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High level of sex ratio at birth in the Caucasus. A persistent phenomenon?

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Abstract

From the mid-1990s, sex ratio at birth in the three countries of the Caucasus abruptly increased to levels that had so far only been observed in certain regions of India and China where families have a very marked preference for male children. Whereas, up to 1995, sex ratio at birth seemed to be fixed at a level very close to the universal level of 1.05 male per 1 female, it reached 1.15 in Azerbaijan, 1.18 in Georgia, and as high as 1.20 in Armenia and the phenomenon was all the more striking as it occurred simultaneously in all three countries, in clear contrast to the neighboring countries. In the 2000s, according to official statistics, levels have stabilized in Azerbaijan at 1.16-1.17, seem to decrease slowly in Armenia (1.14 in 2006) and are subjected to very surprising fluctuations in Georgia (1.11 in 2007 vs 1.28 in 2008).

After the collapse of the USSR all the political, social, and administrative changes of the transition phase produced many disorders in these three specific countries, especially deteriorating national statistics reliability. However, a study managed on the 2000 Armenian Demographic and Health Survey (DHS) and the 1999 Georgian Reproductive and Health Survey (RHS) has confirmed the reality of this phenomenon. Patterns in parity progression ratio showed significant preference for males and special analysis of some questions indirectly evidence that selective abortion appeared to be the way to obtain children of the desired sex. It was also clear that most of the global effect is due to the third birth.

In the most recent years, sex ratio at birth has stopped increasing but it remains abnormally high in the three countries. In the same time, data quality of vital statistics is still questionable. Meanwhile, however, results of new surveys have been released: 2005 DHS in Armenia, 2006 DHS in Azerbaijan, and 2005 RHS in Georgia. The aim of this paper is to analyze data from these surveys and to see if recent trends confirm the first analyses, including Azerbaijan. Our analyses will contribute to a better understanding of the reasons for the persistence of a high sex ratio at birth in the three Caucasian countries. They should be used to make national authorities aware of the problem and to consider adequate health and gender policy.

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Introduction

The increase from the early 1990s of the sex ratio at birth in the Caucasus has been demonstrated few years ago (Meslé, Vallin and Badurashvili, 2007). Analyzing data from the 2000 Armenian Demographic and Health Survey (DHS) and the 1999 Georgian Reproductive and Health Survey (RHS), the authors confirmed trends provided by the official data which have to be carefully interpreted due to incompleteness of the civil registration. Since the beginning of the 2000s, official data continue to show high levels of SRB in the three countries and recent demographic/reproductive and health surveys allow new analysis in the three countries, especially the 2005 Armenian DHS, the 2006 Azerbaijanis DHS, and the 2005 RHS. After looking at the most recent trends in SRB, the objectives of the paper are to confirm the persistence of the high level of SRB, specific to the region, and to find new pieces of evidence of the phenomenon.

The high level of the sex ratio at birth in the Caucasus

In Armenia as well as in Azerbaijan, official data are based on civil registration and this is the unique source over time. Sex ratio at birth is thus calculated by dividing the number of male registered births by the number of female ones. In these two countries, we see the increase of the sex ratio at birth during the 1990s rising the level at more than 1.15 in the early 2000s (figure 1). In the most recent years, the increase has stopped but the level remains high (at around 1.16 in both countries). In Georgia, the source for calculating the SRB has changed over time: births were counted from the civil registration until 1995; the year after, official births became estimated resulting in a constant and stable SRB at 1.11; in 2003, a system was implemented crossing data from the civil registration and those from health services and in 2009, the system has changed once again with the creation of a new

agency. All these changes obviously led to the erratic trends observed in the most recent years (1.28 in 2008 and 1.04 in 2009) difficult to explain, even looking at the monthly trends (annex 1).

Specificity of the Caucasus in the region

When looking at the data of all the former republics of the USSR, especially in Central Asia, the three Caucasian countries are the only ones where has been observed such an increase in the SRB. Nevertheless, in South-Eastern Europe, two countries appear to also have an abnormal high level of SRB, Montenegro and Albania, but the levels observed there remain lower than that given by the official statistics in the three Caucasian countries (Figure 2). Currently, Armenia, Azerbaijan and Georgia which show similar SRB levels than that observed in China, remain very specific in the region. The assumption that it could be specific to all the geographical Caucasian area is not relevant because, when looking at the regional level, neighboring countries which share a frontier with one of the three Caucasian countries are not characterized by a higher level of SRB (Figure 3).

Confirmation of the high level of sex ratio at birth on the basis of different sources

However, as we already mentioned, results calculated according to the official statistics have to be carefully interpreted. As the civil registration is not complete, and we could assume – which is often the case – that it is not an actual phenomenon but an artefact due to a sex difference in the births registration: parents would more often register a male newborn than a female one. But, for the three countries, we hopefully have different sources which can be used for comparison: the demographic surveys which have been carried out in the three countries (the 2000 and 2005 Armenian DHS, the 2006 Azerbaijanis DHS[1], and the 1999 and 2005 Georgian RHS). Despite fluctuations due to small numbers which lead us to show some 5-year moving average, it seems that, according to the women declarations, the SRB has increased over time in the 1990s. Another source of comparison is the sex ratio at age 0 given by the population count at census. Assuming infant male mortality is higher than the female one and there is no sex-differential at this age in migration flows, SRB should be a little bit higher.

In the two countries, Armenia and Azerbaijan, all the sources are rather coherent with the official source: the civil registration (figure 4). In Georgia, the sex ratio at age 0 given by the data from the 2002 census appears to be coherent with the estimate given by the Department for statistics. This is a surprising result whereas the same year the SRB according to the civil registration would be close to 1.20. In the same time, the RHS surveys follow the same trends than in the two previous countries, a global increase during the 1990s.

More precisely, the SRB trends by birth order show it is higher with the order of the child. It has particularly increased starting from the 3rd birth during the 1990s. In Armenia and in Georgia, it appears that SRB has more recently increased since the 2nd and even the 1st birth (figure 5).

[1] One RHS has been carried out in Azerbaijan in 2001 however, data are not available except results published in their report.

A son preference in a context of a limited fertility

Different characteristics related to fertility can help us to discern a possible preference for boys which could explain this high SRB: the birth spacing, the parity progression ratio and the fertility intentions can be analyzed according to the parity and its sex composition.

In these countries, fertility behaviors and intentions occur in a context of a low fertility which has dramatically decreased in the three countries since many decades (figure 6). In Armenia and in Georgia, the total fertility rate is now even lower than 2 (1.7 and 1.6 respectively, see table 1) whereas it remains at this level in Azerbaijan where fertility has always been higher than in the two other countries.

The figure 7 shows the duration in months occurred on average between two children depending on the sex composition of the previous parity. This does not reveal any clear differences, which could let us suppose some evidence of differentials.

Except in Georgia where the probability of having a second child is a little bit lower when women have already a boy, there is no difference in the progression parity ratio for the second child in Armenia and in Azerbaijan (figure 8). However, the differences are large when looking at the probability of having a third child according to the already attained parity. In the three countries, the lowest probability regards women who have one boy and one girl, showing a satisfaction to have a mixed parity. However, the ratio is different comparing women who have two girls and those who have two boys, the firsts are characterized by a probability which is twice or even more higher than the seconds in Armenia (0.41 *vs* 0.22) and in Georgia (0.45 *vs* 0.18), revealing the willingness for them to continue to have children, presumably a son. The fertility intentions clearly confirm these differentials in fertility behaviors (figure 9) with a larger proportion of women (or their partner) who still want a child when they have two girls (e.g. 52% in Armenia) than when they have two boys (23%). For this variable, there is already a difference for Georgian women after their first child depending on its sex, which confirms what was observed regarding the progression parity ratio, but we also see that difference for Armenian women.

