Contemporary Patterns of Unintended Pregnancy Resolution in Low- and Middle-Income Countries

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ABSTRACT

Around 40% of pregnancies worldwide are unintended and a half of those are terminated. Few international comparisons of unintended pregnancy (UIP) resolution (choosing birth or abortion) exist. We analysed parous women in Demographic and Health Surveys from 12 countries using logistic regression. We show family composition (number and gender of children), fertility desires (difference between 'ideal' and actual family size), contraceptive use before pregnancy, and time since last birth were associated with the likelihood of experiencing an UIP; and choosing unintended birth or abortion. The situations in which a pregnancy is unintended often differ from situations in which an unintended pregnancy is aborted reflecting differences in pregnancy and fertility management. While the results signal a preference for having children of both genders and for spacing pregnancies, the characteristics associated with UIP and particularly abortion varied by context. The results reflect determinants of abortion and UIP, but also patterns of underreporting.

INTRODUCTION

In 2012, around 40% pregnancies were unintended in the 'less developed' regions of the world. Around a half of these pregnancies ended in an induced abortion (from now on: *abortion*); 38% in a live birth; and 13% in a miscarriage[1]. Only a few international comparisons of the determinants of unintended pregnancy[2–4] or abortion[5–8] exist. The likelihood of choosing an abortion over an unintended birth has mostly been studied in single countries in Europe[9–11] or North America[12] For low- and middle-income countries (LMICs) there is no research looking into the determinants of unintended pregnancy resolution (including both unintended births and abortions) and how they might differ across settings.

We aim to fill this gap in the literature by analysing Demographic and Health Survey (DHS) data from 12 countries: Albania, Armenia, Azerbaijan, Bangladesh, Bolivia, Cambodia, Colombia, Indonesia, Nepal, Philippines, Tajikistan, and Ukraine. We reveal how family composition (number and gender of existing children), fertility desires (the difference between the 'ideal' and actual number of children), contraceptive use before pregnancy, and interval since last birth are associated with the likelihood of experiencing an unintended pregnancy rather than an intended pregnancy, and with choosing an abortion among those who experience an unintended pregnancy. We focus on these explanatory variables, because our aim is to show how women's pregnancy intentions and abortion decisions are shaped by her previous reproductive experiences and behaviour.

Most countries do not collect prospective longitudinal data on pregnancy intentions or abortions. Therefore, retrospective reports, such as the ones collected in DHS, are the only way to study the topic. We use rarely explored DHS reproductive "calendar" data to identify pregnancies which ended in abortion and unintended pregnancies which were carried to term. Even though not all abortions and unintended pregnancies are captured in surveys, comparing the determinants of those that are reported across countries is of interest, as international comparisons of this topic are rare. Our study provides new information on unintended pregnancy resolution, and tells policy makers which groups of women are more likely to experience an unintended birth or abortion. The results highlight the role of abortion in birth spacing, with important implications for the organisation of postpartum family planning programs, and add to the body of knowledge about the complexity of the measurement of pregnancy intentions in surveys. We also aim to shed light on how important country context is for these decisions.

BACKGROUND

Although in this study we focus on low and middle income countries (LMICs), below we summarise previous literature about the determinants of unintended pregnancy and abortion in general. This provides a more holistic picture of the state of the knowledge on the topic across various contexts, in particular given the scarcity of studies on LMICs about certain aspects of reproductive behaviour we focus on in our study.

Unintended pregnancies

In 2012, the proportion of unintended pregnancies of all pregnancies was around 62% in South America, 36% in South-central Asia, 44% South-eastern Asia, and 52% in Eastern Europe. South America had the highest regional proportion of unintended births out of all unintended pregnancies (46%) when compared to the other regions discussed in this paper. In South-central Asia the proportion was 40%, in South-eastern Asia 31% and in Eastern Europe 15%.[1]

• *Why women have unintended pregnancies*: Unintended pregnancy can be mistimed (occurred earlier than desired) or unwanted (when a woman before becoming pregnant did not want to have children at any point in the future).[13] Women might classify pregnancies as unintended if at the moment of pregnancy they were not prepared for to have a child, for example due to their economic circumstances or union status.[14]

Women who are fecund, sexually active and do not intend to have a child but are not using contraception are at risk of an unintended pregnancy. Many unintended pregnancies are a result of barriers to fertility regulation, such as cost of methods and their physical availability, fear of side effects, misinformation and lack of knowledge about the methods, provider biases, or women's limited decision making possibilities [15,16]. Among women who do use contraception, an unintended pregnancy might result from a method failure.[17]

• *Family composition and unintended pregnancy*: Family composition may affect women's experiences of unintended pregnancy. Studies on LMICs have found that women with no or fewer children at the time of conception were less likely to classify a pregnancy as unintended, as compared to women who have more children.[2,18] Son preference may shape pregnancy intentions in some countries.[19–21] Finally, many women want to space their pregnancies and thus a short interval since the last birth may lead to a mistimed pregnancy.[2]

• *Contraceptive use and pregnancy intentions:* Whenever determinants of unintended pregnancy are studied, contraceptive use should be controlled for, because people tend not to plan their reproductive 'careers' in long term, but rather make decisions on month-to-month

basis depending on availability of methods and their perceived side effects.[22,23] Those who do not plan to become pregnant but also feel ambivalent about their pregnancy intentions may be less likely to use a method in the US.[24] On the other hand, a study of six LMICs showed that women using contraception at the time of conception are also relatively likely to have ambivalent intentions and to report the resulting pregnancy as intended.[25] A qualitative study in Honduras found that many women who used contraception said that it would not be a problem if they became pregnant[26], which highlights the complexity of the relationship between contraceptive use and pregnancy intentions.

The type of contraceptive method used can send signals about the strength of women's motivation to avoid pregnancy, at least in contexts where modern contraceptive use is widely accepted and easily available. Women with a stronger motivation to avoid pregnancy may use more effective methods. For instance, in the US women with ambivalent or weak intentions to prevent pregnancy used less effective methods than those with stronger desires.[27] However, another study found no association between pregnancy intentions and method choice.[28] In Ecuador, women who used a modern contraceptive method before pregnancy were more likely to report that the pregnancy was unintended, as compared to women who did not use a modern method.[18]

• *Measuring unintended pregnancy:* Measuring unintended pregnancy incidence is not straightforward. Women may not want to report an existing child as unwanted and therefore we often find a discrepancy between retrospective and prospective reports.[29] Women may feel ambivalent about their pregnancy desires.[23,24,30,31] The meaning of 'fertility intention' may differ by culture[32] and the implications of an unwanted birth tend to be different from mistimed births.[33] However, the validity of the measure tends to be high at least in HICs.[34,35] In DHSs, unintended pregnancies are more likely reported for the most recent births, so using data from most recent events reduces the level of underreporting.[2]

Abortions

Estimated levels of abortion per 1000 women aged 15-44 vary across the regions of this study. In 2010-14, in South and Central Asia the rate was 37/1000, in South-eastern Asia it was 35/1000, in South America it was 47/1000 and in Eastern Europe 42/1000.[36]

