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What is fertility stalling and why does it matter?

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Introduction

In 1985 the World Bank published a report on stalling fertility declines in S Korea, Sri Lanka and Costa Rica (Gendell 1985). Like many other countries in Latin America, East Asia, and South Asia, they had experienced a period of sustained, and fairly rapid, decline in fertility rates. What made them stand out was that the downward trend had come to a stop. The report does not explain in any detail the reasons for the World Bank's interest in countries where downward trends in fertility had stalled, no doubt because they seemed at the time self-evident, especially in view of the Bank's broad aims. Continuing high rates of population growth were a matter for concern in countries that were still very poor by Western standards. It was hoped and expected that fertility rates in the developing world would eventually decline to somewhere near replacement level. There was (and still is) a wide consensus that this demographic transition would facilitate economic development and improve individual well-being. If it was true, therefore, that in some countries the downward trend in fertility was levelling off with rates still well above replacement level, this would not only challenge theoretical expectations, it also would have important policy implications. The World Bank's interest centred, firstly, on a question of fact - was it really the case that the declines in fertility rates had ground to a halt in some countries? – and, secondly, on the problem of explanation - why was this happening? Without a good understanding of causal mechanisms, any attempt to develop policies that might help restart the transition to lower fertility would be like shooting in the dark.

Although theoretical questions are not considered in the World Bank paper, a central idea does nonetheless frame the questions that it asks. It was expected not only that the observed decline in infant and child mortality in developing countries would be followed by a decline in fertility, but also that fertility rates would continue to fall to a point where they were more or less in equilibrium with the new low mortality regime. Although the process of fertility decline is conceptualised in a way that can accommodate faster and slower rates of decline, an interruption in the downward trend of fertility unsettles the conviction that, once started, fertility decline will continue until rates reach a level that suffices for a new equilibrium (i.e. low or zero population growth). Since fertility stalls have the effect of postponing the achievement of a level of fertility that is expected as well as desired, unless there are solid *theoretical* reasons for thinking that they are likely to last only a few years rather than decades, their occurrence is at the very least disconcerting, and arguably highlights the importance of improving demographic understanding of the forces that promote or impede fertility decline. The force of this conclusion is not much impaired, even if we accept, as the UN pointed out in a commentary on its 2006 population projections, that 'they seldom last more than a quinquennium'. This is, after all, only an empirical generalization[1].

The focus shifts to Sub-Saharan Africa

Between 1985, when the World Bank published its report on fertility stalls that had occurred in the 1970s, and the turn of the century, very few researchers or policy analysts turned their attention to the topic, and not for another 20 years was there to be an attempt at a comprehensive survey. Published studies in this period

[1] It also overlooks the long-lasting stall in Argentina, which Pantelides (1996) reckons to have a lasted for about 30 years.

concentrated instead on single-country analyses (Knodel 1988 on Thailand; Aghajanian 1991 on Iran; DeSilva 1994 on Sri Lanka; Holl *et al* 1993 on Costa Rica).

Then, after the turn of the century, interest in the issue was re-ignited by a series of UN reports. The first of these, published in 2002, was a general review of fertility trends in the developing world that highlighted the stalling of fertility declines in Bangladesh and Egypt in the late 1990s. The second, published in 2005, picked up where the World Bank had left off, and incorporated a comprehensive review of fertility trends in countries where the Demographic and Health Surveys provided sufficient data (a) to identify cases of stalling and (b) to explore trends in the proximate determinants of fertility in cases where stalling had occurred (Bongaarts 2005). The 2005 report identifies a handful of cases of temporary stalling from the 1990s (i.e. no longer stalling in the most recent data, but subsequent to the period covered by World Bank analysis) and several cases of countries where the fertility decline was *currently* stalling (i.e. according to the most recent data). The earlier stalls were mostly in Latin America – the exception being Turkey. Only two of the 7 countries identified as *currently stalling* were from Sub-Saharan Africa (SSA).

