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Fertility preferences and subsequent childbearing in Africa and Asia: a synthesis of evidence from longitudinal studies in 28 populations.

Short title: Fertility preferences & subsequent fertility

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Abstract

Survey data on fertility preferences have played a central but controversial role in fertility research and advocacy for family planning. We summarise evidence from longitudinal studies in 28 Asian and African populations on the relationship between preferences and subsequent childbearing. While we found no consistent association between a women's desire to delay childbearing and subsequent fertility, the baseline desire of women to stop childbearing was a powerful predictor of subsequent fertility in all populations and increased in strength as overall contraceptive use in the study populations rose. The partner's desire also exercised some influence but was of modest importance in most populations. However, the correspondence between desires to stop and behaviour was found to be far from perfect. Weak implementation of preferences by contraception is likely to be the major cause for this preference-behaviour discrepancy. Uncertainty and/or instability in preferences may also contribute to the discrepancy, particularly in sub-Saharan Africa.

Keywords

fertility: fertility preferences/intentions; contraception; unintended pregnancy; longitudinal studies; predictive power.

Introduction

Survey data on fertility preferences have played a prominent role in research on fertility and contraception in low and middle income countries and in advocacy for international support of family planning programmes. Information on desire for more children (and desired timing of the next birth), wantedness of recent births at the time of conception, and current use of modern contraception are the main ingredients of key indicators such as unmet need for contraception and proportion of need for family planning that is satisfied. The United Nations Population Division monitors both indicators, and the latter is an indicator for the Sustainable Development Goals. Retrospective reports on the wantedness of recent births at time of conception, together with estimates of abortion, have generated highly influential publications on levels and trends in unintended pregnancy (Sedgh, Singh and Hussain 2014; Bearak et al. 2018). Reductions in unmet need and unintended pregnancies provide key rationales for family planning programmes.

Despite their widespread use and advocacy value, there are sharp disagreements among scholars about the meaningfulness of stated fertility preferences. Economists tend to be rather dismissive of what people say they want, preferring to assess motive from overt behaviour. For social psychologists, it is intentions, rather than wishes or desires, which drive behaviour. Evidence has been adduced for young women in Cameroon and Malawi that future childbearing desires are not fixed but rather responsive to a changeable and uncertain future and thus fluid in nature, with tenuous links to behaviour (Johnson-Hanks 2005; Yeatman, Sennott and Culpepper 2103; Sennott and Yeatman 2015; Trinitapoli and Yeatman 2018). Data from Demographic and Health Surveys (DHS) in Burkina Faso, Ghana, Kenya and Indonesia suggest that preferences may be ambivalent or weakly held; in those

surveys appreciable minorities of women who want to stop childbearing reported that a pregnancy in the next few weeks would pose no problem and about 10 per cent of women in these African surveys wishing to delay the next birth said that they would be happy with an early pregnancy (Speizer 2006 ; Bardon-O'Fallon and Speizer 2010). Qualitative studies in Mozambique, the Philippines and Ghana have also revealed ambivalence regarding, and lack of firm attachment to, future fertility desires (Agadjanian 2006; Casterline, Perez and Biddlecom 1997; Staveteig 2017).

Despite this evidence, strong aggregate consistency between the per cent of women wanting to stop childbearing and both the prevalence of contraceptive use and realized fertility has been documented for low and middle income countries (Westoff 1990; Bongaarts 1992), and, as will be shown below, longitudinal studies invariably find that desires to stop or continue childbearing are highly predictive of subsequent fertility. For this reason, the prospective measure of desired fertility is commonly preferred to alternatives, such as total desired family size (Bongaarts 1990; Casterline and El-Zeini 2007). The key survey item (i.e.DHS wording) is 'Would you like to have (a/another) child, or would you prefer not to have any (more) children?' In most surveys those women who want another child are then asked the desired timing of the next birth.

In contrast, responses to the retrospective question on whether recent births were welcome at time of conception typically have been regarded with deep scepticism because of the well-established human inability to recall thoughts and feelings a few years in the past compounded by the awkwardness of mothers reporting that young children, no doubt usually much loved, were either mistimed or unwanted at conception. Moreover, the single question typically used 'At the time you became pregnant, did you want to become

pregnant then, did you want to wait until later, or did you not want any (more) children at all?' can be criticised for over-simplifying a complex and multi-dimensional concept. Hence there are good reasons to suspect that responses to the retrospective wantedness question are subject to substantial measurement error.

The main purpose of this paper is to consolidate evidence on the association between prospective fertility preferences and subsequent fertility. We review and synthesise results from longitudinal studies conducted over the past half-century in low and middle income countries. An association between women's stated desire to stop or continue childbearing and subsequent fertility has been documented in numerous longitudinal studies, each specific to a time and place. But whether the strength of this association is rather uniform across populations or varies widely has not been examined systematically. A synthesis of many studies will permit the identification of any underlying regularity (and exceptions). Less well established is the additional predictive power of partners' preferences. A sub-set of studies allows us to examine this topic. Little discussed in the published literature is consideration of the relationship between desires to delay childbearing and subsequent fertility. Again a sub-set of studies provide data to assess this link. Finally, we will compare prospective and retrospective measures where both were collected.

Selection of studies

We selected for inclusion all longitudinal studies in countries classified as low and middle income at time of fieldwork that collected baseline data on fertility preferences and measured births (or pregnancies) over an observation period by follow-up interviews or

from surveillance data. The selected studies either present a comparison of fertility in the observation period between women who stated at baseline that they wanted no more children and those who wished to continue, or they provide sufficient information for us to make this comparison. Omitted are studies that collected the required information but do not permit the comparison of interest (Rogers 1976; Coombs 1979; Vlassof 1990; Jain 1999; Sennott and Yeatman 2005; Jennings and Pierotti 2018). Also omitted were studies restricted to women affected by HIV and those published in a language other than English. Because the number of such longitudinal studies was not large, most of the relevant literature was well referenced and was easy to identify but a check was made on the Popline database, using appropriate search terms. A total of 32 publications presenting longitudinal data on 28 populations was identified. The publications used in the review are listed in Table 1 and separately in the References. The authors carried out additional analyses of their longitudinal data from Malawi, Ghana and Egypt to increase comparability with other studies; these are available on request. Anrudh Jain and Sarah Hayford kindly provided unpublished results from their respective studies in Pakistan and Mozambique (Jain 2018, Hayford 2019). All other results reported below are taken directly, or recalculated, from published data.

Results

Study characteristics

The studies under review were conducted over the past 50 years, from 1967 to the recent past (Table 1). A few used nationally representative samples, for instance in Taiwan and Morocco. Most are geographically focussed, with a mixture of urban and rural sites. Asian,

North African and sub-Saharan African populations are represented but we were unable to locate any eligible studies from Latin America and the Caribbean, a reflection perhaps of the omission of papers published in Spanish or Portuguese. The Matlab surveillance site in Bangladesh is heavily overrepresented with seven of the 28 population estimates. Sample sizes were generally large (>2000 women), though ranging widely from over 10,000 in Matlab, Bangladesh to 475 in South Korea. The typical study population was married women of reproductive age. Two studies followed postpartum women and a further two were restricted to women with children. Four studies, in Oyo State, Nigeria, rural northern Malawi, Egypt, and Jessore District, Bangladesh collected and analysed data from matched couples. Most studies excluded sterilised women (or husbands), those declared or defined as infecund, and women who were pregnant at baseline.