• *Why women have abortions:* The decision to have an abortion is influenced by factors specific to that pregnancy (e.g. emotions about the pregnancy, ability to access care), to the individual (e.g. knowledge about abortion, family context, socio-demographic characteristics) and to the

country context (e.g. legal context, norms, religion, health system).[37] The most commonly cited reasons across a wide range of countries include socioeconomic concerns or desire to limit family size.[7]

Some pregnant women who do not wish to have a child may *not* choose abortion due to the stigma attached to it, religious reasons, or pressure from family and friends.[22,38] Sometimes ambivalence towards having children or abortion leads the woman not to opt for abortion[39], whereas in other contexts stigma attached to a childbirth is larger than that attached to an abortion.[40]

• *Family composition and abortion:* Abortions can be used to postpone, avoid, or stop childbearing, as well as to space births, which highlights the importance of taking into account the preceding birth interval.[5] Among married women in Asia, almost all abortions occurred to women with at least one child, whereas in Eastern Europe 13-16% of abortions occurred to childless women.[8] Gender of existing children may affect abortion decisions, especially in contexts where son preference is strong.[21,41,42]

• *Contraceptive use and abortion:* At the country level, higher use of contraception is typically associated with lower abortion rates, unless the country is in the midst of rapid fertility decline.[43] However, at the individual level the associations may differ. In Turkey, the propensity to terminate a pregnancy was not associated with the type of contraceptive used or with non-use of contraception[44], but in Bangladesh the use of modern contraceptives was associated with a higher probability of abortion if a pregnancy occurred.[41] Women who do not use contraceptives, but abort a pregnancy often report the lack of use being due to low perceived risk of pregnancy[45–47] or due to unmet need for contraception.[48]

• *Measuring abortion:* Collecting reliable information on abortion is difficult. Up to half of abortions are not reported in surveys due to abortion stigma.[49,50] It is difficult to estimate the proportion of underreported abortions in countries where abortion is not legal, as the total number of abortions performed in that country is not known, but it is likely to be even more severely underreported. Surveys also miss reports from women who died due to complications of unsafe abortion.[51]

Country contexts

The determinants of unintended pregnancy and its resolution are likely to vary by context. Access to and the acceptability of family planning is likely to affect the level of unintended

pregnancy. In countries, where pre-marital sex is common, family planning is difficult to access, and pre-marital childbearing is stigmatised, women have a high likelihood of abortion.[51]

If the country is in the early stages of fertility transition, unintended pregnancies and consequently abortions tend to be less common than at the later stages of the transition.[52] In all the countries we examine, fertility transition is in its last or second to last stage – as defined by Bongaarts and Casterline[52] – since the mean ideal number of children varied from 2.0 in Ukraine to 3.6 in Tajikistan (Table 1). Thus, women in all these countries are exposed to a risk of an unintended pregnancy for significant periods throughout their reproductive lives.

The countries in our study represent contexts with different access to family planning services and abortion due to e.g. differences in their abortion legislation, which ranges from being prohibited in all or most circumstances in the Philippines and Indonesia, to being available on request in seven of the countries included. The levels of unintended births, (modern) contraceptive prevalence, total fertility rate (TFR), and the mean desired number of children also vary widely. Two of the countries (Armenia and Azerbaijan) have a high sex ratio at birth, meaning that there are more boys born than one would expect (Table 1).

[Table 1 here]

METHODS

We chose the 12 countries included in the analyses based on DHS calendar data on the timing and planning status of births, timing of abortions, and contraceptive use being available. These surveys span over years 2003-2014 and most of the main regions of DHS: Central Asia, North Africa/West Asia/Europe, Central, South & Southeast Asia, and Latin America & Caribbean. If a country had more than one survey where this information was available, we chose the most recent one. We focus on the outcome of the most recent birth, because unintended pregnancy reporting is likely to be more accurate for recent births.[2]

These surveys include retrospective data on whether the births women experienced in the last five years were wanted then (*wanted birth*), wanted later (*mistimed*), or not wanted at all (*unwanted*) at the time of conception. We included mistimed and unwanted births into one category of 'unintended birth' due to small number of cases in each more precise category. The surveys we use also ask whether (the most recent) terminated pregnancies were abortions, miscarriages, or stillbirths. We use these data to identify abortions. We assume all abortions were unintended pregnancies, although in rare cases they may have been initially wanted, but terminated due to change in life circumstances or a medical reason.

The selected DHSs included data on 209,395 women. We excluded women (in the following order) who were younger than 15 years old (N=3,959), whose last pregnancy outcome was a miscarriage or missing (N=5,782), who had no pregnancy during the 5-year DHS calendar (N=133,647) and who had no children (N=21,450). The final analytic sample thus includes parous women who had a pregnancy during the 5-year DHS calendar (N=44,557). It would be interesting to also study women who did not experience a pregnancy during the five-year period to examine the characteristics of those, who are successfully avoiding pregnancies when they wish to do so. However, we were unable to conduct such analyses, as information on pregnancy intentions of women who did not experience a pregnancy within that time is not collected in the DHS. We did not include nulliparous women, because their motivations for avoiding pregnancies are very different from those, who have already started childbearing. We conducted sensitivity analyses including them, but the characteristics associated with the outcomes of interest were so different from parous women that future research should study them separately.

The women in the analytic sample were on average older (31 years) than those excluded (30 years), had a higher desired family size (2.8 vs. 2.4), were less likely to have higher education (12.4% vs. 19.8%) and less often belonged to the richest 20% of the sample (16.5% vs. 23.6%) (not shown, available on request).

We use two outcome variables extracted from the DHS calendar: a binary indicator showing whether the most recent pregnancy a woman experienced was *unintended* (i.e. unintended birth or abortion), and a binary indicator showing who *chose an abortion* among those who experienced an unintended pregnancy.

The main independent variables include: *family gender composition* (has at least one of each gender, has boy(s) only or has girl(s) only), *number of living children* (1-2, or 3 or more children; family size measured before the outcome pregnancy), *whether used contraceptives in the month before the outcome pregnancy* (did not use; used less effective methods i.e. barrier and traditional; used more effective methods i.e. pill, LARC or sterilization), *interval between the outcome pregnancy and the end of preceding birth* (short <19 months, medium 19-36 months or long >36 months), and *desired number of children* (whether the woman had her exact desired family size before the most recent pregnancy; had fewer children than her desired family size; or had more children than her desired family size). The last variable was constructed by calculating the difference between the number of living children women had

before their most recent pregnancy and the desired number of children* the women reported at the time of the interview. Thus, we assume they had not changed their preference as a result of their most recent pregnancy, which may not hold for some women. However, since we are not aware of internationally comparable data sources that collect prospective longitudinal data on such preferences, we had to make this compromise.

