



Published in final edited form as:

*Stud Fam Plann.* 2012 March ; 43(1): 33–42.

## Correlates of and Couples' Concordance in Reports of Recent Sexual Behavior and Contraceptive Use

**Alain K. Koffi [Research Associate],**

Department of International Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street, Room E8545, Baltimore, MD 21205

**Visseho D. Adjiwanou [Doctoral student],**

Department of Demography, University of Montreal, Quebec, Canada

**Stan Becker [Professor],**

Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street, Room E8545, Baltimore, MD 21205

**Funmilola Olaolorun [Doctoral student], and**

Department of Population, Family and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, 615 N. Wolfe Street, Room E8545, Baltimore, MD 21205

**Amy O. Tsui [Professor and Director]**

Bill and Melinda Gates Institute for Population and Reproductive Health, Johns Hopkins Bloomberg School of Public Health, Baltimore, MD

Alain K. Koffi: [alkoffi@jhsph.edu](mailto:alkoffi@jhsph.edu)

### Abstract

This study uses couple-level data to measure couples' concordance of self-reported time since last coitus and of condom and other contraceptive use at last sexual intercourse among monogamous couples in Liberia (N = 1,673), Madagascar (N = 4,138), and Namibia (N = 588). The study also examines the characteristics associated with sexual behavior and contraceptive use occurring in the 28 days prior to the interviews among couples whose reports are concordant. Overall, our study finds less than 75 percent concordance in reporting of time since last coitus. Use of condoms and other contraceptives yielded fair (0.27) to substantial (0.67) agreement on the kappa index. Factors predicting a shorter time since last coitus among concordant couples in at least two of the countries included wealth, spousal age difference, education, and both partners wanting another child. The discordant reports of recent sexual behavior and contraceptive use suggest that caution should be exercised when inferring couples' behavior from the report of one spouse, that concordant reports should be examined when possible, that methodological changes to improve the validity of spousal reports should be pursued, and that family planning and HIV-prevention programs should target those groups found to be using condoms and other contraceptives less frequently, particularly poorer couples.

Measures of sexual and reproductive health (SRH) outcomes have long been based solely on women's self-reporting. Although convenient, this methodology has left a gap in knowledge about partners' experiences, and raises the question of whether the sexual and contraceptive behavior of couples can be accurately inferred from data from only one partner.

Focusing on couples offers the opportunity to explore the consistency between husbands and wives in their recall and reporting of their sexual behavior and contraceptive use. The 1994 International Conference on Population and Development recognized the couple as a unit by frequently referring to "couples and individuals," and the conference's Programme of Action stated that "the aim of family-planning programmes must be to enable couples and individuals to decide freely and responsibly the number and spacing of their children" (UN 1995: para 7.12). The married or in-union couple has become the unit of interest in many reproductive health studies (Bankole 1995; Ezeh and Mboup 1997; Becker and Costenbader 2001).

The level of spousal agreement about fertility and family planning remains an area of scholarly contention. Using multiple DHS country reports, Becker (1996) found high concordance between sub-Saharan African spouses on the desire for additional children, but lower levels of concordance on family planning approval and ideal family size. In a similar comparison of five countries (four in sub-Saharan Africa), Ezeh and Mboup (1997) found that husbands report higher current and ever use of contraceptives than their wives.

Considerable gaps exist in the literature regarding why concordant responses concerning sexual behavior among monogamous couples occur, and regarding which specific individual or relationship variables might predict concordant reports of sexual, reproductive health, and family planning behaviors such as time since last coitus and use of condoms and other contraceptives (Becker and Costenbader 2001). In prior studies, concordant reporting of contraceptive use was positively associated with women's education and with discussion of family planning among spouses (Becker and Costenbader 2001; Becker, Hossain, and Thomson 2006).

This study assesses levels of concordance between husbands and wives regarding their reporting of the timing of their most recent sexual activity (time since last sex), condom use at last sex, and use of any contraceptive at last sex. A second objective is to ascertain covariates associated with these SRH behaviors among spouses whose reports are concordant. Accordingly, the three research questions addressed by the study are: (1) What is the level of concordance in reports of sexual behavior (time since last coitus, condom use at last coitus, and current contraceptive use) among monogamous couples? (2) What are the joint characteristics that predict time since last coitus as reported by concordant couples for this variable? (3) In reports of condom and contraceptive use at last coitus among concordant couples, what are the associated covariates of both partners? Responses to these questions have implications for programs concerning family planning and sexually transmitted infections (STIs) and/or HIV/AIDS.