A sex-selective abortion?

When rejecting a possible artefact, only the sex-selective abortion can lead to such a rapid increase of SRB level. Abortions according to health services are largely under-reported (from 3 to 8 times less on official statistics than estimates according to surveys, depending on the country). But, during the Soviet period, there was a heavy reliance on abortion as a mean of fertility control in the USSR. Since 1991, the use of abortion has decreased for the benefit of modern effective contraceptive methods but it remains very high, especially in Caucasian countries where it is similar to the total fertility rate in Armenia and more or less in Azerbaijan, it is even twice higher in Georgia (table 1).

Table 1. Total abortion rate in the early 2000s in the three countries

	Armenia	Azerbaijan	Georgia
Period	2003-2005	2004-2006	2002-2005
Total abortion rate	1.7	2.3	3.1
Total fertility rate	*1.7*	*2.0*	*1.6*
Source	ADHS-2005	AzDHS-2006	GRHS-2005

In this context, it is difficult to discern a sex-selective behavior. According to the parity, we even see a result which could appear contradictory, that the probability of having an abortion is lower when women have only girls (figure 10). This is due to their willingness to have a son and the massive use of abortion for limiting the parity. In the Georgian survey, we could exclude mini abortions from the analysis, and we can observe that excluding them, the difference mostly disappears, without highlighting us about a possible sex-selective use of abortions (figure 11). In Azerbaijan, precision on most recent abortions were asked, especially the type of this abortion. The sex-selective abortion has to be done relatively late in the pregnancy, the time when it is possible to know the sex of the fetus. The dilation and curettage method is the one which could be an indirect way to discern such late abortions. In proportion, such a type of abortions has been more frequently done when the woman already has had one or two girls than at least one boy (figure 12): sex selective abortion could be here a possible explanation.

The reason for abortion were asked to women who recently aborted in the Azerbaijani and the Georgian surveys. But only the AzDHS-2006 has a clear category "child's sex selection" in the response choice. In total, only 3% of respondents declare about having aborted for child's sex preference. There is nevertheless a different distribution according to the parity of the women and this answer is larger given for women who have only two or three girls. More generally, those who have only girls more frequently answer that they aborted "for spacing births" than the "others" (figure 13). In the Georgian survey, the same is observed with a larger part of women who declared having aborted for spacing births when they only have female children (figure 14). In Georgia, a question about the use of an ultrasound test before recent abortions was asked with the knowledge of the sex of the fetus. The part of women who aborted after having done an ultrasound test and declaring knowing the sex of the fetus is small but it is larger for women who have only two or three girls than for the others (figure 15). In the same way, regarding to the duration of the pregnancy, women who had only girls are more frequent to have done a late abortion, at 12 weeks or more (figure 16). Those differentials confirm the possibility of sex-selective abortions.

Discussion-conclusion

This work is in progress, those results have to be confirmed, adding notably confidence intervals, there are also other analysis to do on the basis of data from the 2007 and 2009 Georgian Generation and Gender Surveys (GGS) which could also provide interesting results on gender issues and child sex's preferences. Regarding analysis, we would also like to look at SRB according to birth order using data from the civil registration or from health services, if available.

This sex-selective abortion is not obvious because it occurs in a context of a dramatic use of abortion in Caucasian countries for limiting the parity, but we have demonstrated a clear preference for boys in the three Caucasian countries and we assume a part of all the abortions are done to choose the sex of the child. Those results need to be highlighted by the existed literature on the subject and more generally on gender issues, in the Caucasus or in other countries where the phenomenon is observed as in China or in India. This research has to be continued as the sex preference remains largely unrecognized in those countries despite many pieces of evidence.

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Figures

Figure 1. Trends in sex ratio at birth since 1960 in the Caucasus, according to national statistics

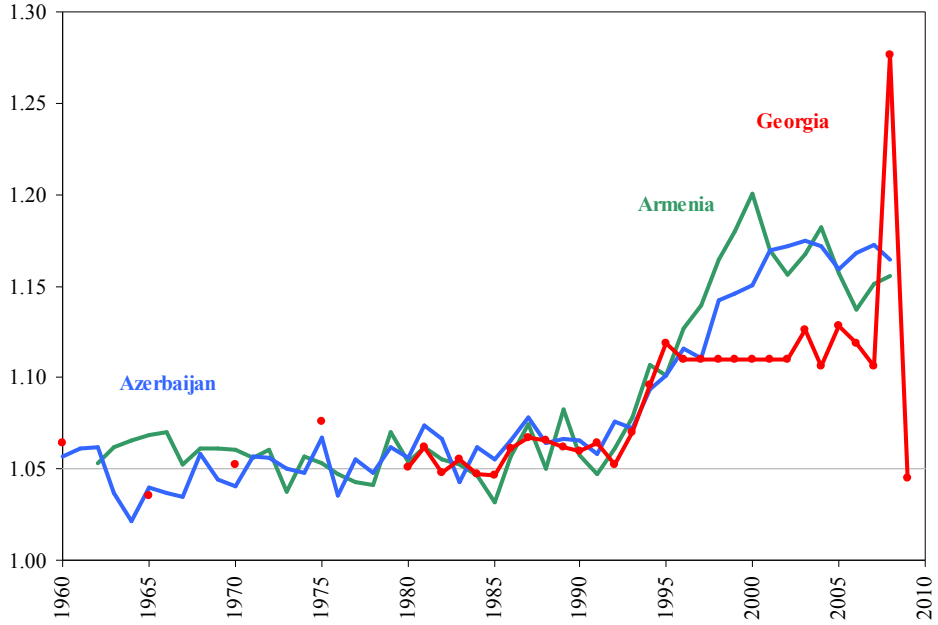


Figure 2. Trends in sex ratio at birth since 1980 in the Caucasus, Central Asia, and South-Eastern Europe, according to official statistics

