using nationally representative data from India. To tackle endogeneity, we instrument income inequality at the state level by mature cohort size relative to the size of the adult population. We demonstrate that when the potential endogeneity of income inequality is not considered, income inequality appears to increase the risk of violence against women either from the husband or anyone other than the husband. When overcoming the endogeneity issue by estimating an IV model, our results are mixed. The income inequality effect on the risk of experiencing violence is confirmed only for violence inflicted by anyone other than the husband.

On the contrary, the effect of income inequality on IPV comes out as modest and insignificant. Our findings are robust to different estimation techniques either IV-Probit or 2SLS.

The determinant effect of state income inequality that we find for the risk of violence against women raises the issue of the pathway through which state income inequality influences violence against women. We suggest social capital erosion as a mediator through which income inequality affects the risk of experiencing violence. The NFHS-3 obtained information on whether women had tried to seek any help to stop the violence. Sources for help include own family, husband's family, friend, neighbor and others. In fact, one can argue that these sources might be being a form of social capital. Interestingly and in line with our argument, we noted a positive correlation between state income inequality and the percent of women who seek help to deal with violence, sources for help to stop the violence include own family, husband's family, friend, neighbor and others. Another potential mechanism from the sociological theories of crime might be that individuals are frustrated by their failure to achieve economic success and poor people are likely to become violent in communities where economic inequality is high compared to individuals living in an equal society (Merton, 1938). Regardless of the mechanisms, the two explanations suggest that higher level of inequality boost violence against women. Nevertheless, income inequality does not affect the risk of IPV.

One potential explanation of why income inequality does not affect couples in marriage yet affect a third party to inflict violence against women is that couples are likely to live together and share to a large extent the same standard of living and thus not affected by inequality by living standards. On the other hand, violence by non-partner is likely to be affected by income inequality since they share do not the same economic resources.

As for the control variables, we noted some interesting findings. Notably, the religion type affects the woman risk of experiencing violence. For instance, the risk of violence is higher among Muslims. Women employment status did not have a protective effect on the risk of violence. As expected, educated wives are less likely to experience violence. A woman married to educated partner is less likely to encounter violence. Economic affluence reduces the risk of IPV.

Overall, we provide evidence that income inequality increases violence against women. However, the income inequality coefficient is not large. Therefore, our findings support the hypothesis that suggests income inequality increase violent acts and our contribution to this hypothesis is: income inequality increase violent acts against women too. Our findings revealed the importance of accounting for endogeneity, as relying on models that do not account for omitted bias and reverse causality would lead to the wrong conclusion that the state of income inequality increases the risk of IPV.

The current study is not free from limitations. Despite that NFHS-3 take several steps to address this concern, underreporting of violence experience because of failure to recall and stigmatization may affect the reliability of our dependent variables. The cross-sectional nature of the NFHS-3 makes causal inference challenging task because of the endogeneity. However, we tackle endogeneity by the IV approach. The NFHS-3 did not collect information on household expenditure or income. However, we overcome by using wealth index, which is a measure of dwelling and household characteristic and household assets. A unique contribution of this study is the use of Gini index that is based on assets ownership, which is a more comprehensive measure of inequality in comparison to the Gini index based on household expenditure or income, which is likely to be understated by interviewed respondents in developing countries.

Conflict of Interest

None

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Appendix

Figure 1: Physical in violence against women in the last 12 months preceding the survey