## Methodology

The Demographic and Health Survey (DHS) was initiated in 1987 to collect and produce SRH data from men and women in households in selected countries. The men's questionnaire in the DHS is similar to the women's, but shorter, and allows comparisons between partners (Becker and Costenbader 2001). In this study, data from Demographic and Health Surveys for both women and men were analyzed, and the DHS definition of a couple was adopted: a man and woman who are legally married or living together in a consensual union. (In this article we refer to all partners as "husbands" and "wives.") Because questions about the sexual activity of husbands are not specific to a particular wife, polygamous couples were excluded from the analysis. We initially planned to use data from matched couples from the most recent DHS surveys (2005 onward) in the countries with the highest percentage of monogamous couples in the four sub-Saharan African regions. We ended up selecting countries based on the availability of data for women and men on questions of interest: time since last coitus, condom use at last coitus, and current contraceptive use. Liberia, Madagascar, and Namibia were selected from western, eastern, and southern Africa, respectively. Central African countries were not included because in the most recent DHSs of countries of interest, the question about "current contraceptive use" was missing for men. Wives were asked, "Does your husband/partner have any other wives besides yourself?" Husbands were asked, "How many wives do you have?" For Liberia, Madagascar, and Namibia, 84 to 95 percent of wives reported that no other wife was in the household, whereas 89 to 99 percent of husbands answered that they had only one wife (Table 1). The couples in which both spouses answered "only one wife" (82 to 94 percent of all couples) are considered monogamous in our analysis. Additionally, to avoid the possibility of confusing spouses with other sexual partners, monogamous couples were excluded from the analysis if one or both spouses answered that at last sex they had sex with someone other than their spouse. Finally, to avoid recall bias in husbands' and wives' reports, we used a short reference period (28 days) for time since last intercourse. Thus, the samples comprised all eligible men and women within a monogamous union who had sex with their spouse in the past 28 days, and consisted of 1,673 couples in Liberia, 4,138 in Madagascar, and 588 in Namibia (Table 1).

All three DHS surveys examined used a multistage, stratified sampling procedure with strata based on regional and rural-urban divisions. Two challenges arise when dealing with these complex survey data: obtaining correct point estimates (avoiding bias) and computing correct variances and standard errors (Kreuter and Valliant 2007). To ensure the sample was representative of the population, we used design-based survey weights. We also used the Taylor linearization method for variance estimation. The DHS datasets contain household and women's and men's weight. The question then becomes which weight is most appropriate to use when analyzing couples data—the woman's or the man's? Neither individual's weight is appropriate for analysis of couples data, however, because the nonresponse rate of couples is different from that of either the women or the men in partnerships and generally not a simple function of either. Therefore, a couple's weight needs to be derived. The step-by-step procedure we used to generate couples' weights is summarized in Becker and Sayer (2009).

## Variables

The dependent variables are: time since last coitus, whether a condom was used at last coitus, and whether any contraceptive was used at last coitus. The “time since last coitus” variable refers to the answer to the question, “When was the last time you had sexual intercourse?” Answers were recorded as the number of days since coitus. Husbands’ and wives’ responses were treated separately. Because men and women were often interviewed on different days, we took the date of the interview into account and adjusted the time since last coitus accordingly. We considered the difference between the day of interview (D1) and the difference in time since last sex as reported by wife and husband (D2). Therefore, exact concordance exists if the difference between D2 and D1 equals 0. For purposes of this study, we assumed that couples were concordant if this difference was equal to  $-1$ ,  $0$ , or  $1$ ; if not, they were considered discordant.

The wording of the question for the “condom use at last coitus” variable was identical in the men’s and women’s questionnaires for all three countries. The variable reflects the response to the question, “The last time you had sexual intercourse, was a condom used?” The coding categories were “yes” or “no.” Wives’ and husbands’ reports were treated as concordant when both said either “yes” or “no”; otherwise, they were treated as discordant. The purpose of condom use was not asked, so couples may have used a condom to avoid STDs, including HIV, and/or for contraceptive purposes.

Use of a contraceptive method at last coitus is drawn from questions worded differently for women and men. Women were asked, “Are you currently doing something or using any method to delay or avoid getting pregnant?” If the woman said “yes,” the interviewer asked, “Which method are you using?” The interviewer was instructed to record only one method. The men’s questionnaire typically asked, “The last time you had sex, did you or your partner use any method (other than a condom) to avoid or prevent a pregnancy?” If the answer was “yes,” the interviewer also asked, “What method did you or your partner use?” This variable was treated as dichotomous. Responses to these differently worded questions—about “current” contraceptive use among women and about contraceptive use “at last sex” among men—were combined with responses to the condom-use question to create a composite coding for whether the respondent reported contraceptive use. Wives’ and husbands’ reports were treated as separate responses to measure concordance. Couples were coded as concordant if both answered “yes” to at least one of the condom-use/contraceptive-use questions, or if both answered “no” to both questions. Couples were coded as discordant if only one answered “yes” to at least one of the condom-use/contraceptive-use questions and the other spouse answered “no” to both. The terms “current contraceptive use” and “use of contraceptive methods at last sex” are used interchangeably throughout this article.

We adjusted for household and couple (joint) characteristics such as place of residence (rural versus urban) and household economic status, which was identified through five wealth quintiles: poorest, lower-middle, middle, upper-middle, and wealthiest. Age differences consisted of three categories: (1) wife and husband are the same age (we considered a difference of less than three years between wife and husband as the same age); (2) wife is three or more years older than her husband; and (3) husband is three or more years older than his wife. We categorized spousal schooling differences into five groups: (1) both have

no schooling; (2) either the wife or (3) husband has some primary schooling but the other has no schooling; (4) both have primary schooling or either has primary schooling and the other has some secondary or more schooling; and (5) both have secondary or more schooling. We categorized fertility preferences into four groups: (1) both want no more children; (2) both want another child; (3) the wife wants another child but the husband does not; and (4) the husband wants another child but the wife does not.

