Linking fertility preferences and unintended birth outcomes to fertility stalls in Kenya, Namibia, and Zimbabwe

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Introduction

Fertility has declined in sub-Saharan Africa since the 1980s, although it has been at a slower pace than in other middle- and low-income countries around the world. Total fertility rate (TFR) indicates that fertility remains high in Africa: Women went from having, on average, 6.8 children in 1980 to 4.8 in 2017 (World Bank 2019). In the same years, TFR in Latin America decreased from 4.2 to 2.1 and in South Asia from 5.1 to 2.4. Not only sub-Saharan Africa has had a slow decline in fertility, but it has also experienced periods of fertility stalls.

Fertility stagnation in sub-Saharan Africa was first identified in the early 2000s in Kenya and Ghana (Bongaarts 2006; Westoff and Cross 2006). Afterward, around 20 countries have been classified in the stalled category at some point (e.g., Bongaarts 2008; Ezeh, Mberu, and Emina 2009; Garenne 2008; Schoumaker 2019). Nevertheless, an in-depth study was carried out to verify the information in such a way that it would be possible to confirm real periods of stagnation and discard those where identification was based on spurious results (Schoumaker 2019). In conclusion, the number of periods diminished and confirmed only six countries with strong evidence of stagnation: Cameroon, Congo, Kenya, Namibia, Zambia, and Zimbabwe.

Many studies have focused on identifying the stalls but fewer on the reasons that led to them. Moreover, this latter kind of studies finds mixed evidence from which it is difficult to draw conclusions. For instance, on the one hand, contraceptive use has been recognized as a major contributor to reducing fertility. Contraceptive prevalence in sub-Saharan Africa is still low even though it has increased, on average, from 15% in 1990 to 29% in 2018 (United Nations 2019). On the other hand, the demand for children has remained high. Most women from sub-Saharan African countries declare still want to have between 4 and 5 children (Casterline and Agyei-Mensah 2017). However, some research has found a correlation between both contraceptive use and demand for children and fertility stalls, but other has not (Westoff and Cross 2006; Ezeh, Mberu, and Emina 2009; Shapiro and Gebreselassie 2008; Askew, Maggwa, and Obare 2016). Mixed results indicate that further research is needed to understand the stalls better.

Women wanting to have more children would lead to high fertility rates. Also, their high demand for children would cause them to consider a greater proportion of their pregnancies

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as wanted. This is not the case for those women with lower demand for children. A recent study analyzes the distribution of unintended birth outcomes by the desired family size in 53 countries, including a sample from sub-Sharan Africa (Bongaarts and Casterline 2018). The share of unplanned and unwanted pregnancies is higher among women wishing to have 4 children or less. Since women continue to have more children than they want, a higher TFR and slower pace of fertility reduction could be expected. Increasing contraceptive prevalence would lead to less unplanned births (Sedgh, Singh, and Hussain 2014). However, not only access to contraceptives matters but also the correct use of them. Women facing contraceptive failure are more likely to declare their pregnancies as unintended and to choose induced abortion to avoid unwanted births (Bradley, Croft, and Rutstein 2011; Sánchez-Páez and Ortega 2019).

There is some research accounting for decreasing fertility after reductions in wanted fertility (Morgan and Rackin 2010; Schoen et al. 1999; Westoff 1990; Westoff and Ryder 1977). Even more, the desired fertility became considered as the only one that can explain reductions of fertility (Pritchett 1994). This position was later criticized (Bongaarts 1997), and subsequent studies recognize the important role of unintended fertility in fertility transitions. For instance, it has been shown that decreases in unwanted fertility would explain half of the TFR declines since the mid-1970s (Lam 2011; Günther and Harttgen 2016). Reductions in both desired and unwanted fertility have contributed equally to fertility declines (Miller and Babiarz 2016). Moreover, a recent study shows that a meaningful decline of fertility in sub-Saharan Africa will only come if the desire to have fewer children is accompanied by a reduction in unwanted fertility (Casterline and Agyei-Mensah 2017). Nevertheless, there is no study linking the effect of unintended fertility on fertility stalls.

Our goal is to analyze whether the number of desired children and unintended fertility have contributed to fertility stalls. Using the Demographic and Health Surveys (DHS surveys), we first analyze the trends of ideal family size, contraceptive use, and unmet need for contraceptives in order to compare them with TFR in the stalls periods. Second, we compute the probability of declaring a birth as unplanned or unwanted after contraceptive failure. Since there, we evaluate whether there is a correlation between unintended birth outcomes and ideal family size (IFS) and the periods of fertility stalls.

