

## Article

# Regional Inequalities in Age at First Marriage: Evidence from Rural and Urban Howrah, India

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**ABSTRACT:** The present study aimed to examine regional inequalities in age at first marriage among Bengali-speaking women in Howrah district, West Bengal. It hypothesized that women in urban areas were more likely to marry after 18 years compared to rural women. The analysis draws on cross-sectional data collected from 665 ever-married women, of whom 60.15% resided in urban areas and 39.85% in rural areas. Bivariate analysis, independent sample *t*-tests, and binary logistic regression were employed, complemented by qualitative in-depth interviews from each region. The mean age at marriage was 22.25 years ( $\pm 4.4$ ), with a pronounced rural–urban regional difference: rural women married significantly earlier (19.83 years) than urban women (23.85 years) ( $t = 12.80$ ;  $p < 0.001$ ). Nearly 48.30% of rural women were married at or below 18 years, compared to only 7.25% of urban women ( $p < 0.001$ ). Logistic regression results reveal strong and persistent regional disparities. In the unadjusted Model I, urban women had significantly higher odds of marrying after 18 years than rural women (OR = 11.95;  $p < 0.001$ ). After adjusting for socio-demographic, familial, and economic factors in Model II, the association remained robust (OR = 9.67;  $p < 0.001$ ). Generational patterns were non linear: women from Generation II were more likely to marry after 18 years (OR = 1.09;  $p < 0.01$ ), while those from Generation III had significantly lower odds (OR = 0.39;  $p < 0.01$ ). Higher education of respondents (OR = 1.66;  $p < 0.01$ ), respondents' fathers (OR = 3.12;  $p < 0.01$ ), and mothers (OR = 3.58;  $p < 0.01$ ) substantially increased the likelihood of delayed marriage. Respondents (OR = 1.51;  $p < 0.05$ ) and respondents' fathers (OR = 1.92;  $p < 0.05$ ) with white-collar jobs significantly increase the likelihood of being delayed in marriage. Respondents belonging to the upper wealth quintile (OR = 1.92;  $p < 0.05$ ) were more likely to marry at later ages. Respondents with  $\geq 3$  siblings (OR = 0.65;  $p < 0.05$ ) and those whose husbands had 1–2 siblings (OR = 0.37;  $p < 0.01$ ) and  $\geq 3$  siblings (OR = 0.39;  $p < 0.01$ ) were significantly less likely to marry after 18 years compared to the reference category. The qualitative findings reveal the intersection of socio-cultural and kinship obligation in marital timing. The finding underscores that delaying marriage requires interventions beyond legal enforcement and schooling alone, highlighting the need for rural-specific, intergenerational, and economically grounded policy strategies.

**Keywords:** Age at marriage; Regional difference; Generation cohort; Development; Ethnography; Howrah; India



## 1. Introduction

Age at marriage is a key demographic indicator reflecting broader social, economic, and cultural transitions within societies. It strongly influences fertility patterns, reproductive health outcomes, women's educational attainment, and life-course trajectories. At the global level, demographic research consistently documents pronounced rural–urban differentials in age at marriage, with urban populations marrying later than rural populations [1–5]. These disparities are largely driven by unequal access to education, employment opportunities, and exposure to modern values, and differences in kinship obligations [4–7]. In many developing regions, early marriage remains more prevalent in rural settings due to entrenched traditional norms, economic vulnerability, and limited opportunities for women [4–7].

In the Indian context, age at marriage has increased steadily over recent decades; however, substantial rural–urban differences persist. National-level evidence from the Sample Registration System and large-scale surveys indicates that women in rural areas continue to marry at younger ages than their urban counterparts [8,9]. Despite legal safeguards such as the Prohibition of Child Marriage Act [10], early marriage remains disproportionately concentrated in rural India, reflecting persistent gender norms, socio-economic inequality, and weaker institutional oversight [11].

Within India, West Bengal exhibits a distinctive pattern of nuptial behavior. State-level data reveal that the mean age at marriage for women in West Bengal remains below the national average, with marked variation across rural and urban areas [12,13]. Rural regions of the state continue to experience earlier marriage compared to urban centers, influenced by differences in educational attainment, livelihood structures, poverty levels, and cultural expectations surrounding marriage and family formation [14]. Although urbanization and educational expansion have contributed to delayed marriage in metropolitan areas, these changes have diffused unevenly across rural parts of the state.

At the district level, empirical evidence on age at marriage remains limited. Howrah district, located adjacent to the Kolkata metropolitan region (formerly the British capital and now the capital of West Bengal) and characterized by a combination of industrial urban zones and agrarian rural areas, presents a relevant setting for examining rural–urban disparities in marital timing. Census-based evidence suggests that early marriage remains more prevalent in rural parts of Howrah than in its urban areas, despite the district's proximity to a major urban center [15]. Small-scale studies from West Bengal further indicate that socio-economic factors such as education, occupation, and household economic conditions play a crucial role in shaping district-level marriage patterns [16]. However, systematic investigation of rural–urban differences in age at marriage within Howrah district remains scarce. Existing research on age at marriage in India has largely relied on national and state-level data, often assuming relatively uniform and linear transitions associated with modernization. However, such approaches tend to obscure micro-level heterogeneity, particularly in districts that are simultaneously proximate to urban centers yet internally stratified. As a result, the persistence of early marriage, non-linear cohort patterns, and the role of intergenerational dynamics remain insufficiently understood in such contexts. This study addresses this gap by examining a metropolitan-adjacent district, Howrah, to explore how well-established determinants operate under conditions of spatial proximity and socio-economic inequality. Specifically, the study contributes in three ways: (i) it demonstrates the persistence of strong rural–urban disparities despite urban proximity, challenging diffusion-based assumptions in the twenty-first century; (ii) it identifies a non-linear generational pattern in marriage timing; and (iii) it highlights the role of intergenerational mechanisms, particularly parental education, in shaping marital outcomes. This district-level analysis further helps to identify local heterogeneity that is often less visible in broader state- or national-level studies.

