For Better or for Worse? Fertility Challenges and Marital Dissolution

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Abstract

If the couples' preferences for children are not met, it can diminish the utility within the union and lead to its dissolution. Using data from 63 developing countries we find that a permanent change in potential family size due to infertility doubles the likelihood of marital dissolution. Additionally, death of the first-born is associated with a small increase in marital instability, while gender of the first-born has no effect. Interestingly, infertility and the death of the first-born are less destabilizing for unions in polygamous countries, consistent with the possibility of another wife providing partial insurance against negative fertility events.

Keywords: Divorce, Fertility, Marital Dissolution, Children, Infertility, Polygamy

JEL Codes: J12, J13

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"The obvious explanation for marriages between men and women lies in the desire to raise own children and the physical and emotional attraction between sexes. Nothing distinguishes married households more from singles households or from those with several members of the same sex than the presence, even indirectly, of children" (Becker, 1973)

1 Introduction

Marriage is a nearly ubiquitous socio-economic institution affecting consumption, savings, labor supply, health status and companionship. A key motive for marriage is the desire to have and raise children. Parents have strong preferences over their desired number of offspring and (to a lesser extent) their sex composition.[1] If the couples' preferences for children are not met, it can lead to distress and diminish the utility within the marriage and may ultimately result in the marriage ending. In this paper, we examine two related questions: whether the inability to achieve desired fertility goals affects the probability of the marital union dissolving, and the role of polygamy in altering the relationship between fertility challenges and marital dissolution.

The paper contributes to the nascent literature on divorce in developing countries. The majority of studies document predictors of divorce within a nation or country-level correlates of marital dissolution (see for instance Jennings (2016); Clark and Brauner-Otto (2015); Agadjanian and Hayford (2018); Alam et al. (2000)). The lack of studies on the factors that influence divorce in developing countries is a concern because divorce is increasingly common in the developing world. According to data from Demographic Health Surveys, 8% of women under the age of 35 report a marital dissolution. The odds of marital dissolution increase with urbanization and education suggesting that divorce rates will rise with continued development.[2] We address this gap by conducting an analysis of how fertility challenges impact marital

[1] In our sample of developing countries, over 99% of respondents state that they want at least one child and 59% desire more than three children. Additionally, 21% of respondents report wanting strictly more sons than daughters.

[2] For women with primary education or more 10% are divorced or not living together compared to 6.6% for women with less than primary education. Women in urban areas are twice as likely to have experi-

dissolution in a sample that covers 63 developing countries. Specifically, we provide an analysis of infertility and marital dissolution. We also show how the death of a child and the gender of the first-born impact divorce.

Studying the drivers of marital dissolution is important because divorce has a strong negative effect on the well-being of the family. Research on the consequences of family dissolution for children finds detrimental impacts on children's health, education, and long term outcomes (Gruber, 2004; Kim, 2011; Amato and Cheadle, 2005; Clark and Hamplová, 2013; Crespin-Boucaud and Hotte, 2021). Additionally, there is evidence of a negative relationship between growing up in a single parent household and suffering long term social and economic difficulties (Gruber, 2004; Kim, 2011; Amato and Cheadle, 2005). While divorce can be welfare enhancing for the party that initiates it, research suggests that, after divorce, women experience declines in subjective well-being (Leopold and Kalmijn, 2016) and household income (Holden and Smock, 1991; Ananat and Michaels, 2008), as well as sharp increases in the risk of poverty (Wineman, 2019).

Becker et al. (1977) present the canonical economic model of divorce. The key to understanding Becker's theory is the fact that a marriage creates a surplus. Thus, when a divorce occurs, something internal or external to the marriage must have changed that reduced the expected value of the marriage surplus relative to the expected utility stream obtained upon divorce. Furthermore, in order for marital stability to be impacted, this change must have been unanticipated by the couple, as anticipated changes should be factored into the initial decision to marry. These unanticipated events– discovering incompatible values, health shocks, improvements/reductions in earning potential, or changes in divorce laws or other policy parameters– serve to reduce the net present value of the marriage relative to what the couple could obtain on their own or if remarried. In this approach to marriage, such shocks have a destabilizing effect on the union.

Our study adds to the body of work estimating the effect of unanticipated shocks on marital stability.

enced a marital dissolution as their rural counterparts. These estimates are for the subsample sample of women with a single marital union. There is also significant heterogeneity in marital dissolution across regions with divorce being highest in Latin American and lowest in South Asia (See Table 2).

Using data from over 500,000 women, we first investigate the effect of infertility on marital dissolution. The infertility measure used in the paper is derived from self-reports from female respondents.[3] For couples that want additional children, the inability to conceive serves as an unanticipated biological event that reduces the benefits from marriage and may result in the marriage's failure.[4] This could be because realized fertility falls below his desired level and he desires to separate (and potentially remarry). Alternatively, if there are fewer children than anticipated she may be less reliant on him for financial support and could be better off single than continuing in a marginal marriage. Ethnographic case studies suggest that the inability to bear children is socially stigmatizing, causes depression and is harmful for marital stability but the relationship between infertility and marital stability has not been empirically studied in developing nations (Dyer et al., 2002; Dyer, 2007; Rouchou, 2013).

The addition of infertility to the literature on drivers of divorce is particularly important because infertility is a large and permanent shock and should correspondingly have a large effect on marital dissolution, especially in settings where a high premium is placed on children. Our results suggest that couples who are unable to have additional children experience a substantial increase in the likelihood of marital dissolution. Specifically, infertility increases the probability of marital dissolution by 7.9 percentage points - a 110% increase over the mean rate of marital dissolution. Since infertility may not be completely random, we adopt formal heuristics to check for the likelihood that our estimates are driven by differential selection into infertility, as discussed in Oster (2019), Altonji et al. (2005) and Diegert et al.

[3] Infertility is the inability to have additional children. It can be divided into infecundity or full infertility where a women has not given birth to a live child or subfecundity where a women already has children but she cannot have additional children. Unless otherwise stated, we use the term infertility to encompass both full infertility and subfecundity.

[4] Our estimates of infertility on marital dissolution are average treatment effects for the subset of women for whom we can measure infertility. This sample is skewed towards women who report wanting additional children. For some couples infertility will have no impact on the marriage (i.e. the couple has already reached their fertility goal). It is also possible that infertility could serve as an effective contraceptive and improve well-being for those couples with low desired fertility and limited access to contraceptives.

(2022). The results from these approaches show that selection on unobservables are unlikely to explain away our results.

We then examine the relationship between marital dissolution and two additional deviations from desired fertility that have been studied previously but in more limited settings: the death of the first-born child and the gender of the first-born child. We hypothesize that the impacts of these fertility challenges on marital dissolution should be smaller than the impacts of infertility because unlike infertility, most couples can smooth these fertility challenges by having additional children. For the 63 countries in our analysis, our results indicate that the death of the first child is associated with an increase in the likelihood of marital dissolution of 12%, while we find no effect of the gender of the first-born child on marital dissolution.

After establishing that deviations from desired fertility goals can have a negative effect on marital stability, we investigate if the presence of polygamy in a country acts as a buffer against the consequences of fertility challenges on the marriage. Polygamy is a widespread family institution in the developing world: practiced in 850 of the 1170 recorded societies (Bergstrom, 1994). In non-polygamous societies if he desires additional biological children, the only option is to separate from the current wife and enter in a new union. In polygamous relationships, other wives and/or the addition of a new wife can help reduce the impact of the fertility challenge on the marriage. As such, we expect a given fertility challenge to have less of an impact on marital dissolution in societies that practice polygamy as desired fertility goals can be met through other wives. In line with the above prediction, we find that polygamy plays a moderating role for marital stability in the event of a negative fertility challenge. Specifically, we find that an infertile woman in a country with no polygamy is more than twice as likely to experience marital disruption, than her counterpart in a country where half of the unions are polygamous in nature. Additionally, the negative effect of the death of the first-born child is also significantly reduced by the presence of polygamy.

We contribute to the literature on the impact of unanticipated events and marital dissolution in the developing world by studying two new unanticipated events (infertility and death of the first-born) and offer insights about the external validity of the impact of having a first-born daughter. Studies on the

impact of unanticipated events on marital dissolution which focus solely on developing countries are few in number and are limited in geographic scope.[5] Farzanegan and Gholipour (2016, 2018) find that increase in either housing cost or in dowry amounts destabilize marriages in Iran. In Mexico, Bobonis (2011) documents an increase in marital turnover among women who received unexpected cash transfers. Relatedly, Berniell et al. (2020) find that an unexpected increase in income stemming from a pension reform increased divorce for educated women in Argentina. Most directly related to our research question, Zhang (2017) finds that a greater exposure to the one-child policy, which limited the fertility of couples in China, increased the likelihood of divorce. Additionally, some evidence also suggests that low parity daughters increase the risk of divorce (Bose and South, 2003; Odimegwu et al., 2017).

We also contribute to the empirical literature on infertility and divorce which is currently limited to couples seeking infertility treatment in high-income nations. Three papers use Nordic IVF data to study the impact of children on marital stability and find mixed results. Using IVF treatment as an instrument for childbearing, Lundborg et al. (2016) find small short-term effects but no long-term effects of additional children on marital stability. While Kjaer et al. (2014) and Bögl et al. (2024) study women who seek fertility treatments in Denmark and Sweden respectively and find that not having a child increases the odds of the relationship ending. Relatedly, Cintina and Wu (2019) find that women in the United States with greater access to infertility treatments are less likely to divorce.

Additionally, we provide suggestive evidence that the presence of polygamy reduces the odds of marital dissolution for couples experiencing a fertility challenge. In doing so, this work contributes to the strand of literature that examines the consequences of polygamy which is limited in its current scope even though polygamy is a highly prevalent family institution around the world (Rossi, 2019).

[5] Results from developed countries suggest that shocks conveying information about individual characteristics, such as being laid off, are more likely to affect divorce rates than one-time external changes. For instance Charles and Stephens (2004) find job loss increases the divorce hazard, but disability does not. Singleton (2012) finds that work-preventing (and not work-limiting) disabilities are associated with a higher probability of divorce. Hankins and Hoekstra (2011) exploit random variation in lottery winnings and find that large cash transfers do not have an impact on divorce.

2 Data and Sample

We use individual-level data from the Demographic and Health Surveys (DHS), which are nationally representative surveys for a sample of women between the ages of 15 and 49 across a large number of developing countries. There are seven rounds of the DHS. The DHS provides information on the reproductive behavior of women, but the available information on infertility differs across rounds. Our analysis uses the third through the seventh rounds because these rounds allow us to construct a uniform measure of infertility for the largest possible sample of women. Additionally, the DHS contains marital history questions, which allows us to construct a consistent measure of marital dissolution across countries. Moreover, there is a rich set of information on the predictors of marital stability, such as age at first marriage, and spouse-related attributes, such as education level, which are important controls in our analysis. Finally, many surveys provide information on polygamy.

For a country-year to be included in the analysis, it needed to meet the following criteria. First, we excluded surveys in which only currently married women were interviewed. Second, we excluded surveys in which infertility status was not collected for key subgroups of respondents.[6] Furthermore, two surveys that had missing information on key control variables (age at first marriage and women's education) were also excluded from the analysis. The final sample consists of 151 DHS surveys from 63 countries. Details on the countries in our sample can be found in Appendix Table A.1.