In the analyses we also control for socio-demographic characteristics which have been previously shown to be associated with the likelihood of an unintended pregnancy and abortion. These control variables include measures of socioeconomic position such as *education* (up to primary, secondary or tertiary) and *wealth* (DHS wealth index quintiles)[6,8,9,18], *place of residence* (urban or rural)[53] as well as demographic characteristics such as *age* (continuous variable)[2,8] *and partnership status* (no partner or married/cohabiting).[2,6,54]

We use binary logistic regression to study: (i) which characteristics were associated with the likelihood of experiencing an unintended pregnancy (vs. a wanted pregnancy) and (ii) which women were more likely to choose an abortion among those who experienced an unintended pregnancy. We chose this stepwise analytical strategy, because it reflects women's decision process, when facing an unintended pregnancy. First the pregnancy occurs, second a decision must be made regarding whether to keep it. We included the same explanatory variables in both analyses apart from marital status, which was not included in the second model due to a very low number of unpartnered women being included in it. The analyses were conducted separately by country. We tested interactions between the number of children and desired number of children, but the results were not significant.

Some of the variables included in our models had a small amount of missing data, including desired family size ($N_{missing}$=1374), birth interval ($N_{missing}$=327), and contraceptive use in the month before pregnancy ($N_{missing}$=1134). Since there was no more than 2.5% of data missing in any of these variables in our analytical sample, we treated missingness with listwise deletion.

RESULTS

Descriptive statistics

In most countries women reported more unintended births than abortions, but there were a few exceptions (Table 2). In Armenia, Azerbaijan, Tazikistan and Ukraine the proportion of pregnancies reported as abortions was larger than the proportion reported as unintended births.

* Based on the DHS question: "If you could go back to the time you did not have any children and could choose exactly the number of children to have in your whole life, how many would that be?"

The most extreme case was Azerbaijan, where 61% of the outcome pregnancies ended in an abortion. In the other extreme, Indonesian women only reported 0.2% of pregnancies having ended in an abortion. The highest proportion of unintended births was observed in Bolivia (66%) and the lowest in Tajikistan (7%). Tajikistan was the country with the highest proportion of pregnancies reported as having been wanted at the time of conception (82%), compared to only 30% of such pregnancies in Azerbaijan.

[Table 2 here]

In most countries, women were on average in their early thirties and those who had abortions were slightly older than those who had births (wanted or unintended). The average number of children ranged from 1.4 in Ukraine to 2.8 in the Philippines. In each country, women who experienced wanted births had on average fewer children than those who experienced unintended pregnancies (Table 2).

Figures 1 and 2 show how the pregnancy outcomes were associated with the family composition and contraception variables. The association between desired family size and pregnancy outcomes was significant ($p<0.001$ in all countries). Those, who had not yet reached their desired family size were more likely to experience a wanted birth than those who had. Whether women who had already reached or exceeded their desired family size chose to give birth or to abort varied by country. Some women reported the outcome pregnancy having been wanted even if that meant they exceeded their desired family size, the most extreme case being Tajikistan, where 55% of pregnancies to women who had already exceeded their desired family size were reported as wanted births. In all countries, women who had children of only one gender were less likely to report an unintended pregnancy than those who had children of both genders (Figure 1).

[Figure 1 here]

In all countries, a short interval since last birth was associated with more reported unintended births and abortions than long or medium intervals ($p<0.001$ in all countries). While using contraception during the month before the outcome pregnancy was positively associated with reporting an abortion or unintended birth ($p<0.001$ in all countries), there was a significant proportion of women, who had used contraception before the month they became pregnant, but nevertheless reported the pregnancy as wanted at the time of conception (Figure 2). Some of these women may have discontinued contraception in order to become pregnant (or for other reasons), whereas others may have experienced a contraceptive failure. Although it would be

of interest to distinguish between pregnancies which resulted from contraceptive failure and those which occurred after method discontinuation, this information is not available for all of the countries covered by our analysis.

[Figure 2 here]

Likelihood of unintended pregnancy

In all countries but Ukraine family gender composition was associated with the likelihood of an unintended pregnancy. Women who only had children of one gender (whether girls or boys), were less likely than those who already had children of both genders to experience an unintended pregnancy (Table 3). We conducted sensitivity analyses only including multiparous women to check whether these results were driven by women with only one child. The results stayed qualitatively the same, but the effect of having only boys compared to having both genders was no longer significant in Albania, Armenia, Azerbaijan, Colombia and Nepal (not shown, available on request). In Bolivia and Cambodia, the effect of having only girls compared to having both genders became non-significant (not shown, available on request).

[Table 3 here]

In all countries, a short birth interval was positively associated with the likelihood of an unintended pregnancy, and in most countries (excluding Armenia, Azerbaijan and Tajikistan) a long birth interval was negatively associated with such likelihood (Table 3).

In all countries, the likelihood of an unintended pregnancy was lower among those who had not yet reached their desired family size than those who had reached it. Interestingly, in Albania, Armenia, Azerbaijan and Ukraine the likelihood of an unintended pregnancy was *lower* among those who had exceeded their desired family size than those who had reached the desired size. In Bolivia, Indonesia, Nepal and the Philippines the likelihood was higher and not significant in the rest of the countries. In Albania, Azerbaijan, Bolivia, Cambodia and Tajikistan those with three or more children were more likely than those with 1-2 children to report an unintended pregnancy, whereas in Philippines they were less likely to report one (Table 3).

In all countries, having used contraception the month before the outcome pregnancy was positively and strongly associated with the likelihood of experiencing an unintended pregnancy. In Bangladesh, Cambodia, Colombia and Indonesia, the odds were higher if the woman was using more effective methods rather than less effective methods, when compared to the reference group of non-users, as expected. Surprisingly, in the other countries, the odds were

higher for those who used less effective methods (Table 3). Full results are available in Appendix Table 1.

Likelihood of abortion among women who had an unintended pregnancy

In Armenia, Azerbaijan, and Cambodia women who only had children of one gender were less likely to choose an abortion than those who had both genders, whereas in Indonesia they were more likely to choose an abortion. In Bangladesh and Nepal, those who only had girls were more likely to report an abortion than those who had both genders. In the other countries, the effect was not significant (Table 4). Again, we conducted sensitivity analyses only including multiparous women to check whether these results were driven by women with only one child. The results were no longer significant for most countries, apart from Azerbaijan and Indonesia. In Azerbaijan those with only girls were less likely to choose abortion, but in Indonesia they were more likely to do so (not shown, available on request).

[Table 4 here]

In most countries, the odds of abortion were higher among those who had a short birth interval than those with a medium interval. A long interval was positively associated with the likelihood of abortion in Colombia and Indonesia (Table 4).

Family size was only significant in Azerbaijan, where those who had three or more children were more likely to have an abortion than those who had 1-2. In most countries having not yet reached the desired family size was negatively associated with the odds of abortion, but in four countries (Bolivia, Colombia, Indonesia and the Philippines) the association was not significant. Perhaps surprisingly, in Albania and Cambodia having exceeded desired family size was also negatively associated with the likelihood of abortion (Table 4).

