

Does ending child marriage in India require a micro-level lens: Deconstructing the socio-economic inequalities through CART analysis?

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Abstract

Child marriage, a violation of human rights, continues to disproportionately affect marginalized girls in India, reinforcing poverty, limiting education, and worsening health and well-being. In India, though the child marriage reduced from 47% in 2005-06 to 23% in 2019-21, stark geographic and socioeconomic disparities persist, complicating efforts to meet SDG 5.3. The practice remains unabated in the country due to deep-rooted social and cultural norms, especially in high-burden states like West Bengal, where child marriage marginally dropped – 52% to 42% during 2005-05 to 2019-21, while Chhattisgarh saw a significant reduction – 55% to 12%. Using the NFHS 2019-21 data, this study employs Classification and Regression Tree (CART) analysis to deconstruct inequalities to identify the furthest behind groups with the highest prevalence of child marriage. The highest prevalence of child marriage (63%) was found among those with no or lower-secondary education belonging to bottom 40 percent of wealth quintile and are from SC caste group. Even in Chhattisgarh, a low-burden state, 34% of girls with no or lower (primary) education were married before 18 years of age. These results are crucial for shaping the policies to accelerate progress toward eliminating child marriage in India by 2030.

Introduction

Marriage before the age of 18 years is a violation of fundamental human rights of girls (UNICEF, 2023). It is also a strong constraint on the agency of young girls and women, pushing them into lifelong subordinate relationships before they have the legal provision to make decisions that have a long-term impact on their lives (UNFPA, 2021). This poses a significant risk to the well-being, health, and future opportunities to young girls as they start experiences unplanned pregnancy, abortion, and childbearing at early ages (Chari et al., 2016; Efevbera et al., 2017; Shaud and Asad, 2018). In less developed countries, early childbearing among young girls contributes to high maternal mortality and neonatal mortality (UNICEF, 2024). Additionally, the young girls forced to marriage face an increased vulnerability to sexually transmitted infections, including HIV, and marriage often signifies the end of their education, diminishes their prospects for pursuing a career, and can steal from her to make fundamental choices about their own lives. (UNFPA, 2012).

The geographic variation in the child marriage is associated with geographical patterns of socioeconomic development, varying income level and urbanization, and cultural practices (Yount et. al., 2016). Education plays a pivotal role in postponing marriage and childbirth by keeping girls in school for longer duration, equipping them with skills for employment, boosting their self-esteem, and enhancing their decision-making power within families (Blum et. al., 2015, Glick et. al., 2015). Studies also showed that girls with higher educational attainment, living in urban areas, or from wealthier households are at a lower risk of early marriage and subsequent childbirth (UNFPA, 2013; Blum et al., 2016).

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The Sustainable Development Goal (SDG) 5.3 aims to end child marriage by 2030 as part of a global commitment to “eliminate all harmful practices, such as child, early, and forced marriage, and female genital mutilation” (United Nations, 2015). Global efforts such as *Every Woman Every Child* have contributed to significant reduction in the prevalence of early marriage and teenage childbearing (Child EWE, 2016-2030). These initiatives recognize the critical role of adolescents in achieving the 2030 Agenda for Sustainable Development through the Global Strategy for Women’s, Children’s, and Adolescents’ health (Kuruville et al., 2016). However, progress has been stalled, uneven, and leading to persistent inequalities between the regions and countries – benefited among the girls from the richer quintile (Blum et al., 2015; Patton et al., 2012). Moreover, the decline in child marriage is too slow to achieve the SDG target of ending child marriage by 2030. Currently 19% of girls married before the age of 18 years globally. To achieve the global commitment of the SDG, it requires 20 times faster progress to eliminate this practice by the end of this decade. The current stalled and uneven progress highlights the need to double efforts to reach the poorest, uneducated, rural, and most vulnerable girls (UNFPA, 2023).

In India, prevalence of child marriage has dropped significantly—from 47.4% in 2005-06 to 23.3% in 2019-21 (IIPS and ICF 2019), yet the practice continues to affect the lives of millions of girls, perpetuating them into a cycle of poverty, restricted educational opportunities, and adverse health outcomes (Raj, 2013). Moreover, this national level decline in child marriage in India is associated with stark regional and socioeconomic disparities which is critical in achieving the SDG target 5.3 (Chopra et al., 2023).