<Insert Table 1 here>

Study designs usually took the form of a baseline survey and a single endline survey after an interval of two to three years. A few used surveillance or birth registration data, notably those in Matlab, instead of a follow-up survey. Multiple follow-up surveys were used in in Ghana, where Kodzi, Johnson and Casterline (2010a) implemented eight follow-ups at intervals ranging from 6-16 months. Sample attrition was not always reported in publications but varied widely from 36 per cent over two years in urban Nigeria to three per cent over the same duration in Upper Egypt.

In publications, baseline fertility preferences were often represented as a binary classification of respondents who want more or no more children. A shorthand label for the latter set of women is “limiters”. A few studies included results for the typically small group who were undecided or unsure about future childbearing. A minority of studies further sub-

divided respondents who wanted more into those who wanted a child soon or within two years, and those who wanted to delay childbearing for two years or longer. The shorthand label for the latter group is “spacers”. Many studies collected baseline information on contraceptive use and most of these used this information as a predictor of subsequent fertility.

The outcome of interest in nearly all papers was the incidence of one or more live births during the observation period. A current pregnancy at endline was typically included in the definition of fertility. Three studies, two in Bangladesh and one in Taiwan, were able to measure abortions. In a minority of studies, the wantedness status at time of conception of births during the observation period was ascertained retrospectively. A few studies permitted assessment of changes in preferences between base- and endline.

The predictive power of women’s limitation preference

Following the eligibility criteria, all studies reported directly or indirectly the difference in the probability of having one or more live births (or endline pregnancy) during the observation period between women who declared a desire to stop childbearing at baseline (limiters) and those who wanted more children. Results are summarised in the right-hand columns of Table 1, where studies have been ordered by the level of use of any reversible method of contraception at baseline in the entire sample. Such use ranged from less than 10 per cent to over 60 per cent. Without exception, large differences in childbearing are apparent between limiters and those who wished to have more children. The odds ratios in the right-hand column are a summary measure of the size of the association between preferences and subsequent fertility. The odds ratios range from 1.71 (study #23, Speizer,

Kenya) to 20.1 (study #13, Hermalin and Freedman, Taiwan). Apart from three studies in sub-Saharan Africa (two in Kenya, one in Mozambique), all the odds ratios exceed 2.0, and indeed more than one-half exceed 5.0. This is powerful evidence of the predictive validity of prospective fertility preferences.

Nevertheless, the proportion of women who do not want another child who nevertheless had a child during the observation period is substantial in most of the 28 studies. At one extreme, in seven populations less than 20 per cent of limiters had a birth. At the other extreme, in five populations this percentage exceeded 40 per cent; these five are characterised by low levels of contraceptive use (<18 per cent). The study by Roy and colleagues (2008) in rural India merits special comment because sterilisation was the dominant method of contraception in this population. If sterilised women are reinserted into the analysis on the irrefutable assumptions that they wanted no more children and had no birth, the percentage of limiters who gave birth falls from 51 to 23 per cent.

As shown in Figure 1 a clear association is evident between overall contraceptive use at baseline and fertility among limiters, though it is modest with a regression coefficient of -0.36. This link can be clearly seen in the Matlab studies conducted at different times with varying levels of contraceptive use. Some pronounced exceptions exist to the generalization that, as overall contraceptive use rises, the proportion of women declaring a desire to cease childbearing but who nevertheless had a child falls. In Oyo State, Nigeria and in city populations of Senegal and Nigeria, the proportion of limiters who gave birth during observation periods of two years was very low (<17per cent), despite low levels of reported contraceptive use (Bankole 1995; Speizer and Lance 2015). When these three studies are

omitted (numbered 2, 10 and 11 in Figure 1), the regression coefficient of baseline contraceptive use rises to -0.50.

<Insert Figure 1 here>

As implied above, contraceptive use mediates the effect of preferences on subsequent fertility at the individual level. In Upper Egypt, for instance, 12 per cent of limiters who were contracepting at baseline gave birth compared with 40 per cent of non-users (Casterline, El-Zanaty and El-Zeini 2003). The corresponding estimates for Pakistan and urban Uttar Pradesh among limiters were 22 versus 47 per cent and 11 versus 26 per cent, respectively (Jain et al. 2014; Speizer et al. 2013). Nevertheless, even limiters who were not contracepting at baseline usually recorded lower fertility than women wanting more children, whether or not the latter were contracepting (results not shown).

The study by Rahman, Da Vanzo and Razzaque (2001) is one of only three with data of sufficient quality to measure induced abortions as well as live births. Between 1984-89 and 1990-94, the proportion of pregnancies to limiters that were aborted rose from three to ten per cent, a rise that the authors attribute to increased intensity to avoid unintended births. The second study that measured induced abortions was also conducted in Bangladesh, though not in Matlab (Gipson and Hindin 2008). Among couples who both wanted no more children, 29 per cent of pregnancies during the follow-up period were terminated, compared with six to seven per cent when only one spouse wanted to stop childbearing and two per cent when both wanted more children. The third study to examine induced abortions was that by Nair and Chow (1980) in Taiwan who found that, in the first year of follow-up, the abortion rate per 1000 pregnancies was 281 for limiters and 37 for women wanting to continue childbearing. In that year women wanting more children were

three times more likely than limiters to experience a pregnancy and four times more likely to have a live birth.

Seven studies examined childbearing among women who were uncertain at baseline about future desires for another birth. In five studies these women comprised small minorities of well under 10 per cent, the two exceptions being in Oyo State, Nigeria and Bali where 17 and 14 per cent, respectively, were uncertain (Bankole 1995; Withers, Tavrow and Adinata 2011). In all seven studies the fertility of the undecided group was intermediate between limiters and others (results not shown).

Only three studies assessed whether measures of the intensity of baseline preferences improved predictive power. In Malawi, the odds of having a child were 18 per cent lower for limiters who thought that childbirth in the next year would pose serious financial or health problems than among limiters who anticipated no such problems (Machiyama et al. 2015). In urban Nigeria, limiters who thought that a pregnancy in the next few weeks would be a 'big problem' were significantly more likely than others to avoid a birth (Babalola et al. 2017). However, in Nairobi slums, the perception that pregnancy in the next few weeks would be a 'big problem' or the mention of financial reasons for avoiding pregnancy did not improve the predictive power of preferences (Machiyama et al. 2019).

