Unmet Need and Sex: Investigating the Role of Coital Frequency in Fertility Control

Suzanne O. Bell and David Bishai

We estimate the relationship between unmet need for contraception and coital frequency using data from the most recent Standard Demographic and Health Surveys conducted from 2005 to 2015. Individual-level analyses include 55 countries (n=245,732 women). The dependent variable is women's report of any sex in the last four weeks; the independent variable is current unmet need. Bivariate ecological results using country averages indicate that prevalence of unmet need is significantly negatively correlated with the proportion reporting recent sexual activity. Multivariate regression of individual-level data show that the overall odds ratio of having had sex in the last four weeks is 3.23 and 2.97 for women with met contraceptive need for spacing and limiting fertility, respectively, compared with women with unmet contraceptive need. These results suggest that current estimates of unmet need exaggerate the risk of unintended pregnancy because coital frequency is not uniform with respect to unmet need. Findings also suggest that, despite being categorized as having unmet need, many women may still be taking measures to control their fertility through regulating the tempo of marital coitus, thus reducing their risk of unintended pregnancy.

Unmet need for contraception is routinely used to evaluate family planning policies and programs (Bradley and Casterline 2014). Measures of unmet need were originally developed to represent the discrepancy between women's fertility preferences and their contraceptive behavior (Mauldin 1965; Berelson 1969; Bradley and Casterline 2014). As defined by the Demographic and Health Survey (DHS), married women of reproductive age (15–49 years) have unmet need for contraception if they are fecund, do not want a child in the next two years or at all, and are not currently using a method of contraception (Bradley et al. 2012). Currently pregnant women and women who are postpartum amenorrheic (and who gave birth within two years prior to the survey) who designate their current/recent pregnancy as unintended are also classified as having unmet need for contraception (Bradley et al. 2012).

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A seemingly overlooked yet critical aspect of unmet need is sexual activity. Modulating the tempo of marital coital frequency is a traditional approach to fertility control that couples may use as an alternative to modern contraception. Data suggest that the primary pre-conception methods used to control fertility during the historical fertility transitions of Europe and the United States were withdrawal and reductions in coital frequency (Notestein 1953; Coale 1973; David and Sanders 1986; Guinnane 2011). These methods, although not as effective as modern methods of contraception, can serve an important role in regulating fertility, particularly when used in combination with other traditional or less effective methods (David and Sanders 1986). Early surveys suggest that deliberate reductions in coital frequency may explain the lower observed marital fertility among urban middle-class women in nineteenth century United States as well as subgroups of women in Europe; the couples that were more successful at sexual restraint within marriage had lower lifetime fertility (Notestein 1953; Coale 1973; David and Sanders 1986; Guinnane 2011). By today's definition, couples choosing marital abstinence, successfully or not, would all be labeled as having unmet need.

Johnson-Hanks (2002) highlights the significant role of periodic abstinence in Cameroon as a means of appropriately timing one's births. Periodic abstinence is perceived as "modern" and was the most commonly used contraceptive method among young, educated, and urban Cameroonian women as of the late 1990s when the data were collected. Such findings counter the common notion that the fertility transition model inherently involves a transition from low-technology/behavioral means of pregnancy prevention to high-technology/biomedical contraception, despite what we know about historical fertility transitions (Johnson-Hanks 2002). Although contraceptive methods are widely available at subsidized prices in Cameroon, periodic abstinence presents an option without side effects that can provide pregnancy prevention for the exact duration required without the risk of subfecundity that many women fear. In addition, mastery of periodic abstinence bestows upon some Cameroonian woman an honor associated with the discipline and sexual restraint that its use entails (Johnson-Hanks 2002). This study emphasizes the role of other social goals that a woman or couple considers when deciding what contraception to use and implies that contraceptive efficacy may not always be the leading factor. Findings from a recent study in Ghana similarly suggest that periodic abstinence and/or reduced coital frequency are being used as a partial substitute for modern contraception, particularly among urban, wealthy, educated women (Machiyama and Cleland 2014).

Davis and Blake's (1956) seminal paper grouped the necessary factors involved in reproduction into (1) intercourse, (2) conception, and (3) gestation and parturition. Factors affecting exposure to intercourse within unions include voluntary abstinence, involuntary abstinence (from impotence, illness, and unavoidable but temporary separations), and coital frequency (excluding periods of abstinence). Bongaarts's (1982) original proximate determinants of fertility framework, which emerged from Davis and Blake's work, did not include sexual frequency and instead used marriage as a proxy of a woman's exposure to sex. More recent refinements incorporate sex in the previous four weeks in some regard, resulting in improved model fit and affirming the continued importance of sexual frequency in explaining fertility (Stover 1998; Bongaarts 2015).