Bongaarts' 2005 report has been followed by several global or regional surveys of fertility stalling in the developing world. Like Bongaarts, these papers restrict their interest to countries which have conducted at least two Demographic and Health Surveys. With that proviso, however, they do try to be comprehensive. In a couple of cases, the surveys include all regions with DHS data (Bongaarts 2008, Shapiro *et al* 2011). The others focus exclusively on Sub-Saharan Africa (Shapiro & Gebreselassie 2008, Garenne 2008, Schoumaker 2009, Sneeringer 2009, Machiyama *et al* 2010). See **table 2.**

The key paper in this series of studies is a second review by Bongaarts (2008). The emphasis shifts from the question of causation in the earlier 2005 report to the elaboration of a systematic approach to case identification. In this later survey of stalling fertility declines, Sub-Saharan Africa, or more exactly that region of Sub-Saharan Africa that lies north of Botswana and Namibia, stands out from the rest of the developing world. Bongaarts' main conclusion is that the average pace of fertility decline slowed significantly in Sub-Saharan African countries between the mid-1990s and the early 2000s. As many as two thirds of the countries in the region experienced no significant decline between the two most recent surveys; and more than half of the countries in mid-transition (*see below*) were in a stall. Outside Sub-Saharan Africa, stalling is now rare, with only one Asian/North African country and one Latin American country identified as stalling. In the context of Sub-Saharan Africa, therefore, fertility stalling seems to be far from exceptional; and in those countries where fertility *is* declining, the rate of decline is in most cases relatively slow (i.e. compared to earlier fertility declines in Asia and Latin America as well as earlier rates of decline in these countries themselves). In the Southern African countries, on the other hand, fertility has fallen below 3 children per woman[2].

The policy concern that motivated the World Bank study in 1985 is clearly present in Bongaarts' commentary on Sub-Saharan Africa. When high fertility is combined with relatively low mortality, it leads to rapid population growth and high rates of child dependency. Stalls and slowdowns in the fertility transition delay the prospect of a demographic dividend from declining dependency rates (Eastwood & Lipton 2011), and

[2] S Africa, Botswana, Namibia, Lesotho, Swaziland. TFR from World Population Prospects, 2012 Revision

there are plenty of powerful reasons for thinking that continuing high fertility undermines the prospects for economic and social development, and makes it more difficult for households to escape from poverty[3]. There is, however, an important additional dimension to the concern about Sub-Saharan Africa, which is that stalling fertility - when it is such a common occurrence across the region - may be symptomatic of the extent to which high fertility is embedded in Sub-Saharan African societies[4]. It lends support to the view that the transition to a low mortality, low fertility demographic regime may prove much harder to achieve in Sub-Saharan Africa than it has elsewhere. The updated list of Sub-Saharan African countries with currently stalling fertility in **table 3** also supports this view. Out of the 26 countries in the region which have 'reasonably current' data, 14 have 'stagnant'[5] fertility.

Definitions and methods

The various analyses and surveys of fertility stalling that have been published since Bongaarts' (2005) report for the UN Population Council do not agree, however, on which countries are experiencing fertility stalls. There are several radically different estimates of the number of countries in Sub-Saharan Africa where fertility is stalling. Schoumaker (2009), Machiyama (2010) and Garenne (2008) all come up with much lower figures than Bongaarts (2008), and they do so on the basis of different definitions and methods[6]. Bongaarts's view, seconded by the analyses of Shapiro and colleagues, that fertility stalling is common in Sub-Saharan Africa, is not universally shared.

Some of the discrepancies in case identification are trivial: studies use data from the most recent DHS to determine whether fertility is *currently* stalling in a given country, and new data may lead to revision of the assessment (i.e. no longer stalling; now stalling)[7]. There are also, however, significant discrepancies which arise from (i) the use of different criteria to identify cases of fertility stalling, and (ii) a different, and arguably more rigorous, approach to the measurement of fertility.

As far as the broad outline of the notion of fertility stalling is concerned, there is general agreement.

- Fertility decline can only stall in a country where the fertility transition has already started. Countries which are *pre-transitional* are not counted as cases of stalling.
- Since only those countries which are in *mid-transition* can experience a stall, fertility should have fallen 'quite a bit' or 'some way' before stalling.
- Countries where fertility is already close to replacement level are also excluded from consideration. Just as it is important to distinguish countries which are countries which are at an early stage of transition from *pre-transitional* countries, so it is important to distinguish countries which are at a late stage of transition from *post-transitional* countries.

