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Sex and susceptibility in Sub-Saharan Africa: implications for the measurement of unmet need for family planning

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The concept of unmet need for family planning has provided a major research focus in fertility studies over recent decades and been highly influential in the development and evaluation of family planning programme effort in the developing world. From initially crude measures in the 1970s the algorithms used to derive unmet need statistics have become increasingly complex, led by major improvements in the supply of data on susceptibility status and fertility intentions. Despite this, the measure remains essentially a dichotomous measure of risk, with women 'in need' or 'not in need', without sensitivity to 'degrees of risk'. The adequacy of such a representation is challenged using evidence from the Demographic Health Surveys (DHS) programme..

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ABSTRACT

The concept of unmet need for family planning has provided a major research focus in fertility studies over recent decades and been highly influential in the development and evaluation of family planning programme effort in the developing world. From initially crude measures in the 1970s the algorithms used to derive unmet need statistics have become increasingly complex, led by major improvements in the supply of data on susceptibility status and fertility intentions. Despite this, the measure remains essentially a dichotomous measure of risk, with women 'in need' or 'not in need', without sensitivity to 'degrees of risk'. The adequacy of such a representation is challenged using evidence from the Demographic Health Surveys (DHS) programme. Data for six Sub-Saharan African countries shows considerable variation, within and between countries, in levels of marital sexual activity. This key determinant of fecundability is only crudely captured in algorithms for unmet need. Crucially, the level of sexual activity is shown here to be strongly correlated with conventionally defined categories of unmet need status. The implications for policy are discussed.

Introduction: unmet need for family planning: a question of degree?

The concept of unmet need for family planning has provided a major research focus in fertility studies over recent decades and been highly influential in the development and evaluation of family planning programme effort in the developing world (Bongaarts 1991; Dixon-Mueller and Germain 1992; Casterline and Sinding, 2000; Sonfield, 2006). Data from the World Fertility Survey (WFS) and the Demographic Health Survey (DHS) programmes have been central to the development of an operational measure of unmet need, and published estimates of met and unmet need for national and sub-national populations have been a key DHS output (Westoff and Bankole 1995, Casterline and Sinding, 2000). Of major interest have been the estimates of very high levels of unmet need across Sub-Saharan Africa (Jolly and Gribble, 1993; Sonfield, 2006). When interpreted as a measure of latent demand for fertility control, high unmet need challenges schools of thought that emphasise a culturally determined persistence of demand for large families (e.g. Caldwell and Caldwell 1987, 1990) and legitimises a more pro-active development of family planning service provision to meet need.

Compared to the first crude measures in the 1970s, the algorithm used to estimate unmet need has become increasingly sophisticated (Westoff and Ochoa 1991; Westoff and Bankole 1995; Casterline and Sinding, 2000; Westoff 2001). This has been led by, and dependent on, the improved supply of survey data on the proximate determinants of fertility and fertility intentions, allowing greater sensitivity to variation in the determinants of natural susceptibility and the demand for fertility control. On the 'demand side' this includes a distinction drawn between the desire to regulate the timing of births (spacing intentions) and the desire to prevent any more births (stopping intentions). On the 'supply side' algorithms have been developed to

include a more sensitive incorporation of states of non-susceptibility. This includes the state of temporary infecundity associated with pregnancy and postpartum amenorrhea (though algorithms still tend to include these women as 'in-need' where the associated pregnancy or birth were unwanted at that time i.e. based on retrospective status), and the permanently infecund (defined by self-assessment and/or a complex algorithm based on recent reproductive history). A detailed account of these developments is provided by Westhoff and Ochoa (1991) and Westoff and Bankole (1995). However, such modifications have essentially concerned the refinement of boundaries defining and distinguishing absolute states (the fecund from the infecund, met-need from unmet-need) rather than greater sensitivity to 'degrees of risk' within those states. Many individual level determinants contribute to fecundability (probability of conceiving in a given month), both physiological and behavioural. The principal behavioural factor is the frequency and timing of coitus (Bongarts and Potter 1983). Using DHS data, this paper considers the extent to which levels of sexual activity may vary between and within sub-populations of women defined by conventional algorithms for unmet need.

Coitus and susceptibility

Demographers have long recognised that variation in lifetime exposure to sexual union is a major determinant of the pattern and level of childbearing – one of four main proximate determinants deemed responsible for 95 percent of fertility variation between populations (Bongaarts and Potter, 1983). In terms of operational models of the proximate determinants, data constraints have meant efforts to capture the period of sexual exposure have relied heavily on marriage status, despite the latter's obvious limitations as a proxy for sexual activity. In an African context, sexual activity among

non-married populations has been well documented (Caldwell et al, 1992; Bledsoe and Cohen, 1993; Garenne et al 2001), with research and policy interest in their sexual networks heightened by the HIV AIDS pandemic (see for example, Curtis and Sutherland, 2004). Less acknowledged, or researched, is the extent of low or non-exposure to sex among married populations. Improved data, notably from the DHS programme, suggests that, in Sub-Saharan Africa particularly, this may be considerable over a woman's lifetime, being variable at the individual level, but also, and more unexpectedly, between populations (Brown, 2000).

In the case of Sub-Saharan Africa, a key explanatory factor accounting for high levels of sexual inactivity within married populations (and variation between countries), is the practice of post-partum sexual abstinence - taboos on sexual activity related to breastfeeding in the postpartum period (Page and Lesthaeghe, 1981, Jolly and Gribble, 1993). While subject to major erosion in the late twentieth century, the practice remains important, particularly in West Africa (Bledsoe et al, 1994; Haggerty and Rustein, 1999). However, a key finding from analysis of the DHS data is that levels of sexual activity among married populations are variable even after postpartum abstinence is taken into account, with many fecund women apparently experiencing very low levels of sexual activity, particularly in West Africa (Brown, 2000). The observation of between-country variation is important because efforts to model fertility using a proximate determinants approach have tended to assume coitus as a constant (among the fecund population) at the population level - see for example the National Research Councils proximate determinants analysis of fertility in Sub-Saharan Africa (Jolly and Gribble, 1993). This has also been the case with the conventional algorithms used to define unmet need, including that developed and used within the DHS programme (Westhoff and Bankole, 1995). The fact that the DHS

data on sexual activity indicates variation at the population level challenges these assumptions and consequently the sensitivity of measures of unmet need. In particular, it raises questions about the comparability of the measure between countries, despite the fact that unmet need statistics are frequently presented and interpreted as a standardised and comparable measure (see for example Westhoff and Ochoa 1991; Westhoff and Bankole 1995; Westhoff, 2001).