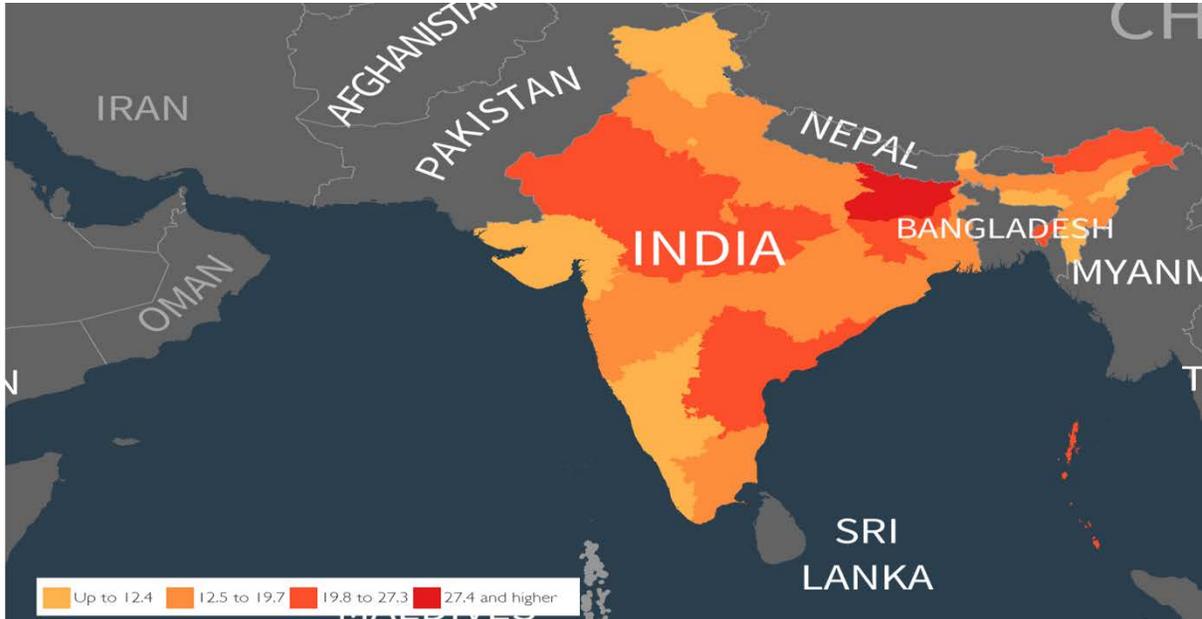


Figure 2: Gini Coefficient across Indian States