Some studies applied multivariate analysis to assess whether factors such as mother's age, family size, education, rural-urban residence confounded the effect of preferences on subsequent childbearing. Typically, the predictive power of preferences attenuated modestly but remained significant in multivariate modelling (Hermalin et al. 1979; Bankole and Westoff 1998; Machiyama et al. 2015; Machiyama et al. 2019). In Mozambique, their predictive power actually increased (Hayford and Agadjanian 2012). In

rural Ghana, the monthly odds of pregnancy fell appreciably from 2.95 to 1.85 but remained significant with control for other factors, for women who wanted to get pregnant soon compared with those who wanted no more children, but the model included contraceptive use, which is on the causal pathway between preferences and pregnancy (Kodzi, Johnson and Casterline 2010a). In a model that also included contraceptive use, Withers, Tavrow and Adinata (2011) found no difference in fertility between women who wanted more or no more children.

The other application of multivariate modelling assessed factors that were associated with subsequent childbearing among limiters (Babalola et al 2017; Da Vanzo, Peterson and Jones 2003; Razzaque 1999; Nair and Chow 1980; Withers, Tavrow and Adinata 2011; Machiyama et al. 2015). All found a negative association between women's age and fertility. Of the five studies that included women's education in their model, three found no effect and two found that better educated women who wanted to stop were less likely to have a child than the less educated.

The predictive power of spousal limitation preferences

Seven studies, covering eight populations, compared in tabular form the relative influence of the wife's and husband's baseline preference on the probability of having one or more births in the follow-up period (Table 2). Two of these, by Razzaque (1999) and Tan and Tey (1994), measured husbands' preferences through proxy reports by wives; in the other studies, husbands were interviewed separately and responses matched to wives. The level of spousal concordance implied by the denominators in Table 2 concerning desire for more children or not was typically high, at around 90 per cent. The three exceptions occurred in

rural Malawi where 25 per cent of couples disagreed, and in Malaysia and Egypt where the level of disagreement was 18-19 per cent. In five of the eight populations discordance took the form of the husband wanting more children but the wife wishing to stop.

<Insert Table 2 here>

With the exception of the study in Egypt, fertility was highest when both spouses wanted more children, intermediate when they disagreed and lowest when both wanted no more. Differences in fertility between the two discordant categories were minor, again with exception of Egypt. Multivariate analyses in two studies yielded results that supported the conclusion from Table 2, namely that wife's and husband's preferences exert roughly equal influences on subsequent reproduction (Bankole 1995; Machiyama et al. 2015). In Bankole's study in Nigeria, the husband's desire was more important than the wife's at small family sizes but the reverse was true at larger sizes. However, Gipson and Hindin (2009) found the wife's preference to be a stronger influence than that of the husband in the southwestern region in Bangladesh. Also in Egypt fertility was much lower among the small fraction of couples where the wife wanted to stop childbearing but the husband wished to continue than vice versa (Casterline, El-Zanaty and El-Zeini 2003). In urban Nigeria and Sri Lanka, the husband's desire for more children, as reported by the wife, had no statistically significant effect on fertility among women who wanted no more children (Babalola et al. 2017; De Silva 1991).

The predictive power of women's spacing preference

Many women who want another child wish to avoid pregnancy for the time being. Timaeus and Moultrie (2008) argued for making the distinction in this group of women between

spacing and postponement preferences. The former refers to a desire to delay the next birth for a specified amount of time -- two years, three years -- whereas the latter is simply a desire not to become pregnant anytime soon (while retaining a wish to have another child sometime in the future). Timaeus and Moultrie argued that fertility declines in sub-Saharan Africa to date are unusual in the extent to which they have been driven by postponement (see also Moultrie, Sayi and Timaeus 2012). As Timaeus and Moultrie noted, the items standard in demographic surveys (e.g. DHS) are designed to detect spacing motivation but ill-designed to detect postponement motivation. This generalization applies to the studies reviewed here: respondents who wanted another child were asked how long they would like to delay the next birth (reported in months or years), with no acknowledgment (other than a residual 'uncertain' category) that the respondent might have no explicit time horizon in mind. Hence we regard the data from the studies reviewed here as indicative of the predictive power of spacing preference but not necessarily postponement preference.

In ten studies, the subsequent childbearing of women who stated at baseline a desire to wait for two or more years for the next child (spacers) and those who wanted a child sooner can be compared (Table 3). The expected result of lower fertility among spacers than non-spacers was found in Malawi and Nairobi (Machiyama et al. 2015; Machiyama et al. 2019). In Mozambique, Egypt, Ghana, urban Uttar Pradesh, India, and urban Kenyan sites, differences were very small (Hayford and Agadjanian 2019; Casterline, El-Zanaty and El-Zeini 2003; Speizer et al. 2013; Speizer and Lance 2015). Moreover, in Pakistan, urban Nigeria and urban Senegal, the probability of one or births was considerably higher for spacers than others (Jain et al. 2014; Speizer and Lance 2015). For half of these populations, estimates of fertility for women who wanted more children but were

undecided or uncertain about how long they wished to wait were available but there is no clear pattern to the results.

The study in Nairobi slums is the only one to examine preferences beyond the conventional two (or three) year cut-off. In this study with a follow-up period of three years, there was a clear gradient in childbearing by desired time to next birth. Whereas 66 per cent of women wanting a child within two years did give birth, this proportion fell to 53 per cent for those wishing to delay between two to four years and further to 31 per cent among women wishing to avoid a birth for five years or more.

<Insert Table 3 here>

Changes in preferences

Changes in preferences over time may be measured by the proportion who wanted no more at baseline but later declared a preference for more children, regardless of whether or not they experienced a birth in the intervening period. The opposite shift from wanting more to no more is more complicated to interpret, as one must take into account childbearing during the observation period. For those with a birth, the shift is a logical progression; only for those without a birth can it be interpreted as a change. Changes of both types may stem from weakly held or ambivalent preferences (ie instability) or from alterations in circumstances, such as acquisition of a new partner or death of a child.

Data on the change in preference from no more to more are available for nine populations and from more to no more for all but one of these (Table 4). Change of a baseline limitation preference was highest in rural Mozambique, with a shift of 30 per cent

over three years (Hayford and Agadjanian 2017). It was also high in Malawi (21 per cent over one year) and rural India (19 per cent over four years) (Machiyama et al. 2015; Roy et al.2008). In the remaining populations, change was lower: typically less than 10 per cent of women changed from wanting no more to more children. The proportion of women changing in the opposite direction, from more to no more, ranged from 6 to 19 per cent, with Mozambique as an outlier at 35 per cent. In five of these eight populations, this proportion exceeded the reverse change.

Two studies collected data at multiple rounds on time-varying factors that might provoke changes in reproductive desires. In Mozambique, Hayford and Agadjanian (2017) found that predictors of change included child death and shifts in marital status but not improvements or deteriorations in objective or subjective economic circumstances. In an analysis of 384 women who changed their fertility preference at least once over the eight follow-up rounds, Kodzi et al. (2012) similarly found that transitions in marital status and child death were associated with change, but predictors of change also included subjective economic prospects, the woman's perceived health status and the anticipated costs of an additional child.