Having demonstrated considerable variation in the level of coitus between married populations at the national level (Brown, 2000), a question pertinent to the current discussion is whether, within populations, the frequency of sexual activity is associated with use of family planning. There are various plausible arguments for why this might be so. First, non-use of contraception may be a conscious response to a low perceived risk of pregnancy because of low sexual activity, a theory for which there is some empirical support (Westhof and Bankole, 1995; Casterline and Sinding, 2000). Conversely low coital frequency may for some represent a family planning 'response' to a perceived state of risk of an unwanted pregnancy. Following the same logic, current use of contraception implies a perception of current risk (and sexual exposure) – thus a finding of disproportionately high levels of sexual activity among those with met-need might reflect a self-selection effect (those most sexually active are most likely to seek family planning). By the same reasoning we may hypothesise that those in the 'non-contracepting-want child soon' group would also record high coital frequencies (as a strategy to maximise the chance of conception).

Variation in sexual activity according to unmet need status would carry potentially important implications for the use and understanding of unmet need statistics. First, it may challenge the notion, implicit in its definition, that unmet need represents irrational behaviour (a mismatch between actions and preferred

reproductive outcomes): i.e. low levels of coital frequency may be a rational behavioural response to, or a reason for, the non-use of contraception. Second, it is likely to influence the amount of unwanted fertility resulting from unmet need – if women in 'unmet need' have disproportionately low levels of coital activity, estimation and projection models that fail to incorporate this are likely to overestimate fertility outcomes, and consequently the impact on fertility of a take up of family planning by this group. Third, the pattern of sexual activity among those defined to be in need has direct implications for programmes seeking to provide fit-for-purpose contraceptive services, including the mix and range of coitus-dependent (e.g. condoms) and coitus non-dependent (e.g. hormonal) methods.

Research objectives

Data from the DHS programme are used to explore the relationship between sexual activity and susceptibility/preference status empirically for six selected Sub-Saharan African countries: Burkina Faso, Ghana, Kenya, Rwanda, Zimbabwe and Zambia. The selection of countries was guided by previous analysis of DHS sexual activity data in nine Sub-Saharan African countries by Brown (2000). This revealed striking variation in levels of sexual activity between countries including a strong regional patterning with the lowest levels in West Africa. This diversity is captured in the chosen countries, though, as with the former study, there is no claim that they make up a representative sample of the Sub-Saharan African region.

The findings provide evidence with which to assess the sensitivity of current measures of met and unmet need for family planning, specifically the degree to which women defined as 'in-need' experience variable levels of sexual activity and consequently variable risk of unwanted pregnancy. This can be considered from both

a demographic perspective (e.g. in the context of modelling fertility outcomes), and from the perspective of those involved in planning, delivering and evaluating family planning programme services.

Operational matters

The measurement of coitus in the DHS

Surveys in the early phases of the DHS programme included two direct measurements of sexual activity: the timing of respondents most recent episode of sex ('coital recency'), and the number of episodes of coitus in the previous month ('coital frequency'). It is important to acknowledge that the quality of sexual activity data derived from surveys has been widely questioned (see for example, Urdy, 1993; Huygens et al 1996; Turner et al 1997; Fenton et al 2001; Cleland et al 2004) Specific assessments of the quality of the DHS data on this topic have been mixed (Brown, 2000). A perceived inconsistency between the level and age pattern of reported coitus and empirically based natural fertility schedules led Thomas and Mercer (1995) to conclude that the data were 'extremely unreliable', and it is indicative of the DHS's own concerns over data quality that the question on coital frequency was dropped from later rounds of the survey. Others (including Knodel and Chayovan, 1991, Blank and Ruttenburg, 1991, Curtis and Sutherland, 2004, Meekers and Van Rossem 2004) have considered the data problematic but usable.

For the current analysis, time since last episode of sex is taken as a direct measure of a woman's recent level of sexual exposure which can be incorporated directly into the algorithm used to determine current susceptibility (being currently 'at risk' can be made conditional on sex within a specified period e.g. one month). Using a method described by Meekers and Van Rossem (2005), the same data is used to

generate an indirect estimate of mean coital frequency as a useful summary measure of variation in the intensity of sexual activity, for all women and specifically for those sexually active in the last month[1]

Susceptibility/Preference status

While the ultimate aim of the analysis is to incorporate a measure of recent sexual activity directly into unmet need algorithms, the first objective is to demonstrate the case for this by comparing levels of sexual activity across categories of women defined according to their current natural susceptibility and fertility preferences (or 'unmet need' status). However, the standard variable for unmet need made available on DHS recode files is unsuitable for this purpose. This is because it uses an algorithm in which the family planning 'need' status of all pregnant and postpartum amenorrheic women is retrospectively defined according to preferences/susceptibility at the time of conception/birth. While this is justified on the basis that where a pregnancy or birth was mistimed or unwanted, it implies an unmet need for family planning at that time, it is inappropriate for the purpose of the current study which is concerned with the association between *current* sexual behaviour and *current* susceptibility/preference status. Thus a revised algorithm is used here in which unmet-need status is defined according to susceptibility and preference *at the time of the survey* (Figure 1).

Under this classification, pregnancy and unmet need are thus mutually exclusive categories. However, this distinction is less clear cut for postpartum amenorrheic women. Although similarly in a state of temporary infecundity, the

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[1] This involves deriving the daily probability of experiencing a sexual act (equal to the proportion of the base population who experienced sex the day before). Multiplying this by 365 and dividing by twelve gives an estimate of monthly coital frequency

perceived unreliability of amenorrhea (the unpredictable nature of the timing of a return to fecundity) means that algorithms typically presume these women to be in a state of unmet need for contraception where they are relying solely on amenorrhea to avoid an unwanted pregnancy. However, this is a contested assumption with many studies showing that, when certain criteria are met, the Lactational Amenorrhea Method (LAM) can be a highly effective form of family planning (Kennedy et al 1989; Labbock et al 1997; WHO, 1999). However, LAM is considered programme effective only under conditions of full breastfeeding and within a maximum period of six months postpartum (Kennedy et al 1989). Beyond six months, the timing of the first menses postpartum becomes an increasingly unreliable indicator of a woman's return to fecundity (there is a much greater likelihood that first menses postpartum will be preceded by an ovulatory cycle).