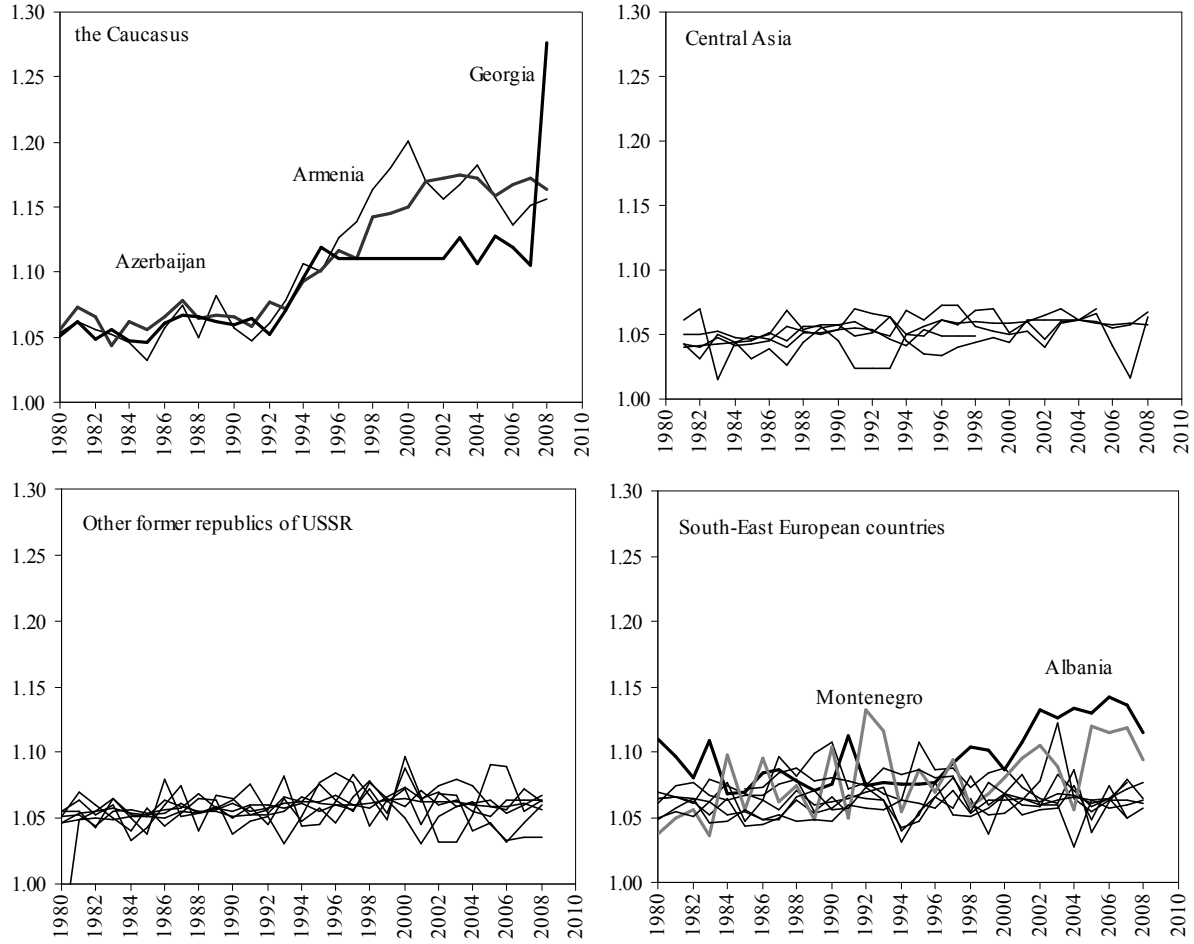


Figure 3. Sex ratio at birth in the period 2006-2008 in the countries around the Caucasus (on the left) and at regional level (on the right)

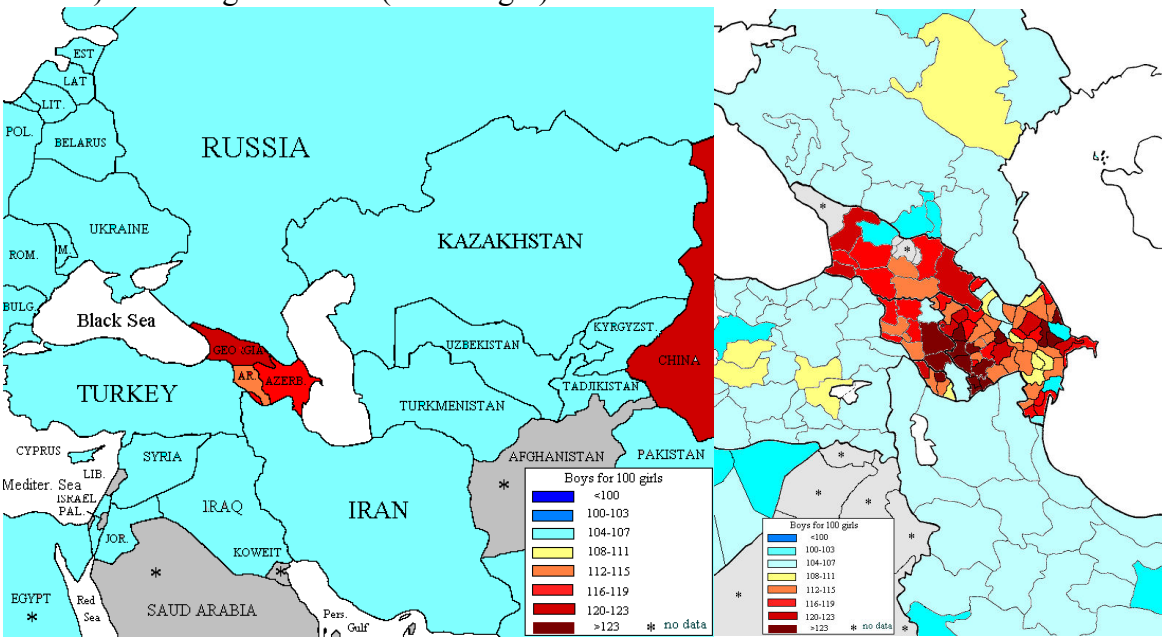


Figure 4. Trends in sex ratio at birth since 1980 in Armenia, Azerbaijan and Georgia according to different sources (5-year mobile average for DHS/RHS)