### Analytic Methods

Our conceptual framework posits that individuals' social and demographic characteristics are the starting point of the decisionmaking process between spouses. Individual characteristics motivate individual desires and intentions which, when pursued in conjunction with perceptions of the partner's desires and intentions, result in a couple's communication and discussion (or lack of discussion) about SRH, which in turn influence concordance in reporting SRH behaviors (Miller 1992).

For each country, we first calculated the reported mean time since last coitus, the proportion of respondents who reported condom use at last sexual intercourse, and the proportion of respondents who reported contraceptive use at last sexual intercourse. We then tested the concordance of these estimates between wives and husbands using t-tests, and concordance within couples for paired data using the McNemar's test. We calculated both the percentage of couples whose responses were in concordance and the kappa statistic to assess whether the concordance in reports was a result of chance alone. The kappa statistic (presented in Tables 3 and 4) is a formal statistical evaluation of the agreement between scorers (in this case, husband and wife). Values of kappa from 0 to 0.20 indicate poor agreement, 0.21 to 0.40 indicate fair agreement, 0.41 to 0.60 indicate moderate agreement, 0.61 to 0.80 indicate substantial agreement, and greater than 0.80 indicate excellent agreement (Landis and Koch 1977). The statistical significance of the kappa scores of the two spouses was determined with a z-test.

We then ran successive multivariate regression models to identify a set of factors associated with concordant reports of time since last sex, condom use at last sex, and current contraceptive use. Multiple linear regressions were used to predict days since last coitus as reported by wives of couples from whom concordant reports were obtained. We ran logistic regressions for contraceptive use and condom use, with these variables coded as 1 if both partners reported use and as 0 if neither reported use.

We hypothesize that: (1) spousal reports regarding sexual behavior will be concordant because polygamy and extramarital partners are excluded from this analysis; (2) on average, wives will tend to report shorter durations since last coitus than will husbands; (3) a positive association will be found between concordant couples' reports of time since last sex and the following background characteristics of couples: education, urban residence, higher socioeconomic status; (4) a negative association will be found between spouses' age difference and couples' joint desire for a (or another) child; (5) condom use and contraceptive use will be positively associated with urban residence and with couples' level of education, and negatively associated with age difference.

## Results

The mean age of sampled respondents in the three countries ranged from 31–32 years for wives and from 35–36 years for husbands. The difference in mean age between wives and husbands varied from about 4 years in Namibia to 5 years in Liberia. In Liberia and Madagascar, husbands tended to have more years of schooling than wives, whereas in Namibia wives were more educated than husbands (results presented thus far not shown). The clear majority of couples in Liberia and Madagascar lived in rural areas, whereas in Namibia the slight majority of couples lived in urban areas (see Table 2). Nearly 50 percent of Namibian couples had at least secondary education, compared with 17 percent in Madagascar and 19 percent in Liberia. Likewise, the proportion of uneducated couples ranged from 7 percent in Namibia to 17 percent in Liberia. In Namibia, 54 percent of couples reported agreement in wanting no more children, compared with 30 percent in Liberia and 41 percent in Madagascar.

### Interspousal Concordance in Reports of Time Since Last Coitus

Interspousal concordance in reports of time since last coitus varied widely across the three countries. To illustrate graphically the number of days of disagreement in the reports of husbands and wives regarding time since last coitus, Figure 1 presents a percent-distribution bar chart of couples by the number of days by which their two reports differed. The difference was calculated by subtracting husbands' reports of time since last coitus (in days) from wives' reports, after adjusting for day of interview. The bar on 0 indicates couples in which both spouses reported exactly the same time since last coitus in days. A positive difference indicates couples in which the wife reported a longer duration than her husband, whereas a negative difference connotes couples in which the wife reported a shorter duration than her husband.

The sizable differences in couples' reports of days since last coitus across the three countries can be shown in several ways. Looking at the proportion of couples reporting exactly the same durations (Figure 1) reveals 59 percent concordance in Madagascar, but only 37 percent of couples in Liberia, and 17 percent in Namibia. Looking at the percentage of couples whose interspousal difference was within  $\pm 1$  day (the sum of the percentages of  $-1$ ,  $0$ , and  $1$ ) suggests rates of concordance that are higher but still well below 100 percent: 57 percent in Liberia, 72 percent in Madagascar, and 29 percent in Namibia (Table 2).

In the three countries, the wives' mean "days since last coitus" was lower than their husbands' (Table 3). Therefore, on average, wives tended to report shorter durations than husbands. T-tests revealed that the mean of the inter-spousal difference was significantly different from zero in Madagascar and Namibia. Concordance tests applied to the countries' samples indicated moderate concordance between spousal reports in Madagascar (0.41) and fair concordance in Liberia (0.33) and Namibia (0.21).