Little is known about marital coitus across the life course. Existing evidence indicates that a decline in its frequency is universal, although there is little variation among women of reproductive age (Brewis and Meyer 2005; Mercer et al. 2013). In addition to age and marital duration, men's self-assessed health has been shown to be associated with coital frequency (Rao and Demaris 1995). With the emphasis placed on measuring modern contraceptive use, the potential current role of long- or short-term abstention from marital coitus as an alternative to modern methods is not well understood. Early evidence demonstrates that the relationship between coital frequency and fecundity is nonlinear, taking the shape of an exponential distribution where the probability of becoming pregnant drops most rapidly in conjunction with the initial declines from daily coitus (Barrett 1971). This relationship is similar for older women but the distribution is shifted downward as fecundability decreases with age (Barrett 1971). We hypothesize a bidirectional relationship between coital frequency and unmet need for modern contraception that is modulated by an individual's community context. Choosing to forego modern methods of family planning while desiring to delay or stop childbearing could result in less frequent sexual activity. The converse is more obvious: having access to and choosing to use modern methods of family planning could result in more frequent sexual activity for married and cohabiting couples. Lifestyle choices of both coital frequency and utilization of modern methods of family planning are intertwined. Exogenous factors like migration or spousal disability that reduce coital frequency would reduce the use of modern methods of family planning, thus increasing unmet need. By the same token, exogenous factors that increase the use of modern methods of family planning could increase coital frequency. Historically, some strands of conservative opposition to contraception were based on the concern that contraception would lead to more marital sex—an outcome that was alien to mid-Victorian attitudes about marital propriety (Gordon 2002). The social/cultural context and the associated availability of contraceptive supplies and information will affect both unmet need and coital frequency because these behaviors are linked. We do not conjecture that all of the conditional choices are necessarily conscious within each individual or couple, but we do hypothesize a statistical correlation between more unmet need and less coital frequency.

In this article we estimate the relationship between unmet need and coital frequency. We hypothesize that higher unmet need is associated with lower coital frequency because couples will revert to intramarital abstinence as a reliable substitute for the modern contraception that they cannot or will not use. We aspire to measure the degree to which marital coital frequency and modern contraception are interlinked as substitute strategies to regulate fertility. This measurement is not the same as a claim that making contraception more available will cause changes in coital frequency or vice versa.

METHODS

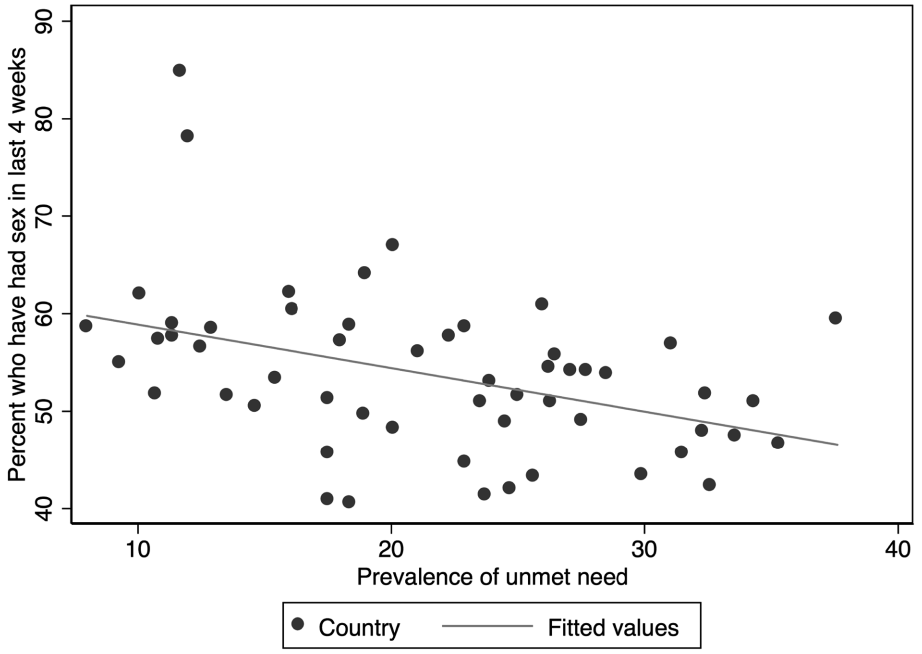
To investigate the association between sexual activity and unmet need, we first conducted an analysis of ecological correlation at the country level using women's questionnaire responses from the most recent Standard DHS surveys in the countries that have the variables of interest (ICF International 2015). For the unit record analysis at the individual level, we restricted

our analysis to data from Standard DHS surveys that were conducted between 2005 and 2015 and were publicly available by the end of 2016 when results were finalized, which reduced the number of countries to 55. DHS data were collected using a multistage, clustered, and stratified probabilistic sampling design.