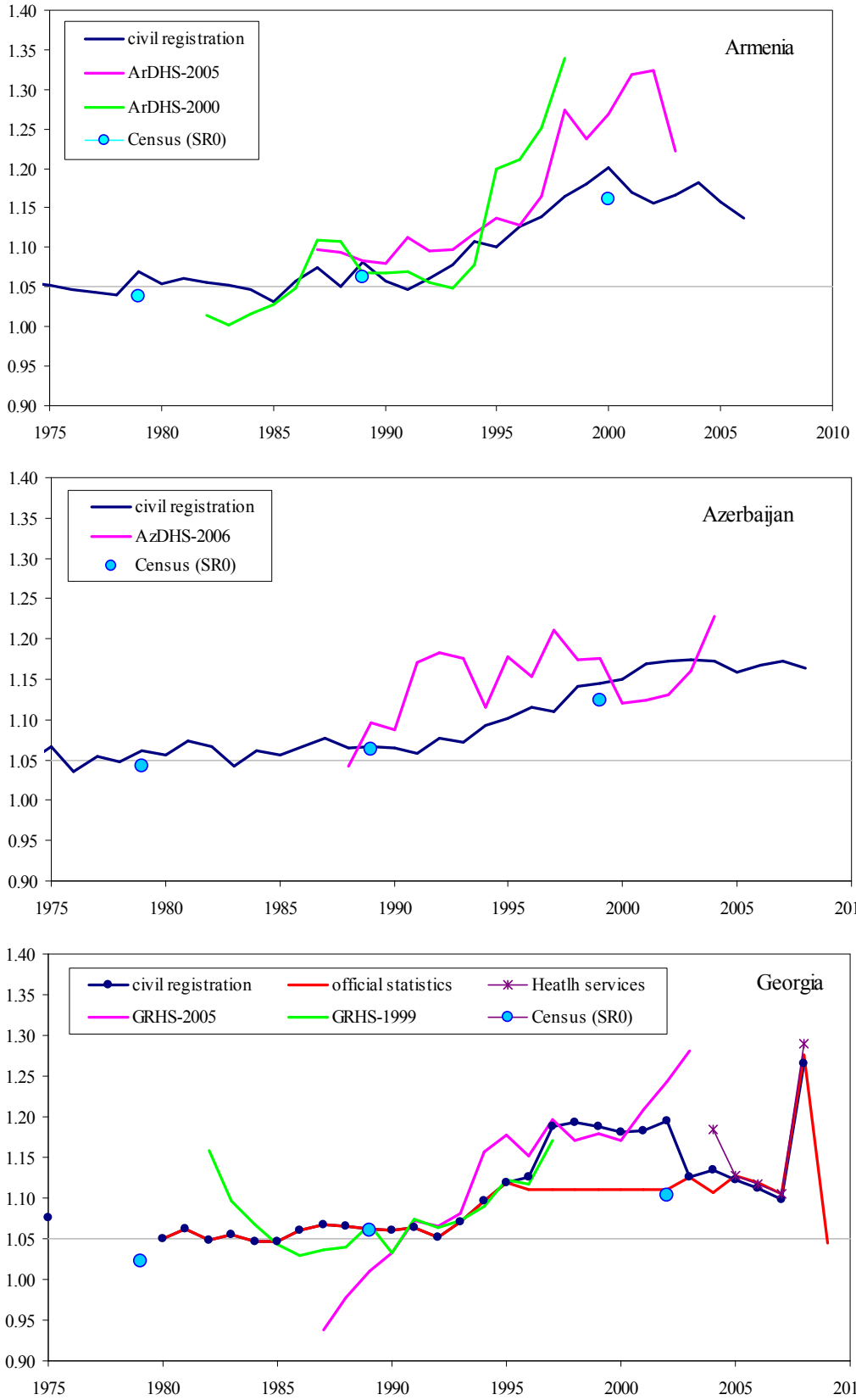
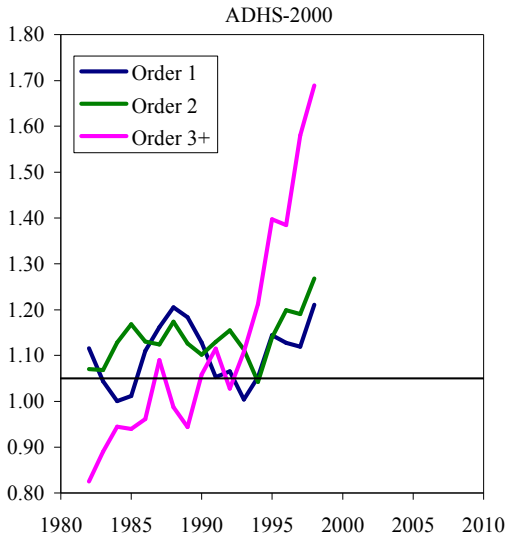
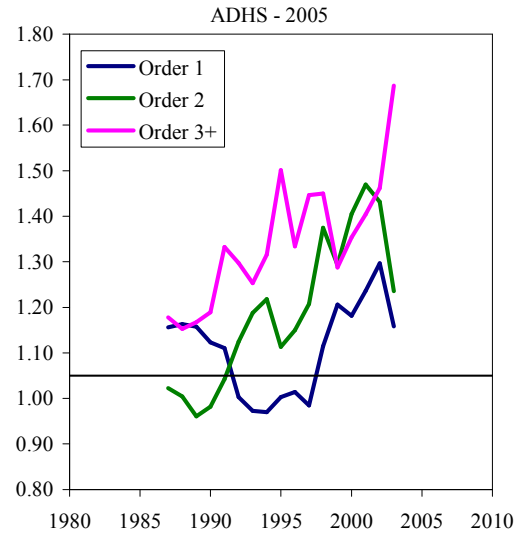


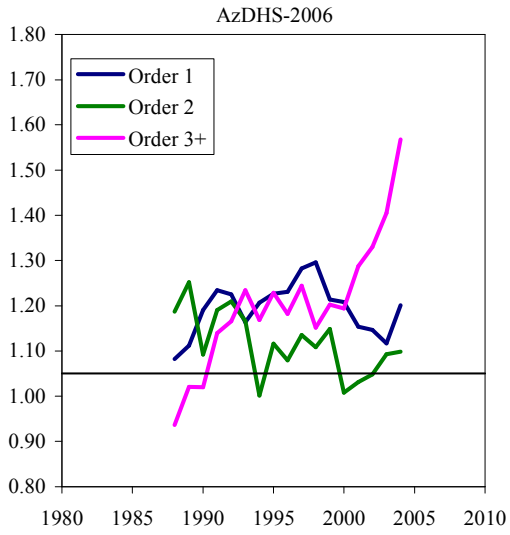
Figure 5. Trends in sex ratio at birth by birth order since 1980 (5-year moving averages)

Armenia

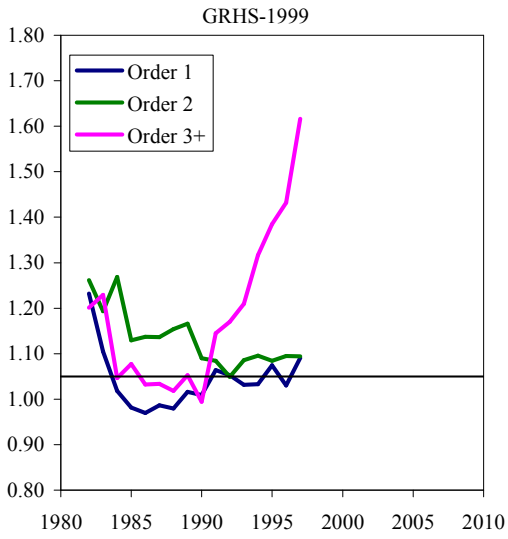




Azerbaijan



Georgia



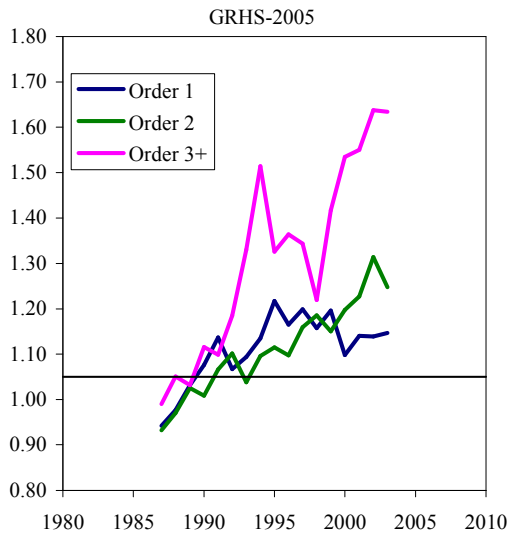


Figure 6. Trends in total fertility rate since 1960 in the Caucasus, according to UN estimates