Data and methods

Data

Fertility stalls have been confirmed in six countries, Cameroon, Congo, Kenya, Namibia, Zambia, and Zimbabwe (Schoumaker 2019); however, for our purposes, we leave aside Cameroon, Congo, and Zambia since their surveys do not include all the information that we need. Therefore, we focus on the remaining three countries with well-recognized fertility stalls periods. They are Kenya (1998–2003), Namibia (2006–2013), and Zimbabwe (2005–2010). In the case of Kenya, we use 5 Demographic and Health Surveys (DHS surveys) (1993, 1998, 2003, 2008 and 2014), 4 (1992, 2000, 2006 and 2013) for Namibia, and 5 (1994, 1999, 2005, 2010 and 2015) for Zimbabwe. We use the information on 53,551 births in the 36 months before the survey. For our purposes, we need to identify if pregnancies are planned, mistimed, or unwanted; thus, all of these surveys include the question "Wanted pregnancy when became pregnant" (`M10`). In this regard, we have discarded two surveys: Kenya 1989 and Zimbabwe 1988. This variable collects data on all pregnancies ending in live-birth during the five years before the survey. Also, we get the information on IFS from the question "Ideal number of children" (`V613`).

Part of our analysis is to understand the relation between contraceptive failure and unplanned and unwanted pregnancies. For this purpose, we use only those DHS surveys that include contraceptive calendar data since this allows us to identify the method used, if any, before pregnancy. In this case, our sample reduces to 3 DHS surveys for Kenya (1998, 2003, and 2008) and 2 for Namibia (2006 and 2013). All Zimbabwean surveys have calendar data. The stagnation periods are contained in this analysis. The subsample includes 32,852 births.

We use the information on contraceptive prevalence (CP), unmet need for contraceptives (UN), and mean IFS for all women from Statcompiler (ICF International 2015).

Methods

From `M10`, it is possible to identify if pregnancies were wanted then, later (mistimed) or unwanted at the time of becoming pregnant. Then, TFR can be decomposed for each of these outcomes (Bongaarts and Casterline 2018). We use some grouping categories. Planned fertility (TFR_p) corresponds to pregnancies wanted then, while unplanned fertility ($TFR_{up} = TFR_m + TFR_{uw}$) are both mistimed ($TFR_m$) and unwanted ($TFR_{uw}$) fertility. On the other hand, wanted fertility ($TFR_w = TFR_p + TFR_m$) includes planned and mistimed fertility. Adding planned, mistimed and unwanted fertility rates gives TFR ($TFR = TFR_p + TFR_m + TFR_{uw}$). Following the same approach, the age-specific fertility rate (ASFR) can be calculated.

From calendar data, we get the number of births coming after contraceptive failure. We consider contraceptive failure if any contraceptive method was being used in the precedent month to becoming pregnant.

Our purpose is to link IFS and unintended pregnancies to fertility stalls in Kenya, Namibia, and Zimbabwe. We aim our goal in two steps. The first step is analyzing the effect of fertility preferences on unintended birth outcomes. We use three models to estimate the likelihood of considering pregnancies as planned, mistimed, or unwanted as a function of IFS and whether the pregnancy came after contraceptive failure. We include the latter since, on the one hand, increases in contraceptive use would lead, theoretically, to lower TFR; however, on the other hand, contraceptives not being used efficiently would drive to contraceptive failure, thus, higher TFR. The first regression is a multinomial logit model to assess the differences by unintended outcome. The second is a logit model grouping pregnancies between planned and unplanned. The last one is also a logit model, but, in this case, it groups pregnancies in wanted and unwanted. All models include age and country fixed-effects. From these results we could conclude how likely it is to declare a pregnancy as unintended after a contraceptive failure and the desired family size.

In the second step, we propose scenarios to simulate the effect of changes on unintended birth outcomes and IFS on TFR in the periods of fertility stalls. In all simulations we modify the number of births and recalculate TFR. The objective is to assess whether fertility stalls would have occurred if there had been fewer unintended births, either from contraceptive failure or not, and if IFS per woman had not increased. The proposed scenarios are "What would the TFR have been if…":

1. there would have been no births above the IFS?
2. there would have been no births above the IFS, except for those declared as planned?
3. there would have been no unplanned births?
4. there would have been no unplanned births, except for those intended to postpone for a shorter period of time between the date of birth and the date of the survey?
5. there would have been no births after contraceptive failure?
6. the percentage of births after contraceptive failure would have been the same as in the survey prior to the period of stagnation?
7. there would have been no unplanned births, except for those after contraceptive failure?
8. there would have been no unplanned births, except for those after contraceptive failure at the same levels as in the survey prior to the period of stagnation?