In our main analysis we restrict the estimation sample to women for whom we can determine their infertility status. As such, we exclude women who state that they do not want additional children because the DHS does not allow these women to report infertility. Additionally, we limit the sample to women aged 15-35 years. 55% of women between the ages of 36 and 49 years state that they do not want additional children (and an additional 16% are sterilized) whereas only 26% of women aged 15-35 state that they do not want additional children, thus issues concerning selection into the sample are less prevalent for

[6] Specifically, we exclude surveys in which one of the following is true: information on infertility was not collected for anyone in the survey, divorced women were not interviewed about their infertility status, or information on infertility was only collected for women with children.

younger women. Additionally, by focusing on a younger sample we are more likely to capture infertility that was unanticipated as opposed to menopause which is more likely to be anticipated.[7] We also exclude observations with missing information on infertility or age at first marriage.

2.1 Infertility: Background and Measurement

Infertility is one of the most common chronic diseases among people of childbearing age. Depending on the criteria used to assess it, the worldwide prevalence of involuntary childlessness varies between 50 and 200 million couples, the majority being residents of low- and middle-income countries (Ombelet and Lopes, 2024). Bilateral tubal occlusion due to sexually transmitted diseases and pregnancy-related infections is the most common cause of infertility in developing countries (Ombelet et al., 2008).

Infertility is commonly divided into primary infertility (full infertility), which is the case when a woman has never been able to conceive, and secondary infertility (subfecundity), when the woman is unable to become pregnant after previously giving birth. It is well established that infertility increases with a woman's age (Dunson et al., 2004). However, the medical literature is not in agreement about what other factors, if any, influence infertility. Many studies show a correlation between lifestyle factors such as STDs, obesity, smoking, caffeine and alcohol consumption on infertility (Frank, 1983; Tsevat et al., 2017; Augood et al., 1998; Gesink Law et al., 2006). However, the majority of this evidence is suspect as the study designs employed in this literature have been shown to produce spurious associations (Juul et al., 2000). Review articles on the causes of infertility reach opposite conclusions. Buck et al. (1997) summarize the epidemiological literature and conclude that there is no clear evidence on the effect of lifestyle factors on secondary infertility. However, other reviews argue that obesity and smoking adversely affect reproductive performance with little evidence that alcohol consumption is harmful (Dondorp et al., 2010; Homan et al., 2007). Lastly, infertility has been found to be unrelated to education, race, occupation and father's social class (Joffe and Barnes, 2000; Wilcox and Mosher, 1993).

[7] Appendix Table A.2 presents results if we add women between the ages of 36 and 44 back into the sample. Including older women, more than doubles the prevalence of infertility. We find impacts of infertilty on marital dissolution that are attenuated but still large and statistically significant.

A key advantage of the DHS is a standardized measure of infertility can be constructed from two nested questions about desire for future children.[8] In all surveys, non sterilized women are asked if they desire future children. All women who want additional children as well as those who report that they are unsure about their desire for additional children are asked a follow-up question about the desired timing. Their response can fall into one and only one of the following categories: a) wants children within 2 years, b) wants children after 2+ years, c) wants children but is unsure of timing, d) undecided, and e) is declared infecund. Those who reported being infecund were coded as infertile. The remaining women, including those who report that they are sterilized, are coded as fertile.[9] Finally, we code as fertile women who report they are currently pregnant regardless of their response to the question on desire for future children.

A related measure of infertility has been used to study the impact of children on maternal labor supply in developing countries. These papers argue that conditional on age, self-reported infertility status is not associated with a large set of predetermined characteristics (Agüero and Marks, 2008, 2011). They also show that the presence of other household members does not affect the reporting of infertility status when using DHS data. Jensen (2012) further finds that infertility is not associated with women's education or household expenditure.

We conduct a similar exercise using our larger sample and our measure of infertility. We collected attributes of women that were available in a sufficient number of DHS surveys. In addition to health variables, we focused on attributes that could plausibly be determined prior to the onset of infertility.

[8] There is another question where women can self-report that they are infertile. Women who are not actively using contraceptives are asked why not, and they can state that they are unable to have children as a response. Unfortunately this question is only asked in the third round of the DHS and thus is missing for 120 out of 151 surveys. See Agüero and Marks (2011) for a more detailed discussion of these two different ways of measuring infertility in the third round of the DHS.

[9] Seven percent of the women in our sample report that they are sterilized. In order maximize sample size, we included these women and classify them as fertile since infertile women would not require sterilization. However, results are robust to excluding sterilized women from the sample (See Appendix Table A.3).

Table 1 reports coefficient estimates from a series of regressions that regress a characteristic of women on fertility status indicators along with flexible controls for her current age, age at first marriage, and country-year fixed effects. As shown in the first row of Table 1, infertile women have .58 fewer children than their fertile counterparts. This suggests that our measure of infertility captures difficulties in conceiving children. When we turn to our measures of socioeconomic status we see that infertile women are similar to their fertile counterparts in terms of quality of current dwelling, likelihood of owning land and current household wealth. However, fertile women have more years of schooling. We also collected data on background traits and preferences. Fertile and infertile women are similar in terms of their childhood place of residence, their religion and are also similar in their stated attitudes about when wife beating is justified. However, fertile women have more siblings and desire more children, and have a slightly stronger son preference. When we look at the health variables, consistent with the medical literature, infertile women are in slightly worse health. They are slightly shorter, more likely to be obese, are significantly less likely to have visited a health clinic, and are more likely to have smoked. However, there are no differences in sexually transmitted disease or the presence of genital ulcer in past 12 months.

Panel B of Table 1 limits the sample to women with at least one birth. Controlling for age, the interval since the last birth is 1.3 years longer for infertile women than their fertile counterparts. Additionally, the gap in birth spacing between the youngest and second youngest child is 0.8 years longer for subfecund women who have had at least two births. Both differences are statistically significant. The fact that self-reported infertile women have significantly longer intervals between births is consistent with the interpretation that struggles in conceiving lead women to self-identify as infertile.[10]

In terms of birth outcomes the age at first birth is slightly older for fertile women. However, the gender of the first born, the odds of death of the first born, and the likelihood of twinning are similar for fertile and infertile women. Additionally, there are no differences in the number of antenatal visits or the odds of pregnancy complications for the most recent birth. While we are reluctant to call infertility random,

[10] As additional evidence that struggles with conceiving are associated with self-reported infertility, the average marriage has lasted 4.7 years longer for women who are childless and report that they are infertile when compared to their fertile childless counterparts.

the differences in observable traits are small and we will assess how large the difference in unobserved characteristics would need to be to overturn our results in Section 4.

A limitation of our infertility measure is that we do not know the timing of the onset of infertility. It is possible that some subset of the couples in our sample know about the infertility prior to marriage; for these couples, infertility is not a shock to the marriage and should not impact the likelihood of marital dissolution. Inasmuch as this is the case, our estimates will be attenuated toward zero.[11]

Additionally, we cannot determine whether infertility is due to male factors, female factors, or unknown factors. In a limited number of DHS surveys, similar questions on fertility preferences were asked to the husband. However, most men's surveys combine the infertility responses as 'respondent or wife declared infecund'. For the few surveys that provide a distinction between the options of 'men declared infecund' and 'wife declared infecund', the data suggest that husbands disproportionately attribute infertility to the woman. For instance, in the men's survey for India, 11% of men chose the option of 'wife declared infecund', whereas only 0.15% of men chose 'respondent declared infecund'. However, as discussed above the union is destabilized regardless of which party is the source of the infertility shock.

Another limitation is that the process by which women come to learn that they are infertile is unknown. Given the limited medical care in our setting, it is unlikely that they receive a formal diagnosis of infertility (Ombelet et al., 2008). As such our results could be biased if the process of learning about infertility depends on the frequency of sexual activity and the frequency of sexual activity influences divorce.

2.2 Measure of Marital Status

The DHS asks each woman her *current* marital status and the number of marital unions she has been in (exactly one or more than one). We restrict our main analysis sample to those women who have been in exactly one marital union—with a marital union defined as married or living together. We do this for two reasons. First, we observe only the current marital status of the respondent and not their marital

[11] Consistent with this, if we limit our sample to women who were not sexually active prior to marriage and for whom infertility is expected to be more of a shock, we find larger effects of infertility on marital stability (See Appendix A.4).

histories. Since we do not know the timing of the onset of infertility, we could be matching the fertility shock to the wrong union in the case of multiple unions. Second, we are able to attach all the match quality variables to the correct union for the subsample with one marital union. For instance, the DHS only asks age when union began for the first union, while the husband's education is only available for the most recent partner. As a robustness check in Section 4.2, we will reproduce our analysis on the sample without the restriction of having been in only one marital union.

Each woman's current marital status is reported under the following mutually exclusive categories: a) never married, b) married, c) living together, d) widowed, e) divorced, and f) not living together.[12] We follow the DHS convention and treat living together as equivalent to married (in a marital union) and not living together as equivalent to divorce.[13] However, in Section 4.2, we will show the robustness of our results to alternative definition of marriage and marital transitions. Panel A of Table 2 shows the current marital status of women in our sample. Almost 92% are currently in a marital union. In 80% of such unions, the women report being married as opposed to living together. Overall, 7% of respondents report their current marital status as dissolved. Of these women, only 30% report their marital status as divorced, and the rest report not living together. 1% of the women in our sample are widows.

Panel B of Table 2 shows the heterogeneity in marital dissolution across the developing world. Marital dissolution varies widely across regions of the world, ranging from 1.6% of women reporting a dissolved marital status in South Asia to 14.2% in Latin America. The share of marital dissolutions that take the form of divorce as opposed to not living together also varies by region of the world. In Europe & Central Asia, 78% of dissolutions take the form of divorce, while the corresponding number is 67% in East Asia, close to 36% in South Asia and Sub-Saharan Africa, and only 13% in Latin America. Most marital unions

[12] A few nations do not have one or more of the above marital categories (e.g., India does not have the "living together" category).

[13] The DHS recode manual specifies that currently married includes married women and women living with a partner, and formerly married includes widowed, divorced, separated women and women who have lived with a partner but are not now living with a partner. Moreover, the DHS collects marital variables such as age at first marriage and husband's education for women who report their marital status as living together.

are formal marriages as opposed to living together with the notable exception of Latin America, where 57% couples live together, and to a lesser degree Sub-Saharan Africa, where 16% of couples in a marital union live together.

2.3 Sample Description

Summary information about the analysis samples is presented in Table 3. Our main analysis sample consists of 561,249 women, of which 61% are from sub-Saharan Africa, 20% from Latin America, 8% from East Asia, 3% from Europe & Central Asia, and 8% from South Asia. Based on our measure of infertility, approximately 1.2% of the sample reports being infertile. Of these infertile women, 25% are fully infertile, while 75% are subfecund (infertile women who have at least one birth).

Note that our setting is one of high fertility in which a large premium is placed on children. In our sample, the average woman has 1.9 living children and desires to have 4.4 children. The DHS provides information on the quality of the match and other predictors of marital stability. The average woman in the sample is 26 years old, was married at age 18 and became sexually active at age 17. About 21% of the women have more education than their husbands, while 42% have less education than their husbands. Approximately 45% of the husbands have education beyond the primary school level. Consistent with our setting, the women in our sample have limited education. 37% percent of the sample report any education above the primary level. About 62% of the sample reside in rural areas. 43% percent of respondents are Christian and 33% are Muslim.

3 Empirical Strategy

We first examine the relationship between infertility and marital dissolution using the following linear probability specification:

$$Y_{is} = \alpha + \beta Infertile_{is} + \delta A_{is} + \mu_s + \gamma X_{is} + \epsilon_{is} \tag{1}$$

where i and s represent the woman and the DHS country-year (survey), respectively. Y_{is} is a measure of marital dissolution. In our main specification, Y_{is} is an indicator that equals 1 if the woman reports her

current marital status as divorced or not living together (marital dissolution). $Infertile_{is}$ is our variable of interest. It is a dichotomous variable that equals 1 if the woman wants children but reports that she is unable to have children in the future due to infertility and 0 otherwise. In some specifications, we split the infertility variable into full infertility (infertile women with zero births) and subfecundity (infertile women with at least one birth. We hypothesize that women who cannot have additional children are more likely to experience marital dissolution and that this effect is larger for women experiencing full infertility, as full infertility reflects a more substantial deviation from the desired family size.