[3] A large increase in the numbers of children puts a massive strain on countries that already struggle to provide enough schooling for their populations. Cities that are already bursting at the seams threaten to grow into increasingly unmanageable megacities, which makes it harder and harder for them to keep up with the demand for infrastructure and productive employment, and this in turn impairs their potential to act as engines of economic growth.
[4] See, for example, leading article on *Fertility treatment* in Economist 08/03/2014
[5] This includes countries with pre-transitional fertility as well as stalling fertility (*see below*).
[6] All 3 studies were undertaken with a view to testing Bongaarts' conclusion.
[7] For example, Bangladesh is included in the list of countries *currently stalling* in Bongaarts (2005), but not in the updated list from Bongaarts (2008).

When it comes to operationalising these ideas, however, there are two important areas of difference:

(i) how they draw the line between *pre-transitional* and *transitional* (i.e. in mid-transition);

(ii) how they draw the line between a stall and a change in the rate of decline that falls short of a stall.

The impact of the first of these differences can be illustrated by comparing cases of stalling identified by Bongaarts's 2005 paper with cases of stalling identified by Shapiro (2008). Bongaarts follows the World bank report in counting countries as pre-transitional if fertility has not yet fallen below 5 births per woman. Shapiro sets the bar higher and stretches the mid-transition phase to include TFRs that Bongaarts would consider as pre-transitional. Five SSA countries with TFRs between 5.5 and 6 are classified by Shapiro as stalling in an *early transition* phase (Cameroon, Guinea, Mozambique, Rwanda, and Tanazania). Bongaarts, looking at exactly same data for the same time periods, classifies these countries as pre-transitional[8]. Machiyama (2010), on the other hand, classifies high fertility countries as pre-transitional unless there has been a decline of at least 20% from the highest observed fertility. The sensitivity of these categories to the setting of boundaries can be further illustrated with the updated TFR estimates used in **table 3**. The choice of a different boundary between transitional and pre-transitional fertility (e.g. TFR > 5 rather than 6) would shift three countries from one category (declining fertility) to another (pre-transitional), and so increase the number of countries with 'stagnant' fertility.

The change in the rate of fertility decline that constitutes a stall also varies across different studies. The earliest definition - Gendell's - requires that the decline should be followed by a stop *or a substantial deceleration* (operationalised as at least a halving of the rate in the preceding period for five or four years at a minimum), and this is followed by Machiyama. Bongaarts (2008) counts a fertility decline as stalled unless there has been *significant decline* in fertility in the most recent inter-survey period, i.e. a decline that is significantly different ($p<0.05$) from zero. Shapiro, in both his papers, states simply that a stall occurs if TFR fails to decline across two measurements. Finally, there is a definition used by both Moultrie (2008) and Garenne (2008), which requires three measurements (i.e. three waves of DHS data) to establish the presence of fertility decline and uses linear regression to test for a significant change ($p< 0.05$ level) in the slope of the line connecting the observations: a stall is a period during which the slope changes from negative (fertility decline) to nil or positive[9]. Once again the implications of these differences can be illustrated by comparing Bongaarts (2008) with Shapiro (2011). Bongaarts' requirement for a decline *significantly different from zero* has the effect of capturing more countries in the net than the criterion used by Shapiro. Hence, whereas Bongaarts counts Cote d'Ivoire, Ethiopia, Nigeria, Zambia, Zimbabwe, and Guatemala as cases of fertility stalling (because the decline is not significantly different from zero), Shapiro considers all of these countries except Nigeria and Zambia to have declining fertility. Garenne's criterion for stalling is even more 'strict', and Nigeria is the only one of this group of countries with stalling fertility. The updated list of countries with currently stalling fertility in **table 3** applies the criteria of Bongaarts and Shapiro to the DHS data for SSA.

[8] In his updated 2008 analysis, Bongaarts uses a different criterion for pre-transitional fertility, namely that contraceptive prevalence among married woman is 10% or less.

[9] Garenne (2011) takes this analysis a stage further by comparing two different methods for estimating the change of slope in the fitted lines.