Having used less effective contraception before the outcome pregnancy was positively associated with the likelihood of an abortion in Azerbaijan, Bangladesh, Bolivia, Cambodia, and Nepal. Having used more effective contraception before the outcome pregnancy was positively associated with the likelihood of an abortion in Azerbaijan, but negatively in Colombia and Indonesia. The association was not significant in the other countries (Table 4). Full results are available in Appendix Table 2.

DISCUSSION

Family gender composition

Our results indicate that women prefer to have children of both genders, as their likelihood of reporting an unintended pregnancy was much lower if they only had children of one gender than if they already had both. Our results are in line with studies in Pakistan[20], and India[41] where despite strong son preference, couples expressed a desire to have at least one daughter as well. However, some of these associations may have been driven by women with only one child preferring to have another child (potentially of any sex), as some of the significant associations disappeared, once women who only had one child before the outcome pregnancy were removed from the model. The effect of having only boys compared to having both genders was no longer significant in Albania, Armenia, Azerbaijan, Colombia and Nepal signalling that in these countries women were more likely to settle for two (or more) boys or (at least) one child of each gender, but less so for two or more girls only. In Bolivia and Cambodia, however, women were more likely to settle for two (or more) girls or (at least) one child of each gender, but less so for two (or more) boys only.

Family gender composition was differently associated with the likelihood of choosing an abortion than with the likelihood of experiencing an unintended pregnancy. In most countries no significant association was found. In Armenia, Azerbaijan and Cambodia those with children of only one gender were less likely to abort than those with both genders indicating a preference to have children of both genders. Again, these results were partly driven by women, who only had one child (and hence by definition children of only one gender). When only women with two or more children were included in the analyses, the results remained significant in one country, Azerbaijan, where those with two (or more) girls were less likely to choose an abortion than women with other gender combinations signalling son preference. This is supported by the high sex ratio at birth in Azerbaijan (Table 1). Other studies have also shown family gender composition can affect abortion decisions[21,41,42], but ours is different, as it shows whether women who experienced an unintended pregnancy choose an abortion depending on the gender of their existing children. In Azerbaijan, son preference may be strong enough that women choose to keep an unintended pregnancy if they only have girls, even though abortions are not uncommon otherwise.

In Indonesia, those who had children of one gender only were, perhaps surprisingly, more likely to choose an abortion than those with both genders. While women with children of both genders

in Indonesia were less likely to report an unintended pregnancy, the direction of association changed in the abortion model. It may be that the results are not fully reliable due to the small number of reported abortions in Indonesia, however. Future studies should examine this in more detail.

The lack of significant associations between family gender composition and the likelihood of choosing an abortion among those, who experienced an unintended pregnancy in the rest of the countries may mean that in these contexts gender of existing children is not an important factor, when women who experienced an unintended pregnancy weigh their abortion decisions. However, it could also be that some of the associations failed to reach statistical significance due to relatively small number of women reporting abortions due to underreporting of the event. More studies on the topic are needed.

Desired family size

As expected, in all countries women who had not reached their desired family size were less likely to report their most recent pregnancy as unintended than those who had reached it. In most countries (apart from Bolivia, Colombia, Indonesia and the Philippines), those women were also less likely to choose abortion if they experienced an unintended pregnancy.

Interestingly, in Albania, Armenia, Azerbaijan and Ukraine those who had already exceeded their desired family size, were less likely to report an unintended pregnancy than those, who were at their exact desired family size. In Albania they were also less likely to choose an abortion. These are all European and Central Asian countries, which are either post-Soviet (Armenia, Azerbaijan, and Ukraine) or post-communist states (Albania). In the post-Soviet contexts, women reported much higher levels of abortion and lower levels of unintended births than in the other countries of the study. These states traditionally had difficult access to modern contraception, but relatively easy and non-stigmatised access to abortion.[54–57] While reporting an abortion seems to be more liberal in these contexts than in the other countries of our study, reporting an existing child as unintended may be stigmatised. It could also be that in the context of liberal abortion legislation and lower abortion stigma, women simply carry fewer unintended pregnancies to term. In Albania, abortion was only allowed under strict medical grounds until 1990, but it shares the difficult access to modern contraception with the post-Soviet states.[58,59] Despite the differences in the history of abortion legislation, the culture around reporting existing children as unintended may still be similar in Albania to the other Eastern European/Central Asian countries of our study.

Moreover, these results raise questions regarding what we measure when we ask women about their pregnancy intentions and desires. The way women internalise and report their pregnancy intentions are complex and culturally specific.[60] The measure of the desired family size might relate to the number of children a woman would like to have under ideal conditions in life, which might not match the actual life circumstances. This mismatch has been found to explain the discrepancies between the reported fertility intentions and fertility behaviour[61], and could possibly also be one of the reasons for the apparent inconsistencies in the reporting of pregnancy intentions and women's desired family size.

Interval since last birth

Both models showed that in the majority of the countries in our study, a short interval since last birth was associated with a higher likelihood of unintended pregnancy and abortion, which has important policy implications. Women wish to space their pregnancies and many will use abortion to do so, when faced with an unintended pregnancy. In countries such as Indonesia, Philippines and Bolivia, more than 50% of women had an unmet need for contraception in the postpartum period; in Nepal and Bangladesh this percentage was as high as 84 and 74, respectively.[62] Given that postpartum family planning is an important factor for birth spacing[63], our findings suggest that contraceptive use among postpartum women needs more support in the countries covered by our analysis.

Contraceptive use month before pregnancy

Contraceptive use during the month before the outcome pregnancy was strongly and positively associated with reporting an unintended pregnancy. This points to women with a stronger motivation to avoid becoming pregnant being more likely to use a method. In three countries (Bangladesh, Colombia and Indonesia), where modern contraceptive use was relatively common (i.e. above 40%, see Table 1), the association was stronger among those, who used a more effective method than those using a less effective method. It may be that the choice of contraceptive method is associated with the motivation to avoid pregnancy in these contexts, where access to modern contraception is relatively straightforward. However, there were exceptions to this rule, as for instance in Ukraine 38% of women used modern contraceptives, but nevertheless the odds for reporting a pregnancy as unintended was lower among the users of more effective than less effective methods signalling that the contraceptive method choice may not reflect the strength of motivation to avoid pregnancy in all contexts.

The association between contraceptive use and the likelihood of choosing an abortion was much less clear. In some countries, contraceptive users were more likely to choose abortion than non-users, but in more than half of the countries the association was not significant. In Colombia and Indonesia, those using more effective contraceptive methods were less likely to choose an abortion than non-users – which is different to the unintended pregnancy model. This may be due to there being a difference between fertility and pregnancy management – while a woman may seek to avoid pregnancy by using a contraceptive method, the situation changes, when an unintended pregnancy actually occurs. The decision to abort depends on the circumstances around that specific pregnancy[37] and may not agree with women's pregnancy intentions prior to that pregnancy.

Strengths and limitations

The strengths of our study include the focus on cross country comparisons and the large sample size. This is the first multi-country study which looked into the determinants of unintended pregnancy (including both unintended births and abortions) and unintended pregnancy resolution in a range of low- and middle-income countries.

