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Knowledge Brief

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CHILD MARRIAGE AND FERTILITY IN NEPAL

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Child Marriage Series with Education Global Practice

KEY MESSAGES:

- In Nepal, women who marry as children have on average 15-26 percent more births over their life time as compared to women marrying after the age of 18.
- Controlling for socio-economic and other characteristics, the average number of births per woman would be reduced by 0.45 births or about eleven percent if child marriage could be eliminated. This in turn would have a substantial effect on demographic growth.

Girls marrying early tend to have children earlier than girls who marry later. They also have more children over their lifetime. Given the importance of population growth, assessing the impact of child marriage on fertility matters.

Child marriage is associated with higher fertility.

The relationship between child marriage and fertility could be due in part to the socio-economic and cultural context in which girls who marry early tend to live. But child marriage may also have a direct impact on fertility after controlling for socio-economic and cultural context. Marrying early is often associated with a lack of agency for girls, including in terms of access to family planning that could help delay or reduce births if women so desire. For societies, higher total fertility rates lead to higher population growth, lower growth in GDP per capita, slower poverty reduction, and difficulties for governments to provide basic services to a growing population. This brief estimates the impact of child marriage on the number of children that women have over their lifetime in Nepal, as part of a series of standardized briefs on this topic for multiple countries.

Box 1: Brief and Series Primer

How is child marriage defined? Child marriage is defined as a marriage or union taking place before the age of 18.

Why a series on child marriage? Child marriage has significant negative impacts – not only for girls, but also for a range of development outcomes. Demonstrating these impacts will assist governments and others to make the case for intervening to reduce the practice.

What are the topics discussed in the series? The series looks at the impacts of child marriage on health, population, education, employment, agency, and violence, among other outcomes. The welfare, budget, and non-monetary costs of child marriage are estimated. Legal/institutional aspects and options to reduce the practice are also discussed.

What is the question asked in this brief? The question is: To what extent would the number of live births that women have over their lifetime decrease if child marriage were eliminated?

How is the question answered? Econometric analysis of Demographic and Health Survey data is used to estimate the impact of child marriage on the number of births women have.

Statistically, women marrying as children have 1.04 more live births than women marrying after 18.

The analysis is based on data from the fourth Demographic and Health Survey for Nepal implemented in 2011. The focus is on the number of births that women have over their lifetime. For sample size reasons, we focus on women between 35 and 49 years of age. Some women continue to have children after age 35, so that the total number of births considered here may be slightly underestimated, but this should not affect too much the estimate of the difference in the total number of births for women marrying as children (before age 18) or not.

Women ages 35-49 who married after 18 have on average 3.39 live births by that age. For women who married before 18, the average is higher at 4.43 births.

As shown in table 1, women ages 35-49 who married after 18 have on average 3.39 births by that age. For women who married before 18, the average is 4.43 births. The difference (1.04 births) is statistically significant. Except for girls marrying very young, the number mostly increases when girls marry earlier, as expected.

Table 1: Mean Number of Children Ever Born by Age of First Marriage, 2011 DHS

	Age 35-49
Sample as a whole	3.95 (0.073)
Married after 18 years of age	3.39 (0.071)
Married before 18 years of age	4.43 (0.084)
Married at 17	4.04 (0.122)
Married at 16	4.32 (0.146)
Married at 15	4.45 (0.111)
Married at 14	4.78 (0.128)
Married at 13	4.69 (0.207)
Married at 12 /below	4.54 (0.153)

Source: Authors. Standard error in parentheses.

Controlling for other factors, child marriage still increases the number of live births substantially.

In order to measure the impact of child marriage at the margin on the number of births, regression analysis is needed. Details of the methodology is provided in the annex. Table 2 shows the results for the variables of interest with two models: a baseline specification and the specification with the largest number of added variables as controls. The interpretation of the coefficients is in terms of incident rate ratios. A coefficient of 1.15 for girls marrying at the age of 17 suggests that if a girl marries at that age, the number of children she will have over her lifetime will be 15 percent higher than the number of children she would have had if she had married at age 18 or later.

Controlling for socio-economic and other characteristics, women who marry as children have on average 15-26 percent more than women marrying after the age of 18.