FIGURE 1 ABOUT HERE

With the widespread practice of extended breastfeeding in Sub-Saharan Africa, the reality is that a high percentage of currently postpartum amenorrheic and non-contracepting women in our study are more than six months postpartum, and so arguably in a state of unmet need (though some analysts have argued that LAM can effectively be used over a nine month postpartum period – see for example Cooney et als 1996 analysis of data for one of the study countries, Rwanda). Nevertheless, for the purposes of this analysis, these women are kept separate to the main unmet-need category on the basis that they represent a different susceptibility status to fully fecund women, and also because it allows us to specifically consider differences in levels of sexual activity between amenorrheic and non-amenorrhiec women. This is a

largely neglected, but potentially important, factor in evaluating the need of postpartum amenorrheic women for family planning. Indeed, given that postpartum abstinence is a taboo directly associated with lactation, it seems highly likely that postpartum amenorrheic women would experience lower levels of sexual activity than the non-amenorrheic (particularly in Sub-Saharan Africa where the practice is still prevalent). On a note of caution, this difference is likely to be accentuated by the fact that in the algorithm used here, postpartum amenorrheic women who are also contracepting (so called 'double-protectors') are coded in the latter group. Although generally only a small share of the postpartum amenorrheic total (Zimbabwe is a notable exception in Sub-Saharan Africa, see Adamchak and Mbizvo, 1991), it is recognised that they are, by reason of their contraceptive use, likely to be disproportionately more sexually active.

The (in)frequency of sexual activity has not previously been an explicit consideration in determining the six-month condition for LAM (the criteria for which relate solely to the reliability of amenorrhea). However, it seems likely that the relationship between fecundability and time postpartum may also be influenced by norms of sexual activity (i.e. the risk of pregnancy may increases with time post partum due to more frequent sex as well as more likelihood that an episode of unprotected sex will result in a pregnancy). The splitting of the postpartum amenorrheic group into women before and after six months postpartum in the current analysis will allow this to be assessed empirically.

Table 1 shows the current susceptibility profiles for the population of married women in each of the study countries. Applying a strict definition of current susceptibility that excludes all the currently postpartum amenorrheic, it is evident that only a minority of women in all countries (from just 18 percent in Zimbabwe to 36

percent in Ghana) were at immediate risk of a pregnancy. Among the non-susceptible, the relative contribution of natural infecundity and contraception varies considerably between countries. Thus in Rwanda, natural infecundity accounts for more than 80 percent of the currently non-susceptible population (60 percent of all married women), while in Zimbabwe 63 percent are protected by contraception (51 percent of all married women). Among the currently susceptible, the proportion wanting to avoid a pregnancy (unmet need) is fairly consistent across countries at around 60 percent, only falling below 50 percent in Zimbabwe, but as a share of all married women, there is more country variation in unmet need (from 24 percent of married women in Ghana to just 8 percent in Zimbabwe).

TABLE 1 ABOUT HERE

Base populations

The following analysis is restricted to married women only. While it is clear that the sexually active population includes many unmarried women, a number of factors justified their exclusion from this study. First, as a group, they are likely to experience substantially lower levels of sexual activity than the married (with a substantial proportion never having had sex) though this is likely to vary considerably between countries (Brown, 2000). Marital status is also likely to be associated with fertility preferences. This, together with the fact that the unmarried make up a varying share of national samples, would make their inclusion in the base population a potentially distorting influence in a comparative analysis between countries. Moreover, while a number of studies have considered sexual activity among the unmarried (e.g. Curtis and Sutherland, 2004) the focus here is on the less investigated question of variable

sexual activity within and between married populations (the group for whom unmet need statistics are typically presented).

The Analysis

Figure 2 shows the distribution of 'coital recency' (time since most recent sexual episode) for married women by country. This shows considerable variation between countries, with the proportion of women sexually inactive in the previous month ranging from 14 percent in Rwanda to 52 percent in Burkina Faso. Estimated mean coital frequency, ranges from just 0.8 episodes a month in Burkina Faso to 4.5 episodes in Zimbabwe.

FIGURE 2 ABOUT HERE

While country differences in the level of marital sexual activity are of interest in their own right, the specific focus of the current analysis is with variation according to susceptibility-preference status. Figure 3 and Table 2 shows this for all six study countries. Figure 3 shows full profiles for each country separately. Table 2 summarises country variation in the percentage 'recently sexually active' (sex within last month) for those groups where variation in coital activity may have a direct baring on immediate family planning need (thus the permanently infecund and pregnant are excluded).

FIGURE 3 ABOUT HERE

TABLE 2 ABOUT HERE

The data suggests that the level of recent sexual activity is indeed strongly associated with susceptibility/preference status. Moreover, there are generally strong consistencies in the pattern of difference across countries, though Rwanda stands out for relatively little variation between sub-groups.

As hypothesised, women currently using contraception and women wanting a child soon are the sub-groups consistently most likely to report sexual activity in the previous month. Moreover estimates for both these groups show less variation between countries than those for all married women (the share of contracepting women reporting sex in the previous month ranges from 67 percent in Burkina Faso to 91 percent in Rwanda, and for women wanting a child soon, from 76 percent in Burkina Faso to 90 percent in Rwanda). Of central interest in this paper is the sexual activity of those in a state of unmet need. This is lower than for the other two 'fecund' groups just discussed, in all countries. However, the difference is more variable. Thus in Burkina Faso, less than 50 percent of women with 'unmet need' had experienced a sexual episode in the previous month (20 percent points less than women with met need). This contrasts with 78 percent in Rwanda (just 10 percentage points lower than women with met need). Thus the sharp country differences observed for all married women are replicated for women with unmet need. The extent of variation in the level of sexual activity within the unmet need population and between countries raises questions about the adequacy of a measure that defines need as a single absolute state and its appropriateness as a measure for cross-national comparison. From a demographic perspective, the likely translation of unmet need into unwanted fertility is almost certainly different in Burkina Faso (where 50 percent of women have had no

sex in the previous month and almost a third no sex in the previous six months) to Rwanda (where the respective figures are 30 percent and 10 percent). Neither are the family planning requirements likely to be the same, in terms of appropriate method mix.