Not all the discrepancies in the identification of cases of fertility stalling arise from differences in criteria. There is also an issue about measurement. Schoumaker (2009) asks whether the cases of fertility stalling that have been identified by Bongaarts in SSA are genuine or spurious, and what he has in mind here is the robustness of the estimates of period fertility that are used in the DHS to classify a country's fertility trend as stalling or not. Schoumaker uses individual birth histories from the DHS to construct retrospective estimates of TFRs for the 15 years before the survey, and these are compared with published values for TFRs. He concludes that some of the SSA estimates suffer from serious data quality problems, leading to underestimation of recent fertility in many surveys. In some cases, underestimation of fertility was larger in the next to last survey than in the last survey, creating the appearance of a stall in fertility. In other cases, a considerable degree of underestimation was repeated in several surveys, and these were re-classified as pre-transitional. As a result, he eventually shrinks Bongaarts' list of 9 countries to just one, Kenya. The re-measurement of fertility stalling in SSA is repeated by Machiyama (2010), who adjusts period fertility estimates in line with assessments of the impact of misreporting of (i) age at birth (ii) date of births. Machiyama agrees with Schoumaker that the evidence for stalling is compelling only in Kenya[10], though he identifies 'possible stalls' in Benin, Rwanda and Zambia. A similar level of methodological rigour - with the same approach to measurement - can be found in a recent examination of possible fertility stalling in Jordan (Cetorelli 2012).

Sneeringer (2009) makes a somewhat different use of the individual birth histories provided by the DHS. Instead of constructing retrospective estimates of period TFRs with these data, he uses them to estimate *cohort* fertility trends for 30 countries in SSA. The data enable him (i) to construct a panel of women born between 1937 and 1990, and (ii) to analyse their fertility behaviour between 1952 and 2005. The study does indeed find evidence of stalling, but it occurs across all age groups only in Congo (Brazzaville) and Madagascar, and concludes that there is not "unequivocal evidence of a reversal in Africa's fertility transition" (p.xv).

A further elaboration of methodologies for identifying fertility stalls is given by Grace and Sweeny (2010) in their analysis of what they call Guatemala's 'potential' stall in fertility decline. After considering the advantages and disadvantages of different measures of fertility (tempo-adjusted period TFR; parity progression ratios; cohort measures) at national and sub-national level, they argue that tempo-adjusted period measures and regional disaggregation offer the best insights into change; and certainly their decision to look at regional differences is in line with several of the analyses of stalling in Sub-Saharan Africa (Ezeh *et al* 2009; Westoff & Charles 2006) and elsewhere (Ishida *et al* 2009).

Causation and explanation

The essential starting point for the analysis of trends in virtually all published studies of fertility stalling is Bongaarts' model of the *proximate determinants of fertility*. This was first published in the 1970s and was used by Gendell in the 1985 World Bank report. The basic idea is that the analysis of trends in total fertility is a two-step procedure: first, identify the effects of observed changes in the proximate determinants of fertility on TFR; second, look for underlying societal factors that can explain the changes in the proximate determinants.

[10] Kenya is in fact the only country identified as a case of stalling (i) under all different criteria (ii) in all analyses which use TFR as their metric.

Many of the studies cited here do not go much beyond the first step, usually because they see themselves as venturing onto much weaker ground when it comes to identifying the ultimate or underlying determinants of fertility stalling. Where conclusions are advanced about the ultimate determinants of these stalls, they are tentative and hedged round with qualifications. Some authors, like Cetorelli and Leone (2012) in their analysis of stalling in Jordan, conclude simply by highlighting the need for 'further investigations' to shed light on the factors that explain what is happening with the proximate determinants of fertility.

As for the proximate determinants themselves, they are a set of factors that have the effect of reducing a woman's fertility from a level set by natural potential, e.g. the likelihood of being in a 'union'; postpartum infecundability; the prevalence of pathological sterility; and the use of contraception. These factors can be seen to vary from society to society, and they change over time. To take one obvious example, where childbearing happens almost exclusively within marriage (as in Sri Lanka and S Korea in the 1970s), a change in the age at first marriage has an impact on the likelihood that a woman of childbearing age is in a 'union' – which has the effect of reducing 'exposure to risk' of childbearing in the female population of childbearing age. In these same societies, changes in customs regulating the duration of breastfeeding or postpartum abstinence from sexual intercourse will have an impact on the likelihood of conception within marriage.

As Bongaarts (1984) notes, we can divide the proximate determinants of fertility into two general classes – those that can be expected in future to exert upward pressure on fertility, such as a shortening of the period of breastfeeding and a decline in pathological sterility, and those that can be expected to reduce fertility, such as a rise in the age at first marriage and higher prevalence and effectiveness of contraception. What Bongaarts has in mind here are general social trends, and as he points out, the fertility-reducing effect of a rise in the age of marriage may be cancelled out by a shortening of the period of breastfeeding, and these twin changes in proximate determinants may themselves be linked to the same underlying social trend (e.g. more formal employment opportunities for women).