With the baseline specification, table 2 suggests that marrying at age 17 increases the number of births by 14.8 percent in comparison to marrying at age 18 or later. Marrying earlier often has a larger impact. Overall, the impacts vary from 26.4 percent for girls marrying at age 14 to 14.8 percent for girls marrying at age 17. The marginal effects of early marriage do not change much when additional controls are added to the regressions. There is thus some evidence that after controlling for a wide range of other variables, child marriage may contribute to higher fertility, but prudence remains needed when interpreting these results given the risk of omitted variable bias (see box 2).

Table 2: Impact of Child Marriage on Number of Children Ever Born by Age of Marriage, 2011 DHS

Age at first marriage	Baseline model	Extended model
Married <= 12	1.204***	1.218***
Married at 13	1.249***	1.217***
Married at 14	1.264***	1.244***
Married at 15	1.199***	1.194***
Married at 16	1.204***	1.202***
Married at 17	1.148***	1.146***

Source: Authors.
Levels of statistical significance: *** 1%, ** 5%, * 10%.

Box 2: Risk of Omitted Variable Bias

Child marriage appears to be positively correlated with fertility after controlling for other factors that may also contribute to fertility. This could indicate a causal effect. However, other variables correlated with both child marriage and fertility not included in the analysis could be at the source of the correlation observed between child marriage and fertility. Because of the risk of omitted variable bias, the results cannot be considered as fully conclusive regarding a causal impact of child marriage on fertility, even though in this specific case causality is very likely.

Because early marriage also has an impact on other variables used as controls in the regression, the overall effect of child marriage on the number of births including through indirect effects could be larger than the direct estimates observed from the regression coefficients. For example, for some girls marrying early, child marriage has a negative effect on education attainment, and it may also contribute to lower household wealth. Still, in terms of magnitude, those indirect effects are likely to be small in comparison to direct effects. Only a relatively small share of girls marrying early would have been able to complete their secondary education if they had married later and the coefficient of secondary education on the number of births in the regression is close to one, suggesting limited impact of a secondary education on fertility in comparison

to a lower level of education. This implies that one may rely on the estimated direct effects of child marriage on the number of births that women have over their lifetime in order to simulate the impact of the elimination of child marriage on total fertility. Not factoring in indirect effects in the simulations does not entail large mismeasurement.

A number of other factors not shown in table 2 lead to differences in the number of births for women. As already mentioned, better educated women, especially those with a higher degree, tend to have fewer children. The impact of wealth on fertility is statistically significant in all quintiles: women in the highest wealth quintile (the richest 20% of households) have 34.1 percent fewer children than women in the poorest 20% of households. Younger women within the sample have fewer births, but may still get more later on in their life. Differences according to religion and ecological zone are not statistically significant, but differences according to development regions are. Most of the additional control are not associated with statistically significant effects on fertility, especially in the last model.

Eliminating child marriage would help reduce the number live births for women marrying early by 0.76.

The last step in the analysis consists in assessing the impact of eliminating child marriage on the total fertility rate. Results in table 3 are obtained by predicting the number of births that women who married as children would have had if they had married later. The first column in table 3 provides the estimates of the number of births in the sample. The second column provides the predicted values under the baseline model (results are similar with other models). The third column provide the simulated number of births without child marriage. Note that for all women who marry after the age of 18, there are no differences between the predicted and simulated number of births marriage since these women did not marry early.

For women who did marry early, the simulated number of births are substantially lower than the predicted values taking into account the fact that they married early. With the baseline model, women who married early have on average 0.76 more children than if they had married later. The difference between predicted and simulated numbers of children for women who married early or not with the expanded model is similar, at 0.74 fewer children.

The top row in table 3 provides the difference that child marriage makes for the average number of births nationally (this is similar to the total fertility rate), thereby factoring the share of women who marry early at different ages. With the baseline model, the average number of births that women have over their lifetime is reduced for the country as a whole by 0.45 births without child marriage. The effect is again very similar when considering the expanded model (not shown), with a reduction of 0.44 in the average number of births that women would have. Given the observed average number of children of about four births per woman in the country (first column in table 3), this suggests that the average number of births (essentially the total fertility rate) would be reduced by about eleven percent if child marriage could be eliminated. This in turn would have a substantial effect on demographic growth in the country.