As 'Leaving No One Behind' is the central to the 2030 Agenda for Sustainable Development, which required addressing the needs of the most marginalized and vulnerable populations (United Nations, 2015). In the context of child marriage, this requires generating robust evidence in diversity of various population groups which are farthest behind for appropriate policy and programmatic response. Accordingly, this paper adopts a micro-level approach to identify the left-behind geography and socioeconomic groups where the practice of child marriage is highest. Such information will support the policy makers to address 'Leaving No One Behind' agenda of the SDGs for ending the child marriage practices. This study aims to analyse inequities in child marriage in India and its two select states which showed a contrasting trend in decline of the child marriage the one is West Bengal with the highest level of child marriage and lowest decline in the last 15 years and the second is Chhattisgarh, where such practice is one of the lowest among larger states of India and the decline during the period was the most.

Data and Methodology

The study is analysed fifth round of the National Family Health Survey (NFHS-5) data of India, conducted during 2019-21. The NFHS is a large-scale household survey (equivalent to DHS) conducted across the states and union territories of India which covers more than 99% of the population of the country. The survey adopted multi-stage sampling designs across rural and urban areas. Details of the sampling design and sample size estimation are given in the report of the NFHS 2019-21 (IIPS & ICF, 2021).

The NFHS data were collected using a household schedule and eligible women/individual schedule. A total of 636,699 households were interviewed with a response rate of 98%. From the selected households a total of 724,115 eligible women (women aged 15-49 years) were interviewed with a response rate of 97% and 101,839 men (aged 15-54 years) were interviewed with a response rate of 92%. For the present study, we analysed sample of currently married women aged 20–24 years which is 118,700.

Outcome variable

Child marriage– Primary outcome variable of the study is defined as ‘percentage of women aged 20-24 years married before 18 years of age’. Those married before 18 years are coded as "1" (indicating child marriage), while those married at age 18 or above were coded as "0." The definition of child marriage and the exposure group is aligned the definition of the SDG target 5.3.1. While all the analyses are based on the unit level data of the NFHS-5, to trace the trend in the child marriage, we fetched data from the published report of the two previous rounds of the survey – conducted in 2005-06 and 2015-16.

Exposure variable

The exposure variables included are place of residence (rural and urban); level of education schooling (no education, primary (lower), Secondary, and Higher); religion (Hindu, Muslim and Others religion (Christian, Sikh, Buddhist, Jain and others); caste (Schedule Tribe (ST)/Schedule Caste (SC), Other Backward Class (OBC) and Others); household wealth index (lowest, second, middle, fourth and highest) and geographical regions of the country.

Statistical analysis

Descriptive statistics was used to understand the differentials in child marriage by selected socioeconomic and demographic characteristics. To identify the farthest behind group in terms of child marriage, the study employed Classification and Regression Tree (CART) analysis. We use the technique developed by United Nations Economic and Social Commission of Asia and the Pacific (UN ESCAP). Regression trees offer a practical way of operationalizing the LNOB pledge. The output is in a form of a decision tree where each fork is split in a predictor variable and each end node contains a prediction for the outcome variable. This method helps uncover inequality by pinpointing specific groups of individuals who are most behind (in terms of high child marriage) in India as well as in the selected states. The intersectionality and deconstruction of child marriage are based on socioeconomic factors such as wealth quintile, educational attainment, place of residence and caste categories.

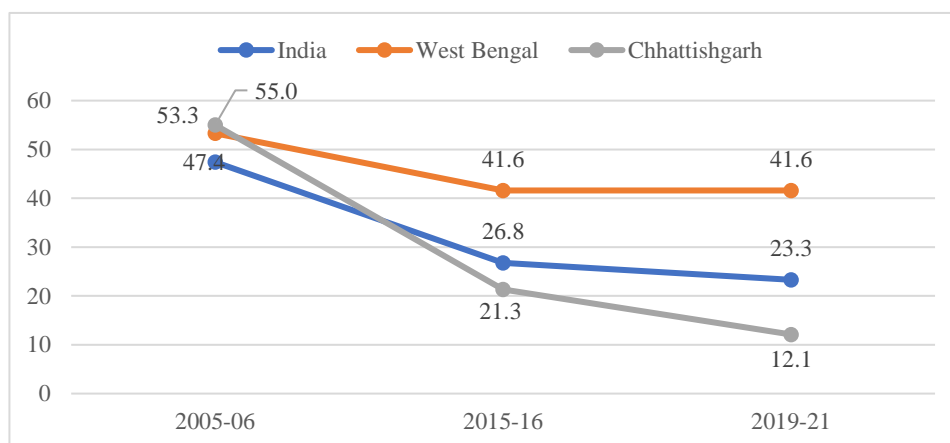
We used STATA SE (version 18.0) for conducting the univariate and bivariate analysis and R software was used to carry out CART analysis. As the NFHS used a multistage sampling design, all the values reported in the study were estimated after applying appropriate weighting

Findings

Trends in child marriage in India and states

Figure 1 presents trend in the percentage of women aged 20-24 who were married before the age of 18 years in India, West Bengal, and Chhattisgarh during from 2005-06 to 2019-21. There is a significant decline in the child marriage rates in the country. For instance, in India, child marriage declined from 47% in 2005-06 to 23% in 2019-21.