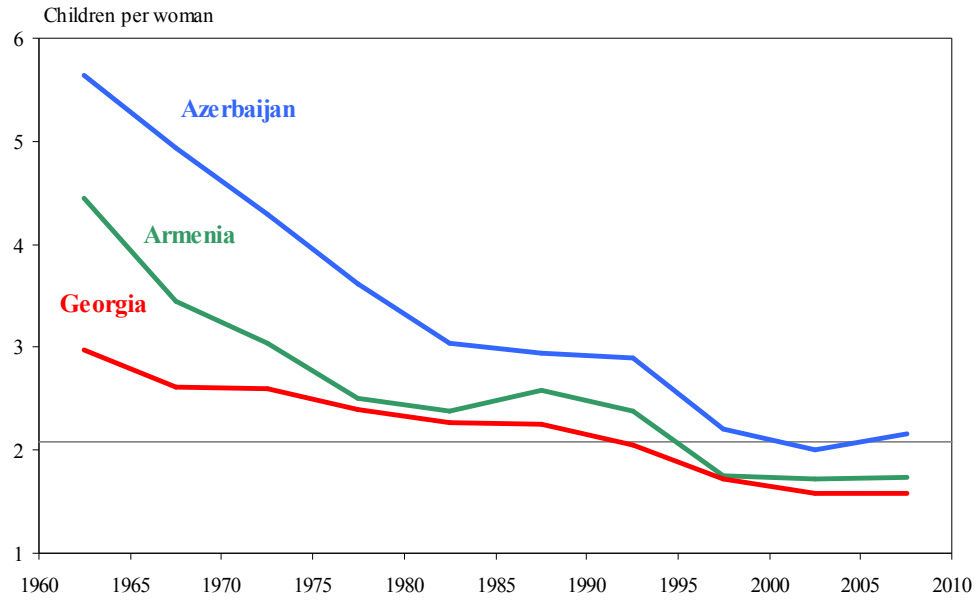
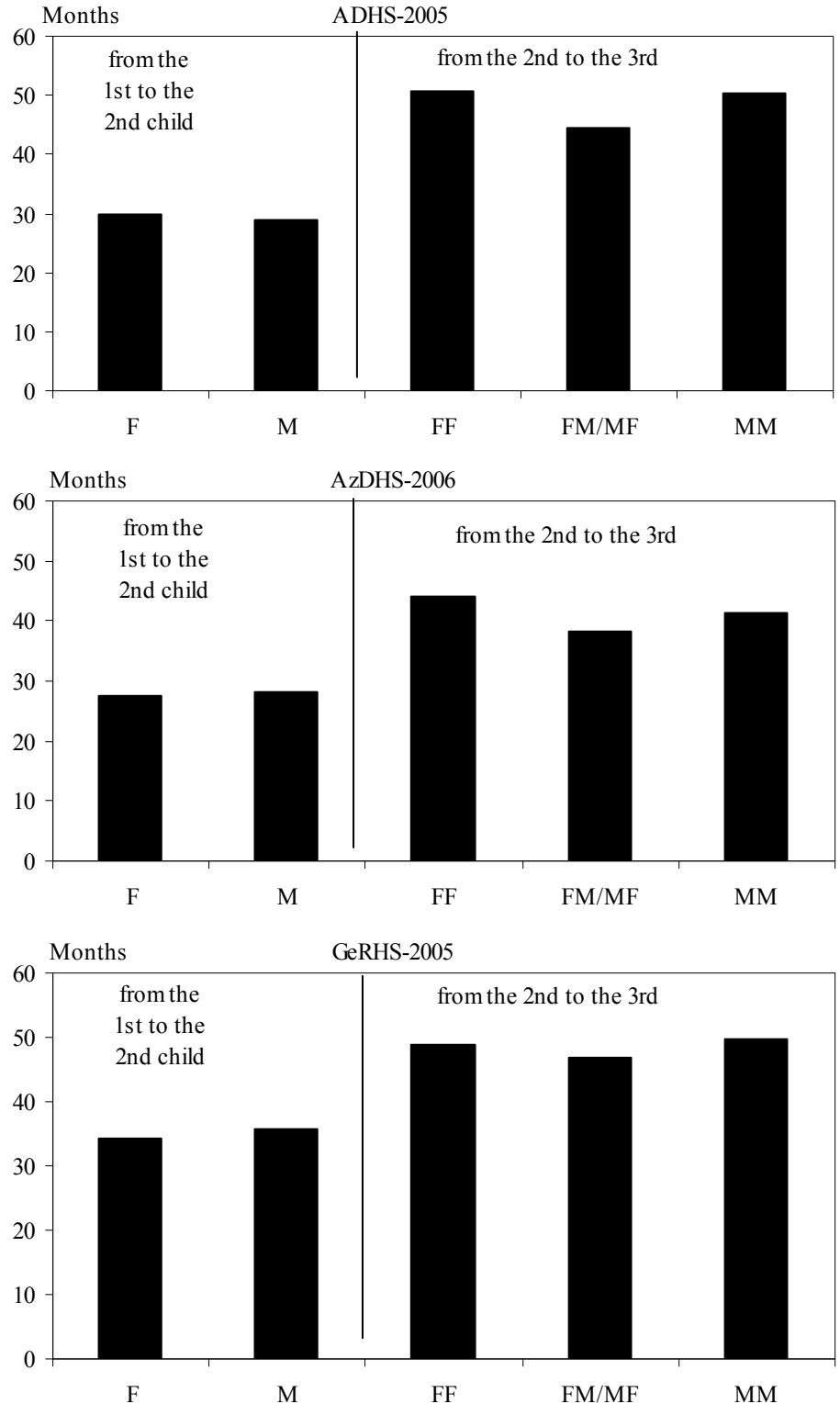
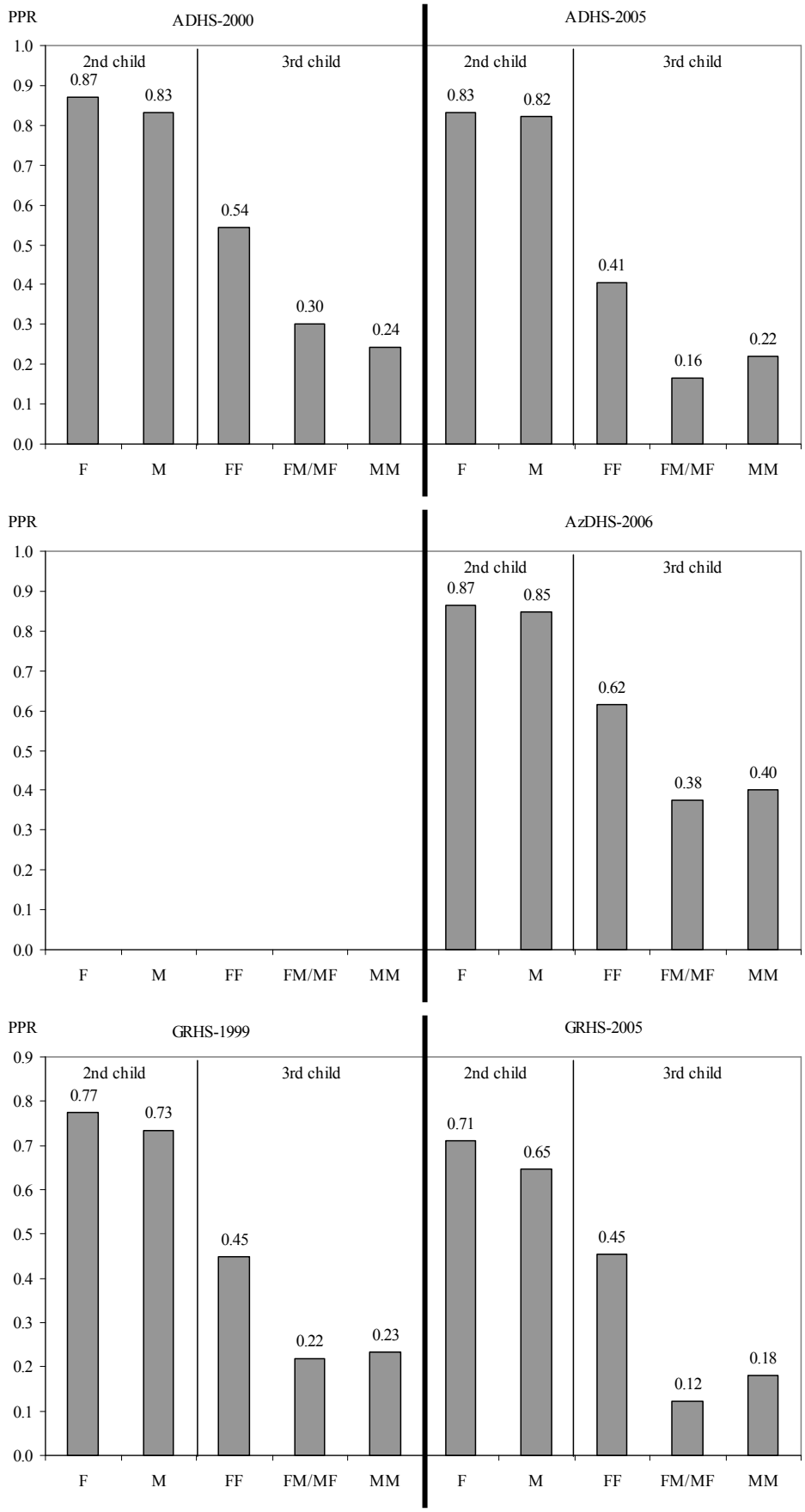