The main limitation is the difficulty in measuring abortion and unintended pregnancy. As discussed in the **Background** section, women tend to underreport abortions and prospective reports of pregnancy intentions might not match the retrospective ones. We believe that studying these phenomena is important nevertheless using the data that we do have. Future studies should focus on developing methods that can better capture these underreported events.

In most of the European and Central Asian post-Soviet countries (Armenia, Azerbaijan, and Ukraine) women reported more abortions and fewer unintended births than in the other countries. These differences in the reporting patterns indicate that culture and stigma around abortions and unintended pregnancy impacts what women report – and consequently, the results of our study. Thus, some of the results reported here may reflect differences in the likelihood to report abortion/unintended pregnancy by population subgroup rather than differences in the propensity to experience these events. Nevertheless, we believe this study contributes to the literature given the lack of international comparisons around this topic in low- and middle income countries.

There were some further limitations in the data. Since most variables were only measured at the time of the survey rather than retrospectively, we had to assume that for instance, women's level of education and their marital status had not changed in between the outcome pregnancy

and the survey interview. Similarly, we had to assume the women had not changed their family size preferences as a result of their most recent pregnancy. While these assumptions meant that we may have misclassified a minority of the women into the wrong marital and education categories, we do not believe the results of the study would have been fundamentally different if retrospective data had been available, as these were control variables and thus not the main focus of the study. Future longitudinal studies should examine the extent to which women change their reports of the desired number of children as a result of new pregnancies.

CONCLUSIONS

Despite different country context and presumably different cultural propensities to report unintended pregnancies, the individual level 'determinants' of unintended pregnancy were quite similar across countries. The relationship between our main explanatory variables and abortion was more context specific than that of unintended pregnancy. This may be due to variability in access to abortion and higher underreporting of this outcome affecting our results. It may also be a sign of the decision-making processes for pregnancy and fertility management being significantly different. While a pregnancy may be unintended, the decision regarding whether to abort depends on the individual and societal circumstances around that specific pregnancy.[37] More research on the topic is needed, ideally using longitudinal data to avoid some of the limitations of the current study. Innovative ways to measure abortion and unintended pregnancy would also be welcomed in any such data collection efforts.

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Table 1. Summary of country contexts.

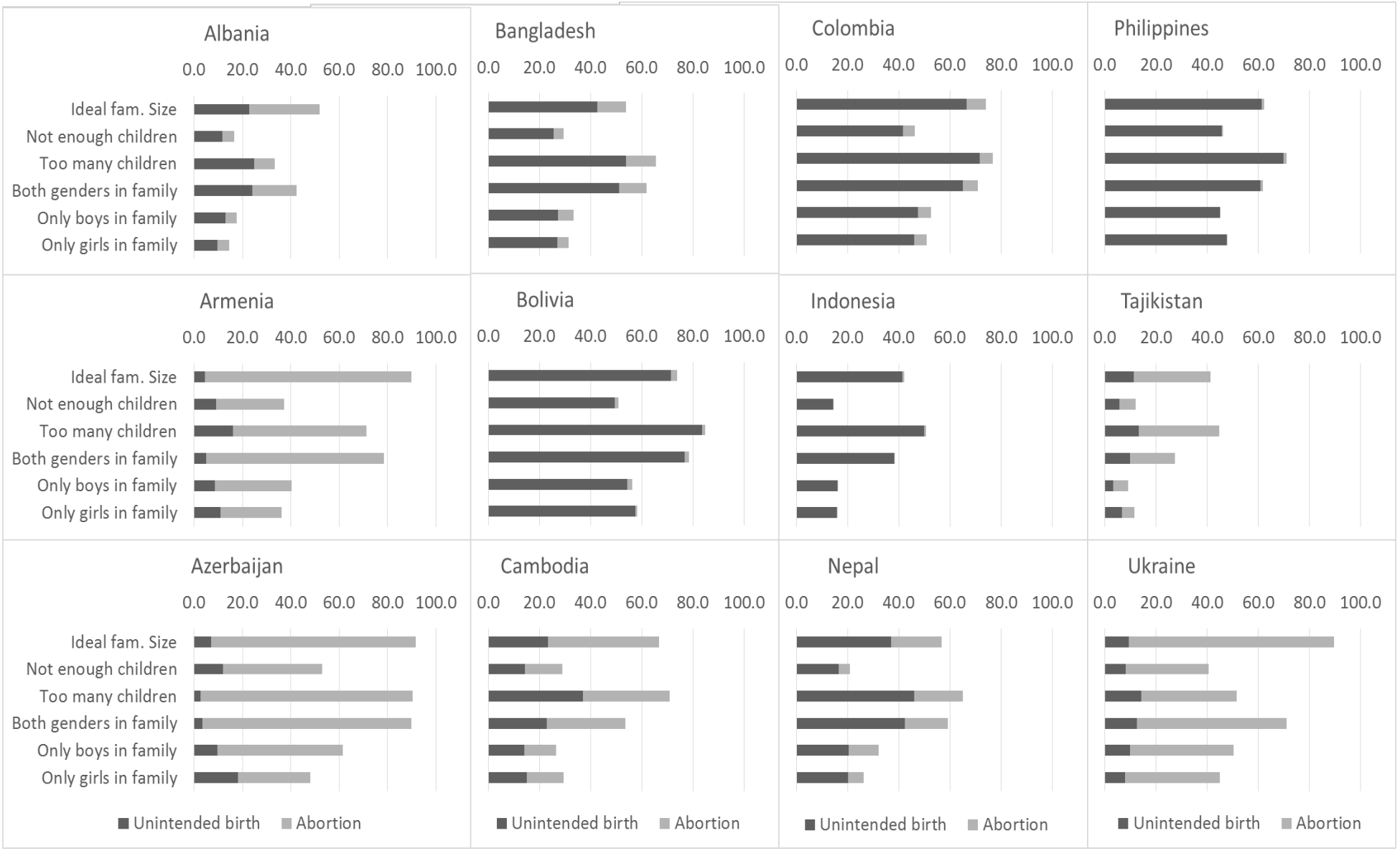
Country	**Albania**	**Armenia**	**Azerbaijan**	**Bangladesh**	**Bolivia**	**Cambodia**	**Colombia**	**Indonesia**	**Nepal**	**Philippines**	**Tajikistan**	**Ukraine**
Year of DHS	*2008-9*	*2010*	*2006*	*2007*	*2008*	*2014*	*2010*	*2012*	*2011*	*2003*	*2012*	*2007*
Abortion law*	On request	On request	On request	Abortion to save life; MR available on request until 10 gestational weeks.	Woman's health, incest, rape	On request	Woman's (mental) health, foetal indication, rape	Foetal impairment, to save woman's life, rape	On request	Not allowed	On request	On request
Abortion rate estimate per 1000 women aged 15-49 [year]	10.8 [2010][64]	19 [2011][65]	13 [2012][65]	29 (10 MR) [2014][66]	Not available	28 [2010][67]	39 [2008][68]	37 [2000][69]	42 [2014][70]	27 [2000][71]	9 [2012][65]	16 [2012][65]
Births wanted later or not at all†, %	12.6	8.4	16.8	28.9	61.2	15.5	52.2	13.6	25.7	44.3	5.3	13.8
Contraceptive prevalence (all methods)†, %	48.0	33.9	32.0	52.1	41.3	38.5	61.2	45.7	38.2	31.6	18.9	50.9
Contraceptive prevalence ("modern" methods)†, %	7.9	16.9	9.0	44.4	24.0	26.6	56.9	42.7	33.2	21.6	17.5	38.3
TFR†	1.6	1.7	2.0	2.7	3.5	2.7	2.1	2.6	2.6	3.5	3.8	1.2
Mean ideal number of children†	2.6	2.5	2.5	2.3	2.4	3.1	2.2	2.6	2.1	3.0	3.6	2.0
Sex ratio at birth‡	1.08	1.14	1.16	1.05	1.05	1.05	1.05	1.05	1.07	1.06	1.07	1.07