The studies that have been cited here can be divided into two categories, according to their scope. There are those, like Gendell's, that limit themselves to the single case or cases under consideration (why did fertility decline stall *here*?); and there are those that look for common factors across several cases (why do fertility declines stall?). Here, for example, is how Westoff & Cross (2006) answer the first question in the case of Kenya, and they do it by looking closely at regional and educational differences in fertility and contraception.

> The decline of fertility has stalled because of the plateau in contraceptive prevalence and, perhaps more fundamentally, a shift toward wanting more children. We have been able to identify the segments of the population where stalls or reversals have occurred and some of the mechanisms. These changes in reproductive preferences have been pervasive; women with no education and Muslim women show dramatic reversals while women with at least some secondary education have continued to want and have fewer births…. Although the analysis has identified the demographic dynamics of the stall in the fertility transition in Kenya, a full explanation is lacking. Shortages of contraceptive supplies have probably played some role but this does not explain the increase in the proportion of women who want more children.

What is true for Kenya may not be true elsewhere however, and the central importance of contraceptive prevalence as a proximate cause is not confirmed by all the individual country case studies. Single case studies may in this way provide counter-examples, or at least *potential* counter-examples, to established generalizations. In Ecuador, for example, contraceptive prevalence increased from 57% to 73% between 1994

and 2004 (Ishida *et al* 2009), and according to Bongaarts' model of proximate cases, this should have translated into a reduction of one lifetime birth per woman. What in fact happened is that total fertility remained more or less stable over the same period. A similar phenomenon (increasing contraception + stagnant fertility) was noted for Bangladesh in the late 1990s (Islam *et al* 2004).

Like Ishida *at al*., Eltigani (2003) takes a case study, the fertility stall in Egypt, as an opportunity to test a generalization. He is interested in the association between fertility decline and socio-economic development, and in particular wants to test the suggestion that, in countries with intermediate fertility, the decline in national TFR will slow down or stall unless there is improvement in socioeconomic conditions for people at lowest socioeconomic level. What he finds is that women from middle and high socio-economic groups acted as a kind of vanguard for the country as a whole. They led the fertility decline, and the fact that the trend toward lower family size simply stopped in this group with fertility around three births per woman can explain most of the stall in the fertility decline of TFR. Once the gap in age at marriage and the uptake of contraception between these women and those from lower socio-economic groups has narrowed (i.e. the trend towards fertility convergence between the different groups continues), it is hard to see how fertility can continue to fall to replacement levels without a significant change in the desired number of children among all social groups, i.e. a general cultural change. In other words, and this is Eltigani's conclusion, improvement in socioeconomic conditions for people at the lowest socioeconomic level is *not* the key to continuing fertility decline.

When it comes to looking beyond single countries to identify common factors in groups of countries, it is important not to forget that some of this research, in particular some of the studies looking at Sub-Saharan Africa, rejects most of the supposed cases of stalling as spurious, and hence sees no reason to look for the causes of fertility stalling *across the region*. For both Schoumaker and Machiyama, therefore, it is a question of explaining one or two isolated cases, which is not how the problem presents itself to other commentators such as Bongaarts, Shapiro or Garenne. For these others, what we see are apparently divergent findings that can be explained, at least in part, by differences in the selection of cases.

Bongaarts' 2005 paper[11] on the causes of stalling fertility transitions includes in its analysis only 2 African countries (Ghana and Kenya) out of a total of 7 cases of stalling. His main conclusion is that fertility-reducing trends in key proximate determinants – modern contraceptive use; demand for contraception; ideal family size – showed signs of levelling off (they 'plateau'). There was, however, no major deterioration in contraceptive access (though in all cases levels of unmet need for contraception and unwanted fertility remain high). Nor was there any link between the presence of a stall and trends in socioeconomic development (measured by GDP per capita and girls' schooling). The later 2008 paper takes a somewhat different view, even though it is not intended or presented as an investigation of the reasons for stalling. The very marked change of pace in fertility decline across Sub-Saharan Africa looks like a *regional trend*, and the cases of fertility stalling are part of this. It is plausible, Bongaarts now suggests, to look for explanations of this trend in three factors, firstly, the impact of the HIV/AIDS epidemic on mortality, secondly, poorly performing economies, and thirdly the lower priority assigned to family planning programs (Cleland *et al* 2006).

[11] Bongaarts' 2008 paper identifies many more SSA countries as stalling, but does not broach the question of causation.