The simulations will be addressed in the full paper.

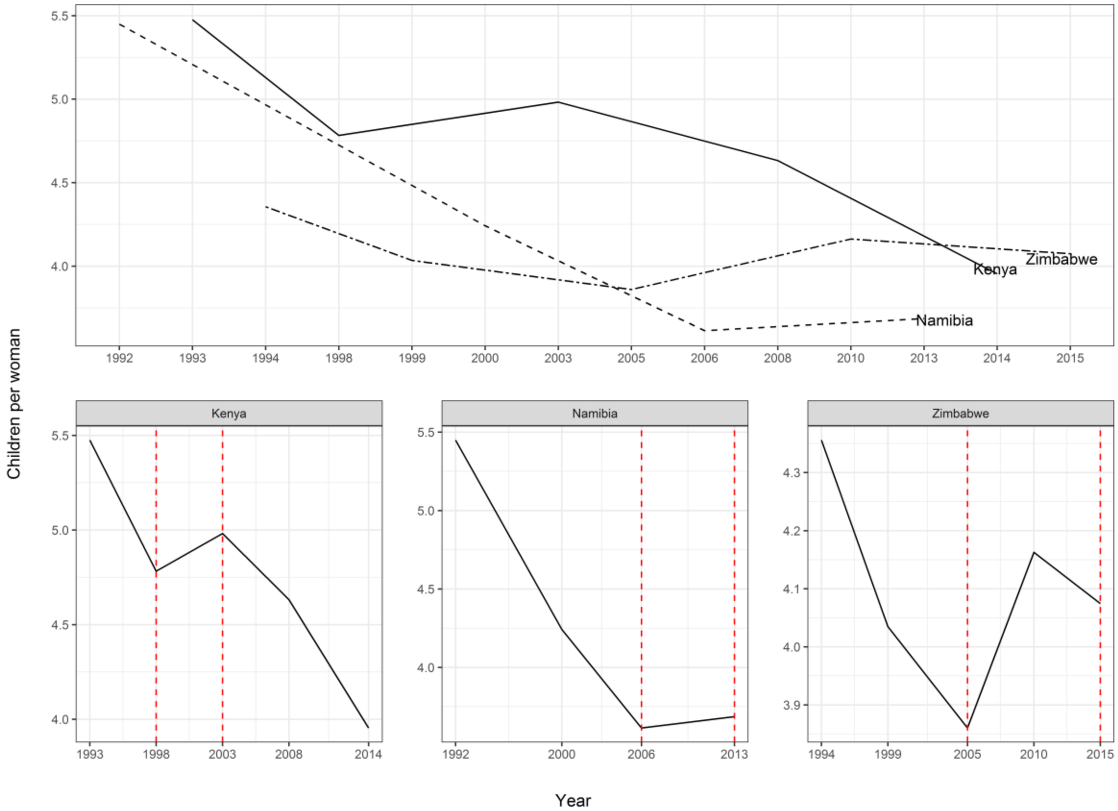
Preliminary results

All three countries currently have lower fertility than they had in the early 1990s. However, the dynamics are different for them. The upper panel of Figure 1 presents TFR evolution and the lower panel the periods of fertility stagnation. Kenya decreased its fertility until 1998 when the stall began. After 2003, TFR has continuously declined. Namibia had a fast decrease in fertility since the 1980s until 2006. TFR has increased since then. In the case of Zimbabwe, it presented a smooth decline in fertility until 2005, then it increased. Although TFR has diminished after 2010, the pace is slow. The average TFR of these countries is around 4.

Panel A of Figure 2 displays TFR and IFS. Panel B presents CP, UN, and TFR. These variables do not behave similarly in each country during its period of stagnation. For example, in Kenya, the rise of TFR is related to an increase of IFS and a decrease of CP and UN. If women keep wanting more children, then higher fertility rates are to be expected. Moreover, reductions in CP are connected to higher fertility. The decline of UN could mean two things. On the one hand, more women are getting contraceptives, and, on the other, fewer women have unintended pregnancies. In this case, the decrease of CP rules out the first option; thus, lower unplanned childbearing would reduce TFR. If the magnitude of the increase of IFS and the decrease of CP exceeds the reduction of UN, we could expect rises in TFR.