Figure 7. Birth spacing on average of women* according to their parity



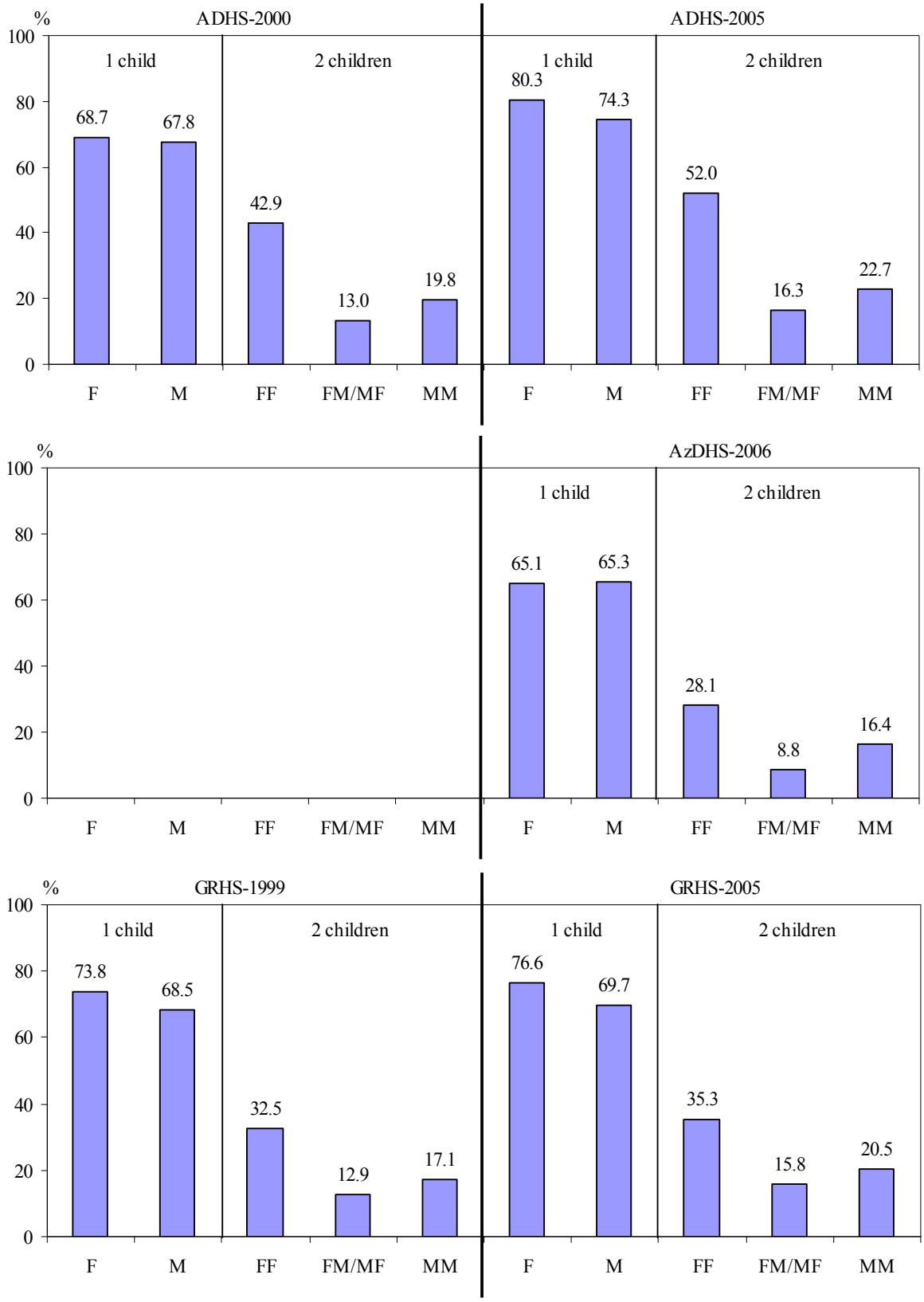
*For women who have had at least child 2 or 3 children and have had the 1st or 2nd child being born between 15 and 5 years preceding the survey

Figure 8. Parity progression ratio* by birth order and sex composition



* Proportion of women who had a second/third children in the following 5 years after their first/second child (in difference of millesime) among women who had their first/second child 10 to 5 years before the survey.

Figure 9. Proportion of women* who want another child according to their parity



* For women who have had 1 child or 2 children, the last one being born in the ten years preceding the survey, and who were not pregnant at the date of their interview.

Figure 10. Probability of abortion in the five years after a child, according to the parity and the period of birth of the last child