This study adopts a biosocial framework in which age at first marriage is understood as the outcome of interacting structural, cultural, and intergenerational processes. Contemporary demographic research increasingly recognizes that marital timing is not determined by a single factor but is shaped by the

combined influence of education, economic conditions, gender norms, and family systems operating within specific socio-spatial contexts [5,6,17,18]. Within this framework, structural factors such as place of residence, education, and occupation shape access to resources and opportunities, thereby influencing the timing of marriage. Cultural norms and kinship systems regulate socially acceptable marital ages and reinforce expectations surrounding female marriageability, particularly in rural contexts. At the household level, economic constraints and family composition mediate these effects by shaping marriage as a strategy of resource allocation. Intergenerational factors, especially parental education, influence aspirations and decision-making environments, thereby affecting daughters' marital timing. Thus, age at marriage emerges from the interaction of these biosocial dimensions, reflecting structural conditions and socially embedded processes rather than the influence of any single determinant. Against this background, the present study aims to examine age at marriage in Howrah district, with a specific focus on rural–urban differentials. It is hypothesized that women residing in urban areas are more likely to marry after 18 years compared to rural women. By situating the district-level analysis within global, national, and state contexts, the study seeks to contribute to a deeper understanding of how spatial and socio-cultural surroundings, along with socio-economic factors, shape marital timing in West Bengal.

## 2. Materials and Methods

### 2.1. Study Setting

The present study was designed as a cross-sectional ethnographic study conducted in the Howrah district of West Bengal, India, with a specific focus on examining rural–urban differentials in age at first marriage. Howrah district was selected from the 23 districts of West Bengal due to its distinctive combination of industrial urban zones and agrarian rural areas located adjacent to a metropolitan region. Within the district, two contrasting residential contexts were included: selected wards of Howrah Municipal Corporation (urban) and selected areas of Uluberia subdivision (rural).

### 2.2. Study Population and Sampling

The study population comprised ever-married women across age groups from the Bengali-speaking population who had resided in the region for at least 3 generations. A household-based sampling strategy was adopted within the selected rural and urban study areas, whereby only one eligible woman respondent was selected from each household to reduce intra-household clustering effects. A total of 695 women were approached during the survey, of whom 665 provided complete information and formed the final analytical sample. The sample size was considered adequate to capture rural–urban variations in age at first marriage and related marital behaviours. The household survey was conducted randomly from both rural and urban regions.

Male respondents were excluded because of the specific focus on women's marital timing. Women undergoing neuropsychological treatment at the time of the survey were also excluded to ensure data reliability.

### 2.3. Data Collection Procedures

Data were collected using a structured household schedule, which was pre-designed and pre-tested to ensure validity, clarity, and internal consistency. The schedules were administered through direct face-to-face interviews to minimize reporting errors. Fieldwork was conducted by trained ethnographers with an anthropological background, facilitating rapport-building and culturally sensitive data collection.

To complement the quantitative survey, qualitative methods were employed to gain deeper insight into perceptions and experiences related to age at marriage across generations and residential contexts. These included twelve in-depth interviews (IDIs)—two from each generational cohort belonging to urban and rural areas—and a series of semi-structured interviews (SSIs) focusing on marital timing, marriage-related

behaviour, and perceived socio-economic change. This mixed-methods approach ensured both breadth and depth in understanding rural–urban differences in marital trajectories.

Data were collected between November 2022 and May 2024, using a pre-tested structured household schedule administered through face-to-face interviews by trained ethnographers. To complement the survey, qualitative data were also collected during the same period through twelve in-depth interviews (IDIs)—two from each generational cohort in rural and urban areas—and semi-structured interviews (SSIs) exploring perceptions of age at marriage.

#### 2.4. Data Management and Analysis

Quantitative data were first entered into Microsoft Excel and subsequently imported into STATA version 14 for statistical analysis. The software was used to estimate rural–urban differentials in age at first marriage using appropriate statistical techniques. Qualitative data from IDIs were transcribed verbatim and used to contextualize and interpret the quantitative findings. The integration of quantitative and qualitative evidence enabled a holistic understanding of marital timing, capturing both measurable patterns and underlying social and cultural dynamics.

#### 2.5. Variables

The primary outcome variable was age at first marriage. Age at marriage was classified into  $\leq 18$  years and  $> 18$  years because 18 years is the legal minimum age at marriage for women in India. Age at marriage was dichotomized into  $\leq 18$  and  $> 18$  years, consistent with the legal minimum age at marriage in India and common practice in demographic research on early marriage. This categorization helps identify factors associated with early marriage and improves policy relevance.