<Insert Table 4 here>

Prospective versus retrospective preferences

In six publications covering eight populations, data were presented that made it possible to cross-classify births (or endline pregnancy) that occurred during the observation period by the mother's baseline preference (more versus no more children) and her retrospective report at a later interview as to whether the birth was unwanted at time of conception, mistimed (i.e. occurred sooner than desired) or wanted at that time. Shifts between the

prospective and retrospective indicators were overwhelmingly unidirectional, from wanting no more children at baseline to a retrospective classification of wantedness. In the research literature a shift of this sort is commonly termed “rationalisation”. In all eight populations, less than half of births to women who wanted to limit family size at baseline were declared as unwanted (Table 5). This proportion is highest, at over 40 per cent, in Pakistan, Morocco, and Egypt. It is intermediate, at about 30 per cent, in India and urban Kenya but very low in the other sub-Saharan African populations (Senegal, Nigeria and Malawi). Conversely, with one marginal exception, less than ten per cent of births to women wanting more children were subsequently declared as unwanted. The proportion of all births classified as mistimed was notably high in three of the sub-Saharan African populations, the exception being urban Nigeria, where women appeared reluctant to classify births as either unwanted or mistimed at conception.

<Insert Table 5 here>

Correlates of the shift from a baseline desire for no more children to a retrospective declaration that a subsequent birth was wanted at that time were assessed in India by Koenig and colleagues (2006). Younger women with smaller families who perceived the husband to favour additional children were more likely than others to classify a birth as wanted. Two additional correlates were strongly suggestive of rationalisation. Older children (as compared to younger) were significantly more likely to be classified as wanted, and also sons (as compared to daughters). Bankole and Westoff (1998) also found evidence that, as children age, there is increased reluctance to classify them as unwanted at time of conception. Using data for 722 births for whom a retrospective measure of wantedness was available both at the base-and endline survey, they found that only 38 per cent of the 140

births classified as unwanted in the earlier survey were identically classified three years later, whereas 87 per cent of wanted births were consistently classified at the two points in time. Very similar results were obtained in Egypt for 268 births for whom wantedness classifications were obtained at two points in time. Only 54.5 per cent of births reported as unwanted in the earlier survey were similarly classified in the later survey compared with 80 per cent of wanted births (Casterline, El-Zanaty and El-Zeini 2001).

It is clear from Table 5 that the retrospective measure yields much lower estimates of unwanted childbearing than the prospective, or baseline, measure. Jain and his colleagues (2014) attempted to decompose and quantify two possible sources of this discrepancy: rationalisation and change in preference. They assumed that births to women who consistently stated at base- and endline that they wanted no more children were unwanted but that births to women who wanted no more at baseline but wanted more at endline were wanted. On this basis, they calculated that 77 per cent of the discrepancy was due to rationalisation and 23 per cent to change in preference.

Discussion

Implementation of women's desire to limit or delay childbearing

This review has served to confirm some findings that were already established in the literature but has also provided some new insights. The key confirmation, from studies in 28 populations conducted over a span of half a century, is that women who say that they want no more children are indeed much less likely to have a child than women who want more children. Over observation periods ranging from two to 12 years, we identified no

exceptions and, moreover, nearly all the differences were large (odds ratios in excess of 2.0) and little modified by adjustment for potential confounders.

One new insight from the review is that consistency between preferences and subsequent reproduction increases as the overall level of contraceptive use in the study population rises. The gradient shown in Figure 1 underscores the importance of the ability to implement preferences and supports evidence that better implementation rather than shifts in preferences has been the major driver of increased contraceptive use (Feyisetan and Casterline 2000). Findings from three studies suggest that abortion is also an important part of the link between reproductive wishes and behaviour in some populations.

One virtue of a synthesis of many studies is that exceptions can be clearly discerned. Three particularly pronounced exceptions were identified to the generalization that, as contraceptive use rises, fertility among limiters falls. No obvious explanation exists though it is surely no coincidence that all three are located in West Africa: Oyo State, Nigeria and selected cities in Senegal and Nigeria (Bankole 1995; Speizer and Lance 2013). In Oyo State in the mid-1980s, only eight per cent of wives expressed a desire to limit family size and the low level of subsequent childbearing of such a small, highly selective minority perhaps is not so surprising. But in urban Nigeria and Senegal, 32 and 22 per cent, respectively, wanted no more children, by no means an exceptional minority. While contraception did increase in both countries, partly in response to an intervention by the Urban Reproductive Health Initiative, the changes were modest, amounting to a seven per cent point increase in modern method use in Senegal and between two and 15 per cent in the four Nigerian cities.

These maverick West African results from Senegal and Nigeria are consistent with other evidence that fertility trends in this sub-region are weakly linked to reported use of

contraception, though an analysis by Bongaarts reaches an opposite conclusion (Westoff and Bankole 2001: Bongaarts 2017). For instance, fertility declines in Ghana and Kenya have been very similar, yet the prevalence of contraceptive use in Kenya is twice that reported in Ghana (Askew, Maggwa and Obare 2017). Similarly, the total fertility rate in Senegal fell from 6.4 in 1985 to 4.9 in 2013-15, while reported contraceptive use among married women increased only from 11 to 18 per cent. Possible explanations include a high incidence of abortion, deliberate concealment of contraceptive practice or underreporting of natural methods (Phillips et al. 2012; Rossier, Senderowicz and Soura 2014), or skilful exercise of a combination of fertility awareness, withdrawal, and emergency contraception that goes undetected by standard survey questions, as documented in Accra, Ghana (Marston et al. 2017).

Putting aside the puzzles in West Africa, an important conclusion from this review is that women's wishes to limit childbearing strongly predict subsequent fertility in sub-Saharan Africa. In seven of the eight studies of African populations, including both urban and rural sites, women declaring a desire to stop childbearing recorded much lower levels of subsequent fertility than women wanting to continue childbearing. The single partial exception was in rural Mozambique, where 56 per cent of women wanting no more children subsequently gave birth compared with 69 per cent of women who wanted more (Hayford and Agadjanian 2017). The Mozambique result may reflect high HIV prevalence and changes in access to testing and treatment (Hayford and Agadjanian 2010; Hayford, Agadjanian and Luz 2012). In view of the extensive literature, described above, portraying reproductive desires in Africa as fluid and ambivalent, and thus lacking interpretive weight, this is an important verdict that tempers assertions that Africa is exceptional in this respect such as

the conclusion that 'women in sub-Saharan Africa are less capable of translating child preferences into birth outcomes than women in other developing countries' (Gunther and Harrtgen 2016 p.71). The evidence from longitudinal studies suggests that they are just as capable.

In marked contrast to the strong predictive power of the family size limitation motive, no consistency was apparent between the baseline desire to delay childbearing and subsequent births. Indeed in three populations (Pakistan, urban Nigeria and urban Senegal), women wishing to delay the next child for at least two years were more likely to have a child in the observation period than those who wanted a child soon or within two years. The explanation offered by the authors for the unexpected results in the African sites was that women wanting a child soon may have been wanting a child for a long time but suffered from infecundity or sub-fecundity whereas spacers were more confident in their reproductive capacity (Speizer and Lance 2015). This interpretation is strengthened by their finding that, among the minority of contraceptive users at baseline, spacers did achieve lower childbearing than those wanting a child soon. But among the much larger number of non-users, fertility was significantly higher among the spacers than the non-spacers.