All specifications flexibly control for current age (A_{is}). μ_s are country-year fixed effects. These fixed effects allow for the latent probability of marital dissolution to vary across countries and time periods within a country. β is our parameter of interest, which is the effect of infertility on marital dissolution. In all specifications, standard errors are clustered at the country-year level. Sample weights provided by the DHS were used to weight all regressions.[14]

Identification of β in the above equation relies on the assumption that infertility should be an unanticipated event and should not be related to other factors that may predict divorce. To test this, we include a rich set of variables in X_{is}. We include variables that capture the quality of match as well as key individual-level demographic characteristics in X_{is}. In the set of match quality controls, we include dummies for the women's age when the union began, the education level of her husband (no education (omitted), primary education, secondary education, more than secondary education), an indicator for whether the husband has a higher education level than the wife, and an indicator for whether the wife has a higher education level than her partner (the omitted category is same education levels). A higher age at marriage and a lower education gap between the couple have been shown to increase the quality of marriage and marital stability (Lehrer, 2008; Jensen and Thornton, 2003; Schwartz and Han, 2014).[15]

[14] We have also made de-normalized weights following ICF (2012) recommendation, when analyzing pooled data from more than one survey. In order to construct de-normalized weights, we multiply the survey weights by the normalization factor (i.e., the ratio of female population 15-49 in the country and the number of surveyed individuals in the same age range). Results are larger in magnitude and highly significant under this alternate weighting scheme.

[15] Mansour and McKinnish (2014) find that the age gap between the couple is an important indicator of

To account for potential differences between fertile and infertile women, we include the following controls for individual-level demographic characteristics: dummies for the education level of the respondent (no education (omitted), incomplete primary, primary, incomplete secondary, secondary, higher education), dummies for her age at first intercourse, an indicator for whether the woman had premarital sex (constructed using current age and age at first intercourse), and the number of siblings of the wife. We also include an indicator for whether the current place of residence is rural and dummies for the respondent's religion (Hindu, Muslim, Christian, Other). An additional concern is that infertility could be capturing poor health and that poor health directly impacts marital stability. To address such concerns in our analysis, in some specifications we include health controls in X_{is}.

4 Results

4.1 Infertility and Marital Dissolution

Table 4 presents the results for the effect of infertility on marital dissolution. Column 1 presents our most parsimonious regression in which the only controls are country-year fixed effects and the flexible controls for women's age. The results suggest a large destabilizing effect of infertility on the marital union. Specifically, infertile women are 8.3 percentage points more likely to report their current marital status as dissolved than their fertile counterparts. Notably, only 7.2 percent of the sample reports their current marital status as dissolved; thus, the findings are economically as well as statistically significant. This finding of a very large impact of infertility on divorce suggests that if the desire for children is not met, it strains the marriage and leads to divorce. This result aligns with evidence from the literature that uses IVF access or success that suggests childlessness is often a cause of divorce (Lundborg et al., 2016; Kjaer et al., 2014; Cintina and Wu, 2019).

To support our finding, it is instructive to consider several potential threats to the validity of a causal interpretation. It is possible that the likelihood of being infertile is known prior to marriage. If so,

match quality. However, we are unable to include this measure in our set of match quality controls because the DHS only collects the husband's age for women who are currently married.

infertile women may match with lower-quality partners, and the poor match, not infertility, increases the likelihood of marital dissolution.[16] To guard against this threat to identification, in column 2 we include an array of match quality variables in X_{is}. If infertility is an unanticipated event, our coefficient estimate should be robust to the inclusion of match quality controls. The estimated coefficient is robust to the inclusion of match quality controls.

To investigate if differences in observable characteristics between fertile and infertile women are driving our findings in column 3, we add a rich set of individual-level controls. We find that the estimated impact of infertility on marital dissolution is basically unchanged after including flexible controls for age at first intercourse, level of education of the woman, her number of siblings, religion, and the woman's current place of residence.[17] After including these controls, the results for the match quality variables agree with those in the existing literature. We find that husbands' education is protective and that partners with educational mismatches are more likely to end their unions. The estimates remain remarkably consistent as we move from column 2 to column 3, suggesting that our measure of infertility is not correlated with key demographic characteristics of the woman or her husband. Column 3 is our preferred specification, which indicates that infertility increases the probability of marital dissolution by 7.9 percentage points—a 110% increase over the mean rate of marital dissolution.[18]

While we have a rich set of controls, we lack consistent data on other potential determinants of

[16] In Panel A of Appendix Table A.5, we investigate the relationship between infertility and the quality of the match. We find that infertile women are less likely to ever marry, more likely to be widowed and marry at a younger age. However, we find no differences in partner's relative or absolute education by infertility status.

[17] We have also tried a model that controls for the desired number of children given the correlation between this variable and reported infertility. The coefficient of interest with this additional control is .074. We do not include this control in the main equation because infertility could influence stated fertility preferences.

[18] Given that our dependent variable is binary and has a low mean, linear probability models may be biased (Horrace and Oaxaca, 2006). As a robustness check we estimated the corresponding logit model. We attain an average marginal effect of -0.057 with an standard error of 0.011. Full results available upon request.

infertility and divorce such as intimate partner violence, reproductive health knowledge, and sexual behaviors which could bias our estimates. In the bottom panel of Table 4, we show the degree of selection on unobservables relative to observables that would be required to generate a null result, using the approaches proposed by Altonji et al. (2005), Oster (2019), and Diegert et al. (2022). The key distinction between the methods is that Altonji et al. (2005) and Oster (2019) assumes exogenous controls, while Diegert et al. (2022) allow for omitted variables to be correlated with the included covariates. The AET ratio as discussed in Altonji et al. (2005) shows that the unobservables would have to be around 18 times greater than the observables to explain away the effect of infertility on divorce. The value of the Oster δ is 15.03, meaning that the unobservables would have to be over fifteen times more important than the observables for the estimated relationship to be nullified. This statistic is much greater than the minimum suggested threshold of 1 in Oster (2019). Finally, the breakdown point using Diegert et al. (2022)'s approach is 98%. A DMP breakdown point of 98% suggests that coefficient on infertility remains positive as long as selection on unobservables is at most 98% as large as selection on observables. Overall, these methods suggest that our main finding is robust to concerns about omitted variable bias.

In columns 4 and 5 of Table 4, we directly investigate whether omitted health status could bias our results. As cited above, some studies in the medical literature suggest a relationship between poor health, risky behaviors and infertility. A subsample of surveys include anthropometric measures of health (height and body mass index) as well as information on whether the woman visited a health clinic in the last year, whether she reported having a sexually transmitted disease or genital ulcers in the past 12 months, and if the respondent currently smokes. In column 4, we first re-estimated our preferred specification for the subsample of surveys that report health measures for all women.[19] Column 5 adds all available health and lifestyle controls. The estimated effect of infertility is nearly identical following the inclusion of health controls, suggesting that infertility is not a proxy for the included health measures. Once again,

[19] Many DHS surveys collect anthropometric information only for women who have given birth in the last five years, resulting in disproportionately missing health controls for infertile women. As a selection rule, we excluded country-years in which more than 90% of childless women had missing anthropometric information.

the test statistics from Oster (2019) and Altonji et al. (2005) convey that the unobservables would have to be 12 times more important than the observables to produce a zero effect of infertility on marital dissolution. The DMP breakdown point is 91%. To preserve the sample size, for the remainder of the analysis, we focus on specifications that exclude health controls, although all findings are robust to the specification that includes health controls.

4.2 Robustness to Alternative Measures of Marital Transitions and Samples

Our baseline results suggest that deviations from desired family size due to the inability to conceive additional children has large negative consequences for marital stability. In this section, we investigate the robustness of our findings to alternative samples and alternative definitions of marital transitions. These results are presented in Table 5. For comparison, column 1 reproduces the estimate from our preferred specification in Table 4.

Our sample excludes women who do not want additional children because their infertility status is indeterminate. Women who do not desire additional children are more likely to divorce as such excluding such women may bias our results. As a robustness check, we add to the sample these women, all of whom we classify as fertile. Column 2 of Table 5 shows the results of this exercise. The estimated impact of infertility on marital dissolution is similar for this sample (0.075 vs. 0.079), assuaging concerns about selection into the infertility measure.[20]

Our definition of marital dissolution takes a value of 1 if a woman reports being currently divorced or not living together and 0 otherwise. Widows may have had their relationships dissolved if the partner had not died. In Column 3 of Table 5, we exclude widows from our sample and find that the estimated

[20] As an additional check to see if our results are robust to concerns regarding selection into the sample we estimate a Heckman selection model where the mother's number of siblings is used in the selection equation but not the outcome equation for 105 surveys that contain information on the number of siblings. As shown in Appendix Table A.6, the infertility coefficient remains statistically significant and positive with a point estimate of 0.082. This, again, suggests that the benchmark estimation results are robust to concerns about selection into the sample based on the desire for additional children.

effect of infertility on marital dissolution increases from .079 to .090. Our main analysis sample is limited to women with a single marital union. Among all women between the age of 15-35 who do not want additional children, 87% report a single union. In column 4, we add back to the analysis sample women who had been in multiple unions and classify all such women as having had a marital dissolution.[21] Including women with multiple unions slightly attenuates the effect of infertility on marital dissolution but the coefficient of interest remains large and similar to our main estimate, suggesting that any sample selection concerns are negligible.

We next examine the issue of defining martial transition. Thus far, we have been following the DHS definitions and treating living together and married as similar forms of marital unions. Additionally, our measure of marital dissolution treats divorced and not living together equally. Living together is a highly common practice for many countries in our sample. Additionally, countries with high rates of living together also have a high rate of not living together. However, living together may not be equivalent to marriage, and not living together may not be equivalent to divorce. We adopt three strategies to investigate the robustness of our results to more traditional marriage-to-divorce pathways.

We first exclude countries with high rates of nontraditional marriages from the analysis sample. Specifically, we exclude country-years (surveys) in which the share of respondents in a marital union who report their marital status as living together is greater than 33%. This limits the sample to settings in which transitions between marriage and divorce are clearer.[22] The results in column 5 of Table 5 show that the impact of infertility on marital dissolution increases when restricting the sample to countries with more traditional marriages (from 7.9 percentage points to 9.0 percentage points). Note that the subsample

[21] The DHS does not provide information on the outcome of previous marriages for women who have had multiple unions, as such this classification has some measurement error as these women may have widowed prior to remarriage. Alternatively, we can assign women with multiple union their current marital status. Results under this coding of the dependent variable are very similar.

[22] The 33% threshold generates a sample where the vast majority of marital unions take the form of marriage (91.4%). Additionally, the share of marital dissolutions that take the form of divorce is 45% for this subsample, compared to 30% for the full sample. The results are robust to alternative cut-offs i.e. 40% instead of 33%.

of countries with more traditional martial arrangements have a significantly lower marital dissolution rate (5.1% vs. 7.2% for the full sample), so the relative impact of infertility on marital dissolution is even larger. In societies with more traditional marital arrangements, infertility is associated with a 176% increase in the odds of marital dissolution compared to a 110% increase in the main sample.