Notes: (*) Source: worldabortionlaws.com and https://www.guttmacher.org/report/menstrual-regulation-postabortion-care-bangladesh; (†) Source: statcompiler.com/en/; (‡) Source: World Population Prospects 2017 (for years 2010-15); MR = Menstrual regulation.

Table 2. Descriptive statistics by country: pregnancy outcomes, women's age and parity (overall and by gender).

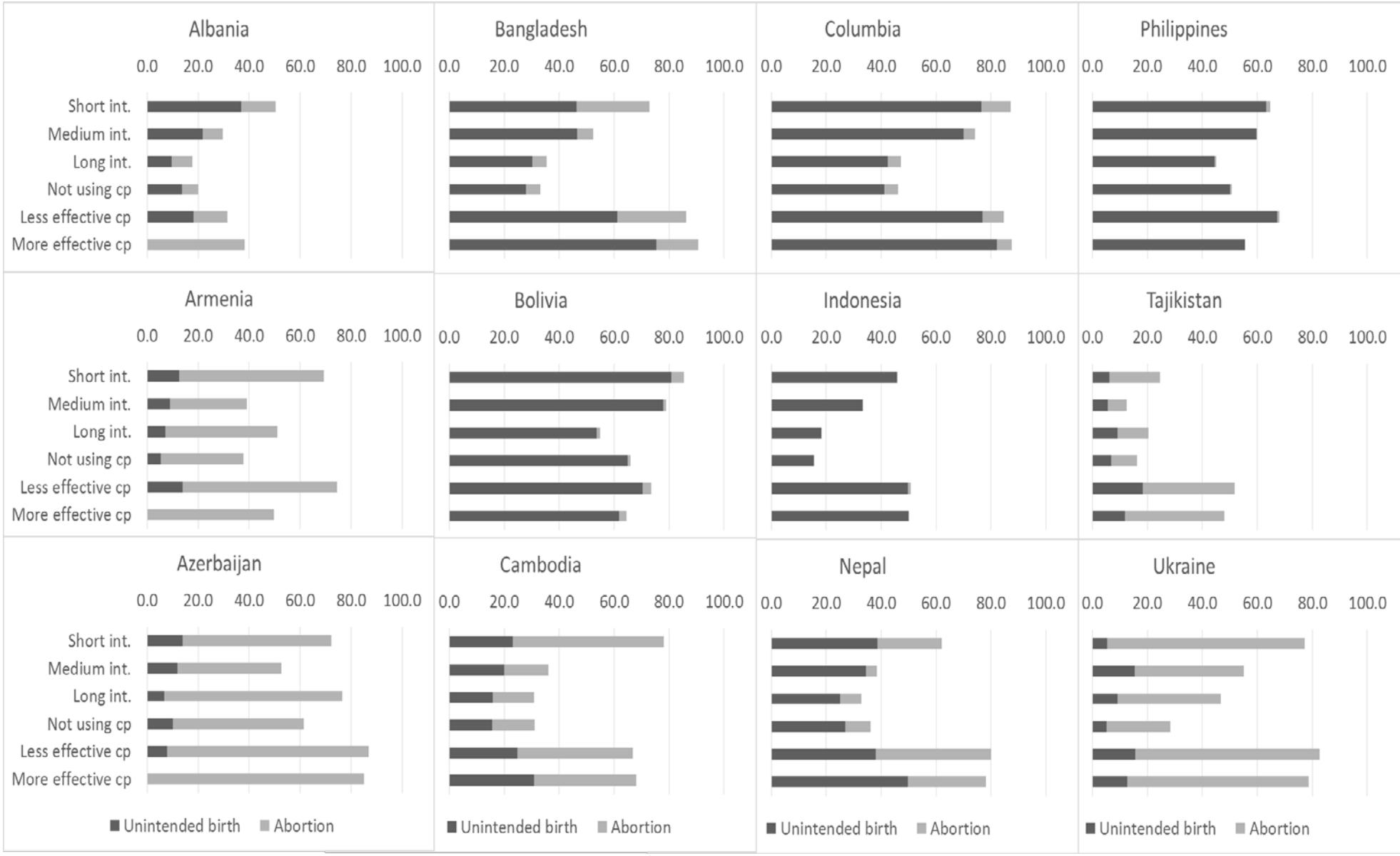
				Age	Parity	# of boys	# of girls
	Pregnancy outcomes	**%**	**N**	**Mean**	**Mean**	**Mean**	**Mean**
Albania	*Wanted birth*	77.1	769	31.6	1.7	0.7	1.0
	Unintended birth	14.5	165	30.7	2.1	1.0	1.1
	Abortion	8.3	89	34.1	2.3	1.1	1.3
	Total	100.0	1023	31.7	1.8	0.7	1.0
Armenia	*Wanted birth*	49.5	495	29.0	1.4	0.7	0.7
	Unintended birth	8.3	70	28.7	1.4	0.7	0.7
	Abortion	42.2	404	32.4	2.1	1.1	1.0
	Total	100.0	969	30.4	1.7	0.9	0.8
Azerbaijan	*Wanted birth*	29.5	573	29.0	1.5	0.7	0.8
	Unintended birth	9.1	185	28.5	1.5	0.6	0.9
	Abortion	61.3	1177	33.1	2.3	1.3	1.1
	Total	100.0	1935	31.5	2.0	1.0	1.0
Bangladesh	*Wanted birth*	56.8	1897	27.7	1.8	0.9	1.0
	Unintended birth	35.8	1226	28.9	2.5	1.2	1.2
	Abortion	7.4	251	30.1	2.6	1.3	1.3
	Total	100.0	3374	28.3	2.1	1.0	1.1
Bolivia	*Wanted birth*	32.6	1478	31.1	2.0	1.0	1.0
	Unintended birth	66.0	2903	31.7	3.1	1.5	1.6
	Abortion	1.4	68	30.0	2.7	1.6	1.1
	Total	100.0	4449	31.5	2.7	1.4	1.4
Cambodia	*Wanted birth*	63.0	2717	31.0	1.8	0.9	0.8
	Unintended birth	17.4	653	32.2	2.5	1.3	1.3
	Abortion	19.5	771	33.1	2.6	1.3	1.3
	Total	100.0	4141	31.6	2.1	1.1	1.0
Colombia	*Wanted birth*	42.3	3686	31.3	1.6	0.8	0.8
	Unintended birth	52.4	5067	30.0	2.2	1.1	1.1
	Abortion	5.3	460	30.6	1.9	1.0	0.9
	Total	100.0	9213	30.6	1.9	1.0	0.9
Indonesia	*Wanted birth*	77.7	7512	32.6	1.7	0.9	0.8
	Unintended birth	22.1	2015	34.5	2.3	1.2	1.1
	Abortion	0.2	18	38.1	2.3	1.2	1.1
	Total	100.0	9545	33.0	1.8	0.9	0.9
Nepal	*Wanted birth*	59.6	1728	28.4	1.8	0.8	1.0
	Unintended birth	28.6	848	30.4	2.8	1.3	1.5
	Abortion	11.8	383	31.1	2.5	1.3	1.2
	Total	100.0	2959	29.3	2.2	1.0	1.2
Philippines	*Wanted birth*	45.8	1609	31.9	2.5	1.3	1.2
	Unintended birth	53.6	1899	32.1	3.1	1.6	1.5
	Abortion	0.6	20	33.5	3.7	2.1	1.6
	Total	100.0	3528	32.0	2.9	1.5	1.4
Tajikistan	*Wanted birth*	82.0	2151	29.7	2.2	1.1	1.1
	Unintended birth	7.1	167	32.7	3.0	1.5	1.5
	Abortion	10.9	307	33.7	3.5	1.8	1.6
	Total	100.0	2625	30.4	2.4	1.2	1.2
Ukraine	*Wanted birth*	48.2	384	31.0	1.3	0.6	0.6
	Unintended birth	9.6	76	30.8	1.6	0.9	0.7
	Abortion	42.2	336	32.9	1.5	0.8	0.7
	Total	100.0	796	31.8	1.4	0.7	0.7