The pattern of sexual activity among postpartum amenorrheic women has a number of features. With the exception of Rwanda, postpartum amenorrheic women report the lowest level of recent sexual activity of all sub-groups. The proportion of women reporting sex in the previous month is lowest of all for women less than six months postpartum. Excluding Rwanda (89 percent reported sex in the previous month) this ranged from 39 percent in Kenya to just 11 percent in Ghana. As revealed in Figure 3, this reflects the high percentage of these women in a state of postpartum sexual abstinence (again excluding Rwanda, this ranges from 55 percent in Kenya to 90 percent in Burkina Faso). For West African countries, the impact of postpartum abstinence generally extends beyond six months postpartum. In the other study countries most (though not all) women have resumed sexual relations by six months. As a result women more than six months postpartum amenorrheic show the greatest between-country differences in coital activity of all sub-groups,

These findings make an important empirical contribution to the debate over family planning need among women in the early months postpartum. The notion that contraception may represent redundant protection in the early months postpartum because of lactational amenorrhea is already apparent from earlier DHS analysis and underlies the case for LAM. Adamchuk, for example, observed extensive double-protection in Zimbabwe, a country where family planning programme effort encourages widespread uptake of the pill as early as three months postpartum, despite almost universal amenorrhea for a considerably longer period (mean duration is 13

months). The current analysis suggests that low levels of sexual activity, especially in the first six months following a birth, may further reduce the need for contraception with an effect quite separate to the protection afforded by lactational amenorrhea. To stick with the Zimbabwe example, the observation that 87 percent of married women in the first six months postpartum had reported no recent sexual activity (the majority of whom were also amenorrhieic) clearly questions the rationale for the countries advocating of mass early use of contraception – both in terms of demographic impact, and from the perspective of efficient use of resources.

There is a general consensus (evident in algorithms of unmet need and in the LAM criteria themselves) that relying on the contraceptive effects of lactational ammenorrhea after six months becomes unreliable as the risk of an ovulatory cycle ahead of menses increases. However, it is self-evident that in terms of unwanted pregnancy the postpartum amenorrheic still represent a lower risk group than the non-amenorrheic even after six months. The evidence that they also experience lower levels of sexual activity - in Burkina Faso and Ghana postpartum amenorrheic women continue to report exceptionally low levels of sexual activity after six months (40 percent were not active in last month, 50 percent of whom were still postpartum abstaining) - adds further weight to the argument that measures of unmet need should recognise different degrees of risk and explicitly incorporate coital frequency into the algorithms used to define it.

Having demonstrated that sexual activity is highly variable between countries and between sub-groups defined according to susceptibility/family planning need status, the analysis moves finally to consider how an explicit incorporation of sexual activity data would impact on the representation of unmet need in the six study countries. Figure 4 disaggregates current 'unmet need' according to sexual activity

status for each of the study countries. To correspond more closely to conventional classifications of unmet need (though women are still classified in terms of their 'current' status rather than retrospective need) unmet need here includes postpartum amenorrheic women who are over 6 months postpartum (not using contraception and not wanting a birth at that time).

FIGURE 4 ABOUT HERE

Figure 4 confirms that a substantial though nationally variable share of unmet need is among women reporting no sexual activity in the previous month (a substantial proportion of which includes women who are in a state of postpartum abstinence). At one extreme, 62 percent of women in Burkina Faso with 'unmet need' report no recent sex. This compares to just 20 percent in Rwanda. Focusing on the sub-group of women reporting no recent sex, there is further country variation in the share who report being in a state of postpartum abstinence: 80 percent in Burkina Faso (or 45 percent of all women with unmet need) compared with just 20 percent in Rwanda (less than 10 percent of women with unmet need).

Since postpartum ammenorheic women are generally less sexually active and more likely to be practicing postpartum abstinence than others with unmet need (Figure 3 and Table 2) it is evident that their inclusion in a more inclusive definition of unmet need will increase within group variation in sexual activity. Moreover, the fact that their share of the unmet need population varies considerably between countries (just 23 percent of those with unmet need in Zimbabwe compared to 55 percent in Burkina Faso - see Table 1) means that country differences in the sexual activity profiles of women with unmet need are increased through a compositional

effect. By explicitly incorporating amenorrheic status as well as sexual activity status into the measure of natural susceptibility, Table 3 provides a more discriminating indicator of variation in individual risk among women with unmet need. Notably the distribution of women across this spectrum of risk differs markedly between countries with almost one third of women with unmet need in Burkina Faso being currently postpartum amenorrheic and abstaining, compared to just two percent in Rwanda. At the other end of the spectrum, more than half of women with unmet need in Zimbabwe are fecund and recently sexually active, compared to just a quarter in Burkina Faso.

TABLE 3 ABOUT HERE

This variation is further illustrated in the estimated mean coital frequencies for unmet need populations in each country (Table 4). These are shown to be consistently lower than for the married population overall, with postpartum amenorrheic women reporting the lowest means within the unmet need category. These are differences that in turn suggest significant differences in fecundability rates between countries, and in the rate at which unmet need is likely to be converted into unwanted fertility.

TABLE 4 ABOUT HERE

Discussion and conclusions

This analysis of six DHS populations confirms that substantial numbers of married women who may conventionally be classified as having an unmet need for family planning may in fact be experiencing very little immediate risk of pregnancy due to

18

low levels of sexual activity. Moreover, the implicit assumption of conventional algorithms that coitus is a constant between fecund populations is challenged by these findings, which raises questions over the comparability of unmet need statistics between countries.

The findings have particular salience in the academic and policy debate over the family planning needs of postpartum amenorrheic women. While there are clear exceptions, postpartum amenorrhea is shown here to be strongly associated with lower levels of sexual activity, an effect relating primarily to the associated practice of postpartum abstinence. The findings suggest that at the population level infrequent coitus must be a significant independent cause of sub-fecundity in the first year postpartum, over and above the protection afforded by amenorrhea. For those concerned with trying to estimate and project the scale of unwanted fertility resulting from the measurement of 'unmet need', methodology may need to take more explicit account of coital frequencies. From a family planning programme perspective it is apparent that, at any one time, a relatively large proportion of women with 'unmet need' may well perceive themselves to be at very low risk of unwanted pregnancy.

More generally, the findings point to the changeable nature of individual fecundability over the life course. Specifically the suggestion that sexual activity may vary (consciously or otherwise) according to fertility intentions (for example, higher frequencies among those wanting a child soon), and postpartum status, has implications for modelling fertility and may indeed be a factor in explaining the apparent inconsistency observed between mean coital frequencies and actual fertility in DHS countries (drawing on empirically derived schedules of fecundability by coital frequency, Brown (2000) observes mean coital frequencies for nine DHS countries were seemingly too low to sustain the actual experience of fertility).