Figure 1: Percentage of women aged 20-24 years married before 18 years of age, West Bengal, Chhattisgarh, and India, 2005-06 to 2019-21

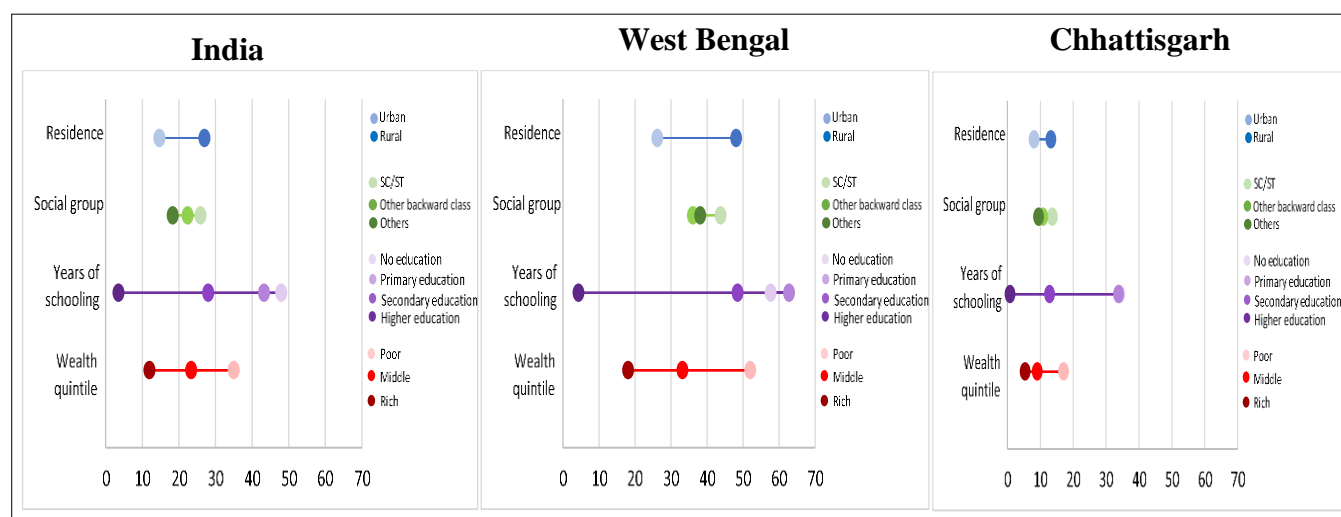


During the same period, the decline in child marriage was relatively lower in West Bengal, from 52% to 42%, while a huge decline is observed in Chhattisgarh, from 55% to 12%.

Differentials in Child marriage

Figure 2. depicts the bivariate estimates of child marriage by selected socio-economic characteristics in India and in the two selected states. The child marriage was higher in rural areas (27%) than urban areas (15%); higher among women with no education (48%) than girls who had higher education (3.5%). Similarly, 35 percent of the poor girls married before age 18 years, compared to only 12 percent of girls belonging to rich quantile.

Figure 2: Prevalence of child marriage by place of residence, social group, educational attainment, and wealth status in, India, West Bengal, and Chhattisgarh, 2019-21



In both the states, the prevalence of child marriage varied by place of residence, education, level and household wealth. For instance, in West Bengal, 48% of girls in rural areas are married before 18, compared to 26% in urban areas. Similarly, in Chhattisgarh, 13% of girls in rural areas are married before 18, while the rate is 8% in urban areas. In West Bengal child marriage is highest (63%) among the girls who has primary education followed by girls with no education, while it lowest among the girls who had completed higher education.

On the other hand, in Chhattisgarh child marriage is almost seven times higher among the girls with no education (34%) than girls with higher education (0.8%). In both the states, child marriage is

highest among the girls belong to SC/ST category and it decrease by increase in household wealth status. Rate of child marriage is three times higher among girls belong to poor household than who belong to rich household – 52% percent vs 18% percent in West Bengal; and 17% vs 5% in Chhattisgarh.