Figure 1. The percentages of unintended pregnancies in each country by the outcome of the pregnancy (birth or abortion) and family composition variables.



Notes: All bivariate associations significant at $p<0.001$.

Figure 2. The percentages of unintended pregnancies in each country by the outcome of the pregnancy (birth or abortion) and pregnancy history variables.



Notes: All bivariate associations significant at $p<0.001$.

Table 3. The likelihood of an unintended pregnancy, odds ratios (ORs).

		Albania	**Armenia**	**Azer-baijan**	**Bangla-desh**	**Bolivia**	**Cam-bodia**	**Colombia**	**Indo-nesia**	**Nepal**	**Philip-pines**	**Tajikistan**	**Ukraine**
		n=1010	*n=952*	*n=1869*	*n=3172*	*n=4138*	*n=4023*	*n=8928*	*n=8140*	*n=2787*	*n=3441*	*n=2568*	*n=754*
Family gender composition	*Both genders*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Boys only	**0.38**	**0.23**	**0.27**	**0.43**	**0.68**	**0.49**	**0.72**	**0.49**	**0.61**	**0.56**	**0.45**	0.62
	Girls only	**0.23**	**0.21**	**0.17**	**0.34**	**0.76**	**0.55**	**0.62**	**0.50**	**0.35**	**0.62**	**0.65**	0.50
Desired family size	*Ideal # of children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Not enough	**0.20**	**0.09**	**0.13**	**0.43**	**0.41**	**0.25**	**0.36**	**0.33**	**0.23**	**0.49**	**0.29**	**0.07**
	Too many	**0.34**	**0.15**	**0.43**	1.26	**1.44**	0.94	0.92	1.05	1.44	**1.54**	0.86	**0.07**
Interval since last birth	*Short <19m*	2.10	**5.51**	**3.93**	**3.72**	**2.27**	**8.92**	**2.64**	**2.28**	**2.56**	**1.44**	**2.82**	**6.57**
	Medium 19-36m	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Long 37+m	**0.33**	0.85	1.52	**0.44**	**0.35**	**0.64**	**0.34**	**0.45**	**0.54**	**0.55**	0.89	**0.42**
Contraceptive use before pregnancy	*Not using cp*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Least effective	**1.60**	**5.76**	**3.96**	**15.36**	**1.99**	**5.22**	**6.63**	**4.94**	**7.20**	**2.09**	**6.05**	**18.14**
	More effective	1.56	1.62	2.45	**20.30**	**1.60**	**6.27**	**8.95**	**5.18**	**6.20**	1.33	**4.12**	**13.26**
Family size	1-2 children	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	3+ children	**1.89**	0.95	**2.23**	0.98	**1.64**	**1.41**	1.17	1.04	0.92	**0.74**	**1.68**	0.69

Notes: bold ORs significant at 5% level. Controlling for parity, age of women, education, place of residence, wealth, and marital status.

Table 4. The likelihood of an abortion among those who had an unintended pregnancy, odds ratios (ORs).

		Albania	**Armenia**	**Azer-baijan**	**Bangla-desh**	**Bolivia**	**Cam-bodia**	**Colombia**	**Indo-nesia**	**Nepal**	**Philip-pines**	**Tajikistan**	**Ukraine**
		n=250	*n=453*	*n=1312*	*n=1399*	*n=2722*	*n=1369*	*n=5355*	*n=1731*	*n=1064*	*n=1543*	*n=457*	*n=397*
Family gender composition	*Both genders*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Boys only	0.70	**0.32**	**0.30**	1.08	1.29	**0.64**	0.81	**3.73**	1.45	0.57	1.08	0.77
	Girls only	0.87	**0.24**	**0.11**	0.78	0.36	**0.65**	0.76	**6.46**	0.51	0.51	0.47	0.99
Desired family size	*Ideal # of children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Not enough	**0.38**	**0.23**	**0.43**	**0.57**	1.00	**0.62**	0.99	0.41	**0.44**	0.40	**0.45**	**0.40**
	Too many	**0.25**	0.09	1.05	1.08	0.49	**0.37**	0.76	2.87	1.91	0.83	0.80	0.48
Interval since last birth	*Short <19 months*	1.05	2.34	**1.95**	**4.64**	**2.74**	**4.09**	**2.12**	2.59	**5.48**	**6.09**	**2.80**	**6.59**
	Medium 19-36m	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Long 37+m	1.47	0.82	1.50	0.87	1.28	0.88	**1.66**	**6.35**	1.22	3.35	0.61	1.06
Contraceptive use before pregnancy	*Not using cp*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Least effective	0.94	0.66	**1.65**	**1.96**	**2.40**	**1.95**	0.78	1.38	**2.33**	0.77	1.45	1.12
	More effective	1.00	1.00	**73.24**	1.22	1.57	1.58	**0.48**	**0.08**	1.47	1.00	1.90	0.90
Family size	1-2 children	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	3+ children	1.54	0.89	**2.28**	0.66	1.87	1.21	0.73	0.58	0.40	0.92	1.90	0.58

Notes: bold ORs significant at 5% level. Controlling for parity, age of women, education, place of residence, and wealth.