Shapiro (2008) considers a different set of cases from Bongaarts, and finds different associations. He is only interested in cases of fertility stalling within Sub-Saharan Africa (n=7)[12]. As with Bongaarts, he looks at causation through the lens of the proximate determinants, and what he does is look for the factors that are associated with faster or slower rates of decline (with stalls as a limiting case of slow decline in fertility). The national-level regression analysis picks out three dominant factors that account for 60% of the variation in declines in TFR: education (faster growth in girls' education associated with lower fertility), infant and child mortality (faster reduction in mortality is associated with lower fertility), and GDP *per capita* (more GDP growth is associated with slower declines in fertility). Unlike Bongaarts, he finds no evidence of significant relationship between changes in fertility and changes in contraceptive use or ideal fertility.

Garenne (2008) looks at a smaller set of cases than Shapiro, and compares them with 5 'control' countries - Burkina-Faso, Cameroon, Ethiopia, Malawi, and Senegal – rather than 'all the others'[13]. He is also at pains to distinguish between the six cases rather than assimilate them to a single pattern. Thus, for example, in Tanzania and Ghana, stalling occurred despite an increase in contraceptive use, whereas in Kenya, Nigeria and Rwanda, the stall was associated with a decline or no improvement in contraceptive use. As he says, 'no pattern seems to emerge from the proximate determinants, and the situations of the six countries appear as diverse'. The same diversity is apparent in the tentative analysis of the ultimate determinants of stalling, which is not to say, however, that the occurrence of stalling in the individual countries is not understandable, and for each case – with one exception – Garenne makes a plausible link between trends in (i) contraceptive use, and/or (ii) age at marriage, on the one hand, and particular configurations of socio-economic factors on the other. The exception is Ghana, where Garenne professes himself to be at a loss for a plausible explanation.

Ezeh *et al* (2009), like both Shapiro and Garenne, focus on Sub-Saharan Africa, but the group of countries that are selected for analysis is different again[14]. They are all from East Africa, and all have four rounds of DHS data. Kenya, Tanzania, Uganda are identified as cases of stalling. In Zimbabwe, the last member of the group, fertility decline was constant across the four surveys – though weak enough across one inter-survey period to be classified as a stall by Bongaarts (and is stalling across the two most recent surveys – see table 3) For these countries, what stand out are, firstly, the trends in contraceptive prevalence (they plateau or go into reverse), secondly, an apparent increase in the desire for large families, and finally, the strong association between fertility decline and access to female education.

Conclusion

The idea of a fertility stall is on the face of it straightforward. It tries to capture a certain kind of change in the rate of progress from one state (pre-transitional fertility) to another (replacement level fertility). A stall is an extreme case of a slowdown in the rate of decline, and once the criteria have been fixed, we can place fertility

[12] 24 SSA countries with the relevant DHA data are included in analysis. Southern African countries are not in the pool.
[13] In addition to three countries identified as cases - Kenya, Ghana, and Nigeria – Garenne looks at three sub-national cases identified through rural/urban analyses: urban Madagascar, rural Rwanda and rural Tanzania.
[14] Ezeh *et al* also uses a somewhat different framework for the analysis – with *three* levels: reproductive health (broadly similar to the proximate determinants); institutional factors (essentially the effort put into family planning services); socio-economic factors. The same model underpins the analysis in a Population Council report on Kenya (Askew *et al* 2009).

trajectories into a small number of categories: pre-transitional, stalling, 'making progress' (i.e. declining), post-transitional[15].

It has been suggested that the original rationale for distinguishing between *declining* and *stalling* was practical; the transition from *declining* to *stalling* could act as a signal for policymakers to intervene, i.e. do something new or to intensify existing efforts so as to restart fertility decline. Looked at from this point of view, we might reasonably wonder whether policymakers should attach much weight to the distinction between a significant slowdown in the pace of decline or a decline that is not significantly different from zero, on the one hand, and a complete stop, on the other. It is hard to see, however, why policymakers would want to insist (a) that a very small decline is still a decline, and not a stall 'in the strict sense', and (b) that the trigger for intervention should be a stall – and nothing short of a stall. Consider a country that has a TFR of 5.5, and then fertility falls by about 0.02 children per woman per year for two decades. At that rate it would take 50 years to attain a TFR of 4.5. As well as being a painfully slow 'rate of progress' by Asian or Latin American standards, there are good reasons that arguing that this is too slow *provided* it is accepted that there are gains from fertility decline. A rate of decline is too slow if it postpones the benefits too far into the future, and a sensible (and minimal) criterion for determining whether the benefits lie too far in the future is to ask if living generations would be deprived of them.