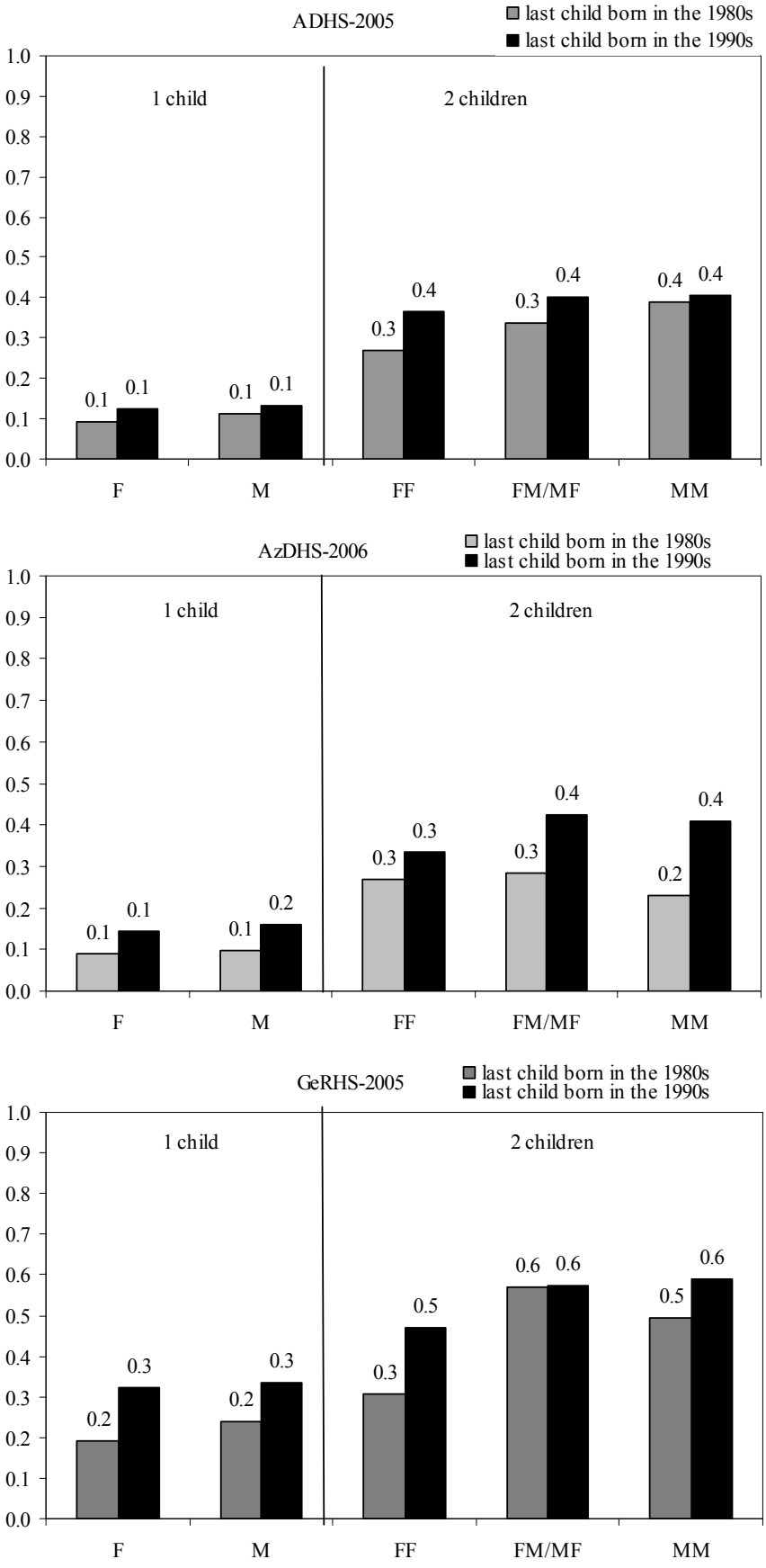


Figure 11. Probability of abortion, excluding mini-abortions, in the five years after a child, according to the parity when the last child is born during the 1990s, in Georgia

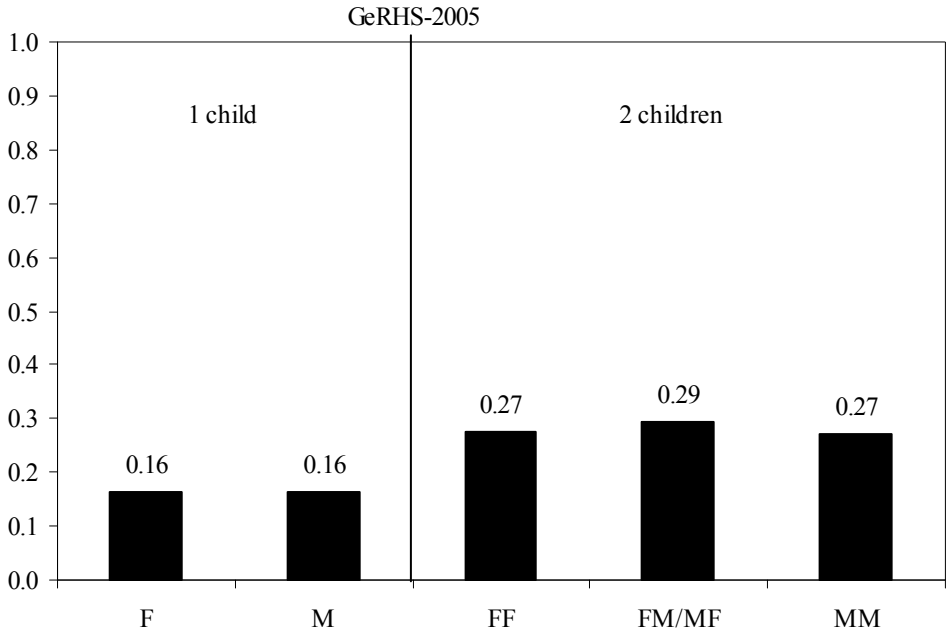


Figure 12. Proportion of women who have aborted during the period 2001-2006 and using the D&C method, in the five years after their last child, according to their parity, in Azerbaijan

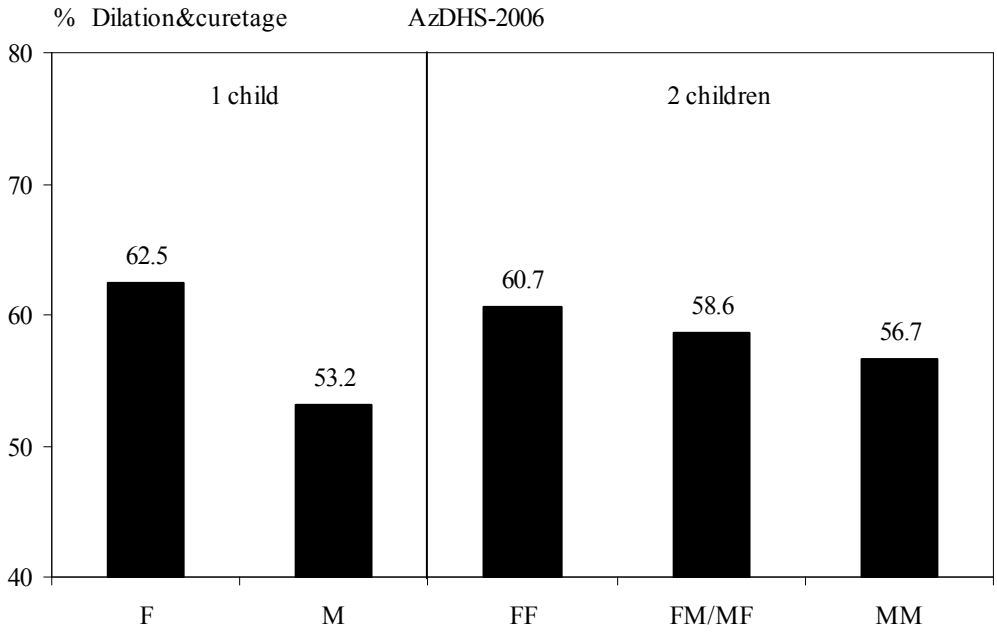


Figure 13. Reasons for abortions occurred since 2001, according to the reached parity, in Azerbaijan