Results of the CART analysis

Figure 3.1 presents results of the CART analysis for child marriage to identify the circumstances that identify groups that are left behind with highest child marriage rate as a group in India. Results presented in the Figure show that higher education among girls create a wide variation in child marriage compared to girls with no or lower -secondary education. The tree shows that girls having no or lower education are the furthest behind group with 46 percent rate of child marriage. On the contrary girls with higher education living in urban areas are the furthest ahead group with only 2.3 percent of child marriage rate. However, it also shows that girls with secondary education, who belong to the bottom 40 percent of the wealth quintile and are from SC or ST communities, still have a higher rate of child marriage (35 percent).

Figure 3.1: Classification of Regression Tree (CART) for child marriage in India, 2019-21

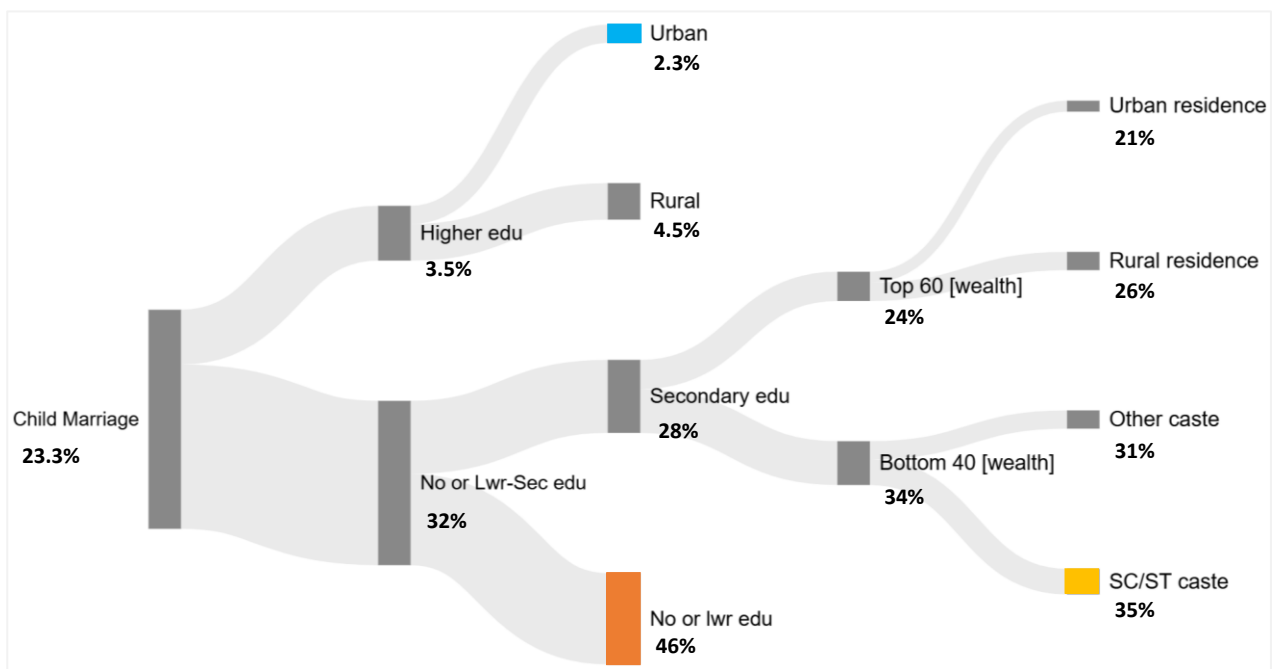


Figure 3.2 indicates that child marriage in West Bengal is deeply shaped by education, wealth, and caste. Girls with higher education only have 4.3% of child marriages, which is ten times lower than compared to the girls with no or lower secondary education (51%). Further split suggest that girls with no or lower secondary education belong to the bottom 40 percent of wealth quintile and are from SC caste exhibits the highest prevalence (63 percent) of child marriage. Even among girls with no or primary education from ST/OBC or general groups, child marriage remains high (61%).