Conjecture over the extent of temporal variability in coitus contributes to a longer standing critique within fertility studies over the shortcomings of a cross-sectional approach to measurement and analysis of reproductive behaviour. These shortcomings were central to the arguments of Hobcaraft and Little in promoting the development of fertility exposure analysis more than two decades ago (Hobcaraft and Little,1984). This approach explicitly sort to measure a woman's exposure status over a period of time using a highly detailed set of exclusion criteria which, in their original paper, notably included six states of absence from sexual activity and five states of postpartum infecundity.

However, a continuing reliance on cross sectional survey design has limited the opportunity to operationalise such a framework. Notwithstanding some limited inclusion of panel designs within the DHS programme - Westhoff and Bankole use panel data from the 1995 Morocco DHS to consider the temporal dynamics of unmet need (1998) - a longitudinal perspective to fertility analysis is more typically reliant on retrospective data collected through reproductive histories. While these have become increasingly demanding on survey respondents (with some experimentation in the DHS with extended six year calendar histories of contraceptive use) they offer only a crude measure of changing natural susceptibility over time, and are subject to real concerns over data quality (Strickler et al 1987) that have limited their application in research.

While the aim of this paper has been to challenge the sensitivity of conventional unmet-need algorithms to variability in susceptibility between women at a point in time, the above discussion emphasises that a more fundamental limitation of conventional cross-sectional measures is the failure to incorporate the temporal dimension to an individuals susceptibility and need status. Thus while a more direct

consideration of sexual activity in current-status algorithms may provide a more accurate measure of a woman's susceptibility at the time of the survey, if family planning need is better understood as the outcome of a process of constantly changing susceptibility and preferences over time, then the interpretation of the snap shot, however accurate, is inherently problematic - from a programme or demographic perspective a women non-susceptible today (whether through sexual inactivity or amenorrhea) may still be considered currently 'in-need' of family planning if she faces the prospect of a return to susceptibility tomorrow, or next week.

The extent to which such women represent a current need for family planning is arguably dependent on the extent to which women have control over, and/or foresight of, the transition from non-susceptibility to susceptibility. This has been extensively debated with respect to postpartum amenorrhea and the reliability of LAM, and it is the lack of control or predictability over the timing of a woman's return to fecundity that dominates the critique of LAM as a viable programme method. Less is known about the extent to which women in a state of postpartum abstinence or temporary sexual inactivity, foresee and/or have control over the timing of a resumption of sexual activity. We might conjecture that this is likely to vary considerably across different cultural settings and by individual characteristics, but further research is required in this area.

Acknowledging that coitus may be a particularly volatile aspect of changing fecundability, there is no suggestion here that a report of low current coital activity should exclude women from being classified in a state of unmet. However, we should recognise that such women (especially when in conjunction with postpartum amenorrhea) have a lower current risk than those who are fecund and reporting recent and frequent sexual activity, and that a current status measure of unmet need should

seek to better differentiate this variation, especially where it manifests at the national level (as clearly demonstrated in the DHS analysis presented here).

It is clear that the interpretation and perceived significance of including different bands of 'high' and 'low' need in statistics would vary on the perspective of the user. For demographers seeking to estimate unwanted fertility it might imply an important adjustment of the fecundability rate used in models. From the perspective of a family planning practitioner or their client, where the goal is to minimise an individuals risk of an unwanted pregnancy, it is the perception of any risk rather than the degree of risk that matters (though certain methods may be more or less amenable to low levels of coitus).

In final conclusion, despite its limitations, the evidence of the current study suggests that variation in the intensity of sexual activity (within and between married populations) demands more attention in fertility studies than it currently receives, and specifically in the measurement and interpretation of unmet need for family planning. Changes in the frequency of coitus arguably move people in and out of risk and need as much as the use and non-use of family planning and the unfolding pattern of reproductive preferences over the childbearing years. While data on all three is collected within the DHS programme, only the latter two are formally incorporated into the standard algorithm for unmet need. Significantly, the decision not to include a measurement of coitus within the unmet need algorithm used in DHS publications is justified, not on theoretical or empirical grounds (indeed, there is explicit acknowledgment within those publications that individual fecundity varies with coital frequency, and even more specifically, that infrequent sexual activity may be a reason for non use of contraception) but through concerns over data quality and the fact that not all countries included the same questions (Westhoff and Ochoa, 1991). While

acknowledging the concerns over the quality of the underlying data, even a cautious interpretation of the current analysis suggests that the intensity of coital activity may be a significant determinant of country and sub-group variation in natural susceptibility. If the current data is considered too unreliable to use in the measurement of susceptibility and family planning need, efforts to establish better instruments for measuring sexual activity in surveys should be prioritised.

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Table 1 Susceptibility/unmet need status of married women (age 15-49) by country

Susceptibility Status	Burkina Faso 2003	Ghana 2003	Kenya 2003	Rwanda 2000	Zimbabwe 1999	Zambia 2000
	Percent of married women					
Permanently Infecund	13.7	12.3	15.0	8.6	13.1	7.0
Pregnant	13.1	11.0	11.6	17.2	11.7	14.7
Amenorrheic <6 m postpartum	9.7	7.2	8.2	11.7	3.4	8.0
Amenorrheic 6+ m postpartum	17.0	9.4	9.5	22.2	2.1	9.8
Using contraception	13.2	23.8	35.1	13.0	51.2	33.3
Susceptible – want child soon	13.6	12.2	7.5	9.9	10.3	13.3
Susceptible – want child later/never (unmet need)	19.6	24.1	13.1	17.4	8.2	14.0
All	100	100	100	100	100	100

Source: DHS recode files

Table 2 Percentage of married women sexually active in previous month, by susceptibility/unmet need status

	PPA* (<6 months)	PPA* (6 months +)	Using cont	Unmet need	Want birth soon	*All married women*
Burkina Faso	12.1	26.0	67.3	47.6	76.2	*47.5*
Ghana	10.9	31.7	79.2	55.7	76.0	*59.8*
Kenya	39.4	66.2	87.0	74.1	85.1	*73.8*
Rwanda	86.8	86.3	91.4	78.3	90.2	*85.9*
Zimbabwe	13.2	53.3	85.5	69.5	86.3	*79.2*
Zambia	19.0	55.6	83.2	68.9	87.5	*72.6*