In view of the widespread trend to longer birth intervals in Asia, Latin America and Africa (Casterline and Odden 2016), evidence that prolonged postponement of births is a major driver of fertility decline in Africa (Moultrie, Sayi and Timaeus 2012) and the well documented value attached to spacing in Africa (Caldwell, Orubuloye, and Caldwell 1992), the weak association between spacing or postponement desires and subsequent fertility is surprising, particularly for Africa. Only the study in Nairobi conformed to expectations and it was also the only one to examine the predictive power of spacing desires beyond the

conventional dichotomy of less or more than two years (Machiyama et al. 2019). Notably in this study 37 per cent of women stated at baseline that they wanted to wait at least five years for another child and their probability of giving birth over the three-year observation period was only fractionally above that of women who wanted no more children (31 per cent versus 27 per cent). This result is consistent with an analysis of four East African DHSs that found increased birth interval lengths to be concentrated in urban areas and most pronounced among ever users of contraception, with median lengths among urban users ranging between 52 and 86 months (Towriss and Timaeus 2018). The Nairobi study also found higher fertility among those wanting a birth soon than among those who wanted to delay for two to four years, in contrast to the results for Nigeria and Senegal. Clearly, more research is needed to clarify how African women implement their stated desires to limit, space, and postpone childbearing.

The influence of husbands

Much advocacy in favour of international family planning either ignores men's perspectives or portrays men as barriers for women to exercise freedom of reproductive choice, hence the emphasis on strengthening women's empowerment or autonomy as a major pathway to the spread of contraceptive practice and reduction of pregnancies that are unwanted by women.

The evidence from longitudinal studies confirms earlier findings from cross-sectional analyses that men's reproductive desires indeed are hugely influential (Ezeh 1993; Dodoo 1998; DeRose and Ezeh 2003). With one marked exception (Egypt), the probability of a birth was typically twice as high when the wife, but not the husband, wants to stop childbearing

than when both want to stop. This difference holds both for studies when the husband's wishes were ascertained independently and when proxy reports by the wife were used. However, when the wishes of spouses diverge, in all but three studies the influence of wife and husband was equal; there was no evidence that the husband's view prevails. In studies conducted in Egypt, Malawi, and Bangladesh, the wife's preference was found to exert a greater influence, i.e. a birth was more likely when the wife wanted a child (but the husband did not) than when the husband wanted a child (but the wife did not). The results from Egypt are especially striking and unexplained; note that in this study a large majority of spouses are in concurrence, with instances of the wife wanting another child but the husband not constituting just one-eighth of the sample. A longitudinal study in the Chitwan Valley, Nepal, which measured preferences through the Coombs scale, also found the wife's preference to be a more decisive influence on progression to a third birth than the husband's (Jennings and Pierotti 2016).This evidence accords with the review by Ann Blanc who concluded that 'the relative weight of each partner's opinion [on reproductive decision making] defies generalization across settings' (Blanc 2000, p.195). It is also consistent with an analysis of cross-sectional data from 18 national surveys that found few differences in contraceptive use between couples in whom the wife, but not the husband, wanted more children and vice versa (Bankole and Singh 1998). Judging from this admittedly small body of empirical work, we infer that most populations are characterised by relative equality of spousal influence rather than men's hegemony. The results also hint that, in a minority, the wife's wishes prevail.

The importance of substituting a couple's for a woman's perspective on childbearing for an understanding of reproductive decisions and behaviour depends on the degree and

direction of disagreement between them. In North Africa, Asia and Latin America, but less so in sub-Saharan Africa, there is very high concordance between men and women in their desires to continue or stop childbearing (Johnson and Gu 2009). In sub-Saharan Africa, interpretation is complicated in some countries by a high prevalence of polygyny, which will inflate the reproductive goals of men, and by the fact the scope for disagreement is limited because so few respondents of either sex want to stop childbearing. A report on 14 African DHSs found that an average of 21 per cent of matched couples disagreed on whether or not to limit family size (Gebreselassie 2008). Disagreement was less common in West African countries than in other sub-regions because only small minorities of either sex wished to stop childbearing. In all but one country, husbands were more likely than wives to want more children.

Spousal disagreement is clearly a more important consideration in sub-Saharan Africa than elsewhere. Only two of the longitudinal studies reviewed here with relevant data were conducted in this region and their results are consistent with DHS evidence. The study in Nigeria reported only 10 per cent disagreement between spouses in monogamous marriages but, in this high fertility pronatalist setting, 86 per cent of couples were unanimous in wanting more children (Bankole 1995). The other study in rural Malawi found 25 per cent disagreement, with husbands slightly more inclined to want to continue childbearing than wives (14.5 per cent versus 11 per cent). As in the other studies, fertility in the observation period among discordant couples was double that among couples agreeing on a desire to have no more children. In sum, a small but not negligible contribution to the inconsistency between women's childbearing desires and behaviour in Africa stems from divergence between partners in reproductive desires and this contribution increases as the

desire for family size limitation becomes more widespread. Bankole's study in Nigeria was the only one to assess how parity mediates spousal influence and this topic merits further investigation.

Lack of correspondence between prospective preferences and childbearing: weak or fluid preferences or poor implementation

Though this review has confirmed the strong predictive power of the desire to stop childbearing (but not the desire to delay) on subsequent reproduction, nevertheless an appreciable proportion of limiters subsequently have a child. Even in populations with high levels of contraceptive use, this proportion is close to one-fifth. Addition of the husband's preference improves the correspondence between desires and behaviour but by no means eliminates the mismatch. In view of the simplicity of the question on desire for more children, poor measurement of future fertility preferences is unlikely to be an important consideration.

As noted earlier, several explanations have been advanced for the imperfect correspondence between preferences and behaviour: preferences are weakly held or ambivalent; women or couples change their mind about having another child; and couples are unable or unwilling to enforce preferences by using effective contraception (or abortion).

It will come as no surprise that this synthesis of evidence from longitudinal studies suggests that all three types of factor are implicated. Two of the three studies that collected relevant data found that a measure of the strength of preferences improved predictive power.

The direct evidence on changes in women's preferences was presented in table 4. Our interpretation of these data is that, with the exception of some populations in sub-Saharan Africa, the stability of the desire to limit family size is high; close to 90 per cent of women gave the same response on desire for no more children after intervals of two to four years. The exception is the study in rural India but the exclusion of sterilised women (the dominant form of contraception) implies that this sample is highly selected for couples who lack a firm commitment to limitation. In contrast, 21 per cent of women in rural Malawi switched from wanting no more children to wanting more over a period of just one year, 24 per cent in rural Mozambique over three years and 13 per cent in rural Ghana over short inter-round periods of five to 16 months. The detailed time-varying information collected in Mozambique and Ghana provide insights into the uncertainties of life that prompt changes in reproductive desires. Over three years, seven per cent of women in Mozambique experienced a child death and 10.5 per cent a change in marital status (Hayford and Agadjanian 2017). In Ghana, 21 per cent reported a severe health problem since the previous round and six per cent reported a worsening economic situation (Kodzi, Johnson and Casterline 2012). All these factors were associated with preference change. Similar shifts in desired timing of births in response to changing circumstances has been documented among young women in Malawi (Sennott and Yeatman 2012; Trinitapoli and Yeatman 2018). These studies demonstrate that change in preferences is not simply random oscillation but instead response to changing circumstances, what Trinitapoli and Yeatman (2018) term "flexibility". Whether such flexibility in preferences is more prevalent in sub-Saharan Africa because the volatility of life is greater in this region cannot be determined because of the absence of comparable research in other regions.