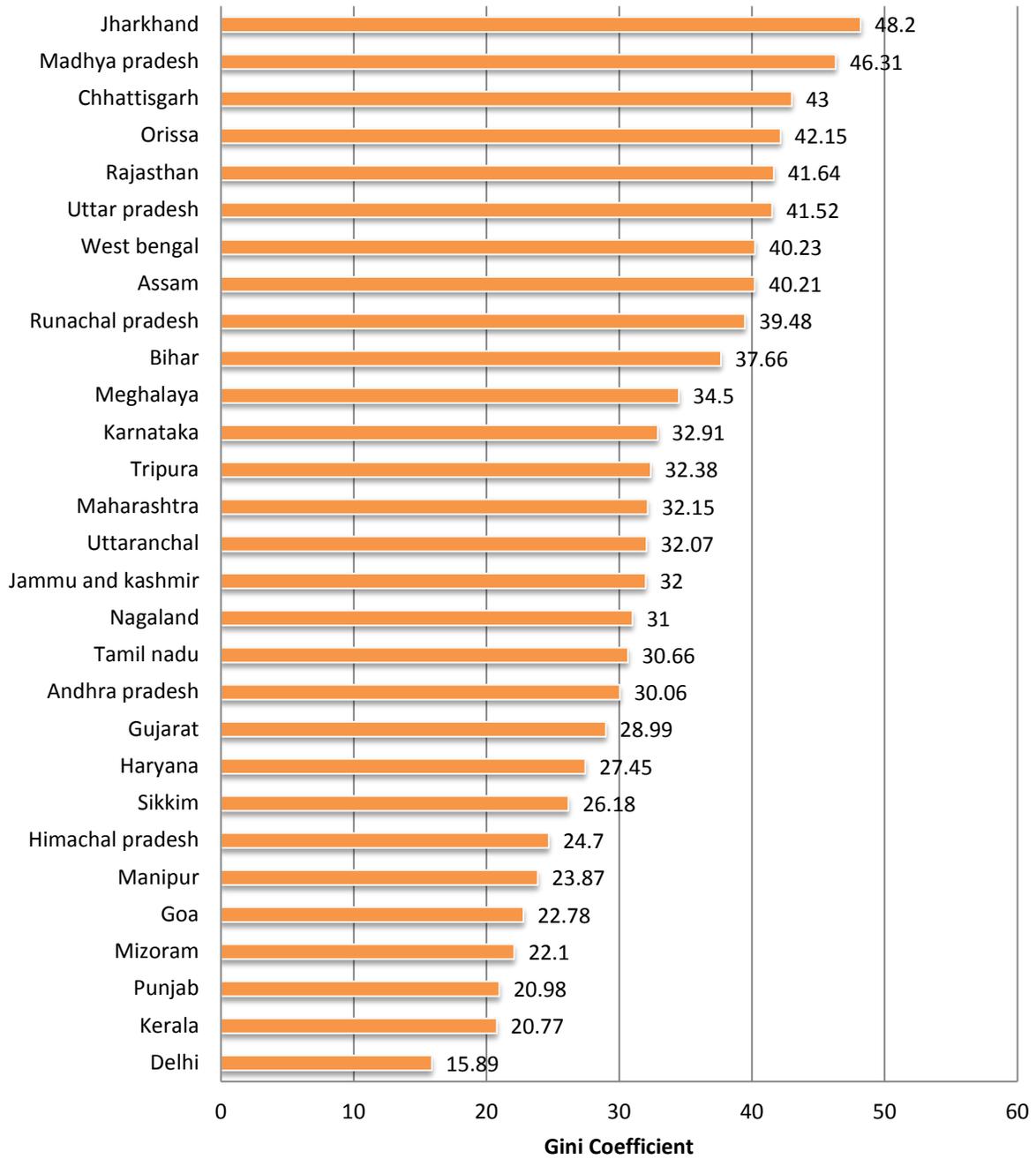
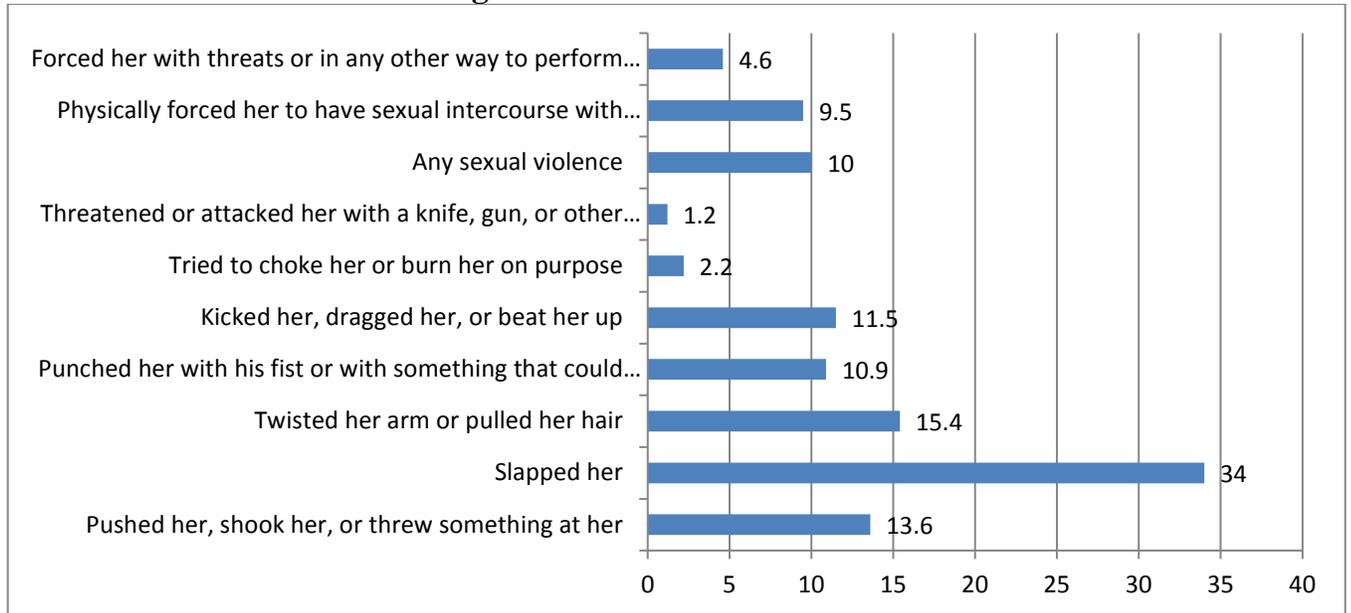