This is not to say, however, that the occurrence of a stall, even when it is loosely defined, is the 'right' signal for policy intervention. There is no reason why policymakers should not choose as a signal for intervention a rate of decline that would not constitute a stall. In other words, they set themselves a target, and the signal for intervention is the failure to achieve it. As this suggests, there is one important advantage to using a stall as a policy signal, which that it requires no prior commitment to a fertility target beyond the minimal target of fertility decline within a reasonable planning horizon. What it does not mean is that the decision to use stalling as a signal for intervention is somehow 'policy-neutral', or that a signal other than stalling would be 'arbitrary' in a way that the occurrence of a stall is not.

The function of the idea of stalling does seem to be more than merely practical, however, at least to the extent that the occurrence of stalling is used to support empirical claims about fertility trends, in particular the claim that the prevalence of fertility stalling in Sub-Saharan Africa is symptomatic of an attachment to fertility-related norms that distinguishes the region from other parts of the world. For sure, a change in a trajectory of fertility decline for one country – or differences in trajectories across different countries - may be 'real' phenomena for which we can try to find an explanation. A significant deceleration in the rate of decline or a slowdown to the point of 'no significant progress' are phenomena of interest, for the simple reason that they throw light on the balance of forces that impede or promote fertility decline.

Whatever definition of stalling is settled on, it is surely important to measure stalling with as much accuracy as possible. It is equally important, however, to be clear about the significance of re-measurements that drastically reduce the number of cases of fertility stalling. It is one thing to be concerned with a certain kind of change in the trajectory decline – and the problem of explanation that this generates – and quite another to be concerned

[15] Note that the terminology would seem to imply that only certain moves between these states are 'allowed'. Countries 'can' make progress and then stall; they 'cannot' make progress and then return to a pre-transitional state. Both Schoumaker and Machiyama add a fifth state to this classification, 'early transition'.

with the slow pace of fertility decline in Sub-Saharan Africa. The conclusion – based on re-measurement – that there are very few (only one perhaps) clear and unequivocal cases of stalling in the region has no real bearing on the claim that the pace of decline is too slow (a normative judgement) or indeed on the claim that the relatively slow pace of decline tells us something about the distinctiveness of the fertility transition in the region. At most therefore, what is required by this conclusion is a reformulation of the claim that the high prevalence of fertility stalling in Sub-Saharan Africa is an important part of the evidence for such a view of regional trends. What matters is not stalling *per se*, but persistent high levels of fertility and the slow pace of change.

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Table1 Countries outside SSA for which stalling has been reported in published papers

Past stalls – followed by continuing decline

	Dates for stall	**Approx TFR at stall**	**Reference**
S Korea	late 1960s & early '70s	4 - 4.5	1985 World Bank report
Sri Lanka	*mid '70s*	*3.5*	*1985 World Bank report*[16]
Costa Rica	mid '70s	3.5 - 4	1985 World Bank report
Iran	*1976-1986*	*6+*	*Aghajanian 1991*
Thailand	*early '80s*	*3.5 - 4*	*Bongaarts 1987*
Brazil	1986-1991	3 - 4	Shapiro et al 2011
Turkey	1993-1998	2.5	Bongaarts 2005
Argentina	1940s-1970s	3 - 3.5	Pantelides 1996
Peru	1992-1996	3.5	Bongaarts 2005
Colombia	1990-1995	3	Bongaarts 2005
Bangladesh	1996-2000	3 - 3.5	Islam et al 2004, Uddin 2006
Egypt	1995-2000	3 - 3.5	Eltigani 2003
Guatamala	1990s	5 – 5.5	Bongaarts 2008
Dominican Republic	1999-2002	3	Bongaarts 2005
Ecuador	1989-2004	3 – 3.5	Ishida 2009

'Currently stalling'

Indonesia	2002-2007	2.5	Shapiro et al 2011
Jordan	1998-2008	3.5	Cetorelli & Leone 2012
Syria	2000-2009	-	Courbage & Todd 2011
Gaza/West Bank	*mid-1980s-early 1990s*	*6+*	*Khawaja 2000*
Israel (Palestinian Arabs)	mid-1980s >	-	Friedlander et al 2010

[16] Countries for which claims of stalling have been contested or seem questionable (because fertility is arguably pre-transitional) are italicised.