* Postpartum ammenorheic

Source: DHS recode files

Table 3 Married women with 'unmet need' disaggregated according to recent sexual activity and postpartum amenorrheic status

	Percent of married women with unmet need						
	No sex in last month (postpartum abstaining)		No sex in last month		Sex in last month		
	Amenorrheic	Fecund	Amenorrheic	Fecund	Amenorrheic	Fecund	
Burkina Faso	29.3	15.4	5.0	12.6	12.1	25.5	100
Ghana	16.1	13.0	3.0	18.8	8.9	40.0	100
Kenya	6.7	3.7	7.6	11.3	27.9	42.9	100
Rwanda	2.0	2.4	5.6	7.2	48.4	34.4	100
Zimbabwe	5.4	6.8	4.1	17.6	10.8	55.4	100
Zambia	10.6	5.0	7.7	13.3	22.9	40.5	100

Source: DHS recode files

Table 4 Estimated mean monthly coital frequencies for married women with 'unmet need' by amenorrheic status

	Mean monthly coital frequency			
	Unmet need (fecund)	Unmet need (postpartum amenorrheic)	Total unmet need	*All married women*
Burkina Faso	0.5	0.3	0.4	*0.8*
Ghana	1.0	0.7	0.9	*1.5*
Kenya	2.8	2.3	2.6	*3.2*
Rwanda	2.7	4.2	3.6	*3.9*
Zimbabwe	4.1	2.4	3.8	*4.5*
Zambia	2.5	1.7	2.1	*2.8*

Source: DHS recode files

Figure 1 Classifying current susceptibility/unmet need status

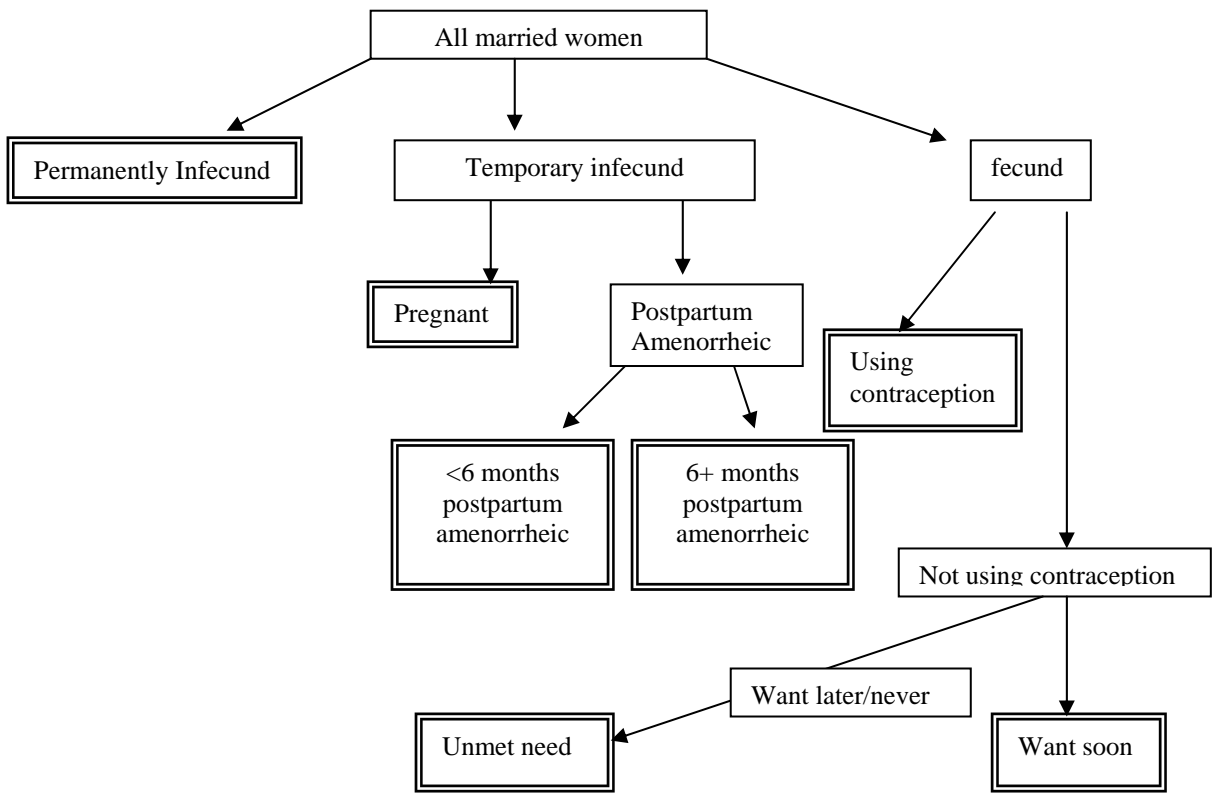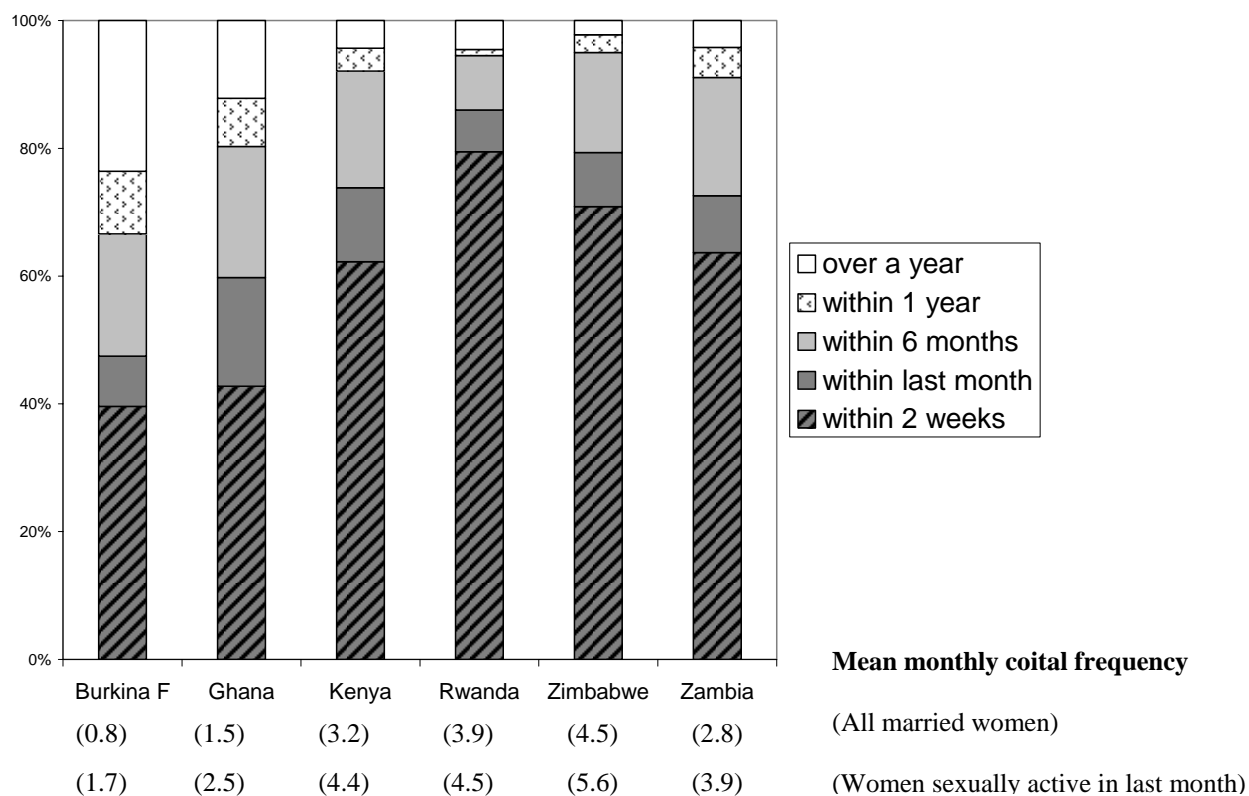(variable categories outlined in double border)