Figure 3: Forms of violence



Source: Authors' calculations based on data from the NFHS-3.

Table1: Descriptive Statistics

Variable	Mean
Spousal physical violence	35.1
Spousal sexual violence	10
Emotional Violence	15.8
Women with no education	40.6
Women with some primary education	8
Women with completed primary education	6.7
Women with some secondary education	32.7
Women with completed secondary education	4.7
Women with more than secondary education	7.3
Women with primary education	14.7
Women with secondary or higher education	44.7
Median years of education completed	4.2
Men with no education	18
Men with some primary education	10.2
Men with completed primary education	6.5
Men with some secondary education	45.5
Men with completed secondary education	7.2
Men with more than secondary education	12.5
Men with primary education	16.7
Men with secondary or higher education	65.2
Married women employed in the last 12 months receiving cash earnings	42.8
Married men employed in the last 12 months receiving cash earnings: Total	98.8
Household Structure	
Nuclear	60.5
Non-nuclear	39.5
Religion	
Hindu	82
Muslim	13
Christian	3
Sikh	2
Buddhist	1
Others	1
Region	
Urban	46
Rural	54
Type of tribe/caste	
scheduled castes	19
scheduled tribes	8

other backward classes	40
Other background	33

Source: Authors' calculations based on data from the NFHS-3.

Table 2: Physical violence in the last 12 months by background

Characteristic	Physical violence in the past 12 months
Woman's age	
15-19	14.5
20-24	19.9
25-29	23.5
30-34	22.5
35-39	19.3
40-44	17.3
45-49	13
Residence	
Urban	14.9
Rural	20.9
Woman's education	
Education (2 groups) : No education or primary	24.4
Education (2 groups): Secondary or higher	12.1
Wealth Index	
Wealth quintile : Lowest	27.5
Wealth quintile : Second	25.1
Wealth quintile : Middle	20.5
Wealth quintile : Fourth	15.5
Wealth quintile : Highest	8.6
Woman employment status	
Employment: Employed for cash	22.2
Employment: Employed for kind	21.6
Employment: Unemployed	16.6

Table 3: Persons committing physical violence in the past 12 months preceding the survey

Persons	%
Physical violence committed by current husband/partner	76.9
Physical violence committed by former husband/partner	6.6
Physical violence committed by current boyfriend	0
Physical violence committed by former boyfriend	0.1
Physical violence committed by father/step-father	6.6
Physical violence committed by mother/step-mother	13.7
Physical violence committed by sister/brother	7.8
Physical violence committed by daughter/son	0.1
Physical violence committed by other relative	1.5
Physical violence committed by mother-in-law	1.7
Physical violence committed by father-in-law	0.6
Physical violence committed by other in-law	1.3
Physical violence committed by teacher	3
Physical violence committed by employer/someone at work	0
Physical violence committed by police/soldier	0
Physical violence committed by other	0.3

Source: Authors' calculations based on data from the NFHS-3.