Namibia also presents contrasting effects but different from those of Kenya. The increase of TFR in the period 2006–2013 presented a decrease in UN and a rise of CP simultaneously. Also, there is a little increase in IFS. The desire for bigger families would lead to higher TFR. Nevertheless, the higher CP and the decline of UN would predict lower fertility. In this case, if the influence of IFS is stronger than the reducing effect of contraceptives, we would expect the increase of TFR.

Figure 1: Total fertility rate 15–49.



Zimbabwe is different from the two previous countries. In this case, while TFR was rising, IFS remained invariant in the period 2005–2010; however, it raised from 2010 to 2015. Moreover, not only CP increased, as in Namibia, but UN did as well. Regarding the implications of UN, its increase means that either fewer women have access to contraceptives even though they want to use them or those who are already using them face failures in use. Since CP rose, contraceptive failure had to increase also in the same period. Hence, the rise of UN would have outweighed CP and would explain the higher TFR.

The findings described above are consistent with the results in Figure 3. Panel A presents TFR grouped by planned (TFR_p) and unplanned (TFR_{up}) and panel B by wanted (TFR_w) and unwanted (TFR_{uw}). Panel C disaggregates TFR by planned (TFR_p), mistimed (TFR_m), and unwanted (TFR_{uw}). During the period 1998–2003, Kenya increased TFR_p and TFR_{uw} while TFR_w decreased, meaning the decline of TFR_m. The growth of TFR is connected to more planned and unwanted births. For Namibia, the stall is mainly related to the increase of mistimed births. In the same period, TFR_p grew little, and TFR_{uw} decreased. In the case of Zimbabwe, we find the rise of TFR_m and the decline of TFR_{uw} in 2005–2015. TFR_p first raises in 2005–2010 and then decreases in 2010–2015.

Figure 2: Total fertility rate (TFR), ideal family size (IFS), contraceptive prevalence (CP) and unmet need for contraceptives (UN).