Figure 2: Time since most recent sexual episode, all married women, by country; and mean monthly coital frequency for those sexually active in last month.

Legend:
- □ over a year
- ⊡ within 1 year
- ▨ within 6 months
- ▨ within last month
- ▨ within 2 weeks

	Burkina F	Ghana	Kenya	Rwanda	Zimbabwe	Zambia	**Mean monthly coital frequency**
	(0.8)	(1.5)	(3.2)	(3.9)	(4.5)	(2.8)	(All married women)
	(1.7)	(2.5)	(4.4)	(4.5)	(5.6)	(3.9)	(Women sexually active in last month)

Source: DHS recode files

Data points for Figure 2

Time since most recent sex:

	within 2 weeks	within last month	within 6 months	within 1 year	over a year
Burkina F	*39.6*	*7.9*	*19.1*	*9.8*	*23.6*
Ghana	*42.8*	*17.0*	*20.5*	*7.5*	*12.2*
Kenya	*62.2*	*11.6*	*18.3*	*3.6*	*4.3*
Rwanda	*79.4*	*6.6*	*8.5*	*1.0*	*4.5*
Zimbabwe	*70.8*	*8.4*	*15.6*	*2.8*	*2.2*
Zambia	*63.7*	*8.9*	*18.5*	*4.7*	*4.2*

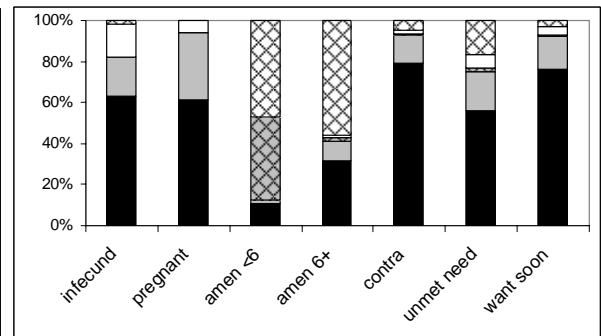**Figure 3: Time since most recent sexual episode, by susceptibility/preference status, by country**

Key: Last episode of sexual activity:

⊠ 6 months or more ago (currently postpartum abstaining)

☐ 6 months or more ago

⊠ within last 6 months (currently postpartum abstaining)
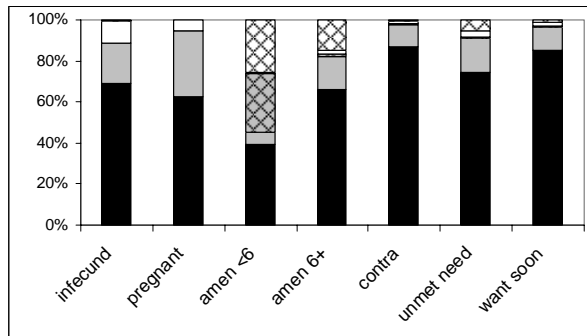
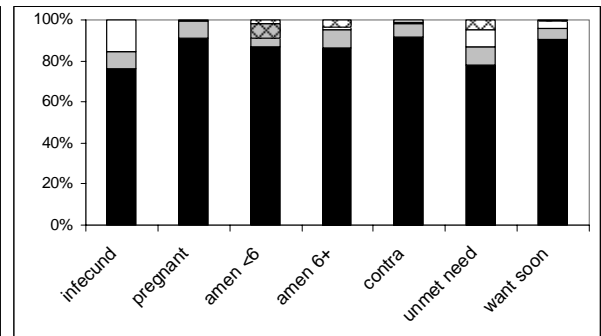☐ within last 6 months

■ within last month
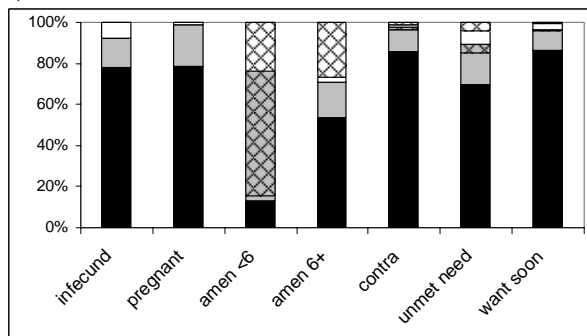
a) Burkina Faso
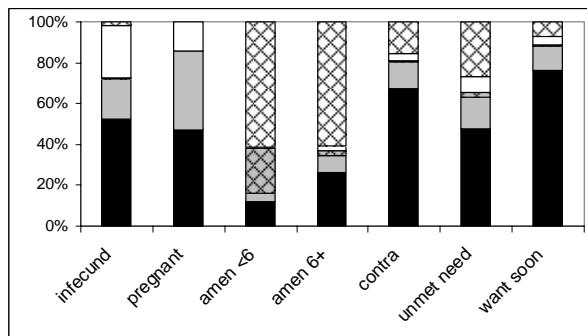
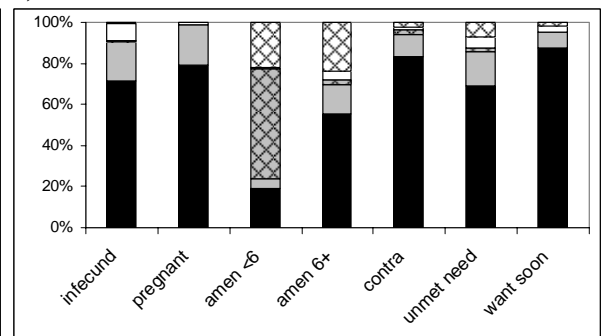**b) Ghana**