We next consider an alternate measure of marital dissolution that takes on a value of 1 if the marital status is divorced and 0 for all other reported marital statuses, including not living together. We note that only 2.2% of women in our sample report their marital status as divorced. Column 6 in Table 5 suggests that infertility increases the odds of divorce by 3.8 percentage points. Thus, if anything, the relative impact of infertility on marital dissolution is even larger if the outcome of interest is formal divorces as opposed to any weakening of the marital arrangement. As a final strategy in column 7, we estimate a model with divorce as our measure of marital dissolution for the subsample of surveys with more traditional marital arrangements. We do this in part because we expect marital transitions to go from married to divorced and living together to not living together. Therefore, our estimated effects on divorce should become stronger if we exclude nations with high rates of living together. This is indeed what we find. Our results suggest that infertile women are 204% more likely to be currently divorced than their fertile counterparts when we restrict our analysis to the subsample of countries with more traditional marital arrangements.

Finally, given the regional difference in marital patterns, economic conditions, desired family sizes, and norms we have estimated our baseline model separately for each of the five regions in our sample. We find a positive and statistically significant association between infertility and marital dissolution in three out of five regions (see Appendix Table A.7). The impact of infertility on marital dissolution is particularly large in South Asia and East Asia.

4.3 Differences by Severity of the Infertility Event

If an unmet desire for children among couples is responsible for the dissolution of the union, we should expect the magnitude of the effect to increase with the severity of the infertility event. To investigate this, we divide our measure of infertility into full infertility and subfecundity. Full infertility means that the

woman reports she is unable to have any children, whereas subfecund women report being infertile but have had at least one successful birth. We expect full infertility to be more destabilizing than secondary infertility for two reasons. First, couples who are unable to have any children would be further away from their desired family outcomes than couples who were able to have some children before the onset of infertility. Second, the information signal is stronger in the case of full infertility than for secondary infertility. In the case of secondary infertility, in a setting where a formal diagnosis of infertility is unlikely, at least one member of the couple may still anticipate future children.

Table 6 shows the results when the infertility measure is split into full infertility and subfecundity as two mutually exclusive independent variables. Column 1 presents our most parsimonious specification, and we find very large effects of full infertility on marital dissolution. Being unable to bring children into the relationship raises the probability of the union ending by approximately 13 percentage points. This implies a more than 185% increase in the likelihood of marital disruption when compared to the sample mean. Columns 2 and 3 add a set of match quality controls and then individual-level controls to the main specification. The coefficient on full infertility is stable after including a rich set of observable control variables. This suggests that full infertility is likely a shock to marriage that has very large negative consequences for the union. Regardless of the set of control variables included, we find that the effect of infertility on marital dissolution is much greater for women who are fully infertile than for those who are partially infertile or subfecund. According to the estimates in column 3, with the full set of controls, subfecundity increases the probability of marital dissolution by 6.1 percentage points, whereas full infertility increases it by 13.1 percentage points. This finding of a much larger effect for full infertility than for subfecundity adds support to the interpretation of the main results that failure to achieve the desired fertility levels leads to an increase in the probability of the marital union ending.

4.4 Other Deviations from Desired Fertility

We complement the above analysis of infertility-driven deviations from desired family size on marital instability with the analysis of two other fertility-related events that cause deviations from desired family size or composition: the death of the first-born and the gender of the first-born. We note that other

authors have documented that both of these fertility challenges destabilize marriages, but we study them in our setting for two reasons. First, we have a much larger sample of countries than other studies, allowing us to investigate external validity. While existing studies have found that the death of a child is detrimental to the marriage, these papers are all developed country studies (Rogers et al., 2008; van den Berg et al., 2017; Finnäs et al., 2018; Lyngstad, 2013). The evidence on the impact of the child's gender on marital outcomes is mixed, with some studies finding that daughters destabilize the marriage, while other studies find no impact.[23] Second, we hypothesize that for the same sample of women, the impacts of these fertility challenges on marital dissolution should be much smaller than the impacts of infertility because unlike infertility, most couples can smooth these fertility challenges by having additional children—especially in a setting such as ours with high fertility levels.

We explore the effect of these secondary fertility challenges on marital stability for the subsample of women who have given birth at least once regardless of the birth outcome. The proportion of women currently divorced or not living together is similar to that in the main analysis sample at 6.9%. Panel B of Table 3 presents some descriptive statistics for this sample. This sample is slightly older and less educated than the main sample. Infant mortality is high in our setting: 8.5% of the respondents report that their first-born child died within the first year of life. 48.6% of the sample had a daughter as their first born, consistent with the natural sex ratio at birth skewing slightly males.

Table 7 reports our results for secondary fertility challenges. For comparison, Panel A presents our subfecundity estimates for this subsample. In our preferred specification, column 3, women who cannot have additional children are 6.6 percentage points more likely to be unpartnered at the time of the survey. In Panel B, we show the results for the effect of the death of the first-born child on marital dissolution.

[23] Evidence from the United States suggests a destabilizing effect of first-born daughters on unions (Dahl and Moretti, 2008; Ananat and Michaels, 2008; Bedard and Deschenes, 2005; Mammen, 2008). By contrast, Diekmann and Schmidheiny (2004) do not find that daughters destabilize marriages for 18 developed countries. For developing countries, Bose and South (2003) and Odimegwu et al. (2017) suggests that early parity daughters increase the risk of divorce, while Jennings (2017) finds no evidence that sex composition impacts the odds of marital dissolution.

Following the literature, we focus on the first-born child because there is evidence of endogenous fertility responses following the loss of a child (Finnäs et al., 2018).[24] We limit the analysis to deaths that occurred in the first year of a child's life. Since we do not know the timing of the marital separation, choosing a short window for the death of the child helps ensure that the death of the child occurred during the marriage and minimizes the risk that the death resulted from the union dissolving (Bhuiya and Chowdhury, 1997).[25] Finally, deaths that occur in the first year of life , while potential correlated with unobserved household traits, are arguably more exogenous since over time, the cumulative effects of parental behavior can put the child at risk of death.

Estimates in column 1 of Table 7, our most parsimonious specification, suggest a small effect of the death of the first-born on the probability that the woman is currently in a marital union. However, the death of a child is not an entirely random event: variables that correlate with child mortality (such as low parental education or support from extended family) are strong predictors of marital stability. In columns 2 and 3, we add match quality and individual-level controls sequentially. The estimate for the effect of the death of the first-born on marital dissolution increases as we add controls. Column 3 of Table 7 suggests that the death of the first-born child increases the probability of marital dissolution by 0.86 percentage points. This is a relatively small increase in the likelihood of marital dissolution when compared to that of subfecundity. The death of a child is unlikely to be an exogenous event, and there are many omitted factors, such as maternal attention and wealth, which are likely to be correlated with the survival of the first-born as well as marital stability. Although the DMP breakdown point is quite

[24] Arguably deaths of later born children could have a larger impact on marital dissolution since the couple has less time to replace these lost children and attain their desired family size. In Appendix Table A.8 we show the results with the death of *any* child as the negative event. In this specification we also control for the number of total births. We find that consistent with this logic the loss of any child is associated with a larger impact on marital dissolution. Specifically, each death is associated with a 3.19 percentage point increase in the odds of divorce.

[25] The majority of deaths occur in the first year of life. As such, if we consider other time frames, we obtain similar results. For instance, for deaths that occurred at any point in time, we find a 1.08 percentage point increase in marital dissolution in our preferred specification.

high, the instability of the point estimate to the inclusion of additional controls and the Oster and AET test statistics suggest that the estimate may be biased due to missing unobservables.

Next we study the gender of the first-born child. We show the estimated effect of having a first-born daughter on the likelihood of marital dissolution in Panel C of Table 7. We find no meaningful effect of first-born gender on marital dissolution. Column 1 shows that having a first-born daughter is associated with a statistically insignificant 0.05 percentage point increase in the probability of divorce. Columns 2 and 3 present the results from adding variables related to the match quality and the demographic characteristics of the mother. The estimates are very similar. Regardless of the set of controls used, the impact of a first-born daughter on marital stability is tiny and never reaches statistical significance. Consistent with recent research that suggests that the gender of the first-born child is close to random (Dahl and Moretti, 2008; Bhalotra and Cochrane, 2010; Heath and Tan, 2018; Anukriti et al., 2022; Gupta, 1987), the AET and Oster test statistics are large. However, the DMP breakdown point is lower at 10 suggesting that time-varying factors such as the availability of sex-selective abortion practices could be correlated with the gender of the first-born and marital dissolution.

It is possible that our null result on first-born daughter is due societal-level heterogeneity in son preference (Jayachandran, 2015; Rossi and Rouanet, 2015; Blau et al., 2020). To investigate this we split our sample of country-years (surveys) by son preference. Following Jayachandran (2015), we calculate the sex ratio of last birth (girls/girls+boys) for each country-year using the sample of women who are most likely to have completed fertility (i.e., women who either want no more children, are sterilized, or report being subfecund). We then categorize a survey as high son preference if the sex ratio of the last birth is below the biological sex ratio of 0.485. This splits the sample into 92 surveys with son preferences and 59 surveys with low or no son preference. Panel D shows the results for surveys with high son preference, while Panel E contains the results for those with low or no son preference. While the coefficient estimate suggests a negative relationship between a first-born daughter and marital stability only in places with son preference; neither coefficient is statistically significant.[26]

[26] We also adopt another measure of stated son preference from Jayachandran (2015). For each country-year we compute the share of women who want strictly more sons than daughters and categorize a

Overall, the results from the secondary fertility challenges reinforce our interpretation of our results. Fertility challenges that result in a deviation from desired family size reduce the utility of marriage and lead to marital dissolution. The magnitude of this effect increases with the size and permanence of the fertility challenge. While losing a child does appear to destabilize the marriage, the impact is much larger if the couple suffers from infertility and cannot have additional children to recover from the shock.

5 Polygamy, Fertility, and Marital Dissolution

Our final contribution is an exploration of the role of polygamy in buffering the marital union against a negative fertility event. In societies where polygamy is common, men have additional channels available to meet their desired fertility goals in the case where she cannot have additional children: namely, they can add another wife to the household, or if they were already in a polygamous union, the other wife/wives can increase their fertility. As such, polygamy decreases the cost of remaining with the current wife if she suffers from infertility or another fertility challenge. Ethnographic studies provide evidence that women can remain in polygamous unions even if infertile (Chojnacka, 1980; Zeitzen, 2008; Naab et al., 2019). For instance, Chojnacka (1980) writes "In a society in which a high premium is placed on children and where a childless wife has little or no chance of continuing in a monogamous union, she may easily be driven out of the matrimonial home to face an uncertain future and insecurity. ...In a polygynous union, even when her function as a mother fails, she is still able to remain as a wife performing her second function as a laborer, and thus to secure her position in the community". These qualitative studies further document instances of wives and family members encouraging men to take another wife in order to add children to the family. While anecdotal evidence is suggestive, to the best of our knowledge, no other quantitative study has investigated the relationship between polygamy, shocks to marriage, and marital dissolution.

In 95 country-years (surveys) representing 39 countries, the DHS collected information about polygamy from women currently in marital union.[27] Respondents who are currently in a marital union are asked

country-year as high son preference if this share is greater than the share in the median country-year. The results are similar using this definition and are available by request.

[27] There are 7 additional surveys with polygamy information. However, polygamy information is missing

if they are in a union with more than one wife. We use this question to construct a country-year-level variable: *Polygamy Rate*. For each survey, we compute the share of married women between the ages of 15-44 years old who report that their current marital unions are polygamous. There is substantial variation in this measure. As shown in Appendix Table A.1, *Polygamy Rate* ranges from near zero in nations such as Timor-Leste and Guyana to more than 45% in Burkina Faso and 49% in Guinea. While polygamy is a widespread phenomenon in Africa, it is also present in some East Asian and Latin American countries.