### Concordance in Reports of Condom and Contraceptive Use at Last Coitus

The differences between wives and husbands were all negative for condom use and positive for contraceptive use, indicating that husbands' reports were higher than wives' reports for

condom use but lower for contraceptive use (Table 2). In 71 to 97 percent of all couples, both husbands and wives reported no condom use; in 30 to 81 percent of all couples, both husbands and wives reported no contraceptive use. The level of concordance in reports of condom use in the three countries was high, ranging from 83 percent in Namibia to 98 percent in Madagascar (Table 2). The kappa statistic suggested only a fair concordance (0.30) in Liberia and a moderate concordance in Madagascar (0.43) and Namibia (0.42) (Table 3). Current use of contraceptives, as reported by husbands and wives, showed 85 percent overall agreement in Liberia, 82 percent in Madagascar, and 67 percent in Namibia (Table 2). The kappa statistic indicated a substantial agreement (0.67) beyond chance in Madagascar, but only fair in Liberia (0.27) and Namibia (0.32).<sup>1</sup>

### **Multivariate Findings of Correlates with SRH Behaviors among Concordant Couples**

Concordant couples in the wealthiest quintile in Liberia and Madagascar tended to report a shorter time since last sex (five and two days shorter, respectively), compared with their poorest-quintile counterparts (Table 4). In all three countries, couples in which the wife was three or more years older than the husband were more likely to report a shorter time since last coitus, compared with couples of same-age partners, although the difference was statistically significant only in Liberia.

The patterns in the associations between time since last sex and level of education differed in the selected countries. In Liberia and Namibia, concordant couples with some education reported shorter time since last coitus, compared with uneducated concordant couples, although the coefficient was statistically significant in only one of the four educational levels in each country. In Madagascar, educated couples tended to report a longer time since last coitus, compared with uneducated couples, although the coefficient was also only statistically significant in one of the four educational levels. In Madagascar and Namibia, concordant couples in which both wives and husbands wanted another child had sex more recently, compared with couples who did not want more children.

Our last set of logistic regressions assessed covariates of condom use and current contraceptive use as reported by concordant couples (Table 5). Measures of urban–rural residence were not significant for either of the outcome variables. In all countries, couples in the three highest wealth quintiles were more likely to report use of contraceptives at last coitus, compared with couples in the poorest quintile. Couples in Madagascar who had some education were significantly more likely than uneducated couples to report use of contraceptive methods at last coitus. Couples' shared desire for another child was negatively associated with contraceptive use at last coitus in all three countries, although the association was statistically significant only in Liberia and Madagascar. This shared desire was also significantly negatively associated with condom use in Liberia. Couples in Namibia in which the wife alone wanted another child were over three times more likely to use a condom at last coitus than were couples in agreement about not wanting more children.

---

<sup>1</sup>The levels of concordance presented in Table 2 differ from the levels presented in Table 3 because the data in Table 2 are weighted by couple, whereas those in Table 3 are weighted by husbands and wives separately.

## Discussion

Interpartner concordance in reporting of sexual, reproductive health, and family planning behavior varies according to the behavior reported. Overall, less than 75 percent concordance in time since last coitus was reported. Wives tended to report shorter time since last coitus. At the population level, shorter time since last coitus implies higher frequency of coitus. Thus, this finding suggests that women in monogamous marriages reported higher coital frequency than husbands, confirming the findings of one previous study in rural Senegal (Lagarde, Enel, and Pison 1995) and contradicting the findings of another in Côte d'Ivoire (Gersovitz et al. 1998), which found that women report 77 percent as much coitus as men at the population level.

Discrepancies between husbands' and wives' reports of recent condom use and contraceptive use were frequent in Liberia, Madagascar, and Namibia. Consistent with prior studies (Becker and Costenbader 2001; Becker, Hossain, and Thomson 2006), interpartner concordance of self-reported condom or contraceptive use in the prior 28 days yielded fair to substantial agreement on the kappa index. In the three countries, husbands reported a higher rate of condom use at last coitus than wives but a lower rate of contraceptive use at last coitus; husbands' responses were 3 to 11 percent lower than their wives' reports. Such differences in spouses' responses have been found in other developing countries (Short and Kiros 2002).

Previous studies have shown that husbands are more likely than their wives to overreport use of condoms or to underreport use (Ezeh and Mboup 1997). Higher reports of condom use among men or lower reports of use among women may result from an inclination to provide more socially desirable answers in light of the HIV/AIDS pandemic. Social desirability of condom-use reporting may also be higher among men than women because condoms are a male method of contraception and because men may include extramarital condom use (excluded from the current analysis).

Some researchers suggest that in order to obtain the best estimate of contraceptive prevalence, women's reports of female methods and men's reports of male methods should be used (Ezeh and Mboup 1997). Broader problems associated with measuring current contraceptive use, however, make this an insufficient solution (Becker, Hossain, and Thomson 2006). First, some contraceptive methods can be used simultaneously. For example, if a husband reported condom use for family planning and his wife reported IUD use, both responses may be correct because they were possibly using both methods. Second, many modern contraceptive methods available to women can be used without the knowledge of the spouse, including oral contraceptives (and emergency contraception), injectables, IUDs, and subdermal implants. The extent to which women covertly practice contraception is estimated to account for between 6 and 20 percent of such practice in sub-Saharan Africa (Biddlecom and Fapohunda 1998). Third, for coital methods such as condoms, the meaning of "currently using" is ambiguous. For example, whether a couple who often use a condom but did not do so at last coitus are current users is not clear.



The association between days since last coitus and concordant couples' wealth quintiles needs to be explained, in particular why the wealthiest quintiles have shorter time since last coitus (thereby, higher coital frequency at the population level) than couples in the poorest quintiles. Furthermore, the use of contraceptive methods is more widespread among couples in the wealthiest quintiles. One explanation is that they may be better positioned to acquire contraceptive methods, or to secure abortions—legal or not—in the event of contraceptive failure (James 1970).