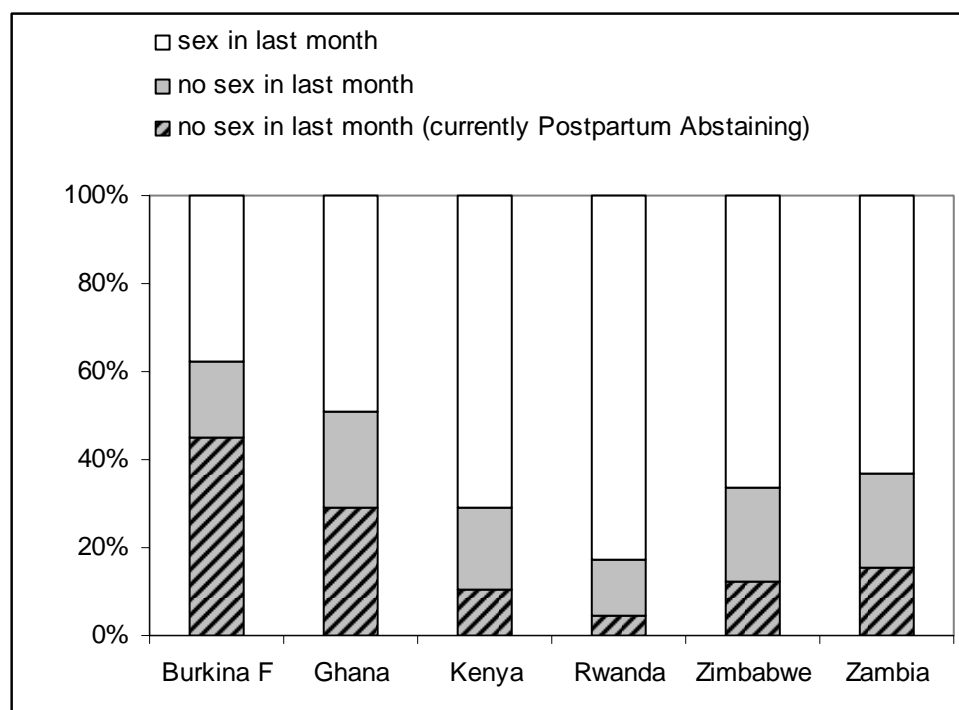**c) Kenya**

d) Rwanda

e) Zimbabwe

f) Zambia

Source: DHS recode files

Data points for Figure 3

Time since most recent sex:

	in last month	in last 6 months	in last 6 months	6 months +	6 months +
Burkina Faso			(PPAbstaining)		(PPAbstaining)
infecund	52.2	20.0	0.3	25.5	2.0
pregnant	46.8	38.6	0.0	14.5	0.0
amen <6	12.1	4.1	21.7	0.9	61.3
amen 6+	26.0	8.6	2.4	2.3	60.8
contra	67.3	12.9	0.7	3.3	15.8
unmet need	47.6	15.7	1.9	7.8	27.0
want soon	76.2	11.8	0.5	4.6	7.0
Ghana					
infecund	62.8	19.0	0.0	16.1	2.1
pregnant	61.2	32.9	0.0	5.9	0.0
amen <6	10.9	1.6	40.2	0.0	47.3
amen 6+	31.7	9.3	1.8	1.5	55.7
contra	79.2	13.8	0.5	1.8	4.7
unmet need	55.7	19.3	1.8	6.9	16.4
want soon	76.0	16.4	0.2	4.6	2.8
kenya					
infecund	69.3	19.5	0.0	10.6	0.5
pregnant	62.5	32.0	0.0	5.5	0.0
amen <6	39.4	5.7	28.9	0.2	25.7
amen 6+	66.2	15.8	1.1	2.1	14.7
contra	87.0	10.9	0.3	1.5	0.3
unmet need	74.1	16.8	0.9	2.6	5.5
want soon	85.1	11.4	0.8	1.4	1.4
Rwanda					
infecund	76.2	8.1	0.2	15.3	0.2
pregnant	90.9	8.3	0.0	0.7	0.0
amen <6	86.8	3.9	7.1	0.0	1.9
amen 6+	86.3	8.8	0.2	1.2	3.4
contra	91.4	6.9	0.8	0.9	0.0
unmet need	78.3	8.4	0.3	8.0	5.0
want soon	90.2	5.6	0.0	3.4	0.8
Zimbabwe					
infecund	77.8	14.6	0.0	7.6	0.0
pregnant	78.3	20.7	0.0	1.0	0.0
amen <6	13.2	2.5	60.3	0.0	24.0
amen 6+	53.3	17.3	0.0	2.7	26.7
contra	85.5	10.8	1.4	1.4	1.0
unmet need	69.5	15.6	4.1	6.4	4.4
want soon	86.3	9.7	0.3	3.2	0.5
Zambia					
infecund	71.6	18.6	0.6	8.8	0.3
pregnant	79.4	19.1	0.0	1.4	0.0
amen <6	19.0	4.5	54.0	0.3	22.2
amen 6+	55.6	14.4	2.0	4.4	23.7
contra	83.2	10.9	2.5	0.8	2.6
unmet need	68.9	16.8	1.7	5.8	6.9
want soon	87.5	7.7	0.2	3.0	1.6

Figure 4: Time since most recent sexual episode for married women with 'unmet need'

Source: DHS recode files

Data points for Figure 4

	no sex in last month (currently Postpartum Abstaining)	no sex in last month	sex in last month
Burkina F	44.8	17.6	37.6
Ghana	29.2	21.9	48.9
Kenya	10.4	18.8	70.8
Rwanda	4.4	12.8	82.8
Zimbabwe	12.2	21.6	66.2
Zambia	15.6	21.0	63.4