The study aimed to examine regional differences in age at marriage, with particular emphasis on variations between rural and urban areas. Accordingly, place of residence—classified as rural or urban—served as the principal explanatory variable in the analysis. The associated explanatory variables are Generational cohort, determined using the method proposed by Dublin and Spiegelman (1951) [19] and subsequently adopted by others [20–23]. Based on this, participants were classified into three cohorts: Generation I:  $\geq 56$  years; Generation II: 28–55 years; Generation III:  $\leq 27$  years. Educational attainment was categorized as primary (below Class 5), secondary (Classes 6–12), and higher education (above Class 12), and included for respondents, respondents' husbands, and respondents' parents (Father and Mother). The occupational status of respondents, their husbands, and parents was also considered. For respondents and their mothers, occupations were grouped into blue-collar, white-collar, and not employed categories. For husbands and fathers, occupations were classified as blue-collar or white-collar, where blue-collar refers to manual, non-skilled, or semi-skilled work and white-collar refers to professional or skilled occupations typically performed in office settings [24,25]. Family composition was assessed through the number of siblings, categorized by number of brothers and sisters as 0, 1–2, and 3 or more. Household-level variables included the type of family as nuclear or joint. Religion was categorized as Hindu or Muslim, and caste as General, OBC, SC, or ST. Household crowding index (HCI) was grouped into  $\leq 2.0$  and  $> 2.0$ . Spousal relatedness was grouped into two categories: either previously unknown (not related) or known (Related). Economic status was measured using per capita monthly household expenditure and classified into three quintiles as bottom, middle, and upper quintiles. Media exposure was classified as Yes or No. Respondents who reported exposure to any form of media, including newspapers, television, or smartphones/internet, were categorized as “Yes”, while those with no media exposure were categorized as “No”, following standard demographic survey classifications [9]. The selection of variables was guided by the biosocial framework outlined above, where structural, household, and intergenerational factors are expected to jointly influence age at marriage. Although information on the husband's education and

occupation was collected and found to be reliable, data on the husband's age were not consistently reported and were subject to potential recall bias. Therefore, variables related to spousal age and age gap were not included in the analysis.

## 2.6. Statistical Analysis

Frequency and percentage distribution was conducted to describe the background characteristics of the respondents. *t*-test was applied to examine whether differences in the age at marriage between rural and urban respondents were statistically significant. Bivariate chi-square tests were conducted to assess the association between age at marriage and other background characteristics of the respondents. Covariates included in the adjusted model were selected a priori based on theoretical relevance and prior literature concerning determinants of age at first marriage and related socio-demographic determinants. Prior to estimation, explanatory variables were examined for potential multicollinearity. Multicollinearity among independent variables was assessed using the Variance Inflation Factor (VIF). The VIF values for all predictors were below commonly accepted thresholds (VIF = 4.4), indicating no severe multicollinearity. Although some correlation is expected among variables such as education, occupation, and economic status, these were retained due to their distinct theoretical roles within the biosocial framework.

Binary logistic regression analysis was used to estimate the likelihood of age at marriage. For the analysis, age at marriage was categorized into two groups: 0 = 18 years and below ( $\leq 18$  years); and 1 = above 18 years of age ( $> 18$  years). Two models were constructed: Model I included the principal explanatory variable, place of residence (rural/urban), while Model II included place of residence along with all other explanatory variables (Table 1). Model I tests the baseline hypothesis regarding the effect of place of residence. Model II incorporates additional covariates to examine the influence of structural, household, and intergenerational factors, as derived from the conceptual framework.

To ensure model adequacy and avoid overfitting, the number of predictors included in the logistic regression models was evaluated in relation to the number of outcome events using the events-per-variable (EPV) criterion. The distribution of the outcome variable (marriage  $\leq 18$  years/ $> 18$  years) indicates that the number of events is sufficient relative to the number of covariates included in Model II, satisfying commonly recommended thresholds for logistic regression. Furthermore, model specification was guided by theoretical relevance derived from the conceptual framework and hypotheses, ensuring parsimony by excluding redundant or weakly justified variables.

**Table 1.** The models used in the analysis.

Models	Outcome Variables	Explanatory Variable
Model I		Main: Place of residence: Urban/Rural
	Age at marriage	Main: Place of residence: Urban/Rural
	$\leq 18$ years (0)	+
Model II	$> 18$ years (1)	Associated: Generation cohort; Education of Respondents, her husbands', her fathers', her mothers'; Occupation of Respondents, her husbands', her fathers', her mothers'; siblings (own and husbands); Family type, Religion; HCI; Caste; Spousal relatedness; Economic condition, Media exposure.

All statistical analyses were conducted using STATA software.

## 3. Results

### 3.1. Characteristics of the Studied Population

Table 2 presents the background characteristics of the studied population (N = 665). A larger proportion of respondents resided in urban areas (60.15%) compared to rural areas (39.85%). Most respondents belonged to the second generation cohort (28–55 years; 65.26%), followed by the first generation (56 years

and above; 19.10%) and the third generation (below 27 years; 15.64%). The mean age at marriage for women was 22.25 years ( $\pm 4.4$ ). A significant rural–urban difference was observed, with rural women marrying at a significantly younger age (mean = 19.83 years) than urban women (mean = 23.85 years) ( $t = 12.80$ ,  $p < 0.001$ ). Nearly half of the respondents had secondary education (46.92%), while 31.43% attained higher education. The majority of husbands had a primary education (69.77%). Parental education showed relatively lower levels, particularly among mothers, over half of whom had only primary education (54.89%). Occupationally, most respondents were not employed (63.76%), whereas a substantial majority of husbands were engaged in white-collar occupations (77.44%). The population was predominantly Hindu (91.28%), with Muslims constituting 8.72%. More than half of the respondents belonged to the General caste category (56.99%), followed by the Scheduled Castes (24.36%). The median number of siblings among respondents was three, while that of husbands was approximately three. The mean number of children per woman was 1.64. The median per capita monthly household expenditure was INR 4687 (USD 55.12), indicating modest economic conditions.