Table 4: Standard LPM Model

VARIABLES	Violence by spouse in the last 12 months	Violence by other than partners
Gini	0.00257** (0.000463 - 0.00468)	0.000297** (5.01e-06 - 0.000590)
partner drinks alcohol , yes	0.143*** (0.123 - 0.164)	0.00949*** (0.00473 - 0.0142)
Wealth Index		
Poorer	-0.00714 (-0.0217 - 0.00743)	0.000331 (-0.00398 - 0.00464)
Middle	-0.0454*** (-0.0763 - -0.0145)	-0.00536* (-0.0114 - 0.000705)
Richer	-0.0854*** (-0.116 - -0.0544)	-0.00822*** (-0.0130 - -0.00341)
Richest	-0.140*** (-0.173 - -0.106)	-0.0119*** (-0.0169 - -0.00692)
partner's education level		
primary	0.00726 (-0.00861 - 0.0231)	-0.00167 (-0.00552 - 0.00219)
secondary	-0.0169* (-0.0341 - 0.000220)	-0.00425* (-0.00924 - 0.000736)
higher	-0.0192 (-0.0472 - 0.00880)	-0.00609** (-0.0114 - -0.000807)
don't know	-0.0173 (-0.0527 - 0.0181)	0.00729 (-0.0122 - 0.0268)
respondent currently working, yes	0.00340 (-0.0145 - 0.0213)	-0.000216 (-0.00367 - 0.00324)
highest educational level		
primary	0.00699 (-0.0140 - 0.0280)	0.00610* (-0.000209 - 0.0124)
secondary	-0.0148 (-0.0363 - 0.00666)	0.00563** (0.00105 - 0.0102)
higher	-0.0503*** (-0.0808 - -0.0198)	0.00850** (0.00105 - 0.0159)
partner's occupation = 1, professional/technical/managerial	-0.0301* (-0.0607 - 0.000519)	-0.0103** (-0.0201 - -0.000476)

partner's occupation = 2, clerical	-0.0416**	-0.0114**
	(-0.0726 - -0.0105)	(-0.0215 - -0.00137)
partner's occupation = 3, sales	-0.0173	-0.00829
	(-0.0486 - 0.0139)	(-0.0183 - 0.00176)
partner's occupation = 5, agricultural	-0.0230	-0.0131**
	(-0.0589 - 0.0130)	(-0.0237 - -0.00243)
partner's occupation = 7, services	-0.0519***	-0.0169***
	(-0.0761 - -0.0276)	(-0.0279 - -0.00597)
partner's occupation = 8, skilled and unskilled manual	-0.0188	-0.00898*
	(-0.0536 - 0.0161)	(-0.0191 - 0.00111)
partner's occupation = 98, don't know	-0.103*	0.0167
	(-0.220 - 0.0146)	(-0.0730 - 0.106)
type of place of residence = 2, rural	-0.0227***	-0.00163
	(-0.0377 - -0.00775)	(-0.00503 - 0.00178)
religion = 2, muslim	0.0712***	0.00146
	(0.0377 - 0.105)	(-0.00611 - 0.00904)
religion = 3, christian	-0.0256	-0.00219
	(-0.0851 - 0.0338)	(-0.0116 - 0.00725)
religion = 4, sikh	0.00305	0.000834
	(-0.0274 - 0.0335)	(-0.00404 - 0.00571)
religion = 5, buddhist/neo-buddhist	-0.0341*	-0.00696**
	(-0.0743 - 0.00606)	(-0.0133 - -0.000617)
religion = 6, jain	-0.0143	-0.0113***
	(-0.0486 - 0.0200)	(-0.0154 - -0.00710)
religion = 7, jewish	-0.0662***	-0.00681
	(-0.100 - -0.0323)	(-0.0162 - 0.00256)
religion = 8, parsi/zoroastrian	0.791***	0.907***
	(0.575 - 1.007)	(0.712 - 1.101)
religion = 9, no religion	-0.0111	-0.0213***
	(-0.182 - 0.160)	(-0.0282 - -0.0144)
religion = 10, donyi polo	0.0706***	-0.0153***
	(0.0280 - 0.113)	(-0.0235 - -0.00711)
religion = 96, other	-0.0538	0.00624
	(-0.146 - 0.0380)	(-0.0207 - 0.0332)
type of caste or tribe of the household head = 2, scheduled tribe	-0.0419**	-0.00161
	(-0.0777 - -0.00604)	(-0.0119 - 0.00865)