Another study finding was that couples tended to report higher coital frequency when the wife was older than the husband, whereas couples with a younger wife had less frequency. This conforms to speculation by other researchers that marital coital rates are more highly correlated with the husband's age than the wife's, and that the decline observed in coital rates when the husband's age increases is attributable to waning male capacity and motivation (Martin 1981; Richters et al. 2006; Studd and Schwenkhagen 2009).

Consistent with previous findings (Regan et al. 2003), the desire for another child (as reported by both partners) shortens the time since last coitus and diminishes the odds of contraceptive use among concordant couples.

The potential utility of information on sexual intercourse for estimating the need for and effectiveness of contraception has been well documented (Westoff 1988; Caldwell, Caldwell, and Quiggin 1989). Indeed, information on variation in coital frequency by fertility regulation and intention within marriage can help family planning programs formulate recommendations regarding which contraceptive methods are most suitable for particular groups of couples or individuals (newly married women, older women, couples who wish to delay a birth) and for training family planning service providers on how to guide couples to appropriate methods (Blanc and Rutenberg 1991). Lack of agreement between partners about relationship dynamics could increase STIs, including HIV risk, because beliefs about who is responsible for decisions regarding condom use could lead one or both partners to refrain from initiating safer sexual behavior. This gives credence to encouraging joint voluntary counseling and testing in these settings (De Walque 2007). Despite the potential value in designing effective intervention programs, research on agreement in partners' perceptions of power and decisionmaking in their relationships is generally lacking.

This study contains several limitations to be noted. Research examining self-reports of sexual behavior and contraceptive use has received criticism for lacking reliability and validity (Seal 1997). Several studies have found that both men and women tend to underreport their level of sexual activity (Smith 1992; Cleland et al. 1992; Gersovitz et al. 1998). Furthermore, many researchers have warned against interpreting self-reported sexual behavior as a valid measure of interpartner concordance without validation against biological markers (including daily urine specimens) and population prevalence of HIV (De Walque 2006), STIs (Orr, Fortenberry, and Blythe 1997), and pregnancy. In addition, the DHS data used in this analysis are cross-sectional, and many of the variables used are potentially endogenous. Thus, no causal relationship should be implied in this analysis. Another limitation of this study is that our choice to restrict the sample to monogamous and

concordant couples precludes examining the effects of polygyny and discordance on the outcomes of interest. Moreover, our exclusion of a large number of couples from the sample reduces the efficiency of the statistical techniques used in the analysis.

## Conclusion

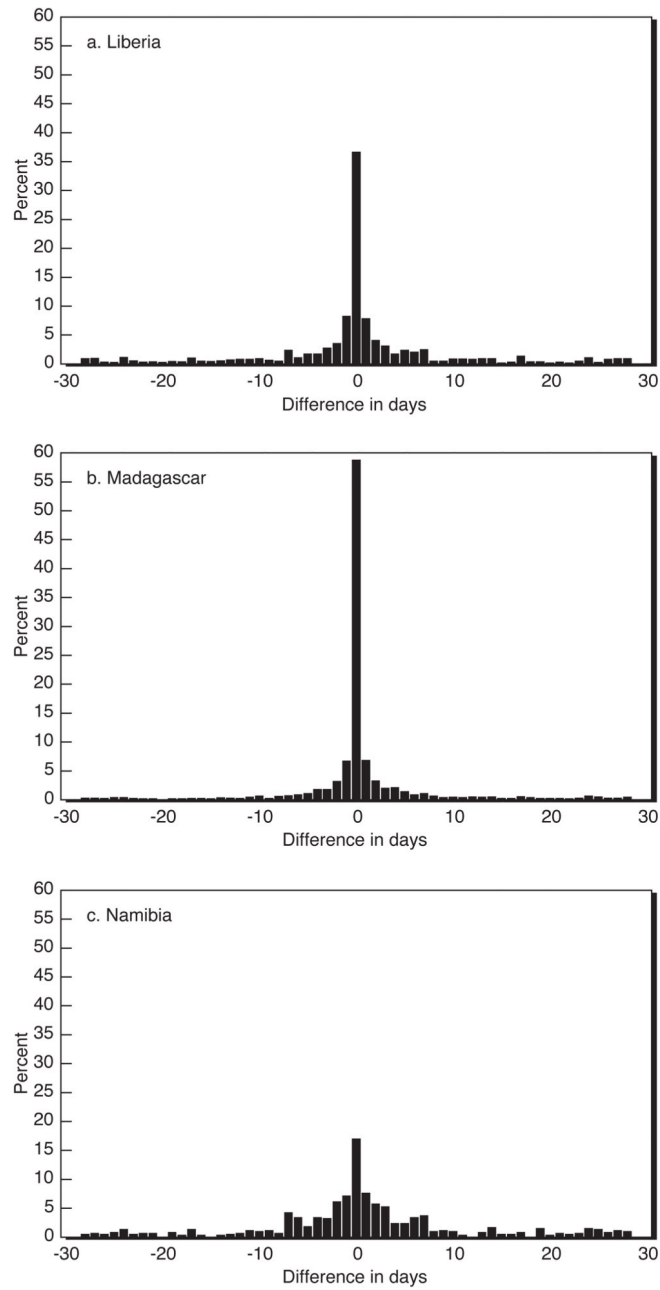
The large discrepancies found between spouses' reports suggest that many wives and husbands misreport their recent sexual behavior and contraceptive use. This discordance confirms that the validity of such reports needs to be scrutinized carefully, that a certain proportion of such reports should be expected to be inaccurate, and that caution should be exercised when drawing inferences about the behavior of couples from the report of one spouse. Efforts to improve the quality of SRH data—in African countries where the AIDS epidemic is most severe as well as in other settings—could involve using a time frame shorter than 28 days and standardizing the wording and the ordering of contraceptive-use questions for men and women.