The third explanation for imperfect correspondence between prospective preferences and subsequent childbearing is that women face obstacles that prevent them from achieving their reproductive preferences through consistent use of effective methods of contraception (or abortion). A huge literature has accumulated on barriers to contraceptive use encompassing lack of knowledge in low contraceptive prevalence settings to heath concerns, side effects and perceived low risk of pregnancy (Casterline and Sinding 2000; Sedgh and Hussain 2014). Even in relative high use populations, negative beliefs about specific methods and discontinuation are common (Machiyama et al. 2017). The evidence shown earlier that the likelihood of births to women who stated a desire to stop childbearing falls as overall contraceptive rises is consistent with the view that barriers are genuine and account for much unwanted fertility. A complementary explanation is that, in low contraceptive use populations, preferences are weakly held but they strengthen as birth prevention becomes widespread and is recognized as a viable option. Motives and means are intertwined.

One ultimate but elusive goal of longitudinal research into the links between childbearing preferences and behaviour is to estimate the relative contributions to fertility of weak or flexible desires versus problems of implementation among women wishing to stop or delay childbearing. If data on the retrospective wantedness of children were totally reliable and valid, this goal would be achievable. However, this is not the case. Two studies, in Egypt and Morocco reviewed above, indicated very low test-retest reliability with a largely unidirectional shift towards declaring a child as wanted. A third review study, in rural India, also found that, as children age, they are less likely to be reported as unwanted at

time of conception. Other evidence suggests that reports are biased by death and illness of children (Smith-Greenaway and Sennott 2016)

These considerations undermine reliance on retrospective reports as a basis for assessing the incidence of unwanted fertility. Consider the results in Table 5. In Egypt, Pakistan and Morocco over 40 per cent of subsequent births to women wishing to stop childbearing at baseline were declared retrospectively as unwanted, confirming the large contribution of imperfect implementation to childbearing. But because of the evidence of rationalisation in two of these three populations, these are lower bound estimates. An upper bound estimate of 77 per cent was reached by Jain and colleagues (2014) for Pakistan who assumed that any birth occurring to women who consistently reported the wish to stop childbearing was unwanted, regardless of the retrospective reports by mothers.

The results in Table 5 for sub-Saharan populations showed larger discrepancies between prospective and retrospective measures than elsewhere, with small minorities of births to limiters being declared as unwanted. Preference change and spousal differences in reproductive desires probably account for a larger fraction of the discrepancy than in other regions. Rationalisation has also certainly contributed. But more fundamentally, it also seems probable that the prospective and retrospective questions are measuring different constructs, the former tapping a somewhat abstract future desire and the latter a more emotional response to an event. Given the high value traditionally attached to children in Africa, it is perhaps unsurprising that the advent of pregnancy and an additional child in the family evokes a positive emotion, regardless of prior wishes. Complete reconciliation between the two approaches to the measurement of unwanted childbearing may be an unrealistic goal.

Conclusions and future research priorities

The strongest conclusion from this review, essentially a confirmation of existing knowledge, is that women who say they want no more children are indeed much less likely to have a child than those who want more children. This verdict holds for populations in sub-Saharan Africa, a region for which doubts about the validity of reproductive preferences have been expressed. One potential limitation of most studies was the short observation period of two to three years but results were similar for the minority with longer periods. A further concern is the high attrition, particularly in urban settings. To the extent that mobility and fertility are linked, results may be biased but, in our view, insufficiently to undermine conclusions.

The link between desires and outcomes tends to strengthen as overall contraceptive use increases, a new though unsurprising insight. We speculate that the exceptions, notably in West Africa, reflect poor measurement of birth-prevention behaviour. An inevitable weakness of all but three studies was their inability to measure abortion. The proliferation of medication abortion is likely to further complicate links between preferences, contraceptive use and reproductive outcomes in future studies. In the Bangladesh study by Gipson and Hindin, the incidence of abortion was inferred by repeated collection of information on date of last menses and this approach might be replicated where feasible.

The other topics investigated had to rely on a sub-set of results from eight to ten populations and thus generalisations need to be cautious. Nevertheless, we are confident about the conclusion that instances of husband's preferences over-ruling contradictory wife's preferences are relatively rare, because the results are consistent with a considerable

body of evidence from cross-sectional analyses. As spousal concordance in reproductive wishes is lower in sub-Saharan Africa than elsewhere, future studies in this region ideally should ascertain the preferences of both partners.

Though only studies in eight populations permitted a comparison of prospective and retrospective classifications of unwanted births, the results were so emphatic that again a confident conclusion may be drawn. Retrospective measures invariably yield lower estimates of unwantedness than prospective measures, with larger differences in sub-Saharan Africa than elsewhere. However, the evidence did not permit any advance in quantifying the reasons for the discrepancy. Prospective measures of unwantedness are biased upwards because they may be held weakly or ambivalently and may change over time. Retrospective indicators are biased downwards, because of measurement error including rationalisation. In theory, one way of ascertaining the merits of the two approaches would be to assess the association between each type of measure of unwantedness and child outcomes (mortality, health, schooling) but this would assume that unwanted children suffer conscious or unconscious discrimination; we are aware of just one study that provides this comparison and this found no association between either measure and child survival (Bawah et al. 2016). More generally, attitudes before an event has occurred and reactions to it are unlikely to be identical. Neither the prospective nor the retrospective measure is ideal but the evidence from rural India, Morocco and Egypt on the unreliability of the retrospective estimates is very damaging. Our view is that the prospective approach comes closer than the retrospective one to gauging the extent to which women and couples are able or willing to enforce reproductive desires. However, longitudinal studies are expensive and time consuming.

Thus despite the evidence of low validity of the retrospective item, population estimates of unintended childbearing will continue to rely on this item in cross-sectional surveys (such as DHS). And therefore improving retrospective assessment should be a goal of methodological research. One possible approach is the London Measure of Unplanned Pregnancy (LMUP), which has been field-tested in India and Malawi (Rocca et al. 2010; Hall et al. 2013). LMUP is a six-item scale that includes contraceptive use, intention, desire to have a child, discussion/agreement with partner, and behaviour change to prepare for pregnancy. Whether LMUP or another innovation, the priority is to develop a line of questioning that yields data of higher reliability and face validity than responses to the current question used by DHS. The item(s) must be succinct to have a chance to be incorporated into future routine, multipurpose enquiries.