type of caste or tribe of the household head = 3, other backward class	-0.0325*** (-0.0481 - -0.0170)	-0.000298 (-0.00483 - 0.00423)
type of caste or tribe of the household head = 4, none of above	-0.0238** (-0.0439 - -0.00368)	-0.00139 (-0.00711 - 0.00434)
type of caste or tribe of the household head = 8, don't know	-0.129*** (-0.175 - -0.0835)	0.00364 (-0.0103 - 0.0176)
Constant	0.201*** (0.120 - 0.282)	0.0203** (0.00332 - 0.0374)
Observations	66,479	66,479

Robust confidence intervals in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

Table 5: 2SLS Estimation

VARIABLES	Violence by spouse in the last 12 months	Violence by other than partners
Gini	0.00181 (-0.00416 - 0.00778)	0.00149** (7.24e-05 - 0.00290)
partner drinks alcohol = 1, yes	0.142*** (0.122 - 0.163)	0.0108*** (0.00544 - 0.0161)
type of place of residence = 2, rural	-0.0227*** (-0.0372 - -0.00829)	-0.00163 (-0.00579 - 0.00254)
wealth index = 2, poorer	-0.00945 (-0.0287 - 0.00977)	0.00392 (-0.00233 - 0.0102)
wealth index = 3, middle	-0.0498** (-0.0883 - -0.0113)	0.00147 (-0.00834 - 0.0113)
wealth index = 4, richer	-0.0910*** (-0.135 - -0.0465)	0.000519 (-0.0111 - 0.0122)
wealth index = 5, richest	-0.147*** (-0.202 - -0.0912)	-0.000848 (-0.0152 - 0.0135)
partner's education level = 1, primary	0.00734 (-0.00759 - 0.0223)	-0.00178 (-0.00538 - 0.00181)
partner's education level = 2, secondary	-0.0164** (-0.0320 - -0.000842)	-0.00507** (-0.0101 - -5.00e-06)
partner's education level = 3, higher	-0.0172 (-0.0408 - 0.00649)	-0.00925*** (-0.0156 - -0.00294)
partner's education level = 8, don't know	-0.0163 (-0.0520 - 0.0195)	0.00568 (-0.0131 - 0.0244)
partner's education level = 9, 9	0.0523 (-0.0505 - 0.155)	-0.00369 (-0.0336 - 0.0262)
respondent currently working = 1, yes	0.00242 (-0.0152 - 0.0201)	0.00131 (-0.00246 - 0.00507)
highest educational level = 1, primary	0.00653 (-0.0117 - 0.0248)	0.00682** (0.00104 - 0.0126)
highest educational level = 2, secondary	-0.0159* (-0.0336 - 0.00187)	0.00726*** (0.00289 - 0.0116)
highest educational level = 3, higher	-0.0523*** (-0.0779 - -0.0267)	0.0115*** (0.00429 - 0.0188)
partner's occupation = 1, professional/technical/managerial	-0.0296** (-0.0582 - -0.000916)	-0.0111** (-0.0205 - -0.00165)