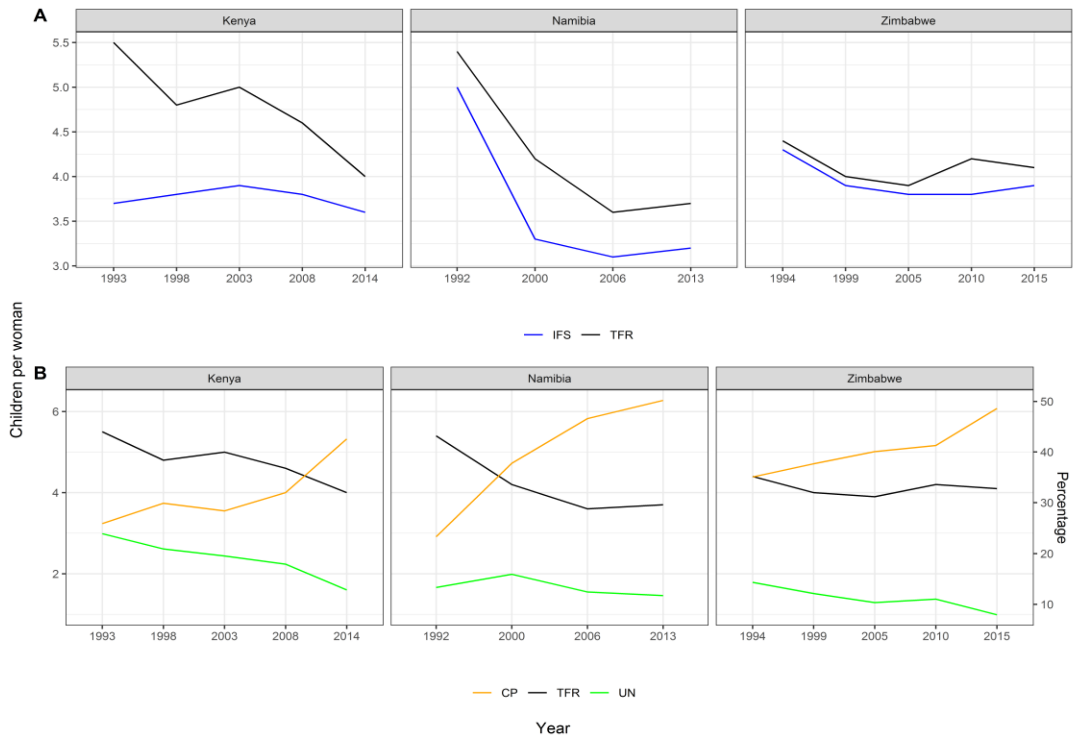
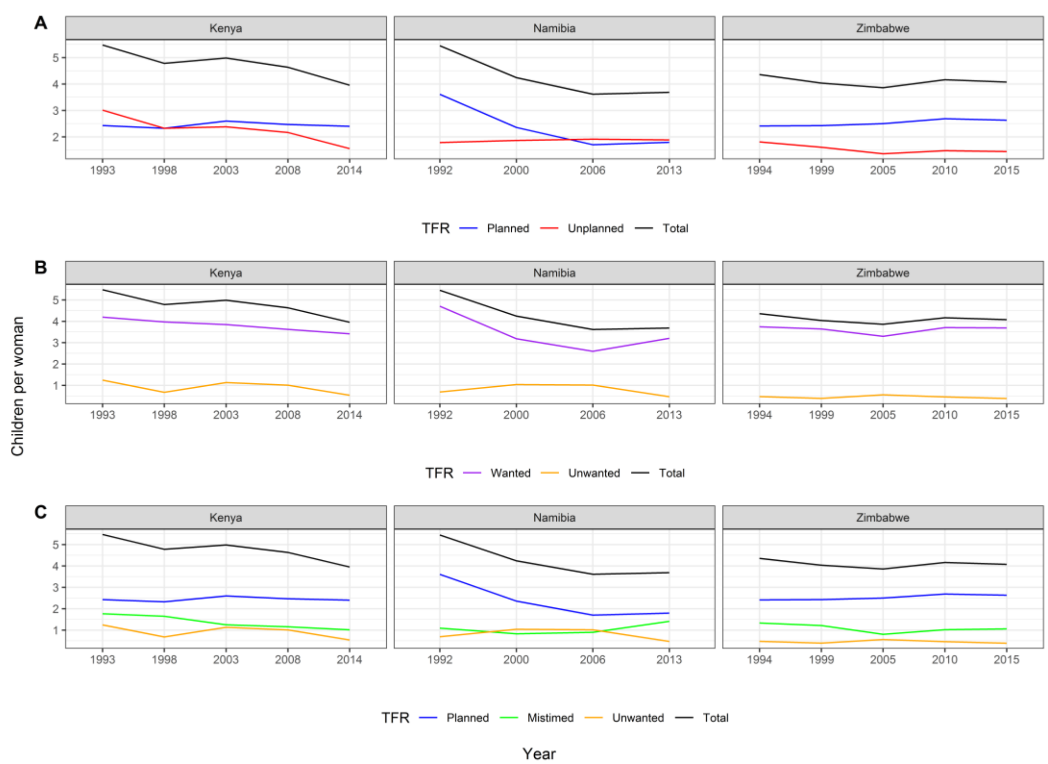


Figure 3: Total fertility rate (TFR) disaggregated by birth preference.



Contraceptive failure is usually behind pregnancies declared as unplanned. This premise is confirmed in Figure 4. For all countries, the incidence of contraceptive failure is lower in planned than in mistimed and unwanted births. For Kenya, from 1998 to 2003, the increase of TFR_p could be connected to IFS while the rise of TFR_{uw} to contraceptive failure. In the case of Namibia, there is a jump between 2006 and 2013 in the percentage of births from contraceptive failure, especially those declared as mistimed. Since UN declined and CP rose at the same time, perhaps these births correspond to women who were not using contraceptives but neither demanding them. In Zimbabwe, contraceptive failure increased from 2005 to 2015 not only for unplanned births but also for those planned; nevertheless, the highest increase occurred among births declared as unwanted. This finding is consistent with the rise of UN in the same period.

Figure 4: Total births and contraceptive failure.