To investigate whether the presence of polygamy in a country alters the impact of a fertility challenge on marital stability, we estimate the following regression:

$$Y_{is} = \alpha + \beta_0 FC_{is} + \beta_2 (FC_{is} * Polygamy\ Rate_s) + \delta A_{is} + \mu_s + \gamma X_{is} + \epsilon_{is} \quad (2)$$

where, as before, Y_{is} equals 1 if woman i in country-year (survey) s reports her current marital status as divorced or not living together. FC_{is} is an indicator that takes a value of 1 if the respondent reports a specific fertility challenge (infertility, subfecundity, the death of the first-born child, a first-born daughter). $Polygamy\ Rate_s$ is the country-year-level polygamy rate as defined above. The coefficient on the interaction, β_2, tests whether the impact of a given fertility challenge on marital dissolution differs by the underlying polygamy rate in a society.[28] All other control variables (including country-year fixed effects,

for more than 10 percent of married women, so we do not include those surveys. The results are robust to including these surveys in the sample.

[28] An alternative approach would be to use individual level polygamy status. Our data does not support this approach because we lack polygamy information for women who are not currently in marital unions. Regardless we believe the polygamy rate in a country-year is a superior measure because individual polygamy status may be a function of the fertility challenge. For instance, Milazzo (2014) finds that women with first-born daughters are more likely to end up in polygamous unions. There is also evidence of a positive relationship between fertility challenges and polygamous unions in our data. Among currently married women in our estimation sample, infertile women are 2.3 percentage points more likely to be in a polygamous union in a regression that contains the full set of individual controls and country-year fixed effects.

μ_s) are the same as in Equation 1. As above, for the secondary fertility challenges we restrict the sample to women with at least one birth. Standard errors are clustered at the country-year level.

We start by verifying that infertility impacts marital dissolution for the subsample of surveys for which we can compute a polygamy rate. Column 1 of Table 8 shows the results of infertility on marital dissolution in a parsimonious model similar to Equation 1 for the polygamy subsample. If anything, the baseline impact of infertility on marital dissolution is larger for this subsample. In column 2, we add the match quality and individual controls and the coefficient remains stable. We note that in the subsample of countries that contain polygamy information, the incidence of marital dissolution is lower than in the full sample (5.7% vs. 7.2%). Thus, the relative impact of infertility on martial dissolution is larger in this subsample. Specifically, in the polygamy subsample, infertility is associated with a 173% increase in the odds of marital dissolution, compared to a 110% increase in the full sample.

We next test whether the degree of polygamy in a country alters the impact of a fertility challenge on marital stability. We begin with infertility as the fertility challenge. Columns 3 and 4 of Table 8 report the estimates from Equation 2 for models without and with individual and match quality controls, respectively. In both columns, the coefficient on the interaction between $Infertility$ and *Polygamy Rate* is negative and statistically significant. This suggests that the presence of polygamy in a country significantly moderates the effect of infertility on marital dissolution. The coefficient estimates in column 3 suggest that an infertile woman in a country with near zero polygamy (e.g. India) faces a 14.2 percentage points increase in her likelihood of experiencing a marital disruption, while her counterpart in a country with a 50% *Polygamy Rate* (e.g. Guinea) is only 3.2 percentage points more likely to experience a marital dissolution if infertile. As shown in column 4, the finding that infertile women are significantly less likely to experience marital dissolution in countries with high levels of polygamy is robust to conditioning on our full set of individual control and match quality controls.[29]

[29] In Appendix Table A.9 we explore the robustness of this finding to alternative samples and measures of marital transition in the manner of section 4.2. As shown in columns 2-5 the finding that infertile women are significantly less likely to experience marital dissolution in countries with high levels of polygamy holds across all sample definitions. However, this finding loses statistical significance if we

Given that our measure of polygamy is at the country-year-level, a weakness of our approach is that our finding that the impact of infertility on marital dissolution is lower in more polygamous societies may simply reflect country specific differences in norms, institutions, and access to divorce that correlated with polygamy and independently impact divorce. As such, any shock may have a diminished impact on the likelihood of divorce in these societies. To guard against this, we collected data on country-level factors that impact the odds of divorce and correlate with the prevalence of polygamy in a society. The first variable is a country-year-level marriage index which measures legal constraints that women experience related to marriage and divorce. The data for the marriage index come from the Women, Business and the Law dataset published by the World Bank (see World Bank (2020)). The second variable is a country-year-level estimate of the labor participation rate for women aged 15-44 constructed from the DHS. Higher female labor force participation should be associated with greater female autonomy and the ability to support oneself upon divorce. The third factor is the country-level historical use of plough, which has been shown to predict women's participation in society (Alesina et al., 2013). To test that *Polygamy Rate* does not simply proxy for these variables, we include interactions between infertility and these three aggregate-level variables in Equation 3. All three proxies for women's social and economic participation in the society correlate strongly with *Polygamy Rate*.[30] As shown in column 5 of Table 8, we continue to find that the impact of infertility on marital dissolution is smaller in societies with high polygamy rates. The coefficient on the interaction between $Infertility$ and *Polygamy Rate* remains large, negative and statistically significant.[31]

limit the definition of marital dissolution to divorce.

[30] The correlation coefficients are -0.42, 0.31, -0.65 respectively.

[31] Another concern is that divorce may carry a stronger social stigma in polygamous societies than in non-polygamous ones. To investigate if this difference in norms is responsible for our finding, we gathered data from the World Value Survey which asks on a 10 point scale how justifiable is divorce. Unfortunately, only 13 of 39 countries with polygamy information participate in the World Value Survey. For this subset of countries β_2 from equation 2 is -0.227 and statistically significant. When we estimate the specification that corresponds to column 5 of Table 8 with the addition of an interaction term between Infertility and a country-year measure of divorce acceptance the coefficient on β_2 is -.293,

In Table 9, we investigate whether the moderating effect of polygamy on marital dissolution also holds for other lesser fertility challenges. In Panel A we consider the impact of subfecundity. Column 1 shows that for the subsample of countries with polygamy data, subfecunity is less harmful for marriage than full infertility. Column 2 contains our results from estimating Equation 2. The coefficient estimates suggest that a woman who cannot have an additional child faces a 10.9 percentage-point increase in the likelihood of experiencing a marital disruption if she lives in a country without polygamy, while her counterpart in a country with a 50% *Polygamy Rate* experience only a 3.5 percentage point increase in marital dissolution if subfecund.

Turning to the other fertility challenges, Panel B presents the regression results when the secondary fertility challenge is the death of the first-born. Column 1 reinforces the earlier finding that the death of the first-born child is associated with a small destabilizing impact on marriage. The results shown in column 2 of Panel B again suggest that polygamy reduces the odds of marital dissolution in response to a fertility challenge. For a woman who lives in a highly polygamous country (a polygamy rate of 50%), the likelihood of separation due to the death of the first-born is almost fully mitigated. Panel C presents the results for first-born daughter. As before, we do not find any disruptive effects on the union due to a first-born daughter in the subsample with polygamy. Unsurprisingly, we find no differential impacts by polygamy prevalence.

While fertility challenges lower the expected benefits of remaining in a marital union, we provide suggestive evidence that the presence of polygamy provides men a means to reduce the impact of such shocks and therefore reduce the odds of marital dissolution. Our findings offer quantitative evidence of a moderating role for polygamy on marital stability in the wake of a fertility challenge. In societies in which marriage and childbearing are the primary paths to resource control and social status, infertile women

albeit not statistically significant. If we only include an interaction term between infertility and the attitudes towards divorce in a nation the coefficient on β_2 is -.197 and statistically significant. We take this as suggestive evidence that nation-level social stigma surrounding divorce is not responsible for our finding of lower estimates of the effect of infertility on divorce in polygamous societies. See Appendix Table A.10.

can continue to be in unions instead of potentially facing economic insecurity on their own. While women who suffer fertility challenges have an increased likelihood of remaining in a marital union, it is likely that their well-being in the marriage falls. Additionally, prior research has documented large negative consequences of polygamy on societal violence, health of children, and marital satisfaction of women in general (Barash, 2016; Arthi and Fenske, 2018).

6 Conclusion

Economic theory predicts that unanticipated shocks over the course of a marriage can have a destabilizing effect on the marriage. We study fertility shocks, which are more permanent in nature and can lead to potentially larger negative consequences for marital well-being than other unanticipated shocks studied in the literature. In particular, we investigate the impact of unmet fertility goals on marital dissolution using data on over 500,000 women from 63 developing countries. We first document a large negative effects of female infertility on marital dissolution. While we are agnostic as to the precise mechanism, we find that being unable to have additional children is associated with a doubling of the odds of a marital disruption.

Additionally we show that the effect of a negative fertility event on marital dissolution increases with the severity of the fertility challenge. Specifically, we find that the negative effect of infertility is stronger among women who are fully infertile than among those who have at least one living child before the onset of infertility. While the death of the first-born child has a small positive influence on the likelihood of the union ending, we find no effect of the gender of the first-born on marital disruption. Our findings align with those of the prior literature that shocks that reveal information about the partner lessen marital stability.

Our paper provides additional evidence of the need to increase access to fertility treatments in lower-income countries. Previous work has documented that infertility is associated with depression, anxiety, social isolation, and violence (Njagi et al., 2020; Rouchou, 2013; Wang et al., 2022). We identify a new cost of infertility that should be considered by policy makers, especially in settings where the economic

well-being of women is strongly correlated with marriage and children. With increasing age at first marriage and reduced childbearing years, the likelihood of experiencing infertility shocks will increase, and measures aimed at mitigating these shocks will be increasingly important.

Finally, we examine the relationship between polygamy, fertility challenges and marital dissolution. We find that infertile women in countries with no polygamy are more than twice as likely to experience marital dissolution than similar women in countries where half of the unions are polygamous in nature. Additionally, we show that polygamy mitigates the consequences of the death of the first-born child on marriage. While the literature has documented other consequences of polygamy, to the best of our knowledge, we contribute some of the first evidence on its ability to reduce the odds of marital dissolution following a shock.

Marital instability decreases socioeconomic welfare for women. Additionally, divorce has been linked with worse education and health outcomes of children. While there is a large literature on divorce in the developed world, the literature on the causes of marital dissolution in developing countries is scarce despite the increasing prevalence of divorce. This paper fills this gap by shedding light on the critical role of fertility for marital stability.