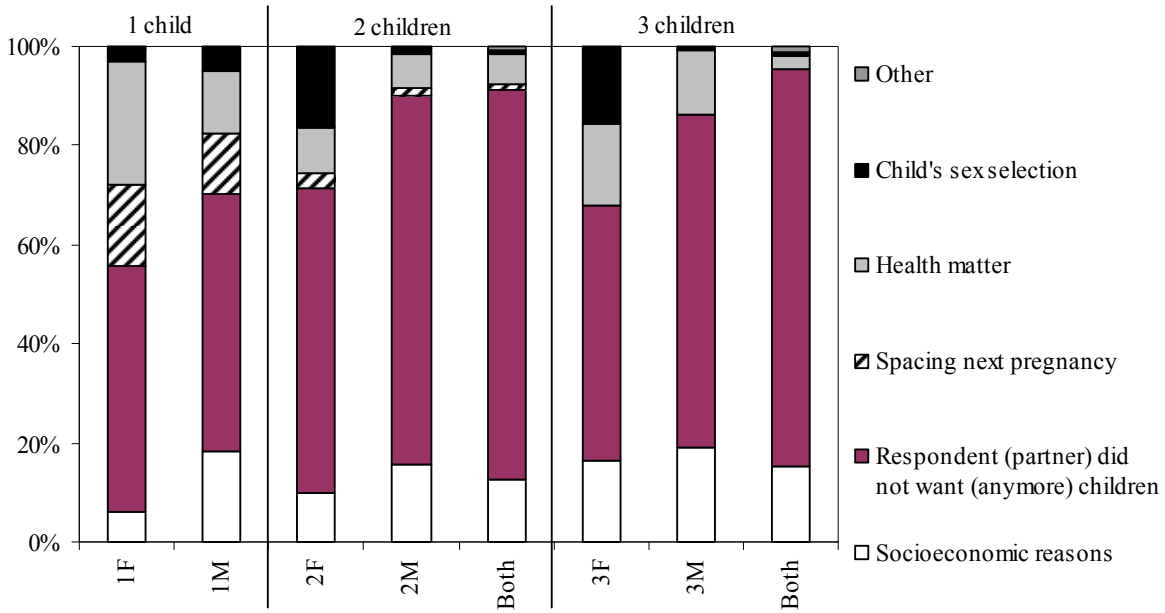


Figure 14. Reasons for abortions occurred since 2000, according to the reached parity, in Georgia

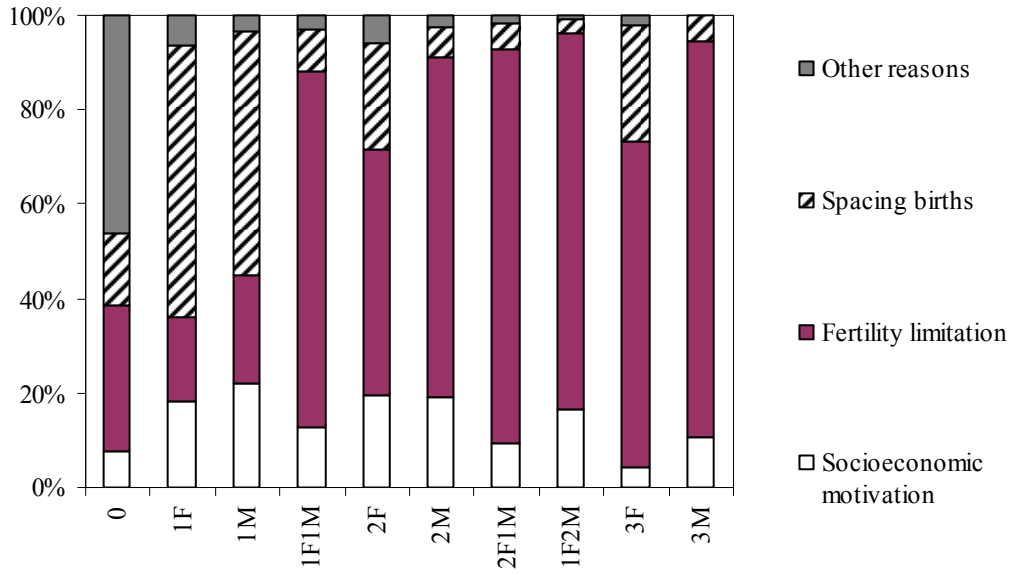


Figure 15. Ultrasound test and knowledge of the sex of the foetus before abortions occurred since 2000, according to the reached parity, in Georgia

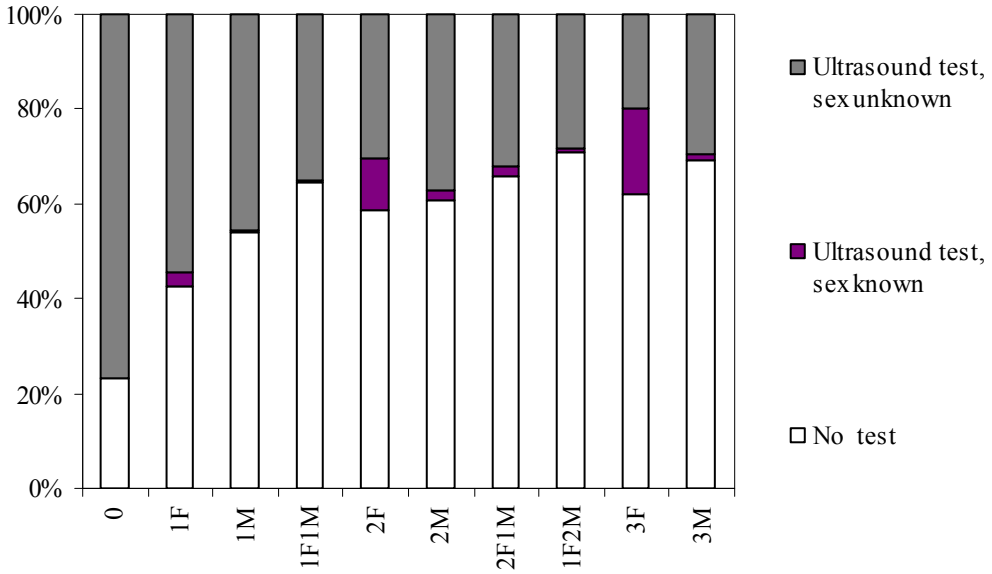
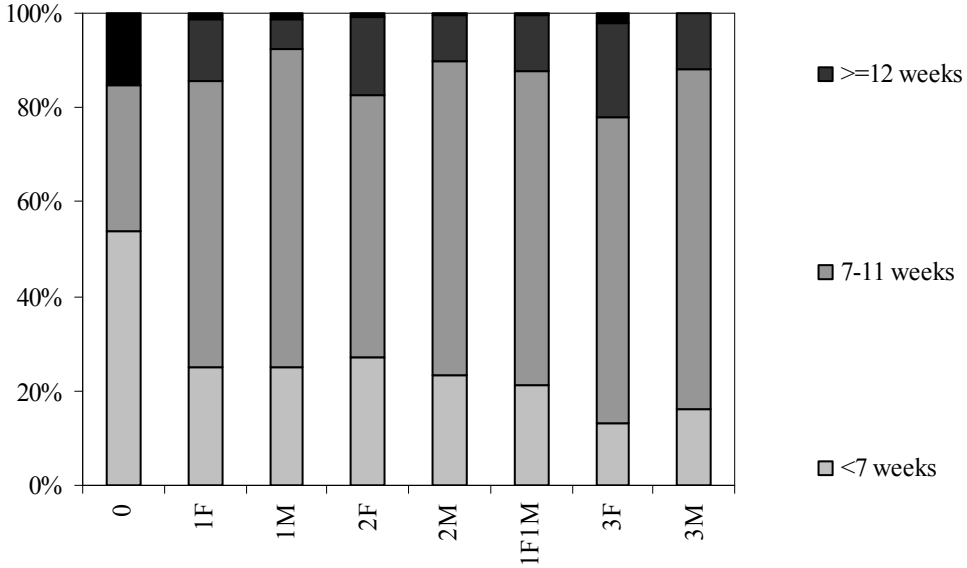


Figure 16. Duration of gestation at the date of the abortions occurred since 2000, according to the reached parity, in Georgia



Annex 1. Trends in sex ratio at birth by month since 2005 in Georgia