partner's occupation = 2, clerical	-0.0410***	-0.0123**
	(-0.0707 - -0.0113)	(-0.0219 - -0.00271)
partner's occupation = 3, sales	-0.0167	-0.00918*
	(-0.0460 - 0.0125)	(-0.0185 - 0.000111)
partner's occupation = 5, agricultural	-0.0230	-0.0131**
	(-0.0570 - 0.0110)	(-0.0233 - -0.00281)
partner's occupation = 7, services	-0.0519***	-0.0168***
	(-0.0748 - -0.0291)	(-0.0270 - -0.00663)
partner's occupation = 8, skilled and unskilled manual	-0.0190	-0.00865*
	(-0.0519 - 0.0139)	(-0.0182 - 0.000867)
partner's occupation = 98, don't know	-0.103*	0.0169
	(-0.212 - 0.00601)	(-0.0691 - 0.103)
religion = 2, muslim	0.0713***	0.00142
	(0.0397 - 0.103)	(-0.00572 - 0.00855)
religion = 3, christian	-0.0295	0.00388
	(-0.0953 - 0.0362)	(-0.00749 - 0.0152)
religion = 4, sikh	-0.00325	0.0106
	(-0.0545 - 0.0480)	(-0.00289 - 0.0241)
religion = 5, buddhist/neo-buddhist	-0.0369	-0.00261
	(-0.0831 - 0.00931)	(-0.0112 - 0.00595)
religion = 6, jain	-0.0110	-0.0164***
	(-0.0528 - 0.0307)	(-0.0257 - -0.00709)
religion = 7, jewish	-0.0722***	0.00247
	(-0.127 - -0.0176)	(-0.0124 - 0.0173)
religion = 8, parsi/zoroastrian	0.792***	0.905***
	(0.591 - 0.993)	(0.720 - 1.090)
religion = 9, no religion	-0.0113	-0.0210***
	(-0.173 - 0.150)	(-0.0292 - -0.0127)
religion = 10, donyi polo	0.0735***	-0.0198***
	(0.0251 - 0.122)	(-0.0298 - -0.00980)
religion = 96, other	-0.0528	0.00470
	(-0.139 - 0.0333)	(-0.0177 - 0.0271)
type of caste or tribe of the household head = 2, scheduled tribe	-0.0407**	-0.00342
	(-0.0756 - -0.00587)	(-0.0140 - 0.00717)
type of caste or tribe of the household head = 3, other backward class	-0.0318***	-0.00150
	(-0.0460 - -0.0175)	(-0.00699 - 0.00399)
type of caste or tribe of the household head = 4, none of above	-0.0243***	-0.000613

	(-0.0421 - -0.00640)	(-0.00582 - 0.00459)
type of caste or tribe of the household head = 8, don't know	-0.131***	0.00552
	(-0.174 - -0.0871)	(-0.00619 - 0.0172)
Constant	0.232**	-0.0280
	(0.00563 - 0.458)	(-0.0829 - 0.0269)
Observations	66,479	66,479