The ambivalent, indeed surprising and baffling, result concerns the lack of the predictive power of desires to delay pregnancy. In most of the study populations, the difference in fertility between women who wanted to wait for two or more years and thus who wanted a birth sooner was small or contrary to expectations. Perhaps this reflects selection on fecundability: an expressed desire to have a child soon may be selective of women with lower fecundability (and hence some desperation to become pregnant). . Alternatively, desires to delay may be weakly held and fluid; the evidence in Table 4 indicates this is the case in the African populations (Mozambique, Malawi), a surprising result in view of the salience of birth-spacing goals in this region, Certainly this is a topic on which more investigation is needed. Only a few longitudinal studies have explicitly examined the responsiveness of fertility desires to changing individual and household circumstances (health, economic, partnership status) (Hayford and Agadjanian 2012; Kodzi et al. 2012;

Trinitapoli and Yeatman 2018). All three studies are African, pursuing the suppositions of Johnson-Hanks (2005) and Timaeus and Moultrie (2008) that the uncertainty of daily existence in African societies makes fertility preferences unusually volatile. Whatever the explanation for the small predictive power of the desire to delay, from a reproductive rights perspective, the ability of couples to have a child when one is wanted should be equally important as the ability to avoid an unwanted birth.

This synthesis contains many lessons for the design of future longitudinal studies. In our view an ideal study would: (a) include interviews with both partners, particularly if conducted in Africa; (b) conduct frequent follow-up contacts, perhaps by telephone, to minimise the time gap between measurement of preferences and the occurrence of a pregnancy or birth and to allow monitoring of changes in circumstances that might prompt shifts in fertility desires, as done in the studies in Ghana and Mozambique; and (c) contain more nuanced preference measures than attempted in most of the studies reviewed above.

Points (a) and (b) need no further elaboration but the third point merits further consideration. With regard to the prospective measure we agree with Timaeus and Moultrie (2008) the standard DHS questions do not permit adequate identification of postponement motivations, namely the desire to have no more children for the foreseeable future or until circumstances change. Rectifying this shortcoming while respecting the long-standing DHS items could be achieved through a few additional items. Among women who state a desire for no more children, an additional probe could ask whether their stance might change if circumstances change. Similarly, among those wanting more children, the question on desired waiting time could be preceded by a question to ascertain whether or not

respondents have a defined view on this matter or whether the desired waiting time depends on future events.

Many attempts to measure the intensity of prospective preferences can be found in the US literature, including numerical and semantic scales. Unfortunately, the meagre experience in low and middle income populations prevents clear recommendations. One promising approach is to enquire of those wishing to avoid or delay future births whether a pregnancy or birth in the near future would pose serious health, financial or other problems. Such information would be valuable but the results from the Nairobi study serves as a warning that it would not necessarily improve predictive power.

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Table 1: Survey characteristics and percentage of women having one or more births, by baseline preference for more or no more children

First author and year of publication	Population	Sample	Baseline date and duration	FP use at baseline[1]	Percentage of women with 1+ birth		Odds ratio of having 1+ birth among women wanting more compared with those wanting no more
					Want no more	Want more	
1. Roy 2008, Koenig 2006	Rural Bihar, Maharastra, Tamil Nadu states, India	MW 15-39, non-sterilized, 1+ children N=4413	1998/9 4 years	6	51	74	2.73
2. Bankole 1995	Oyo State, Nigeria	Monogamous couples, wife 15-44 N=2662	1984 2 years	(7)	16	55	6.42
3. Nair 1980	6 townships, Taiwan	MWRA, with birth in past 12 months, all offered FP. N=3237	1975 3 years	13	31	83	10.87
4. Hayford 2012, 2017, 2019	Rural Gaza province, Mozambique	MW, 18-40 N=1678	2006 3 years	15	56	69	1.75
5. Foreit 1980	Mainly rural, Rep Korea.	MW, 20-35, 2-3 children. N=475	1971 5 years	16	56	88	5.76
6. Rahman 2001	Comparison area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized. N=1473	1984 5 years	16	46	77	3.93
7. Razzaque 1999	Comparison area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized N=1244	1984 5 years	17	44	84	6.68
8. Casterline 2001, 2003	Upper Egypt	MWRA N=2444	1995 2 years	24	18	41	3.17

9. Jain 2014, 2018	14 mainly rural districts, Pakistan	MWRA, non-pregnant. N=4446	2008/9 3 years	28	34	73	5.25
10. Speizer 2013	3 cities, Senegal	EMWRA, fecund, non-sterilized. N=1570	2010 2 years	28	12	32	3.45
11. Speizer 2013, Babalola 2017.	4 cities, Nigeria	EMWRA, fecund, non-sterilized. N=2713	2010 2 years	28	15	51	5.90
12. Rahman 2001	Comparison area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized. N=2838	1990 5 years	28	39	76	4.95
13. Hermalin 1979, Freedman 1975	Taiwan, national	MWRA N=2003	1967 7 years	30	22	85	20.09
14. Kodzi 2010a,b., 2012	6 mainly rural communities in 3 regions, Ghana	MWRA, non-sterilized, sexually active N=1190	1999 3 years	35	21	40	2.51
15. DaVanzo 2003	Peninsular Malaysia	MWRA, non-pregnant, fecund N=650	1976/7 12 years	(37)	30	67	4.74
16. Razzaque 1999	Treatment area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized N=2075	1984 5 years	40	34	80	7.76
17. Rahman 2001	Treatment area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized. N=2439	1984 5 years	46	34	74	5.52
18. Bankole 1998	Morocco, national	MWRA N=1664	1992 3 years	46	29	63	4.17
19. Withers 2011	11 villages, rural Bali, Indonesia.	MWRA N=1018	2002 4 years	46	29	57	3.25

20. Machiyama 2015	Rural north Malawi	Matched couples, non-sterilized, non-pregnant N=2244	2008/9 3 years	48	27	65	5.02
21. Machiyama 2019	2 slums, Nairobi, Kenya	WRA (85% married), with recent birth, non-pregnant, non-sterilized, fecund. N=4578, at baseline	2007 3 years	49 (at 10-12 months postpartum)	28	39	1.73
22. Tan 1994	Peninsular Malaysia	MWRA N=3884	1984 3 years	51	15	54	6.65
23. Speizer 2013	3 cities, Kenya	EMWRA, non-sterilized, fecund. N=2051	2010 2 years	56	17	48	1.71
24. Da Silva 1991	Sri Lanka, national	MWRA, non-sterilized. N=1554	1982 3 years	(58)	35	64	5.95
25. Islam 2003	Matlab, treatment area, rural Bangladesh	MWRA, non-pregnant, non-sterilized. N=10,436	1992 5 years	(60)	23	79	13.34
26. Rahman 2001	Treatment area, Matlab, rural Bangladesh	MWRA, non-pregnant, non-sterilized N=3489	1990 5 years	61	22	70	10.63
27. Gipson 2008, 2009	Jessore district, Bangladesh	Matched couples, non-pregnant, non-sterilized. N=3052	1998 5 years.	65	18	65	16.71
28. Speizer 2013	4 cities, Uttar Pradesh, India	MWRA, non-pregnant, non-sterilized, fecund. N=3551	2010 2 years	69	10	48	4.51

[1] Percentage of total sample using reversible contraceptive method at baseline.
Figures in parentheses are derived from an independent source.
MWRA: Currently married women of reproductive age
EMWRA: Ever married women of reproductive age

Table 2: Percentage of women having one or more births, by baseline preferences of wife and husband

Author/ population	Baseline preferences							
	Neither want more		Wife no more/ husband more		Husband no more/ wife more		Both more	
	%	N	%	N	%	N	%	N
Bankole/ Nigeria	8	(103)	25	(110)	23	(159)	54	(2290)
Razzaque/ Matlab (comparison area)	40	(439)	77	(66)	73	(11)	85	(408)
Casterline/ Egypt	18	(410)	18	(61)	55	(120)	39	(278)
DaVanzo/ Malaysia	23	(268)	65	(57)	57	(49)	71	(170)
Razzaque/ Matlab (treatment area)	28	(634)	59	(126)	62	(34)	82	(871)
Tan/ Malaysia	12	(1243)	27	(184)	29	(107)	55	(2066)
Machiyama/ Malawi	20	(650)	41	(326)	49	(246)	67	(1022)
Gipson/ Bangladesh	17	(1847)	39	(109)	47	(256)	70	(840)

Note: N = denominator for each cell.