**Table 2.** Characteristics of the studied population.

<b>Background Characteristics</b>	<b>N = 665 (100.00)</b>	
% of respondent belonged to Rural region	265	(39.85)
% of respondent belonged to Urban region	400	(60.15)
% of respondent belonged to Gen-I (56 & Above)	127	(19.10)
% of respondent belonged to Gen-II (between 28–55)	434	(65.26)
% of respondent belonged to Gen-III (Below 27)	104	(15.64)
Mean age at marriage for women	22.25 $\pm$ 4.4	
Mean age at marriage among rural respondents	19.83 $\pm$ 4.5	$t = 12.80$ , $p < 0.001$
Mean age at marriage among urban respondents	23.85 $\pm$ 3.6	
Educational attainment of the respondent		
Primary	144	(21.65)
Secondary	312	(46.92)
Higher	209	(31.43)
Educational attainment of the respondents' husband		
Primary	464	(69.77)
Secondary	81	(12.18)
Higher	120	(18.05)
Respondents' father's education		
Primary	302	(45.41)
Secondary	125	(18.80)
Higher	238	(35.79)
Respondents' mother's education		
Primary	365	(54.89)
Secondary	135	(20.30)
Higher	165	(24.81)
Occupational attainment of the respondent		
Blue Collar	145	(21.81)
White Collar	96	(14.44)
Not Employed	424	(63.76)
Occupational attainment of the respondents' husband		
Blue Collar	150	(22.56)
White Collar	515	(77.44)
Respondents' father's Occupation		
Blue Collar	155	(23.31)
White collar	510	(76.69)

Respondents' mother's Occupation	
Blue Collar	133 (20.00)
White collar	100 (15.04)
Not Employed	432 (64.96)
Religion belief	
% of respondents believer of Hinduism	607 (91.28)
% of respondents believer of Muslim	58 (8.72)
Caste	
% of respondents belonged to General	379 (56.99)
% of respondents belonged to OBC	77 (11.58)
% of respondents belonged to SC	162 (24.36)
% of respondents belonged to ST	47 (7.07)
Median number of siblings of respondents	3.0
Median number of siblings of the husbands	2.9
Mean number of children per women (respondent)	1.64
Percapita monthly household expenditure (median)	INR4687 (USD 55.12)

Figures in parenthesis indicate percentage.

### 3.2. Distribution of Age at Marriage by Background Characteristics

Table 3 presents the bivariate distribution of age at marriage ( $\leq 18$  years and  $> 18$  years) across selected background characteristics of the respondents, along with the results of chi-square tests indicating statistical significance. Nearly half of rural women (48.30%) were married at or below 18 years, compared to only 7.25% of urban women, indicating a substantial rural disadvantage ( $p < 0.001$ ). Early marriage was most prevalent among women belonging to Generation III (below 27 years; 46.15%), followed by Generation I (56 years and above; 22.83%) and Generation II (28–55 years; 18.43%) ( $p < 0.001$ ). Early marriage was highest among women with primary education (42.36%), followed by those with secondary education (24.04%), and was least common among women with higher education (10.05%) ( $p < 0.001$ ). Women married to husbands with higher education showed a markedly different pattern than those married to husbands with primary or secondary education ( $p < 0.001$ ). Both fathers' education ( $p < 0.001$ ) and mothers' education ( $p < 0.001$ ) were significantly related to early marriage, with higher levels of parental education associated with lower proportions of marriage at or below 18 years. The association between respondents' occupation and age at marriage was statistically significant ( $p < 0.001$ ). Women engaged in blue- and white-collar occupations had higher proportions of early marriage than those who were not employed. In contrast, husbands' occupation did not show a statistically significant association with age at marriage ( $p = 0.456$ ). Both fathers' occupation ( $p < 0.001$ ) and mothers' occupation ( $p < 0.001$ ) were significantly associated with age at marriage, with early marriage more common among women whose parents were engaged in blue-collar work or where mothers were not employed. Family structure variables also played an important role. Number of siblings ( $p = 0.005$ ) and number of siblings of husbands ( $p < 0.001$ ) were significantly associated with age at marriage, with early marriage being more prevalent among respondents from larger families. Family type showed a significant association ( $p = 0.002$ ), with early marriage being more common in nuclear families than joint families. With respect to socio-cultural factors, caste was significantly associated with age at marriage ( $p < 0.001$ ). Early marriage was most prevalent among Scheduled Caste women, followed by OBCs, while women from the General and ST categories exhibited lower proportions. Religion, however, did not show a statistically significant association ( $p = 0.165$ ). Economic indicators also demonstrated significant relationships. Household economic condition was significantly associated with age at marriage ( $p < 0.001$ ), with early marriage more common among women from lower economic strata. Household crowding index (HCI) showed a significant association ( $p = 0.008$ ), indicating a higher prevalence of early marriage in more crowded households. Exposure-related variables revealed mixed

results. Media exposure was significantly associated with age at marriage ( $p < 0.001$ ), with women lacking media exposure experiencing substantially higher levels of early marriage. In contrast, spousal relatedness did not exhibit a statistically significant association ( $p = 0.165$ ).