Robust confidence intervals in parentheses. *** p<0.01, ** p<0.05, * p<0.1

Table 6: IV Probit Estimation

VARIABLES	Violence by spouse in the last 12 months	Violence by other than partners
gini	0.00875 (-0.0152 - 0.0327)	0.0421** (0.00718 - 0.0770)
partner drinks alcohol = 1, yes	0.514*** (0.454 - 0.575)	0.260*** (0.161 - 0.359)
type of place of residence = 2, rural	-0.0880*** (-0.148 - -0.0281)	-0.0511 (-0.160 - 0.0575)
wealth index = 2, poorer	-0.0150 (-0.0865 - 0.0565)	0.118 (-0.0283 - 0.264)
wealth index = 3, middle	-0.137* (-0.281 - 0.00800)	0.0930 (-0.162 - 0.348)
wealth index = 4, richer	-0.287*** (-0.463 - -0.112)	0.0703 (-0.248 - 0.389)
wealth index = 5, richest	-0.568*** (-0.795 - -0.341)	0.000549 (-0.401 - 0.402)
partner's education level = 1, primary	0.0301 (-0.0183 - 0.0785)	-0.0404 (-0.111 - 0.0302)
partner's education level = 2, secondary	-0.0477* (-0.102 - 0.00684)	-0.119** (-0.223 - -0.0156)
partner's education level = 3, higher	-0.0699 (-0.184 - 0.0444)	-0.247*** (-0.417 - -0.0767)
partner's education level = 8, don't know	-0.0518 (-0.177 - 0.0736)	0.0846 (-0.229 - 0.398)
partner's education level = 9, 9	0.179 (-0.160 - 0.518)	-0.0730 (-0.816 - 0.670)
respondent currently working = 1, yes	0.0110 (-0.0573 - 0.0792)	0.0364 (-0.0544 - 0.127)
highest educational level = 1, primary	0.0264 (-0.0336 - 0.0865)	0.154** (0.0228 - 0.285)
highest educational level = 2, secondary	-0.0638* (-0.130 - 0.00244)	0.178*** (0.0670 - 0.290)
highest educational level = 3, higher	-0.348*** (-0.495 - -0.200)	0.319*** (0.118 - 0.520)
partner's occupation = 1, professional/technical/managerial	-0.136**	-0.251***

	(-0.251 - -0.0212)	(-0.433 - -0.0682)
partner's occupation = 2, clerical	-0.187***	-0.278***
	(-0.319 - -0.0545)	(-0.457 - -0.0984)
partner's occupation = 3, sales	-0.0681	-0.195**
	(-0.181 - 0.0444)	(-0.358 - -0.0322)
partner's occupation = 5, agricultural	-0.0865	-0.284***
	(-0.212 - 0.0391)	(-0.484 - -0.0836)
partner's occupation = 7, services	-0.212***	-0.443***
	(-0.298 - -0.126)	(-0.672 - -0.215)
partner's occupation = 8, skilled and unskilled manual	-0.0795	-0.186**
	(-0.202 - 0.0434)	(-0.360 - -0.0121)
partner's occupation = 98, don't know	-0.392	0.215
	(-0.905 - 0.122)	(-0.718 - 1.147)
religion = 2, muslim	0.270***	0.0317
	(0.167 - 0.374)	(-0.137 - 0.201)
religion = 3, christian	-0.107	0.103
	(-0.389 - 0.175)	(-0.195 - 0.401)
religion = 4, sikh	0.0126	0.318*
	(-0.201 - 0.226)	(-0.0287 - 0.666)
religion = 5, buddhist/neo-buddhist	-0.129	-0.0804
	(-0.331 - 0.0742)	(-0.333 - 0.172)
religion = 6, jain	-0.132	
	(-0.441 - 0.178)	
religion = 7, omitted	-	-
religion = 8, parsi/zoroastrian	2.601***	3.504***
	(1.167 - 4.034)	(2.113 - 4.895)
religion = 9, no religion	-0.0392	
	(-0.530 - 0.451)	
religion = 10, donyi polo	0.228**	-0.570***
	(0.0523 - 0.404)	(-0.790 - -0.350)
religion = 96, other	-0.186	0.0476
	(-0.491 - 0.118)	(-0.293 - 0.388)
type of caste or tribe of the household head = 2, scheduled tribe	-0.153**	-0.0827
	(-0.273 - -0.0336)	(-0.318 - 0.152)
type of caste or tribe of the household head = 3, other backward class	-0.113***	-0.0430
	(-0.169 - -0.0572)	(-0.176 - 0.0904)

type of caste or tribe of the household head = 4, none of above	-0.0895** (-0.160 - -0.0191)	-0.00961 (-0.131 - 0.112)
type of caste or tribe of the household head = 8, don't know	-0.533*** (-0.721 - -0.345)	0.140 (-0.0951 - 0.375)
Constant	-0.870* (-1.787 - 0.0480)	-3.453*** (-4.698 - -2.207)
Observations	66,475	66,196

Robust confidence intervals in parentheses. *** p<0.01, ** p<0.05, * p<0.1

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