Table 3: Percentage of women having one or more births, by women's baseline preference to delay

Author/ Population	Wife's baseline preference		
	Want in 2+ years	Want soon/ <2 years	Want more/ don't know when
Hayford/Mozambique	78	72	NA
Casterline/ Egypt	38	45	33
Jain/ Pakistan	81	64	na
Speizer/ Senegal	38	25	23
Speizer/ Nigeria	61	47	38
Casterline/ Ghana	43	37	na
Machiyama/ Malawi[1]	59	68[2]	na
Machiyama/ Nairobi	39	66	43
Speizer/ Kenya	48	53	35
Speizer/ India	51	46[2]	na

[1] Results relate to three years not two.
[2] The response includes "want more/don't know when".

Table 4: Stability of preferences: Percentage of women changing from wanting no more to more children and, among those with no birth, percentages changing from wanting more to no more

Author/Population	Duration	Women's preference change	
		No more->more	More -> no more
Roy/ India	4 years	19[1]	na
Hayford/ Mozambique	3 years	30	35
Casterline/ Egypt	2 years	13	19
Jain/ Pakistan	3 years	8	6
Hermalin/ Taiwan	3 years	4	8
Kodzi/ Ghana	5-16 months	13	12
Nair/ Taiwan	3 years	7	14
Bankole/ Morocco	3 years	7	12
Machiyama/ Malawi	1 year	21[1]	11

[1] Restricted to women with no birth in observation period.

Table 5: Percentage of births in the observation period according to retrospective wantedness, by women's baseline preference

Author/Population baseline preference	Retrospective wantedness of births (%)				N
	Unwanted	Mistimed	Wanted	Total	
Koenig/ India					
No more	30	23	47	100	645
More	4	15	85	100	1742
Casterline/ Egypt					
No more	41	30	30	100	245
More	12	17	70	100	841
Jain/ Pakistan[1]					
No more	44		56	100	542
More	7		93	100	845
Speizer/ Senegal					
No more	17	49	32	100	41
More	0	37	63	100	372
Speizer/ Nigeria					
No more	17	7	76	100	128
More	5	13	82	100	941
Bankole/ Morocco					
No more	43		57	100	248
More	9		91	100	455
Machiyama/ Malawi					
No more	14	38	47	100	250
More	1	31	67	100	825
Speizer/ Kenya					
No more	29	25	46	100	146
More	6	33	61	100	579

[1] Results refer to last birth before endline, excluding women with multiple births or pregnant women at baseline.

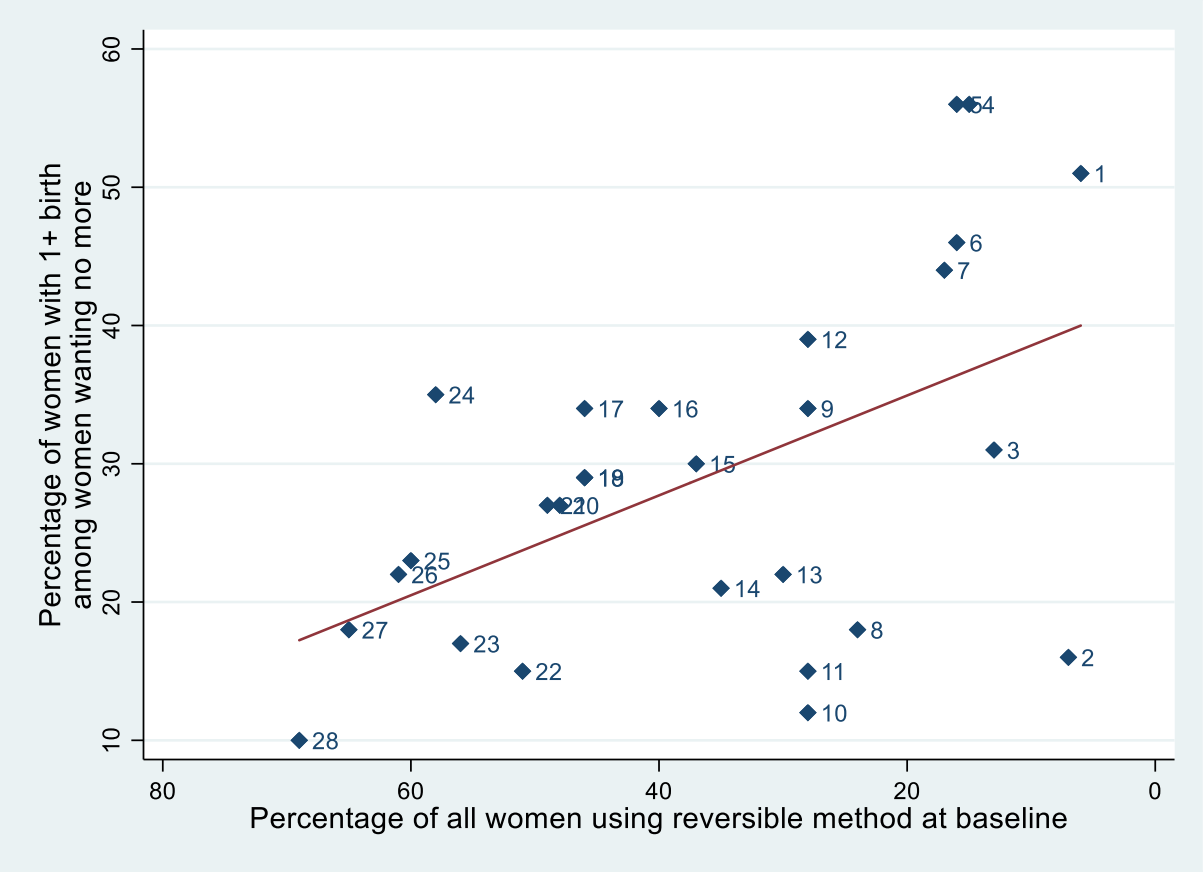

Figure 1: Scatterplot of percentage having one or more births among women wanting no more children and percentage of all women using any reversible method at baseline

Note: Populations numbered as in Table 1.