**Table 3.** Distribution of age at marriage by background characteristics of the respondents.

Background Characteristics	Age at Marriage		Total	<i>p</i>
	≤18 Years	>18 Years		
Place of residence				
Rural	128 (48.30)	137 (51.70)	265 (100.00)	$p = 0.000$
Urban	29 (7.25)	371 (92.75)	400 (100.00)	
Generation cohort				
Gen-I (56 & Above)	29 (22.83)	98 (77.17)	127 (100.00)	$p = 0.000$
Gen-II (28–55)	80 (18.43)	354 (81.57)	434 (100.00)	
Gen-III (Below 27)	48 (46.15)	56 (53.85)	104 (100.00)	
Respondents' Education				
Primary	61 (42.36)	83 (57.64)	144 (100.00)	$p = 0.000$
Secondary	75 (24.04)	237 (75.96)	312 (100.00)	
Higher	21 (10.05)	188 (89.95)	209 (100.00)	
Husbands' education				
Primary	84 (18.10)	380 (81.90)	464 (100.00)	$p = 0.000$
Secondary	4 (4.94)	77 (95.06)	81 (100.00)	
Higher	69 (57.50)	51 (42.50)	120 (100.00)	
Respondents' father's education				
Primary	178 (58.94)	124 (41.06)	302 (100.00)	$p = 0.000$
Secondary	68 (54.40)	57 (45.60)	125(100.00)	
Higher	104 (43.70)	134 (56.30)	238 (100.00)	
Respondents' mother's education				
Primary	204 (55.89)	161 (44.11)	365 (100.00)	$p = 0.000$
Secondary	78 (57.78)	57 (42.22)	135 (100.00)	
Higher	62 (37.58)	103 (62.42)	165 (100.00)	
Respondents Occupation				
Blue Collar	82 (56.55)	63 (43.45)	145 (100.00)	$p = 0.000$
White collar	51 (53.12)	45 (46.88)	96 (100.00)	
Not Employed	156 (36.79)	268 (63.21)	424 (100.00)	
Husbands' occupation				
Blue Collar	32 (21.33)	118 (78.67)	150 (100.00)	$p = 0.456$
White collar	125 (24.27)	390 (75.73)	515 (100.00)	
Respondents' father's Occupation				
Blue Collar	32 (20.65)	123 (79.36)	155 (100.00)	$p = 0.000$
White collar	125 (24.50)	385 (75.49)	510 (100.00)	
Respondents' mother's Occupation				
Blue Collar	44 (33.08)	89 (66.92)	133 (100.00)	$p = 0.000$
White collar	9 (9.00)	91 (91.00)	100 (100.00)	
Not Employed	104 (24.07)	328 (75.93)	432 (100.00)	
Number of sibling				
0	18 (15.79)	96 (84.21)	114 (100.00)	$p = 0.005$
1–2	67 (21.34)	247 (78.66)	314 (100.00)	
≥3	72 (30.38)	165 (69.62)	237 (100.00)	
Number of sibling of husbands				
0	14 (10.22)	123 (89.78)	137 (100.00)	$p = 0.000$
1–2	68 (22.37)	236 (77.63)	304 (100.00)	

≥3	75 (33.48)	149 (66.52)	224 (100.00)	
Family type				
Joint	33 (16.10)	172 (83.90)	205 (100.00)	$p = 0.002$
Nuclear	124 (26.96)	336 (73.04)	460 (100.00)	
Religion				
Hindu	133 (21.91)	474 (78.09)	607 (100.00)	$p = 0.165$
Muslim	24 (41.38)	34 (58.62)	58 (100.00)	
HCI				
≤2.0	85 (20.29)	334 (79.71)	419 (100.00)	$p = 0.008$
>2.0	72 (29.27)	174 (70.73)	246 (100.00)	
Spousal relatedness				
Non relative	118 (22.43)	408 (77.57)	526 (100.00)	$p = 0.165$
Related	39 (28.06)	100 (71.94)	139 (100.00)	
Caste				
General	61 (16.09)	318 (83.91)	379 (100.00)	
OBC	21 (27.27)	56 (72.73)	77 (100.00)	$p = 0.000$
SC	67 (41.36)	95 (58.64)	162 (100.00)	
ST	8 (17.02)	39 (82.98)	47 (100.00)	
Economic condition				
Bottom	73 (32.44)	152 (67.56)	225 (100.00)	$p = 0.000$
Middle	64 (25.10)	191 (74.90)	255 (100.00)	
Upper	20 (10.81)	165 (89.19)	185 (100.00)	
Media exposure				
No	47 (46.53)	54 (53.47)	101 (100.00)	$p = 0.000$
Yes	106 (18.96)	453 (81.04)	559 (100.00)	

Figures in parenthesis indicates percentage.

### 3.3. Results of Binary Logistic Regression Analysis of Age at First Marriage

Table 4 presents the results of binary logistic regression analysis examining rural–urban regional differentials in age at first marriage among Bengali-speaking women in West Bengal, with marriage at age ≤18 years as the base outcome. Two models were estimated to understand the direct regional effect and the effects along with other explanatory indications.

In Model I, which included only place of residence, a strong and statistically significant association was observed. Women residing in urban areas were 11.95 times more likely to marry after 18 years than their rural counterparts. After adjusting for socio-demographic, familial, and economic characteristics in Model II, place of residence remained a highly significant predictor. Urban women continued to have substantially 9.67 times more likely to marry above 18 years than rural women, highlighting persistent rural–urban regional disparities in age at marriage. Results showed that, compared to women belonging to Generation I (56 years and above), those from Generation II (28–55 years) were significantly 1.09 times more likely to marry after 18 years. Women from Generation III (below 27 years) were significantly 0.39 times less likely to marry above 18 years, indicating clear generational changing trajectories towards age at marriage. Respondents with higher education are 1.66 times more likely to marry at age 18 or older than primary-educated respondents. Parental education emerged as a key determinant. Women whose fathers had higher education were 3.12 times more likely to marry after 18 years than those whose fathers had primary education. Similarly, mothers' education showed strong effects: secondary education was associated with a 3.58 times greater likelihood of marrying at age 18 or older compared to respondents whose mothers were primary educated. Respondents in white-collar occupations were 1.51 times more likely to marry after 18 years than those in blue-collar occupations. Respondents whose fathers were engaged in white-collar occupation 1.92 times more likely to marry above 18 years. Respondents with three or more siblings are significantly 0.65 times less likely to marry after 18

years of age compared to those with no siblings. Women whose husbands had one to two siblings (1–2) and three or more siblings ( $\geq 3$ ) were significantly 0.37 times and 0.39 times less likely to marry after 18 years compared to single siblings respectively.