Eliminating child marriage could reduce the country's total fertility rate by 0.45 births or about eleven percent. This would help reduce population growth substantially.

Table 3: Impact of the Elimination Child Marriage under the Baseline Model for the Estimations

Women 35+ (n=3,777)	Observed Mean	Predicted Mean	Simulated Mean
All	3.95	4.00	3.55
Age at first marriage			
30-34	1.33	2.93	2.93
25-29	2.24	3.28	3.28
20-24	3.15	3.24	3.24
18 and above	3.39	3.39	3.39
18	3.98	3.61	3.61
17	4.04	4.04	3.52
16	4.32	4.32	3.59
15	4.45	4.45	3.71
14	4.78	4.78	3.78
13	4.69	4.69	3.76
12 or below	4.54	4.54	3.77
Never married	0.01	-	-
17 and below	4.43	4.43	3.67

Source: Authors' estimations.

Conclusion

Child marriage is linked to higher and less controlled fertility for girls who marry early. In Nepal, under the baseline specification, girls marrying before the age of 18 have one fifth more births over their lifetime than women who marry after the age of 18. This translates on average for all girls who marry early in an increase in the number of children ever born of 0.76 children versus the number of children born for girls who marry at 18 or later. For the country as a whole, the average number of births (essentially the total fertility rate) would be reduced by about 0.45 births or about eleven percent if child marriage were to be eliminated.

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Annex: Methodological Note

Previous research has been conducted on child marriage and fertility (e.g., Santhya, 2011; Kamal, 2012; Godha et al., 2013; Nasrullah et al., 2013; Kamal et al. 2015). This brief has three features that differentiate it from previous work. First, the impact of each additional year of early marriage on the number of births a woman has over her lifetime is estimated. Previous studies typically looked only at the impact of marrying early or not. Here, we look at the impact of each single additional year of early marriage. Second, we estimate the impact of child marriage on a woman's number of child births over her lifetime. Previous studies focused mostly on young women (ages 18 to 24). The reason for considering older women is to account for potential substitution effects whereby if a woman does not have children early in life, she may want more children later on.

In order to look at the impact of child marriage on total fertility, we need to consider women towards the end of their fertile age. Third, we use the estimations from the regression analysis to conduct simulations about the magnitude of the reduction in the average number of children that women are expected to have that could be achieved through the elimination of child marriage.

A few additional explanations on definitions may be useful. In this brief, the focus is on the impact of child marriage on the number of children ever born to women towards the end of their fertile life. This is a useful statistic that summarizes the fertility behavior of women who are nearing the end of their reproductive period. If fertility is stable over time, the mean number of children ever born is similar to the total fertility rate (TFR) which refers to the average number of live births a woman would have if she were subject to current age-specific fertility rates throughout her reproductive years. In other words, under stable conditions, the number of children ever born is a good proxy for the TFR. If fertility levels have been falling, the TFR will however be (slightly) lower than the mean number of children ever born. For sample size reasons, we consider women ages 35 to 49 to estimate the number of children ever born, rather than women ages 40-49. This does not affect our results substantially given the focus on the differential impact of child marriage

As for the regression analysis, given that the variable of interest is a count variable (taking values such as 1, 2, 3…), Poisson regressions are estimated. Different models are estimated to test for the robustness of findings to the specification used. Apart from the age at first marriage or union, the baseline model controls for: (1) location (urban versus rural); (2) education level of the girl/woman; (3) wealth quintile (from the poorest to the richest); (4) religion; (5) ecological zone (6) development region; (7) ethnicity and (8) age group (35-39, 40-44, and 45-49). In other models variables capturing agency for girls/women in the household and additional community-level controls are added. The community variables are the leave-out-means of contraceptive use and whether women experienced a child death before the age of five (leave-out-means are estimated at the level of the primary sampling units in the survey). Overall, the estimated impacts of early marriage on the number of births for women over their lifetime are fairly robust to the choice of specification.

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The economic impacts of child marriage