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7 Tables

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Table 1: Differences in women's characteristics by infertility status

	Infertile (q1)		Fertile (q2)		Test: q1-q2=0		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Women's characteristics	b	se	b	se	beta	t-val	Obs.
Panel A: Full Sample							
Number of living children	-0.77	(0.074)	-0.19	(0.043)	-0.58	-8.68	561249
Owns land alone or jointly	0.33	(0.046)	0.33	(0.036)	0.00	0.08	173066
Low quality dwelling	0.24	(0.029)	0.22	(0.023)	0.02	1.33	544463
Wealth index (DHS)	2.01	(0.106)	2.04	(0.086)	-0.03	-0.80	423691
Education in years	6.69	(0.380)	6.99	(0.337)	-0.31	-3.85	560946
Woman has above primary education	0.14	(0.035)	0.16	(0.030)	-0.02	-2.08	561174
Childhood rural	0.45	(0.026)	0.46	(0.022)	-0.01	-0.82	231102
Number of siblings	5.06	(0.141)	5.25	(0.119)	-0.19	-2.62	399450
Wife beating justified	0.42	(0.024)	0.43	(0.021)	-0.01	-1.03	446277
Desired number of children	2.34	(0.138)	2.83	(0.128)	-0.48	-6.42	528316
Stated son preference	0.17	(0.018)	0.18	(0.018)	-0.01	-1.88	524087
Muslim	0.90	(0.044)	0.89	(0.041)	0.02	1.91	435462
Christian	0.05	(0.046)	0.06	(0.042)	-0.01	-0.75	435462
Health variables:							
Woman's height (in cm)	158.16	(0.428)	158.52	(0.402)	-0.36	-2.32	342764
Body mass index	22.40	(0.184)	22.27	(0.222)	0.14	1.24	342055
BMI-underweight	0.18	(0.028)	0.17	(0.027)	0.01	1.45	342055
BMI-normal	0.60	(0.033)	0.63	(0.031)	-0.03	-3.67	342055
BMI-overweight	0.18	(0.013)	0.18	(0.012)	0.00	0.36	342055
BMI-obese	0.04	(0.012)	0.02	(0.012)	0.02	2.59	342055
Visited health facility in last 12 mon.	0.07	(0.029)	0.16	(0.021)	-0.09	-6.42	389064
Smokes/chews- any product	0.06	(0.008)	0.04	(0.006)	0.02	3.63	373203
Sexually Transmitted Disease	0.01	(0.010)	0.01	(0.009)	-0.00	-0.14	410950
Genital ulcer	0.03	(0.011)	0.03	(0.009)	-0.00	-0.52	397558
Panel B: Subsample of women with at least one birth							
Age at first birth	14.40	(0.16)	14.72	(0.18)	-0.33	-4.76	476092
Interval since last birth	2.65	(0.22)	1.34	(0.15)	1.31	7.44	452875
Interval between second last to last birth	4.35	(0.37)	3.55	(0.33)	0.80	3.88	279718
First-born daughter	0.49	(0.02)	0.50	(0.02)	-0.01	-0.67	476114
First-born died	0.02	(0.01)	0.02	(0.01)	-0.00	-0.60	476114
First-born twin	0.01	(0.00)	0.01	(0.00)	0.00	1.62	476114
Number of antenatal visits	3.70	(0.36)	3.92	(0.29)	-0.22	-1.78	383129
Pregnancy complications last birth	0.40	(0.04)	0.41	(0.03)	-0.00	-0.08	284167

Variable definitions: Low quality dwelling is a dummy equals one if the main floor material of the household is related to earth, sand, mud or dung, zero if related to wood, cement, or other hard material. Wealth index is a categorical variable: 1 (poorest) to 5 (richest) which divides the DHS wealth index into quintiles. Wife beating justified is a dummy equal to one if woman reports that wife beating is justified in at least one of five cases. Stated son preference equals 1 if the woman's ideal number of boys is strictly greater than ideal number of girls. Number of antenatal visits is the number of visits during the most recent pregnancy in last three to fives years. STD is an indicator variable equals 1 if woman reports any sexually transmitted disease in past 12 months.

Variable availability: Sample for health variables excludes surveys in which more than 90% of childless women had missing anthropometric information. Childhood rural is missing for 76 surveys. Number of siblings is missing for 47 surveys. Desired number of children is missing for Moldova 2005. Stated son preference is missing for 4 surveys. No premarital sex is missing for Jordan 1997. Wife beating justified missing for 44 surveys. Owns land alone or jointly missing for 113 surveys. Wealth index is missing for 54 surveys. Visited health facility is missing for four surveys. Smokes/chews- any product missing for 17 surveys. STD missing for nine surveys. Genital ulcer missing for nine surveys. Pregnancy complications missing for 39 surveys.

Table 2: Descriptive Information: Marriage and Marital Dissolution

	Panel A (Full Sample)	
	Mean	SD
Divorced or not living together	7.23	25.90
Divorced	29.8%	
Not living together	70.2%	
In marital union	91.81	27.42
Currently married	79.8%	
Living together	20.2%	
Widowed	0.96	9.75
Observations	561,249	
Number of countries	63	

	Panel B (By Region)					
	Europe & Central Asia*		East Asia		Latin America & Caribbean	
	Mean	SD	Mean	SD	Mean	SD
Divorced or not living together	6.4	15.4	3.8	24.7	14.2	49.5
Divorced	78.3%		66.9%		13.3%	
Not living together	21.7%		33.1%		86.7%	
In marital union	92.6	26.1	94.9	22.1	85.3	35.4
Currently married	97.6%		93.5%		43.2%	
Living together	2.4%		6.5%		56.8%	
Widowed	0.9	9.6	1.3	11.4	0.5	7.2
Observations	20,919		45,680		110,324	
Number of countries	10		4		10	

	South Asia		Sub-Saharan Africa	
	Mean	SD	Mean	SD
Divorced or not living together	1.6	0.3	6.4	36.3
Divorced	35.7%		35.3%	
Not living together	64.3%		64.7%	
In marital union	97.0	17.2	92.7	26.1
Currently married	100.0%		84.4%	
Living together	0.0%		15.6%	
Widowed	1.5	12.0	1.0	9.8
Observations	44,335		339,991	
Number of countries	3		36	

Notes: Sample includes ever-married women between the ages 15-35 years who have been in a single marital union and desire additional children. Countries are classified according to the World Bank's World Development Indicators. Divorced is the share of total marital dissolutions (divorced or not living together) that take the form of divorce. Not living together is the share of total marital dissolutions that take the form of not living together. Similarly, currently married is the share of total marital unions (currently married or living together) that take the form of marriage and living together is the share of total marital unions that take the form of living together. *For this table, Jordan was combined with Europe & Central Asia because it is the only country in the Middle East region.

Table 3: Summary Statistics

	Panel A: Full sample		Panel B: Subsample of women with at least one birth	
	Mean	SD	Mean	SD
Infertility	1.17	10.76	1.03	10.12
Subfecundity	75.0%		100.0%	
Full Infertility	25.0%			
Number of living children	1.88	1.51	2.22	1.39
Desired number of children	4.39	2.55	4.51	2.56
Age	25.61	5.18	26.29	4.93
Age at first marriage	18.31	3.77	18.14	3.67
Age at first intercourse	17.39	3.28	17.24	3.18
Woman has more education	21.36	40.99	20.75	40.55
Partner has more education	41.64	49.30	41.64	49.30
Partner has more than primary education	45.20	49.77	43.69	49.60
Woman has more than primary education	36.90	48.25	35.03	47.71
Current residence is rural	62.02	48.53	62.97	48.29
Number of siblings	5.57	2.31	5.60	2.33
No premarital sex	69.19	46.17	69.24	46.15
Hindu	8.92	28.50	8.34	27.65
Muslim	33.10	47.06	33.23	47.10
Christian	42.89	49.49	43.35	49.56
Other religion	15.09	35.80	15.08	35.79
First-born died			8.46	27.83
First-born daughter			48.61	49.98
Observations	561,249		476,114	

Notes: Full sample in the first two columns includes all ever-married women between the ages 15-35 years who have been in a single marital union and desire additional children. Infertility is divided into full infertility and subfecundity. Full infertility is 1 for women who are infertile and have zero births. Subfecundity is 1 for women who are infertile and have at least one birth. First-born died measures if the first-born child died in the first year of the marital union.

Table 4: Effect of infertility on marital dissolution

	(1)	(2)	(3)	(4)	(5)
Infertility	0.083***	0.080***	0.079***	0.081***	0.079***
	(0.013)	(0.013)	(0.013)	(0.015)	(0.016)
Partner primary education		-0.035***	-0.052***	-0.050***	-0.048***
		(0.004)	(0.004)	(0.005)	(0.005)
Partner secondary education		0.001	-0.035***	-0.032***	-0.029***
		(0.004)	(0.004)	(0.004)	(0.004)
Partner higher education		0.001	-0.046***	-0.043***	-0.039***
		(0.005)	(0.005)	(0.006)	(0.006)
Woman has more education=1		0.026***	0.014***	0.014***	0.014***
		(0.003)	(0.002)	(0.002)	(0.002)
Partner has more education=1		0.018***	0.026***	0.025***	0.025***
		(0.002)	(0.002)	(0.002)	(0.002)
Woman incomplete primary			0.018***	0.015***	0.017***
			(0.003)	(0.003)	(0.003)
Woman primary education			0.025***	0.019***	0.022***
			(0.004)	(0.004)	(0.004)
Woman incomplete secondary			0.032***	0.027***	0.031***
			(0.005)	(0.005)	(0.006)
Woman secondary education			0.032***	0.029***	0.033***
			(0.006)	(0.006)	(0.006)
Woman higher education			0.037***	0.033***	0.037***
			(0.007)	(0.008)	(0.008)
Match quality controls	No	Yes	Yes	Yes	Yes
Individual controls	No	No	Yes	Yes	Yes
Health controls	No	No	No	No	Yes
Observations	561,249	561,249	561,249	435,231	435,231
R^2	0.04	0.05	0.06	0.06	0.06
Outcome mean	0.072	0.072	0.072	0.071	0.071
Number of surveys	151	151	151	107	107
Number of countries	63	63	63	54	54
AET (2005) ratio			18.59		11.97
Oster(2019) δ; β^*			15.03; 0.074		11.93; 0.072
DMP(2022) breakdown point			97.8		91

Notes: All regressions control for country-year fixed effects and dummies for woman's age. For the match quality controls the base category is partner's no education and women and partner same education. The match quality controls also include dummies for age at first marriage. For the individual controls the base education category is no education. In addition to education variables, individual-level controls include her religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. Health controls include the respondent's height, indicators for having visited the health facility, dummies for STD and genital ulcer in past 12 months, whether the respondents uses tobacco, and dummies for four BMI categories. Observations with missing information for the control variables were included in the sample with an indicator for the missing value. The baseline specification for the Oster's statistics, DMP breakdown point and the AET ratio in columns 3 and 5 includes controls for country-year fixed effects and age dummies. Oster's δ is calculated using *psacalc* Stata command and DMP(2022) breakdown point is calculated using *regsensitivity* Stata command. For the subsample with health controls in column 5, the coefficient on infertility in the baseline specification is .082. All regressions are weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: Robustness to Alternative Marital Transitions and Sample Restrictions

	Outcome= Marital dissolution					Outcome= Divorce	
	(1) Main sample	(2) Include do not desire additional children	(3) Exclude widows	(4) Include multiple unions	(5) Exclude high living together	(6) Main sample	(7) Exclude high living together
Infertility	0.079***	0.075***	0.090***	0.075***	0.090***	0.038***	0.047***
	(0.013)	(0.013)	(0.017)	(0.012)	(0.015)	(0.007)	(0.009)
Match quality controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	561,249	768,972	555,748	646,933	427,567	561,249	427,567
R^2	0.06	0.06	0.06	0.06	0.04	0.05	0.03
Outcome mean	0.072	0.080	0.073	0.077	0.051	0.022	0.023
Number of surveys	151	151	151	151	112	151	112

Notes: Marital dissolution includes both divorce and not living together, while the outcome in Columns 6 and 7 is limited to divorce. Column 2 includes women who do not desire additional children. Column 3 excludes widows from the sample. Column 4 adds women with multiple marital unions back in to the main analysis sample. Columns 5 and 7 exclude the country-years in which living together constitutes more than 33% of the total number of marital unions. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: Effect of Full Infertility vs. Subfecundity on Marital Dissolution

	(1)	(2)	(3)
Full infertility	0.133***	0.132***	0.131***
	(0.029)	(0.028)	(0.028)
Subfecundity	0.066***	0.062***	0.061***
	(0.011)	(0.010)	(0.010)
Match quality controls	No	Yes	Yes
Individual controls	No	No	Yes
Observations	561,249	561,249	561,249
R^2	0.04	0.05	0.06
Outcome mean	0.072	0.072	0.072
Number of surveys	151	151	151

Notes: Full infertility is 1 for women who are infertile and have zero births. Subfecundity is 1 for women who are infertile and have at least one birth. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: Secondary Fertility Challenges and Marital Dissolution