Religion showed a significant association, where Muslim women were 0.47 times less likely to marry after 18 years compared to Hindu women. Respondents belonged to upper wealth quintiles showed 1.31 times more likelihood of marrying after 18 years of age compared to those living in bottom quintile.

**Table 4.** Rural-Urban differentials in the age at first marriage among the Bengali speaking population of West Bengal.

Background Characteristics	Category	Model I (Crude Model)		Model II (Adjusted Model)	
		Odds Ratio (OR)	95% CI	Odds Ratio (OR)	95% CI
Place of residence	Rural (Ref.)	1.00	–	1.00	–
	Urban	11.95 ***	7.61–18.73	9.67 ***	5.35–17.49
Generation length	Generation I (Ref.)			1.00	–
	Generation II (28–55)			1.09 **	1.03–2.03
	Generation III (Below 27)			0.39 **	0.18–0.87
Respondents' Education	Primary (Ref.)			1.00	–
	Secondary			1.02	0.80–1.30
	Higher			1.66 **	1.20–2.10
Husbands Education	Primary (Ref.)				
	Secondary			1.00	0.60–1.30
	Higher			1.20	0.80–1.60
Respondents Father's education	Primary (Ref.)			1.00	–
	Secondary			1.58	0.74–3.33
	Higher			3.12 **	1.22–7.95
Respondents Mother's education	Primary (Ref.)			1.00	–
	Secondary			3.58 **	1.10–11.68
	Higher			0.40 ***	0.22–0.72
Respondents Occupation	Blue Collar (Ref.)				
	White Collar			1.51 *	1.30–2.30
	Not Employed			1.12	0.80–1.70
Husbands' occupation	Blue Collar (Ref.)				
	White Collar			0.95	0.9–1.4
	Blue collar (Ref.)			1.00	–
Respondents Father's occupation	White collar			1.92 *	1.32–2.66
	Not employed			1.75	0.94–3.27
	Blue collar (Ref.)			1.00	–
Respondents' Mother's occupation	White collar			0.64	0.34–1.22
	1 (Ref.)			1.00	–
Number of siblings	1–2			1.11	0.50–2.48
	$\geq 3$			0.65 *	1.28–1.51
	1 (Ref.)			1.00	–
Number of siblings of the husband	1–2			0.37 **	0.17–0.81
	$\geq 3$			0.39 **	0.17–0.91
	Joint (Ref.)			1.00	–
Family type	Nuclear			0.89	0.51–1.57
	$\leq 2.0$			1.00	–
HCI	$> 2.0$			1.22	0.65–1.78
	Non related			1.00	–
Spousal relatedness	Related			1.32	0.60–1.89
	General (Ref.)			1.00	–
Caste	OBC			0.66	0.28–1.53

	SC	0.77	0.43–1.36
	ST	0.90	0.33–2.47
Religion	Hindu (Ref.)	1.00	–
	Muslim	0.47 *	0.19–0.97
Household expenditure quintile	Bottom (Ref.)	1.00	–
	Middle	0.75	0.43–1.30
	Upper	1.92 *	1.31–3.01
Media exposure	No (Ref.)	1.00	–
	Yes	1.44	0.67–3.09
Pseudo $R^2$		0.37	

Notes: Model I includes only the place of residence (crude model). Model II includes place of residence together with socio-demographic, familial, and economic covariates (adjusted model). OR = Odds Ratio; CI = Confidence Interval, \*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ . Base outcome = age at marriage  $\leq 18$  years.

### 3.4. Ethnographic Voices: Rural and Urban Perspectives on Age at Marriage

To contextualise the quantitative patterns observed in this study, ethnographic interviews were conducted with women from different generations across rural and urban settings. These narratives provide insight into how age at marriage was shaped by family expectations, economic considerations, and perceived life-course options, and how these factors vary by place of residence.

#### 3.4.1. Voices from Rural Participants

Among rural participants, marriage was consistently described as a normative and expected transition closely tied to family responsibility, economic security, and social reputation. A woman from a rural region, aged 62 years, reflected on early marriage as a taken-for-granted life event:

*“In our time, no one asked about age. Once a girl grew up and people started talking, marriage was fixed. Education was not important. What mattered was settling the girl properly.”*

A rural woman expressed awareness of education and legal norms but described persistent structural and familial pressures. A respondent of rural, aged 24 years, noted:

*“I studied till Class 10, but after that my parents said there is no value of studying further. Marriage will give security. If I stay unmarried, other kins and people will talk negative.”*

Marriage is framed as a form of protection—both social and economic—especially in the absence of stable employment opportunities. Even when education is valued symbolically, it does not always translate into delayed marriage if pathways to employment remain uncertain. A rural respondent of 45 years age remarked:

*“One senior woman in our area had completed graduation, but as her age increased and she did not have a stable job, marriage became difficult for her. People speak about her sarcastically, and parents often cite her as an example to justify early marriage for their daughters.”*

Economic considerations were repeatedly invoked. A rural woman of 35 years of age explained:

*“I have many siblings, and my father could not support all of us. Marriage was seen as the only way to reduce the economic burden. That is how such decisions were made.”*

Such accounts illustrate how larger family size and limited household resources shape marriage timing as a household-level strategy rather than an individual choice, reinforcing findings from the quantitative analysis.