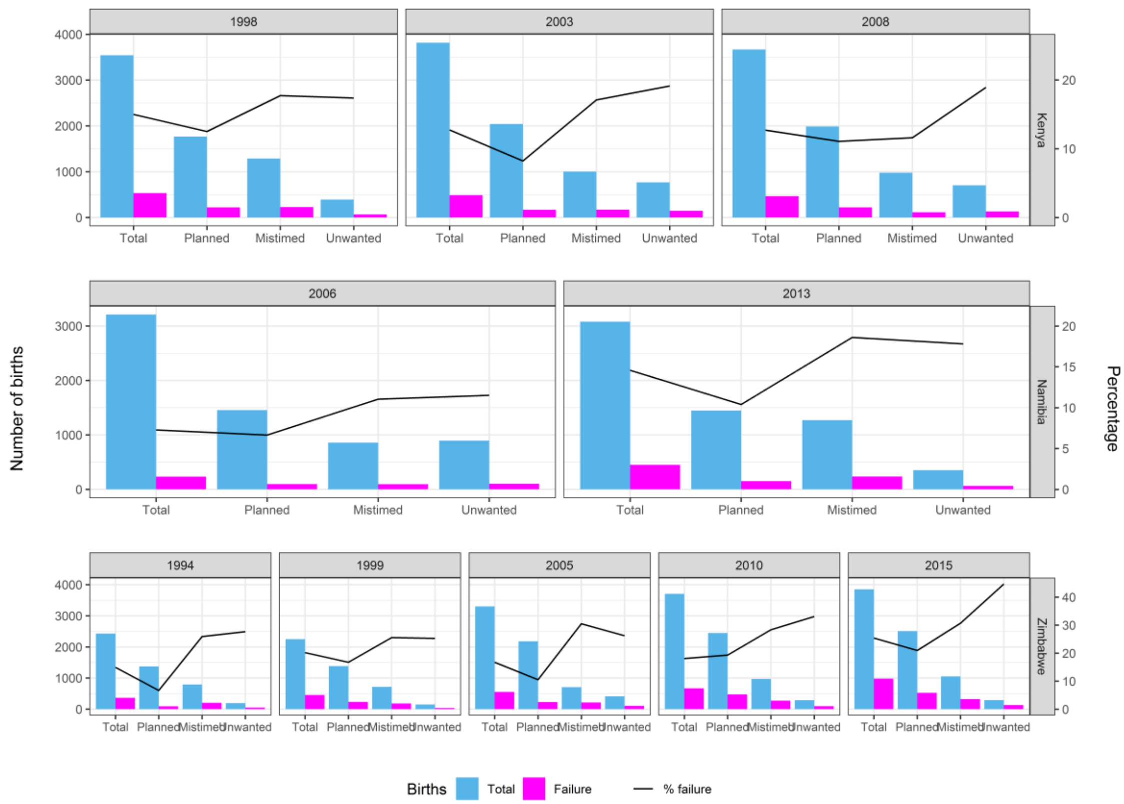


Figure 5 displays ASFR disaggregated by planned, mistimed, and unwanted fertility. Age-profiles help to explain fertility dynamics, especially in Namibia. The observed increase of TFR_m between 2006 and 2013 focus on women aged 15-24, who have lower contraceptive prevalence rates. For Zimbabwe, from 2005 to 2015, there is an increase of TFR_p for women aged 25-29 and of TFR_m for those aged 15-24. In the case of Kenya, between 1998 and 2003, TFR_p rose for ages 20-29 and TFR_{uw} for women aged 15-29.

Results from Table 1 show the effect of IFS and contraceptive failure on unintended reproductive outcomes (mistimed, unplanned, and unwanted) for the pooled data. The Multinomial model evaluates the effect when the three outcomes are possible: planned —is the reference group—, mistimed and unwanted. If women increase in one child the IFS, the odds of identifying a pregnancy as mistimed decrease 0.96 times (p-value=<0.001) and as unwanted 0.84 times (p-value=<0.001). The desire of big families makes more likely every birth to be considered as planned. Having contraceptive failure doubles the chances of considering pregnancy as mistimed (AOR=2.11, p-value=<0.001) and unwanted (AOR=2.06, p-value=<0.001). The age-profile presents the trade-off between mistimed and unwanted pregnancies. As women age, the probability of reaching their IFS increases; therefore, each additional birth has a higher chance of being considered unwanted. Indeed, from ages 20-24, the odds rapidly increase to AOR=15.97 (p-value=<0.001) at ages 45-49. In the case of mistimed pregnancies, the odds decline as women age mainly because they consider them to be unwanted. Binomial models in Table present the effect when we gather births in two groups: planned/unplanned and wanted/unwanted. Results are similar to those found in the multinomial model. For instance, the marginal effect of IFS decreases the odds of having unplanned (AOR=0.92, p-value=<0.001) or unwanted (AOR=0.85, p-value=<0.001) births. After contraceptive failure, the odds of unplanned (AOR=2.09, p-value=<0.001) and unwanted (AOR=1.54, p-value=<0.001) births increase; however, for the latter the odds are lower than that of the multinomial model since, in this case, mistimed births are treated as wanted births —reference category— and they have high probability of coming after contraceptive failure.