	(1)	(2)	(3)
Panel A			
Subfecundity	0.0696***	0.0666***	0.0655***
	(0.0107)	(0.0105)	(0.0105)
R^2	0.04	0.05	0.06
Oster(2019) δ; β^*			12.73; 0.061
AET (2005) ratio			15.98
DMP(2022) breakdown point			96.9
Panel B			
First-born died	0.0056***	0.0070***	0.0086***
	(0.0017)	(0.0017)	(0.0017)
R^2	0.04	0.05	0.06
Oster(2019) δ;β^*			-2.53; 0.012
AET (2005) ratio			-2.90
DMP(2022) breakdown point			84.6
Panel C			
First-born daughter	-0.0005	-0.0005	-0.0004
	(0.0010)	(0.0010)	(0.0010)
R^2	0.04	0.05	0.06
Oster(2019) δ;β^*			5.74; -0.000
AET (2005) ratio			6.66
DMP(2022) breakdown point			10
Panel D (High son preference sample)			
First-born daughter	0.0005	0.0003	0.0005
	(0.0015)	(0.0015)	(0.0015)
R^2	0.04	0.05	0.05
Oster(2019) δ;β^*			-19.51; 0.001
AET (2005) ratio			-17.67
DMP(2022) breakdown point			37.2
Panel E (Low son preference sample)			
First-born daughter	-0.0017	-0.0016	-0.0016
	(0.0011)	(0.0010)	(0.0010)
R^2	0.03	0.04	0.04
Oster(2019) δ;β^*			29.20; -0.002
AET (2005) ratio			31.33
DMP(2022) breakdown point			12
Match quality controls	No	Yes	Yes
Individual controls	No	No	Yes

Notes: The sample in Panels A-E is restricted to women with at least one birth. Sample in Panel D (N=205,927) is further restricted to surveys where sex ratio at last birth (SRLB)<0.485 and in Panel E (N=270,187) is for surveys with SRLB>=0.485. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. First-born died measures whether the child died within the first year of their life. The baseline specification for the Oster's statistics, DMP breakdown point and the AET ratio in columns 3 and 5 includes controls for country-year fixed effects and age dummies. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: Polygamy, Infertility and Marital Dissolution

	(1)	(2)	(3)	(4)	(5)
Infertility	0.101***	0.099***	0.142***	0.139***	0.154**
	(0.015)	(0.015)	(0.019)	(0.018)	(0.076)
Infertility X Polygamy Rate			-0.221***	-0.220***	-0.240**
			(0.064)	(0.062)	(0.114)
Infertility X Marriage index					-0.000
					(0.000)
Infertility X FLFP					0.020
					(0.126)
Infertility X Plough					0.014
					(0.054)
Match quality controls	No	Yes	No	Yes	Yes
Individual controls	No	Yes	No	Yes	Yes
Observations	391,426	391,426	391,426	391,426	391,426
R^2	0.03	0.05	0.03	0.05	0.05
Outcome mean	0.057	0.057	0.057	0.057	0.057
Number of surveys	95	95	95	95	95
Number of countries	39	39	39	39	39

Notes: The sample includes country-years in which polygamy information is available for more than 10% of the women in marital unions. Polygamy Rate is the share of all marital unions in a country-year that are polygamous in nature. Marriage Index is the country-year-level index that lies between 0 and 100 (no constraints) and measures legal constraints that women experience related to marriage and divorce. FLFP is the female labor force participation rate and is calculated at the country-year level using the DHS for women ages 15-44 years old. Plough is a country level estimated measure of the fraction of citizens with ancestors that traditionally engaged in agriculture where plough was used. This measure is borrowed from Alesina et al. (2013) and is missing for Timor-Leste. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. All regressions weighted using sample weights. Standard errors are clustered at the survey level. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: Polygamy, Secondary Fertility Shocks and Marital Dissolution

	(1)	(2)
Panel A		
Subfecundity	0.080***	0.109***
	(0.012)	(0.021)
Polygamy Rate X Subfecundity		-0.148**
		(0.069)
R^2	0.05	0.05
Panel B		
First-born died	0.007***	0.013***
	(0.002)	(0.004)
Polygamy Rate X First-born died		-0.023**
		(0.011)
R^2	0.05	0.05
Panel C		
First-born daughter	-0.001	-0.001
	(0.001)	(0.002)
Polygamy Rate X First-born daughter		0.003
		(0.005)
R^2	0.05	0.05
Match quality controls	Yes	Yes
Individual controls	Yes	Yes
Outcome mean	0.054	0.054
Observations	336,480	336,480
Number of surveys	95	95
Number of countries	39	39

Notes: The sample includes country-years in which polygamy information is available for more than 10% of the women in marital unions. Additionally, the sample is restricted to women with at least one birth. Polygamy Rate is the share of all marital unions in a country-year that are polygamous in nature. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

8 Appendix

Table A.1: Descriptive Information by Country

Country	Year/s	Dissolution rate	Infertility rate	Polygamy rate	Observations
Central Asia					
Albania	2008	3.1	2.5	na	1127
Armenia	2000, 2005, 2010	4.7	4.4	na	3104
Azerbaijan	2006	7.7	7	na	1135
Kazakhstan	1995, 1999	10.5	2.9	na	1871
Kyrgyz Republic	1997, 2012	8	2.9	na	4141
Moldova	2005	9	3.6	na	1531
Tajikistan	2012	3.8	3.2	na	2953
Ukraine	2007	14.9	7.4	na	1437
Uzbekistan	1996	3.7	2.1	na	1327
East Asia					
Cambodia	2000, 2005, 2010, 2014	5	4.6	3.2	17172
Indonesia	2012	3.3	0.2	na	13173
Philippines	1998, 2003, 2008, 2013	3.3	0.8	na	11436
Timor-Leste	2009	2.2	2.6	1.9	3899
Latin America & Caribbean					
Bolivia	1993, 1998, 2003, 2008	8.6	1.7	na	8311
Brazil	1996	8.3	1.4	na	2906
Colombia	1995, 2000, 2004, 2009	17.1	0.8	na	22070
Dominican Republic	1996, 1999, 2002, 2007, 2013	22.1	1	na	17542
Guatemala	1995, 1998	5.2	1.7	na	5245
Guyana	2009	12.8	0.6	1	876
Haiti	2000, 2005, 2012	10.7	0.5	21.2	6375
Honduras	2005, 2011	14.3	0.6	na	11367
Nicaragua	1997, 2001	16.3	1.5	na	6291
Peru	1996, 2000, 2003, 2010, 2011, 2012	11.2	1	na	29341
Jordan	1997	1.6	1.5	6.2	2293
South Asia					
India	2005	1.5	2.1	1.7	38438
Maldives	2009	4.5	0.4	na	2854
Nepal	2011	0.7	1.1	3.7	3043
Sub-Saharan Africa					
Benin	1996, 2001, 2006, 2011	2.8	1	40.4	18811
Burkina Faso	1998, 2003, 2010	1.7	0.3	45.2	16167
Burundi	2010	5.4	0.3	6	2928
Cameroon	1998, 2004, 2011	8.1	0.6	28.1	11225
Central African Republic	1994	9.1	1.1	28.6	2203
Chad	1996, 2004	4.4	1.4	38.3	6538
Comoros	1996, 2012	9.1	1.5	19.8	2275
Congo	2005, 2011	18.2	1.5	12.3	6449
Congo Democratic Republic	2007, 2013	8.7	1.7	22.2	11130
Cote d'Ivoire	1998, 2011	7.2	0.7	25.6	4803
Ethiopia	2000, 2005, 2011	8.2	0.3	11.3	13967
Gabon	2000, 2012	15.8	1.2	15.4	3989
Gambia	2013	4.1	0	36.5	4600
Ghana	1998, 2003, 2008, 2014	10.2	0.7	18.2	7046
Guinea	1999, 2005, 2012	3.1	1	48.9	10317
Kenya	1998, 2003, 2008	6.6	0.5	14.7	6787
Lesotho	2004	4.1	0.6	na	1575
Liberia	2006, 2013	11	0.4	13.9	4650
Madagascar	1997, 2003, 2008	12.2	0.7	3.2	9476
Malawi	2000, 2004, 2010	8.1	1.1	15	15922
Mali	1995, 2001, 2006, 2012	1.8	0.8	39	23581
Mozambique	1997, 2003, 2011	10.7	2.4	24.1	12901
Namibia	2000, 2006, 2013	7.6	1.7	8.8	3042
Niger	1998, 2006, 2012	2.5	0.3	35.5	14250
Nigeria	2003, 2008, 2013	2.6	0.7	32	32755
Rwanda	2000, 2005, 2010, 2014	7.8	0.6	8.7	11169
Sao Tome and Principe	2008	11.4	1.2	26.1	563
Senegal	2005, 2010, 2012, 2014	4.9	0.2	32.9	19884
Sierra Leone	2008, 2013	4.9	1.6	35	8376
South Africa	1998	8	1.2	7.2	1559
Swaziland	2006	4.1	0.9	19.9	541
Tanzania	1996, 1999, 2004, 2009	8.3	0.4	29.4	11331
Togo	1998, 2013	5.2	0.7	36	6288
Uganda	1995, 2000, 2006, 2011	9.2	0.8	28.1	10420
Zambia	1996, 2001, 2007, 2013	10.7	0.7	13.7	13339
Zimbabwe	1994, 1999, 2005, 2010	8.3	0.8	13.4	9134

Notes: Dissolution rate is the average share of women in our sample who report their marital status as divorced or not living together. Infertility rate is the average share of women in our sample who report being infertile as per our definition. Polygamy rate is the share of women in marital union who report being in a polygamous relationship in a given country and is calculated in the data before any sample restrictions. All figures have been calculated using sample weights. * For Cambodia 2000, Cambodia 2005, and Tanzania 1999 polygamy information is missing. When a survey was conducted over two years, we report the first year. na stands for not applicable.

Table A.2: Effect of infertility on marital dissolution for 15-44 year old sample

	(1)	(2)	(3)	(4)	(5)
Infertility	0.055***	0.052***	0.052***	0.050***	0.048***
	(0.007)	(0.006)	(0.007)	(0.008)	(0.008)
Partner primary education		-0.034***	-0.052***	-0.050***	-0.048***
		(0.003)	(0.004)	(0.004)	(0.004)
Partner secondary education		0.002	-0.036***	-0.033***	-0.030***
		(0.005)	(0.004)	(0.004)	(0.004)
Partner higher education		0.002	-0.049***	-0.046***	-0.042***
		(0.005)	(0.006)	(0.006)	(0.006)
Woman has more education=1		0.027***	0.014***	0.014***	0.014***
		(0.002)	(0.002)	(0.002)	(0.002)
Partner has more education=1		0.018***	0.027***	0.025***	0.025***
		(0.002)	(0.002)	(0.002)	(0.002)
Woman incomplete primary			0.017***	0.015***	0.017***
			(0.003)	(0.003)	(0.003)
Woman primary education			0.025***	0.019***	0.022***
			(0.004)	(0.004)	(0.004)
Woman incomplete secondary			0.032***	0.028***	0.032***
			(0.005)	(0.006)	(0.006)
Woman secondary education			0.034***	0.030***	0.034***
			(0.006)	(0.006)	(0.007)
Woman higher education			0.041***	0.037***	0.042***
			(0.007)	(0.008)	(0.008)
Match quality controls	No	Yes	Yes	Yes	Yes
Individual controls	No	No	Yes	Yes	Yes
Health controls	No	No	No	No	Yes
Observations	685,501	685,501	685,501	528,923	528,923
R^2	0.04	0.05	0.06	0.06	0.06
Outcome mean	0.075	0.075	0.075	0.073	0.073
Number of surveys	151	151	151	107	107
Number of countries	63	63	63	54	54
Oster(2019) δ; β^*			18.19; 0.050		9.95; 0.044
AET (2005) ratio			22.57		10.13
DMP(2022) breakdown point			98		94.2

Notes: We add women of ages 36-44 years to our main sample. All regressions control for country-year fixed effects and dummies for woman's age. For the match quality controls the base category is partner's no education and women and partner same education. The match quality controls also include dummies for age at first marriage. For the individual controls the base education category is no education. In addition to education variables, individual-level controls include her religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. Health controls include the respondent's height, indicators for having visited the health facility, dummies for STD and genital ulcer in past 12 months, whether the respondents uses tobacco, and dummies for four BMI categories. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1. The baseline specification for the Oster (2019) statistics, AET ratio and DMP breakdown point in columns 3 and 5 includes controls for country-year fixed effects and age dummies. For the subsample with health controls in column 5, the coefficient on infertility in the baseline specification is .052.