This study also illustrates one way to overcome these concerns about the validity of individually reported couple-level data: namely, to restrict analyses to concordant reports. Our analyses of SRH behavior among concordant couples found one variable—wealth—to be correlated with greater contraceptive use and fewer days since last coitus in all three countries, and found education, spousal age difference, and spousal concordance in wanting another child to be significantly correlated (or inversely correlated) with days since last coitus and condom and contraceptive use in some of the countries examined. These findings suggest that these and other sociodemographic and fertility-related characteristics of couples should be considered when targeting recipients of HIV-prevention and family planning messages and services.

## References

- Bankole, Akinrinola. Desired fertility and fertility behaviour among Yoruba of Nigeria: A study of couple preferences and subsequent fertility. *Population Studies*. 1995; 49:317–328.
- Becker, Stan. Couples and reproductive health: A review of couple studies. *Studies in Family Planning*. 1996; 27(6):291–306. [PubMed: 8986028]
- Becker, Stan; Costenbader, Elizabeth. Husbands' and wives' reports of contraceptive use. *Studies in Family Planning*. 2001; 32(2):111–129. [PubMed: 11449861]
- Becker, Stan; Hossain, Mian B.; Thomson, Elizabeth. Disagreement in spousal reports of current contraceptive use in Sub-Saharan Africa. *Journal of Biosocial Science*. 2006; 38(6):779–796. [PubMed: 17029662]
- Becker, Stan; Sayer, Bryan. [Accessed 25 May 2011.] Sampling weights for analyses of couple data in demographic and health surveys," Section on Survey Research Methods. *Journal of Survey Method*. 2009. <<http://www.amstat.org/sections/srms/proceedings/y2009/Files/305750.pdf>>
- Biddlecom, Anne E.; Fapohunda, Bolaji M. Covert contraceptive use: Prevalence, motivations, and consequences. *Studies in Family Planning*. 1998; 29(4):360–372. [PubMed: 9919630]
- Blanc, Ann K.; Rutenberg, Naomi. Coitus and contraception: The utility of data on sexual intercourse for family planning programs. *Studies in Family Planning*. 1991; 22(3):162–176. [PubMed: 1949099]
- Caldwell, John C.; Caldwell, Pat; Quiggin, Pat. The social context of AIDS in sub-Saharan Africa. *Population and Development Review*. 1989; 15(2):185–234.

- Cleland, John M.; Carael, JC Deheneffe; Ferry, B. Sexual behaviour in the face of risk: Preliminary results from first AIDS-related surveys. *Health Transition Review*. 1992; 2(Suppl):185–204.
- De Walque, Damien. Policy Research Working Paper 3844. World Bank; Washington, DC: 2006. Who gets AIDS and how? The determinants of HIV infection and sexual behaviors in Burkina Faso, Cameroon, Ghana, Kenya, and Tanzania. <[http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/02/03/000016406\\_20060203104911/Rendered/PDF/wps3844.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/IW3P/IB/2006/02/03/000016406_20060203104911/Rendered/PDF/wps3844.pdf)> [Accessed 10 October 2011.]
- De Walque, Damien. Sero-discordant couples in five African countries: Implications for prevention strategies. *Population and Development Review*. 2007; 33(3):501–523.
- Ezeh, Alex Chika; Gora Mboup, G. Estimates and explanations of gender differentials in contraceptive prevalence rates. *Studies in Family Planning*. 1997; 28(2):104–121. [PubMed: 9216031]
- Gersovitz, Mark; Jacoby, Hanan G.; Seri Dedy, F.; Goze Tape, A. The Balance of self-reported heterosexual activity in KAP surveys and the AIDS epidemic in Africa. *Journal of the American Statistical Association*. 1998; 93(443):875–883.
- James, William H. Legal abortion and social class (letter). *Lancet*. 1970; 296(7674):658. [PubMed: 4195788]
- Kimuna, Sitawa R.; Adamchak, Donald J. Gender Relations: Husband-wife fertility and family planning decisions in Kenya. *Journal of Biosocial Science*. 2001; 33(1):13–23. [PubMed: 11316391]
- Kreuter, Frauke; Valliant, Richard. A survey on statistics: What is done and can be done in Stata. *Stata Journal*. 2007; 7(1):1–21.
- Lagarde, Emmanuel; Enel, Catherine; Pison, Gilles. Reliability of reports on sexual behavior: A study of married couples in rural West Africa. *American Journal of Epidemiology*. 1995; 141(12):1194–1200. [PubMed: 7771458]
- Landis, J Richard; Koch, Gary G. The measurement of observer agreement for categorical data. *Biometrics*. 1977; 33(1):159–174. [PubMed: 843571]
- Martin, Clyde E. Factors affecting sexual functioning in 60–79- year-old males. *Archives of Sexual Behavior*. 1981; 10(5):399–420. [PubMed: 7198432]
- Orr, Donald P.; Fortenberry, Dennis J.; Blythe, Margaret J. Validity of self-reported sexual behaviors in adolescent women using biomarker outcomes. *Sexually Transmitted Diseases*. 1997; 24(5):261–266. [PubMed: 9153734]
- Regan, Pamela C.; Lyle, James L.; Otto, Amy L.; Joshi, Anupama. Pregnancy and changes in female sexual desire: A review. *Social Behavior and Personality*. 2003; 31(6):603–612.
- Richters, Juliet; de Visser, Richard; Rissel, Chris; Smith, Anthony. Sexual practices at last heterosexual encounter and occurrence of orgasm in a national survey. *Journal of Sex Research*. 2006; 43(3):217–226. [PubMed: 17599244]
- Seal, David W. Interpartner concordance of self-reported sexual behavior among college dating couples. *Journal of Sex Research*. 1997; 34(1):39–55.
- Short, Susan E.; Kiros, Gebre-Egziabher. Husbands, wives, sons, and daughters: Fertility preferences and the demand for contraception in Ethiopia. *Population Research and Policy Review*. 2002; 21(5):377–402.
- Smith, Timothy W. A methodological analysis of the sexual behavior questions on the general social surveys. *Journal of Official Statistics*. 1992; 8(3):309–325.
- Studd, John; Schwenkhagen, Anneliese. The historical response to female sexuality. *Maturitas*. 2009; 63(2):107–111. [PubMed: 19487089]
- United Nations. Report of the International Conference on Population and Development; Cairo, Egypt. 5–13 September 1994; New York: 1995. <<http://www.un.org/popin/icpd/conference/offeng/poa.html>>
- Westoff, Charles F. Is the KAP-gap real? *Population and Development Review*. 1988; 14(2):225–232.