Figure 5: Age-specific fertility rate (ASFR) disaggregated by birth preference.

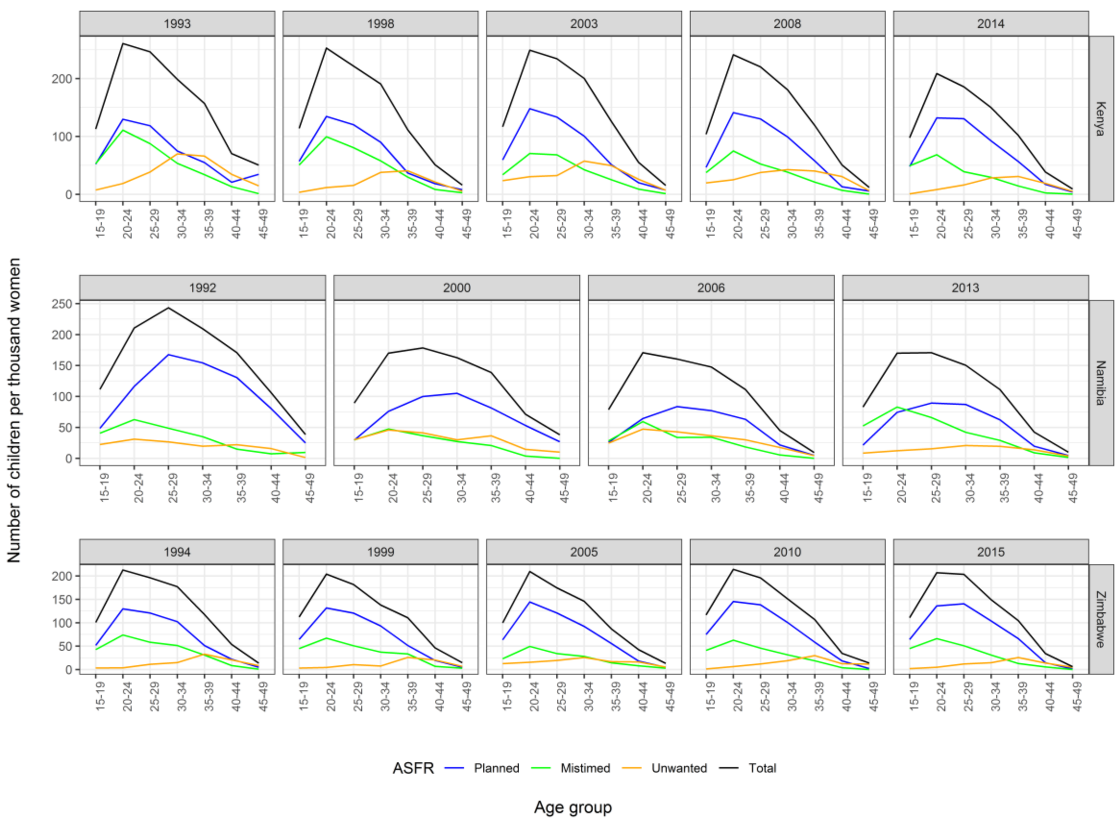
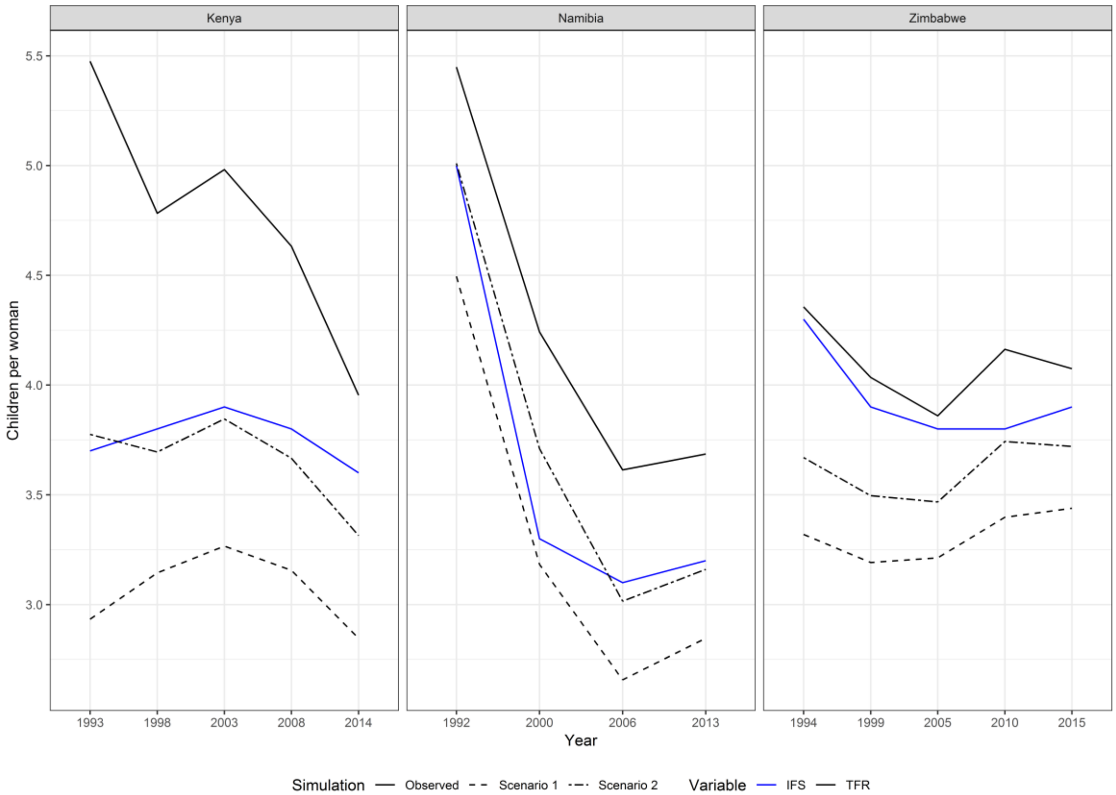