#### 3.4.2. Voices from Urban Participants

Respondents from urban regions were more likely to describe marriage as negotiable and contingent upon education, employment, and personal readiness. Although family involvement remained important, women reported greater scope for delaying marriage. An urban respondent aged 41 years stated:

*“My parents wanted me to complete my studies first. Marriage talks started only after I got a job. Until then, there was no pressure regarding marriage.”*

This reflects how education and employment function as socially legitimate reasons for postponing marriage in urban contexts, reshaping norms around appropriate marital timing.

Younger urban women articulated marriage as one option among several life-course possibilities. A younger urban respondent aged 23 years remarked:

*“Now-a-days, marriage is not the thing which comes first in mind. Education first, then job. Marriage can wait. Parents also understand this.”*

Such narratives suggest that urban settings provide greater exposure to alternative role models and life trajectories, reinforced through education, media, and peer networks.

However, urban women also acknowledged that autonomy has limits. A respondent of older cohort in urban region, aged 57 years, shared:

*“Even now, girls cannot delay marriage too much. Education helps, but finally marriage has to happen, though a few years later.”*

This indicates that while urban residence facilitates delayed marriage, it does not eliminate normative expectations surrounding women's marital roles.

#### **4. Discussion**

The findings of the study indicate that women residing in urban areas are significantly more likely to marry after the age of 18 years, consistent with the hypothesis of the study. This supports the expectation that in urban contexts, characterized by greater access to education, employment opportunities, and exposure to diverse social norms, contribute to delayed marriage. Rural–urban inequality in age at marriage reflects more than simple spatial differences; it is rooted in unequal access to education, employment opportunities, and exposure to modern social norms. Households in urban settings, particularly those proximate to Kolkata, are better positioned to delay daughters' marriages due to stronger investments in education, job opportunities, and the relative economic feasibility of postponement. In contrast, rural regions were not well equipped with educational institutions and open job opportunities for females. The rural families mostly continue to rely on early marriage as a practical strategy to reduce household burden and pre-empt escalating dowry demands [26,27]. The strong negative social stigma of later marriage in rural areas and strong kinship obligations force rural parents for early marriage for their daughters. These differences are reinforced by structural conditions: urban areas provide greater access to education and female employment, whereas limited infrastructure and constrained labour market opportunities in rural areas restrict such options. Ethnographic narratives consistently reflect these contrasting parental perceptions and decision-making environments. The present study emphasizes anthropological demographic understanding that recognizes marriage as a demographic event shaped by the interaction of social structure, cultural norms, household economy, and intergenerational processes. Within this framework, marital timing is not determined by a single factor but emerges from the combined influence of educational attainment, household economic conditions, kinship norms, and residential context. While age at marriage in India has increased over time, the present findings demonstrate that this transition is neither spatially uniform nor generationally linear, even within a district located adjacent to a major metropolitan region. Instead, marital timing continues to reflect entrenched rural–urban inequalities, family-level constraints, and differential access to educational and socio-economic resources [1,5,6,11]. Generational patterns further complicate this picture, revealing a non-linear trajectory rather than a straightforward shift toward later marriage. The second generation records the highest mean age at marriage, indicating the positive influence of expanding education and occupational mobility. However, the third generation shows a decline despite higher literacy levels, highlighting the limits of a linear modernization

perspective. This reversal appears to be shaped by growing parental anxieties surrounding employment insecurity, concerns over premarital relationships, and enduring kinship pressures, which frequently override aspirations for prolonged education. In the Indian context, marriage decisions remain embedded within family authority structures, where parents and grandparents play a decisive role [26–28], and where daughters' marital timing is closely linked to notions of family honour. Ethnographic evidence further illustrates this shift across generations. For the second generation, increased access to education, expanding work opportunities, and perceptions of improved safety encouraged parents to support daughters' higher education, often in urban centres. In more recent periods, however, these aspirations are increasingly mediated by uncertainty and social anxieties. In some cases, this leads to earlier marriage, with continued education becoming contingent upon the approval of the marital household.

From a biosocial perspective, this reflects not merely regional habitation but differential exposure to institutions, labour markets, and normative environments that shape life-course transitions [2,3]. Urban settings typically offer prolonged educational trajectories, delayed entry into reproduction, and greater autonomy in marital decision-making, while rural contexts remain more tightly governed by kinship obligations, economic precarity, and normative expectations surrounding female marriageability [7,11,29]. The persistence of early marriage in rural Howrah—despite its proximity to Kolkata—suggests that spatial diffusion of modern marriage norms is selective and mediated by structural inequalities rather than simple geographic closeness. Similar patterns have been reported in other parts of India, where rural pockets adjacent to urban centres continue to exhibit traditional nuptial behaviour [13–16]. The present study shows a changing generational perspective, revealing a non-linear pattern of marital change. While women from the middle generation show evidence of delayed marriage relative to older cohorts, younger women do not uniformly display further postponement. This finding challenges classical demographic transition assumptions that younger cohorts will necessarily marry later as education expands and fertility declines.