For our dependent variable we used the Standard DHS women's questionnaire variable that asks, "When was the last time you had sexual intercourse?" We coded the results into a dichotomous variable based on whether or not the woman reported sexual activity in the last four weeks, the reference group being no sexual activity in the last four weeks. We also conducted a sensitivity analysis to examine whether results were robust to the choice of cut-point, using one week as an alternative reference period. The independent variable was current unmet need as calculated by the DHS using the 2012 revised definition (Bradley et al. 2012). Women with unmet need are defined as those who are married or cohabiting (i.e., report living with a man), are fecund but not currently using contraception (modern or traditional, including periodic abstinence), are pregnant or who have been postpartum amenorrheic for less than 24 months and whose last birth was unintended but who do not want a/another child for at least two years or ever (Bradley et al. 2012). We generated categorical indicator variables from the DHS unmet need variable. Compared with women who were using modern methods of contraception, we set up a common reference group of women with either unmet need for limiting or unmet need for spacing. Covariates of interest were selected based on existing literature and were those that we hypothesized to be associated with both unmet need status and sex in the last four weeks. These variables included age (categorical), education (categorical), parity (categorical), and residence (dichotomous). Categorical covariates were modeled using indicator variables. Less than 5 percent of data were missing among all variables, an amount we do not think would affect our results. As such, observations with missing data were omitted from final analyses.

We limited our analyses to currently married/cohabiting, nonpregnant, fecund women, who either have met need or unmet need for contraception (i.e., who have a demand for contraception). Women who were postpartum abstinent or who were using lactational amenorrhea were not included in the analysis. We conducted a bivariate analysis at the ecological level, calculating a correlation coefficient for the relationship between the percent of women who have unmet need for contraception and the percent who report having had sex in the last four weeks at the country level. We then conducted individual-level analyses for each country. For the unit record analysis, we conducted univariate and bivariate analyses with variables of interest using design-based F tests to evaluate differences in the distribution of variables by unmet need status and sex in the last four weeks. The design-based F test is a corrected, weighted Pearson chi square statistic that appropriately accounts for the complex sampling design. For Model 1, we conducted simple logistic regression analyses of sex in the last four weeks on unmet need status, comparing women currently using contraception to those with unmet need for either spacing or limiting. For Model 2, we conducted multiple logistic regression analyses including the variables that we hypothesized to be confounders of the relationship between unmet need and sex in the last four weeks. For each of the 55 countries, we computed an adjusted log odds ratio (OR) of having sex in the last four weeks among women with met need for spacing compared to women with unmet need, and for each of the 55 countries we computed an adjusted log OR of having sex in the last four

FIGURE 1 Prevalence of sex in last four weeks and total unmet need among 55 DHS countries



weeks among women with met need for limiting compared to women with unmet need. We then displayed in separate forest plots the log ORs for spacing and limiting from Model 2, as well as the overall weighted pooled estimates for each. To account for the complex sampling design of the DHS, we applied survey weights and used the Taylor linearization method to calculate variances in all analyses, appropriately adjusting for the clustering, strata, and design effects. In instances of strata with single units, we used the average of the variances from the strata with multiple sampling units. Stata Version 14 was used for the analyses (StataCorp 2014). Statistical significance was determined by 95% confidence intervals (CIs) and p-values less than or equal to 0.05.

RESULTS

Figure 1 demonstrates the presence of an ecological correlation at the country level between the prevalence of sexual activity in the last four weeks and current unmet need for family planning among 55 DHS countries. An increase in the percent of unmet need on the x-axis appears to be associated with a decrease in the percent of individuals reporting sexual activity in the last four weeks on the y-axis. Bivariate results indicate that prevalence of unmet need is significantly negatively correlated with recent sexual activity at the ecological level ($r=-0.41$, $p=0.02$).