**Figure 1.** Percent distribution of difference between spousal reports of days since last coitus during previous 28 days, Liberia, Madagascar, and Namibia, 2006–09  
**Note:** Data are weighted.

**Table 1**

Number of couples with characteristics used to select final study sample of monogamous couples, Liberia, Madagascar, and Namibia, 2006–09

Country (survey year)	Total number of matched couples	Couples in which									
		wife reported no other wives in household		husband reported having only one wife		both husband and wife reported only one wife		both spouses reported last intercourse to be with spouse		both spouses reported last intercourse to be with spouse, within past 28 days	
		(n)	Percent	(n)	Percent	(n)	Percent	(n)	Percent	(n)	Percent
Liberia (2007)	(2,677)	(2,259)	84	(2,378)	89	(2,208)	82	(1,728)	65	(1,673)	62
Madagascar (2008–09)	(4,599)	(4,347)	95	(4,532)	99	(4,334)	94	(4,199)	91	(4,138)	90
Namibia (2006–07)	(867)	(740)	85	(849)	98	(732)	84	(639)	74	(588)	68

**Note:** Age range is 15–49 for all respondents except for men in Madagascar (15–59).

**Table 2**

Percentage distribution of couples, by outcome variables and household and joint characteristics, Liberia, Madagascar, and Namibia, 2006–09

Characteristic	Liberia (N = 1,673)	Madagascar (N = 4,138)	Namibia (N = 588)
<b>Outcome variable</b>			
Time since last coitus			
Concordance <sup>a</sup>	56.7	71.7	29.3
Discordance	43.3	28.3	70.7
Condom use at last coitus			
Both said yes	1.4	0.8	12.0
Both said no	92.8	96.8	71.0
Only husband said yes	4.1	1.3	10.8
Only wife said yes	1.7	1.1	6.2
Current contraceptive use			
Both said yes	3.9	25.8	36.8
Both said no	80.6	55.8	29.8
Only husband said yes	6.1	3.6	13.5
Only wife said yes	9.4	14.8	19.9
<b>Household characteristic</b>			
Residence			
Urban	37.2	13.1	53.3
Wealth quintile			
Poorest	19.6	18.3	16.0
Lower-middle	20.4	19.9	11.4
Middle	19.1	20.2	19.9
Upper-middle	19.9	20.8	24.5
Wealthiest	21.0	20.8	28.1
<b>Joint characteristic</b>			
Age			
Same age	22.2	29.5	29.3
Wife 3+ years older	7.1	5.0	11.9
Husband 3+ years older	70.7	65.5	58.8
Education			
Both uneducated	17.4	9.7	7.2
Wife has primary, husband has none	4.2	7.4	7.1
Husband has primary, wife has none	32.6	11.4	5.5
Both have at least primary education <sup>b</sup>	27.1	54.4	30.7
Both have secondary or more education	18.6	17.1	49.5
Fertility preference			
Both want no more children	30.2	41.1	54.2
Both want another child	50.5	44.9	22.1
Only wife wants another child	8.7	5.9	6.5

Characteristic	Liberia (N = 1,673)	Madagascar (N = 4,138)	Namibia (N = 588)
Only husband wants another child	10.6	8.1	17.1

<sup>a</sup>Couples whose interspousal difference was -1, 0, or 1 day.

<sup>b</sup>Both have primary education, or one has primary and the other has higher schooling.