Table A.3: Effect of infertility on marital dissolution excluding sterilised women

	(1)	(2)	(3)	(4)	(5)
Infertility	0.079***	0.075***	0.073***	0.077***	0.074***
	(0.013)	(0.013)	(0.013)	(0.015)	(0.015)
Partner primary education		-0.035***	-0.053***	-0.052***	-0.050***
		(0.004)	(0.004)	(0.004)	(0.004)
Partner secondary education		0.001	-0.036***	-0.033***	-0.031***
		(0.004)	(0.004)	(0.004)	(0.004)
Partner higher education		0.002	-0.047***	-0.044***	-0.040***
		(0.005)	(0.005)	(0.006)	(0.006)
Woman has more education=1		0.026***	0.013***	0.013***	0.014***
		(0.002)	(0.002)	(0.002)	(0.002)
Partner has more education=1		0.019***	0.026***	0.026***	0.026***
		(0.002)	(0.002)	(0.002)	(0.002)
Woman incomplete primary			0.021***	0.018***	0.020***
			(0.002)	(0.003)	(0.003)
Woman primary education			0.027***	0.021***	0.024***
			(0.003)	(0.003)	(0.003)
Woman incomplete secondary			0.035***	0.030***	0.034***
			(0.004)	(0.004)	(0.004)
Woman secondary education			0.034***	0.031***	0.035***
			(0.005)	(0.005)	(0.006)
Woman higher education			0.037***	0.035***	0.039***
			(0.006)	(0.008)	(0.007)
Match quality controls	No	Yes	Yes	Yes	Yes
Individual controls	No	No	Yes	Yes	Yes
Health controls	No	No	No	No	Yes
Observations	522,649	522,649	522,649	405,978	405,978
R^2	0.04	0.05	0.06	0.05	0.06
Outcome mean	0.073	0.073	0.073	0.072	0.072
Number of surveys	151	151	151	107	107
Number of countries	63	63	63	54	54
Oster(2019) δ; β^*			11.18; 0.067		10.09; 0.067
AET (2005) ratio			13.65		9.64
DMP(2022) breakdown point			95.3		96.6

Notes: All regressions control for country-year fixed effects and dummies for woman's age. For the match quality controls the base category is partner's no education and women and partner same education. The match quality controls also include dummies for age at first marriage. For the individual controls the base education category is no education. In addition to education variables, individual-level controls include her religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. Health controls include the respondent's height, indicators for having visited the health facility, dummies for STD and genital ulcer in past 12 months, whether the respondents uses tobacco, and dummies for four BMI categories. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1. The baseline specification for the Oster (2019) statistics, AET ratio and DMP breakdown point in columns 3 and 5 includes controls for country-year fixed effects and age dummies. For the subsample with health controls in column 5, the coefficient on infertility in the baseline specification is .082.

Table A.4: Sub-sample results by whether woman is sexually active before marriage

	(1) Age 1st intercourse < Age 1st marriage	(2) Age 1st intercourse>=Age 1st marriage
Full infertility	0.069***	0.148***
	(0.019)	(0.032)
Subfecundity	0.049***	0.067***
	(0.015)	(0.013)
Match quality controls	Yes	Yes
Individual controls	Yes	Yes
Observations	167,460	374,445
R^2	0.05	0.06
Outcome mean	0.105	0.059

Notes: Full infertility is 1 for women who are infertile and have zero births. Subfecundity is 1 for women who are infertile and have at least one birth. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, the woman's number of siblings, and an indicator for the current place of residence being rural. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.5: Infertility, Subfecundity, and Match Quality

	β on Infertility	se	Observations	R^2	Dep. Var.mean
Panel A: Full Sample					
Ever married	-0.077***	(0.013)	1036055	0.47	0.62
Age at first marriage	-0.531***	(0.072)	561249	0.36	18.31
Partner's education in years	-0.055	(0.059)	539355	0.58	6.39
Partner has more than primary education	0.001	(0.007)	544850	0.47	0.45
Woman has more education	0.003	(0.005)	542411	0.19	0.21
Partner has more education	-0.009	(0.007)	542411	0.16	0.42
Widowed	0.076***	(0.025)	561249	0.02	0.01
Panel B: Sub-sample with at least one birth					
Ever-married	-0.016***	(0.004)	591123	0.13	0.94
Age at first marriage	-0.861***	(0.080)	476114	0.35	18.14
Partner's education in years	-0.038	(0.066)	458483	0.57	6.23
Partner has more than primary education	0.005	(0.008)	462682	0.46	0.44
Woman has more education	0.002	(0.005)	460909	0.20	0.21
Partner has more education	-0.006	(0.008)	460909	0.16	0.42
Widowed	0.092***	(0.028)	476114	0.02	0.01

Notes: Each row is a separate regression. In addition to infertility, all regressions include country-year fixed effects and the following controls- dummies for age, dummies for women's education level, number of siblings, dummies for religion, and an indicator variable for current place of residence being rural. Regressions with ever-married as the outcome add never-married women to the analysis sample. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.6: Heckman Selection Model

	OLS	Heckman	
		1st stage	2nd stage
	(1)	(2)	(3)
Infertility	0.080***		0.0817***
	(-0.0130)		(0.0039)
Number of siblings		-0.0131***	
		(0.0007)	
Match quality controls	Yes	Yes	Yes
Individual level controls	Yes	Yes	Yes
Observations	399,533	531,079	531,079

Notes: All samples are restricted to the subset of surveys with non-missing information on the number of siblings. Number of siblings information missing for 46 surveys. Column 1 shows the estimates of equation 1 when we do not correct for selection. Columns 2 and 3 includes women who do not want additional children and show the estimate results from a Heckman selection model with the number of siblings is the key dependent variable in the selection equation. All regressions include match quality and individual level controls. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.7: Infertility and marital dissolution: heterogeneity by region

	(1) Main sample	(2) East Asia	(3) Europe & Central Asia	(4) Latin America & Caribbean	(5) South Asia	(6) Sub-Saharan Africa
Infertility	0.079***	0.128***	0.027	-0.004	0.137***	0.080***
	(0.013)	(0.037)	(0.021)	(0.009)	(0.009)	(0.012)
Observations	561,249	45,680	20,919	110,324	44,335	339,991
R^2	0.06	0.05	0.05	0.05	0.04	0.04
Outcome mean	0.072	0.038	0.064	0.142	0.016	0.064
Number of surveys	151	10	14	30	3	94
Number of countries	63	4	10	10	3	36

Notes: Countries are classified according to the World Bank's World Development Indicators. For this table, Jordan was combined with Europe & Central Asia because it is the only country in the Middle East region. Column 1 reproduces our main estimate for full sample with our preferred set of controls for comparison. See Table 4 for details on control variables. All regressions include individual and match quality controls and are weighted using sample weights. Standard error clustered at country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.8: Death of any child and marital dissolution

	(1)	(2)	(3)
Any child died ever	0.0301***	0.0313***	0.0319***
	(0.0024)	(0.0025)	(0.0024)
Match quality controls	No	Yes	Yes
Individual controls	No	No	Yes
Observations	476,114	476,114	476,114
R^2	0.06	0.07	0.07
Outcome mean	0.07	0.07	0.07
Oster(2019) δ; β^*			-1.093; 0.06
AET (2005) ratio			-18
DMP (2022) breakdown point			8.41

Notes: Sample restricted to women with at least one birth. Any child died is an indictor that takes a 1 if a child of any birth order died. All regressions control for country-year fixed effects dummies for woman's age and the total number of births. See Table 4 for additional details on the control variables. The baseline specification for the Oster's statistics, DMP breakdown point and the AET ratio includes controls for country-year fixed effects and age dummies. Oster's δ is calculated using *psacalc* Stata command and DMP(2022) breakdown point is calculated using *regsensitivity* Stata command. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.9: Robustness of Polygamy Results to Alternative Marital Transitions and Sample Restrictions

	Outcome= Marital dissolution					Outcome= Divorce	
	(1) Main sample	(2) Include do not desire additional children	(3) Exclude widows	(4) Include multiple unions	(5) Exclude high living together	(6) Main sample	(7) Exclude high living together
Infertility	0.139***	0.133***	0.176***	0.144***	0.133***	0.056***	0.059***
	(0.018)	(0.018)	(0.026)	(0.017)	(0.020)	(0.017)	(0.019)
Polygamy Rate X Infertility	-0.220***	-0.209***	-0.316***	-0.237***	-0.205***	-0.084	-0.076
	(0.062)	(0.062)	(0.086)	(0.060)	(0.064)	(0.055)	(0.059)
Match quality controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	391,426	489,377	387,255	450,638	351,847	391,426	351,847
R^2	0.05	0.05	0.05	0.05	0.04	0.02	0.03
Outcome mean	0.057	0.062	0.057	0.060	0.049	0.021	0.022
Number of surveys	95	95	95	95	80	95	80

Notes: The sample includes country-years in which polygamy information is available for more than 10% of the women in marital unions. Additionally, the sample is restricted to women with at least one birth. Polygamy Rate is the share of all marital unions in a country-year that are polygamous in nature. All regressions control for country-year fixed effects and dummies for woman's age. See Table 4 for additional details on the control variables. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.

Table A.10: Polygamy, infertility and marital dissolution controlling for divorce jusifiability

	(1)	(2)	(3)
Infertility	0.148***	0.117**	0.021
	(0.007)	(0.049)	(0.106)
Infertility X Polygamy Rate	-0.235***	-0.211***	-0.373*
	(0.061)	(0.071)	(0.185)
Infertility X Divorce Justifiable		0.114	0.112
		(0.159)	(0.154)
Infertility X Marriage index			-0.001
			(0.001)
Infertility X FLFP			0.288
			(0.178)
Infertility X Plough			0.032
			(0.069)
Match quality controls	Yes	Yes	Yes
Individual controls	Yes	Yes	Yes
Observations	174,792	174,792	174,792
R^2	0.04	0.04	0.04
Outcome mean	0.045	0.045	0.045
Number of surveys	34	34	34
Number of countries	13	13	13

Notes: The sample is restricted to countries for which we have information on divorce is justified from World Value Survey as well as in which polygamy information is available for more than 10% of the women in marital unions. Polygamy Rate is the share of all marital unions in a country-year that are polygamous in nature. All regressions control for country-year fixed effects and dummies for woman's age. The match quality controls include partner's education and the education mismatch between partners and dummies for age at first marriage. The individual-level controls include her education level, religion, dummies for age at first intercourse, an indicator for the woman having intercourse before marriage, the woman's number of siblings, and an indicator for the current place of residence being rural. See Table 8 for information on variable definitions. All regressions weighted using sample weights. Standard errors are clustered at the country-year level. *** p<0.01, ** p<0.05, * p<0.1.