Figure 3.2: Classification of Regression Tree (CART) for child marriage in West Bengal, 2019-21

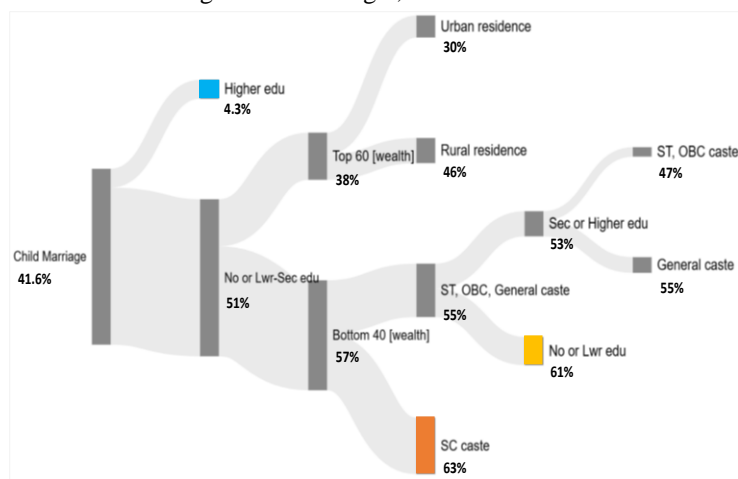
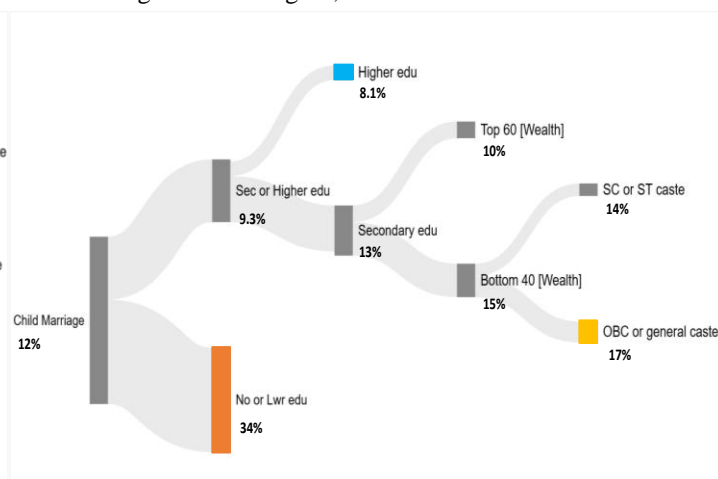


Figure 3.3: Classification of Regression Tree (CART) for child marriage in Chhattisgarh, 2019-21



In Chhattisgarh, 34% of girls with no education or primary (lower) education are married below 18 years of age, and this drops to 8.1% among those with higher education (Figure 3.3). Additionally, girls with secondary education belongs to bottom 40 percent of wealth quintile and are from OBC or general caste group exhibit the second highest prevalence of child marriage at 17%. Further disaggregation with more number of categories is limited due to smaller sample size in each intersecting categories.

Summary

In the last 15 years, India made commendable progress in reduction of child marriage – 20% percentage points decline between 2005-06 to 2019-21. Such decline has contributed to a sharp decline in the child marriage globally (UNICEF 2019). However, such a decline in India can mask the sub-national and socioeconomic gaps owing the diversity in the country. Hence, the policymakers need robust information and identification of marginalized populations which needs to be targeted by eliminating the child marriage practice by 2030 and achieving the global agenda of Sustainable Development Goals. Accordingly, using data from the fifth round of the National Family Health Survey (NFHS) conducted during 2019-21 in India, this paper aims to deconstruct the gap in child marriage persist across the socioeconomic group.

Preliminary findings suggest that, in the past decade, India experienced about 20-percentage point decline in the proportion of women married before the age 18 years. A huge variation, however, exists across the geography of the country – the decline is very minimal in West Bengal and most in Chhattisgarh. Importantly, there are several sub-groups within India and the states where the child marriage is still very high. Historically, we have known that increasing the level of education among girls is the most important factor in reducing child marriage. However, the evidence of this study, generated through the CART analysis suggests not all highly educated girls are equally associated with reduction in child marriage. For instance, even among educated girls who belong to poor households and from SC or ST caste group have very high prevalence of child marriage. The CART analysis further showed that though the overall child marriage rate is 42% in West Bengal and 12% in Chhattisgarh, there are some sub-populations, where child marriage exceeds 60% in West Bengal, and 34% in Chhattisgarh, (nearly four times than the current overall rate almost same with the average level of West Bengal).

The compelling findings, based on the CART analysis suggest that there is a need to adopt intersectionality approach to identifying the most marginalized group of girls who still experienced high level of child marriage, in era when the country is enjoying reduction. Such an approach will help in identifying those ‘who are left behind’ and where program needs to focus. And timely action

to these groups will turn into achieving the related global agenda of the Sustainable Development Goals by 2023, with central theme is “No one left behind”.

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