Table 1: Adjusted odds ratios (AOR) from multinomial and binomial regressions. Pooled data.

	Multinomial (Planned is ref.)				Binomial			
	Mistimed		Unwanted		Unplanned=1		Unwanted=1	
	AOR	p-value	AOR	p-value	AOR	p-value	AOR	p-value
Ideal family size								
IFS	0.96	1.2e-09	0.84	< 1e-10	0.92	< 1e-10	0.85	< 1e-10
Contraceptive failure								
No failure	1.00		1.00		1.00		1.00	
Failure	2.09	< 1e-10	2.03	< 1e-10	2.06	< 1e-10	1.53	< 1e-10
Age-group								
15-19	1.43	< 1e-10	1.59	< 1e-10	1.46	< 1e-10	1.37	5.3e-08
20-24	1.00		1.00		1.00		1.00	
25-29	0.77	< 1e-10	1.33	1.4e-07	0.88	7.9e-05	1.46	< 1e-10
30-34	0.71	< 1e-10	2.30	< 1e-10	1.00	0.910	2.60	< 1e-10
35-39	0.73	1.5e-08	4.81	< 1e-10	1.44	< 1e-10	5.39	< 1e-10
40-44	0.76	0.007	10.27	< 1e-10	2.30	< 1e-10	11.31	< 1e-10
45-49	0.48	0.023	15.90	< 1e-10	2.72	6.9e-08	19.54	< 1e-10
Country								
Kenya	1.00		1.00		1.00		1.00	
Namibia	1.31	< 1e-10	1.13	0.008	1.25	< 1e-10	1.02	0.710
Zimbabwe	0.70	< 1e-10	0.39	< 1e-10	0.59	< 1e-10	0.44	< 1e-10

Regarding the simulations, Figure 6 presents scenarios 1 and 2. Through these scenarios we want to isolate the effect of IFS on TFR. Scenario 1 shows women who have no more than the desired number of children would significantly reduce TFR. Moreover, TFR and IFS moving in the same direction means that demand for children can explain the stagnations. Scenario 2 shows that an important share of pregnancies are considered as planned eventough women would wanted to have less children.

Figure 6: Scenario 1 and scenario 2 estimates.



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