Table 2 Countries in SSA with stalling or stagnant fertility in 1990s and 2000s*

	Bongaarts 2005 n=19	*Shapiro et al 2008* n=24	*Bongaarts 2008* n=22	*Garenne 2008* n=30	*Schoumaker 2009* n=24	*Machiyama 2010* n=9	*Shapiro 2011* n=26
Benin	decline	decline	decline	-	early transition?	*possible '01-06*	**2001-2006**
Burkino Faso	Pre-transitional	decline	decline**	decline	-	-	decline
Cameroon	decline	**1998-2004**	**1998-2004**	decline (98-04)	decline (98-04)	decline (98-04)	**1998-2004**
Chad	-	decline	Pre-transitional	-	-	-	decline
Côte d'Ivoire	decline	decline	**1998-2004**	-	-	-	decline (94-99)
Ethiopia	-	decline	**2000-2005**	decline	-	-	decline
Ghana	**1998-2003**	**1998-2003**	**1998-2003**	**1998-2003**	decline (98-03)	decline (98-03)	decline (03-08)
Guinea	-	**1999-2005**	Pre-transitional	-	-	-	**1999-2005**
Kenya	**1997-2003**	**1997-2003**	**1997-2003**	**1997-2003**	**1997-2003**	**1997-2003**	**1997-2003**
Madagascar	decline	decline	decline**	**1997-2003** urban	-	-	decline (04-08)
Mali	Pre-transitional	Pre-transitional	Pre-transitional	-	-	-	Pre-transitional
Mozambique	Pre-transitional	**1997-2003**	**1997-2003**	-	Pre-transitional	-	**1997-2003**
Niger	Pre-transitional	Pre-transitional	decline	-	-	-	Pre-transitional
Nigeria	decline	decline	**1998-2003**	**1998-2003**	early transition?	decline	**2003-2008**
Rwanda	decline	**1998-2004**	**1998-2005**	**1998-2003** rural	*possible '98-05*	*possible '98-05*	decline (05-07)
Tanzania	decline	**1999-2004**	**1992-2004**	**1992-2004** rural	decline	early transition?	**1996-2004**
Uganda	Pre-transitional	Pre-transitional	**1995-2001**	-	Pre-transitional	early transition?	decline
Zambia	decline	decline	**1998-2004**	-	decline	decline	**2001-2007**
Zimbabwe	decline	decline	**1999-2005**	-	-	-	decline

*The only SSA countries included in this list are those that have been identified as cases of either fertility stalling or pre-transitional fertility by one or more of the cited authors. For some of the countries omitted from the list there are no DHS data are available, or data from only one survey, or no recent data. Stalls are marked by dates in bold type. ** Bongaarts identifies Madagascar and Burkina Faso as cases of stalling in the 1990s (i.e. not current at time of writing).

Table 3 Updated classification of 'current' fertility trends in Sub-Saharan Africa*

Declining	Pre-transitional TFR>6	Stalling **
Benin 2006-11/12	Burundi 1987-2010	Burkina Faso 2003-10
Ethiopia 2005-11	Chad 1996-2004	Cameroon 2004-11
Eritrea 1995-2002	Mali 2001-06	Mozambique 2003-11
Ghana 2003-08	Niger 1998-2006	Nigeria 2003-08
Guinea 2005-12	Uganda 2006-11	Zambia 2001-07
Kenya 2003-08/9		Zimbabwe 2006-11
Lesotho 2004-2009		
Liberia 1986-2007		*Cote d'Ivoire 1998-2011*
Madagascar 2003/4-2008/9		*Gabon 2000-12*
Malawi 2004-10		*Tanzania 2004/5-10*
Namibia 2000-06/7		
Rwanda 2005-07/8		
Senegal 2005-10/11		

*Includes only countries with more than 1 DHS and most recent DHS is no earlier than 2004. The list has more recent data than Shapiro (2011), which leads to some re-classification. **TFR in Cote d'Ivoire declined by 0.2 children over a 12 year period, in Gabon by 0.1 children over 12 years, and in Tanzania by 0.2 children over 10 years i.e. < 0.03 children per year. These would all be stalls by Bongaarts' 2008 criterion, though not by Shapiro's – which is the criterion used to identify all the other stalls.