From a biosocial standpoint, this apparent stagnation—or partial reversal—may reflect competing pressures acting on younger women. On the one hand, educational expansion and media exposure promote later marriage; on the other, economic uncertainty, limited employment absorption, and continued gendered expectations surrounding marriageability may encourage earlier marital transitions [6,30,31]. In rural and peri-urban contexts, marriage may continue to function as a socially sanctioned pathway to adulthood and security, particularly when alternative life-course options remain constrained. Such generational unevenness has been documented elsewhere in South Asia and underscores the importance of situating cohort analysis within local socio-economic realities rather than assuming uniform progress [11]. Education remains one of the most important protective factors against early marriage, but its effects are best understood within an intergenerational framework. While women's own education is associated with delayed marriage, the strong influence of parental education observed in this study highlights the role of family background in shaping marital decisions. Educated parents are more likely to prioritise schooling, negotiate later marriages, and resist normative pressures for early unions, particularly in arranged-marriage settings [11–14,32]. Urban areas are better equipped with higher educational institutions that help women in urban areas become decision-makers and prepare them for job opportunities. The influence of mothers' education is especially noteworthy, as it reflects women's agency operating across generations. Educated mothers may possess greater bargaining power within households and act as advocates for delaying their daughters' marriage. This aligns with biosocial evidence that maternal status and knowledge significantly shape daughters' reproductive and marital trajectories [2]. The findings thus reinforce the argument that age at marriage is not solely an individual outcome but the product of accumulated family-level advantages or disadvantages.

Household economic conditions and family composition continue to exert strong influences on marital timing. Women from economically better-off households and those linked to white-collar occupational backgrounds tend to marry later, reflecting the role of material security in postponing marriage. Conversely,

larger sibship sizes—both of respondents and their spouses—are associated with earlier marriage, likely due to resource dilution and the strategic use of marriage to reduce household dependency burdens [6,7,33]. Marriage in such contexts functions as a household-level strategy rather than an individual choice [27,28]. Early marriage may reduce consumption pressure on natal households and facilitate the redistribution of economic responsibility across kin networks. These dynamics remain particularly salient in rural and lower-income settings, where social security mechanisms are weak, and kinship continues to play a central role in welfare provision. Rising dowry demands disproportionately pressure economically disadvantaged families to arrange their daughters' marriages at earlier ages [34,35].

Although caste and religion did not retain strong independent effects in the fully adjusted models, their associations in bivariate analyses indicate that social stratification continues to shape marriage timing indirectly through education, occupation, and economic status. The higher prevalence of early marriage among Scheduled Caste women reflects cumulative structural disadvantage rather than cultural preference alone [36]. Religious differences, while present, should be interpreted cautiously, as they often intersect with socio-economic position rather than operating as independent determinants [9]. Media exposure emerges as an important contextual factor, reflecting access to information rather than direct behavioural causation. Exposure to television, print, and digital media may broaden aspirations, increase awareness of legal norms, and challenge traditional expectations surrounding marriage and gender roles [37]. In a biosocial sense, media function as a pathway through which macro-level ideational change enters household-level decision-making.

## 5. Conclusions

The study highlights that age at first marriage in Howrah district was closely associated with rural–urban differentials. Even after accounting for education, household economic conditions, and other socio-demographic factors, rural residence remains significantly associated with a higher likelihood of marriage at or below 18 years. The findings also suggest that generational shifts in marriage timing are uneven: while some middle cohorts exhibit delayed marriage, younger cohorts do not consistently reflect a continued trend toward postponement. Education, particularly paternal and maternal education, was strongly associated with later age at marriage, pointing to the potential importance of intergenerational influences in shaping marital timing. At the same time, the results indicate that early marriage may be linked not only to prevailing social norms but also to household-level constraints and perceived life-course opportunities. The study's findings should be interpreted as indicative of patterns within the study context rather than as evidence of definitive causal relationships. The study underscores the importance of considering both socio-economic conditions and family contexts while examining variations in marital timing, and suggests that interventions may benefit from addressing broader structural constraints alongside social and cultural factors.

## 6. Limitations

The study is limited by its cross-sectional design, which restricts causal inference. Age at marriage is self-reported and may be subject to recall bias, particularly among older respondents. The analysis is confined to Bengali-speaking women in selected rural and urban areas of Howrah district, which may limit generalisability to other regions. Although the sample size was adequate for the main analysis, inclusion of multiple covariates in the adjusted model may have reduced the precision of some subgroup estimates, particularly for categories with smaller sample sizes. Therefore, selected adjusted associations should be interpreted with appropriate caution. Although binary classification facilitates policy interpretation, dichotomizing age at marriage may reduce variation and lead to a loss of information by simplifying a continuous variable. Future studies could employ continuous or ordinal specifications to capture more

nuanced variations in marital timing. Reliable data on husbands' age were not consistently available; hence, spousal age differences could not be examined, although their inclusion could have strengthened the analysis.

### **Statement of the Use of Generative AI and AI-Assisted Technologies in the Writing Process**

The authors used an AI-assisted language tool Grammarly, ChatGPT and Deepsearch solely for improving grammar, language clarity, and manuscript editing. All study design, data collection, statistical analysis, interpretation, and final content decisions were undertaken entirely by the authors.

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### **Author Contributions**

M.A.K. and S.P. conceptualized the study, collected data, did analysis. M.A.K. wrote and edited the manuscript. S.P. reviewed and edited the manuscript.

### **Ethics Statement**

This study did not involve any invasive experimental procedures. All research activities adhered to the guidelines outlined in the Declaration of Helsinki. Ethical review and approval were waived for this study, due to Non-invasive nature of the study. Prior consent were taken from all the respondents participated in the study.

### **Informed Consent Statement**

Informed consent was obtained from all subjects involved in the study.

### **Data Availability Statement**

The data used in this study were collected through ethnographic fieldwork.

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### **Declaration of Competing Interest**

The authors declare that they have no known financial or personal conflicts of interest that could have influenced the work presented in this paper.

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