Wives' and husbands' reports of sexual behavior and contraceptive use and percentage of couple agreement, Liberia, Madagascar, and Namibia, 2006–09

**Table 3**

Outcome variable	Liberia			Madagascar			Namibia		
	Wife	Husband	Couple agreement (kappa)	Wife	Husband	Couple agreement (kappa)	Wife	Husband	Couple agreement (kappa)
Days since last coitus (mean)	9.2	9.8	54.0 (0.33)	7.2	7.6***	74.7 (0.41)	8.7	9.6*	30.7 (0.21)
Condom use at last sex (percent)	3.1	5.5****	93.8 (0.30)	1.9	2.1	98.3 (0.43)	18.2	22.8*	80.4 (0.42)
Current contraceptive use (percent)	13.3	10.0**	85.1 (0.27)	40.6	29.4***	83.5 (0.67)	56.7	50.3*	66.0 (0.32)

\* Test for difference between wives and husbands significant at  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$ .

**Notes:** Data for wives and husbands separately (but not for couples) are weighted. P-value for “days since last coitus” variable determined by t-test for paired means. For the two contraceptive-use variables, p-value determined by McNemar’s chi-square test for paired proportions. All kappa values are significantly different from zero ( $p < 0.0001$ ).



**Table 4**

Linear regression coefficients assessing the association between explanatory variables and reported days since last coitus among concordant couples, Liberia, Madagascar, and Namibia, 2006–09

Characteristic	Liberia	Madagascar	Namibia
Residence			
Urban (r)	0.0	0.0	0.0
Rural	-0.9	-0.3	-3.9
Wealth quintile			
Poorest (r)	0.0	0.0	0.0
Lower-middle	0.4	-1.3*	-9.6*
Middle	0.1	-0.8	-4.2
Upper-middle	-1.8	-2.4***	-2.3
Wealthiest	-5.2**	-2.3**	-5.7
Age			
Same age (r)	0.0	0.0	0.0
Wife 3+ years older	-3.8**	-0.1	-3.0
Husband 3+ years older	0.7	1.1*	-0.1
Education			
Both uneducated (r)	0.0	0.0	0.0
Wife has primary, husband has none	-4.9**	0.9	-5.6
Husband has primary, wife has none	-1.4	0.9	-2.3
Both have at least primary education <sup>a</sup>	-1.1	1.3*	-5.1
Both have secondary or more education	-1.2	-0.1	-9.1*
Fertility preference			
Both want no more children (r)	0.0	0.0	0.0
Both want another child	-0.5	-1.7***	-5.2*
Only wife wants another child	-0.3	-0.9	-5.0
Only husband wants another child	0.3	-1.3	-2.0
Constant	12.6***	8.0***	23.8***
Number of couples	(876)	(2,975)	(184)
R-squared	0.044***	0.020***	0.105***

\* Significant at  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$ . (r) = Reference category.

<sup>a</sup> Both have primary education, or one has primary and the other has higher schooling.

**Table 5**  
Odds ratios from logistic regression analysis assessing the association between explanatory variables and condom and contraceptive use at last coitus among concordant couples, Liberia, Madagascar, and Namibia, 2006–09

Characteristic	Liberia		Madagascar		Namibia	
	Condom use	Contraceptive use	Condom use	Contraceptive use	Condom use	Contraceptive use
Residence						
Urban (r)	1.0	1.0	1.0	1.0	1.0	1.0
Rural	1.8	0.7	1.3	1.0	0.6	0.9
Wealth quintile						
Poorest (r)	1.0	1.0	1.0	1.0	1.0	1.0
Lower-middle	7.4	6.6*	0.6	1.1	5.6*	5.2***
Middle	3.4	17.6***	0.6	1.4*	3.0	3.5**
Upper-middle	5.8	16.5***	1.8	2.2***	4.6	6.4***
Wealthiest	6.3	17.1***	3.6	2.3**	3.5	7.2***
Age						
Same age (r)	1.0	1.0	1.0	1.0	1.0	1.0
Wife 3+ years older	—	—	0.4	1.0	2.9	0.8
Husband 3+ years older	11.4*	1.5	0.3*	1.0	1.4	1.0
Education						
Both uneducated (r)	1.0	1.0	1.0	1.0	1.0	1.0
Wife has primary, husband has none	0.2	0.2	—	2.0*	1.2	1.2
Husband has primary, wife has none	0.4	0.6	4.7	2.0**	0.6	0.8
Both have at least primary education <sup>a</sup>	1.3	1.3	8.5	3.4***	2.9	2.3
Both have secondary or more education	2.1	1.9	15.6*	4.5***	2.6	2.6
Fertility preference						
Both want no more children (r)	1.0	1.0	1.0	1.0	1.0	1.0
Both want another child	0.3*	0.4**	1.0	0.6***	1.1	0.7
Only wife wants another child	0.2	0.2**	2.1	0.9	3.5*	0.5
Only husband wants another child	1.4	1.8	2.9	0.9	1.0	0.6

Characteristic	Liberia		Madagascar		Namibia	
	Condom use	Contraceptive use	Condom use	Contraceptive use	Condom use	Contraceptive use
Number of couples	(1,467)	(1,322)	(3,739)	(3,455)	(479)	(393)

\* Statistically significant at  $p < 0.05$ ;

\*\*  $p < 0.01$ ;

\*\*\*  $p < 0.001$ . (r) = Reference category. — = Not included in the model.

<sup>a</sup> Both have primary education, or one has primary education and the other has higher schooling.