Appendix Table 1. The likelihood of an unintended pregnancy, odds ratios (ORs), full results including control variables.

		Albania	Armenia	Azer-baijan	Bangla-desh	Bolivia	Cam-bodia	Col-ombia	Indo-nesia	Nepal	Philip-pines	Taji-kistan	Ukraine
Family gender composition	*Both genders*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Boys only	**0.38**	**0.23**	**0.27**	**0.43**	**0.68**	**0.49**	**0.72**	**0.49**	**0.61**	**0.56**	**0.45**	0.62
	Girls only	**0.23**	**0.21**	**0.17**	**0.34**	**0.76**	**0.55**	**0.62**	**0.50**	**0.35**	**0.62**	**0.65**	0.50
Desired family size	*Ideal # of children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Not enough	**0.20**	**0.09**	**0.13**	**0.43**	**0.41**	**0.25**	**0.36**	**0.33**	**0.23**	**0.49**	**0.29**	**0.07**
	Too many	**0.34**	**0.15**	**0.43**	1.26	**1.44**	0.94	0.92	1.05	1.44	**1.54**	0.86	**0.07**
Interval since last birth	*Short <19 months*	2.10	**5.51**	**3.93**	**3.72**	**2.27**	**8.92**	**2.64**	**2.28**	**2.56**	**1.44**	**2.82**	**6.57**
	Medium 19-36m	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Long 37+m	**0.33**	0.85	1.52	**0.44**	**0.35**	**0.64**	**0.34**	**0.45**	**0.54**	**0.55**	0.89	**0.42**
Contraceptive use month before pregnancy	*Not using cp*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Least effective	**1.60**	**5.76**	**3.96**	**15.36**	**1.99**	**5.22**	**6.63**	**4.94**	**7.20**	**2.09**	**6.05**	**18.14**
	More effective	1.56	1.62	2.45	**20.30**	**1.60**	**6.27**	**8.95**	**5.18**	**6.20**	1.33	**4.12**	**13.26**
Family size	*1-2 children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	3+ children	**1.89**	0.95	**2.23**	0.98	**1.64**	**1.41**	1.17	1.04	0.92	**0.74**	**1.68**	0.69
Age	*Age*	0.99	**1.05**	1.02	1.00	**0.98**	1.01	**0.98**	1.02	1.01	0.99	**1.04**	**1.07**
Education	*Up to primary*	1.74	0.91	1.14	0.88	**1.43**	1.58	1.19	0.90	0.74	0.95	0.49	0.39
	Secondary	2.19	**2.00**	0.94	1.15	1.07	1.59	1.23	1.04	1.29	1.03	**0.59**	0.79
	Higher	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Place of residence	*Urban*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Rural	0.92	0.57	**0.54**	**0.66**	0.92	**0.72**	0.91	0.82	0.77	0.97	1.07	0.70
Wealth	*Poorest*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Poorer	1.41	0.60	0.67	1.18	**0.73**	1.14	0.99	**1.44**	1.04	0.99	0.87	0.98
	Middle	1.47	1.17	0.88	1.22	**0.66**	1.17	0.92	1.32	**1.51**	0.94	1.18	1.02
	Richer	0.98	0.48	1.18	0.96	**0.60**	1.25	0.93	1.12	1.10	1.01	**1.57**	1.00
	Richest	1.28	0.77	1.38	0.87	**0.50**	1.18	**0.69**	1.00	1.28	0.81	1.38	0.56
Marital status	*No partner*	4.23	3.54	**7.33**	**5.05**	**1.98**	0.95	**2.22**	1.60	1.12	**1.62**	1.29	**3.87**
	Married/cohabiting	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

Notes: bold ORs significant at 5% level.

Appendix Table 2. The likelihood of an abortion among those who had an unintended pregnancy, odds ratios (ORs), full results including control variables.

		Albania	Armenia	Azer-baijan	Bangla-desh	Bolivia	Cam-bodia	Col-ombia	Indo-nesia	Nepal	Philip-pines	Taji-kistan	Ukraine
Family gender composition	*Both genders*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Boys only	0.70	**0.32**	**0.30**	1.08	1.29	**0.64**	0.81	**3.73**	1.45	0.57	1.08	0.77
	Girls only	0.87	**0.24**	**0.11**	0.78	0.36	**0.65**	0.76	**6.46**	0.51	0.51	0.47	0.99
Desired family size	*Ideal # of children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Not enough	**0.38**	**0.23**	**0.43**	**0.57**	1.00	**0.62**	0.99	0.41	**0.44**	0.40	**0.45**	**0.40**
	Too many	**0.25**	0.09	1.05	1.08	0.49	**0.37**	0.76	2.87	1.91	0.83	0.80	0.48
Interval since last birth	*Short <19 months*	1.05	2.34	**1.95**	**4.64**	**2.74**	**4.09**	**2.12**	2.59	**5.48**	**6.09**	**2.80**	**6.59**
	Medium 19-36m	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Long 37+m	1.47	0.82	1.50	0.87	1.28	0.88	**1.66**	**6.35**	1.22	3.35	0.61	1.06
Contraceptive use month before pregnancy	*Not using cp*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Least effective	0.94	0.66	**1.65**	**1.96**	**2.40**	**1.95**	0.78	1.38	**2.33**	0.77	1.45	1.12
	More effective	1.00	1.00	**73.24**	1.22	1.57	1.58	**0.48**	**0.08**	1.47	1.00	1.90	0.90
Family size	*1-2 children*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	3+ children	1.54	0.89	**2.28**	0.66	1.87	1.21	0.73	0.58	0.40	0.92	1.90	0.58
Age	*Age*	**1.10**	**1.12**	**1.06**	**1.06**	0.97	**1.04**	1.02	1.14	**1.10**	1.00	1.02	1.06
Education	*Up to primary*	0.56	0.61	0.68	0.79	0.87	0.96	**0.50**	0.13	0.81	0.29	0.26	1.00
	Secondary	0.89	0.84	**2.30**	1.18	1.56	1.14	0.71	0.84	1.26	**0.34**	0.71	0.52
	Higher	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Place of residence	*Urban*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Rural	0.53	1.70	0.60	0.94	0.53	1.04	0.92	**0.11**	0.79	1.01	0.75	0.68
Wealth	*Poorest*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
	Poorer	**3.87**	0.73	1.55	0.65	**3.56**	**2.21**	1.33	1.15	**2.24**	0.80	1.85	1.39
	Middle	3.15	1.39	1.01	0.98	1.87	**1.91**	1.06	4.87	**4.48**	0.96	**2.24**	1.14
	Richer	**4.67**	0.94	1.92	1.73	5.16	**2.23**	1.19	0.98	**5.73**	0.25	**4.06**	1.02
	Richest	3.75	1.30	1.67	**2.20**	3.61	**2.48**	1.64	6.68	**14.11**	1.00	**3.85**	2.58

Notes: bold ORs significant at 5% level.