The final unweighted sample in the unit record analysis consisted of 245,732 married/cohabiting women of reproductive age having a demand for contraception from 55 countries, with a mean of 4,466 women per country. As seen in Table 1, 81.4 percent of

TABLE 1 Background characteristics among subpopulation of women with a demand for contraception, 55 DHS countries (weighted)[a]

	Percent	Weighted N
Sex in last 4 weeks		
No	14.19	34,861
Yes	81.37	199,854
Current unmet need status		
Met need	68.81	169,010
Unmet need (spacing and limiting)	27.52	67,590
Age		
<20	4.49	11,031
20–29	36.72	90,185
30–39	37.62	92,404
40–49	21.17	51,992
Highest educational level		
No Education	18.24	44,798
Primary	33.80	83,006
Secondary	36.80	90,379
Higher	11.17	27,423
Number of children		
0	3.30	8,093
1–2	42.48	104,338
3–4	29.94	73,542
5+	24.28	59,639
Residence		
Rural	56.29	120,289
Urban	43.71	138,255
Total	100.00	245,612

[a]Mean N per country is 4,466 women.

women had had sex in the last four weeks, and 27.5 percent currently had unmet need for contraception (spacing and limiting). Only 4.5 percent of women were less than 20 years old, and 18.2 percent had received no formal schooling. Forty-two percent of women had one to two children and the majority of women resided in a rural area (56.3 percent).

Table 2 provides weighted percent distributions of key variables by the dependent variable, sex in the last four weeks, among the subpopulation of interest from all 55 countries. Among women with met need for contraception, 89.4 percent had had sex in the last four weeks, compared with 72.1 percent among women with unmet need for contraception. By age distribution, women aged 20–39 have the highest percent reporting having sex in the last four weeks (approximately 82.0 percent), whereas women aged 40–49 have the lowest percent (78.0). Increasing education is generally associated with a higher percent of women reporting having sex in the last four weeks, with 79.3 percent of women who have no education reporting having sex in the last four weeks versus 84.5 percent among women with the highest level of education. In terms of parity, women with no children have the lowest percent reporting having sex in the last four weeks (76.5), whereas women with 1–2 children have the highest percent (83.3); the percent of women reporting having had sex in the last four weeks then decreases with increasing numbers of children. In urban areas, 82.3 percent of women reported having had sex in the last four weeks, compared with 80.6 percent in rural areas.

Table 3 presents the adjusted log ORs and 95 percent CI bounds of sex in the last four weeks among those with met need for spacing and limiting compared to those with unmet need for contraception from the 55 country-specific multivariate logistic regression analyses. Figures 2 and 3 display forest plots with the country-specific effects sizes (ES), which in this

TABLE 2 Percent who have had sex in the last four weeks by key variables among subpopulation of women having demand for contraception, 55 DHS countries (weighted)

	Percent				
	No sex	**Sex**	**Total**	**P-value**	**Weighted N**
Current unmet need status					
Met need	10.20	89.40	100.0	<0.001	169,010
Unmet need (spacing and limiting)	26.04	72.05	100.0		67,590
Age					
<20	14.58	81.73	100.0	<0.001	11,031
20–29	12.76	82.53	100.0		90,185
30–39	13.72	82.10	100.0		92,404
40–49	17.44	77.97	100.0		51,992
Highest educational level					
No education	16.68	79.28	100.0	<0.001	44,798
Primary	13.66	79.99	100.0		83,006
Secondary	14.24	82.72	100.0		90,379
Higher	11.59	84.48	100.0		27,423
Number of children					
0	18.90	76.50	100.0	<0.001	8,093
1–2	12.94	83.30	100.0		104,338
3–4	14.20	80.95	100.0		73,542
5+	15.74	79.17	100.0		59,639
Residence					
Rural	14.68	80.62	100.0	<0.001	138,255
Urban	13.57	82.34	100.0		107,357
Total	14.19	81.37	100.0		245,612

NOTE: P-value associated with design-based F test.

case are adjusted log ORs, and associated 95 percent confidence interval bounds for spacing and limiting, respectively. The figures also contain the weight associated with each country's estimate, which is determined by each country's effect size variance. Thus the overall pooled estimates are variance weighted. As shown, the preponderance of the log ORs are statistically significantly greater than the null of 0 (the solid vertical line), among both the log ORs for coitus if using contraception for spacing and the log ORs for coitus if using contraception for limiting. The overall weighted, adjusted OR of coitus in the last four weeks (the dashed vertical line/diamond) is 3.23 (95% CI 3.09–3.38) and 2.97 (95% CI 2.86–3.10) for women with met contraceptive needs for spacing and limiting fertility, respectively, compared to women with unmet needs. The ORs of the other covariates in the multivariate regression typically had the expected directionality but varied in magnitude and significance across countries; increasing age was often associated with decreasing odds of recent sex; increasing parity was often associated with increasing odds of recent sex; residence was typically not associated with recent sex; and for all educational categories except the highest, more years of schooling was generally associated with decreasing odds of recent sex.

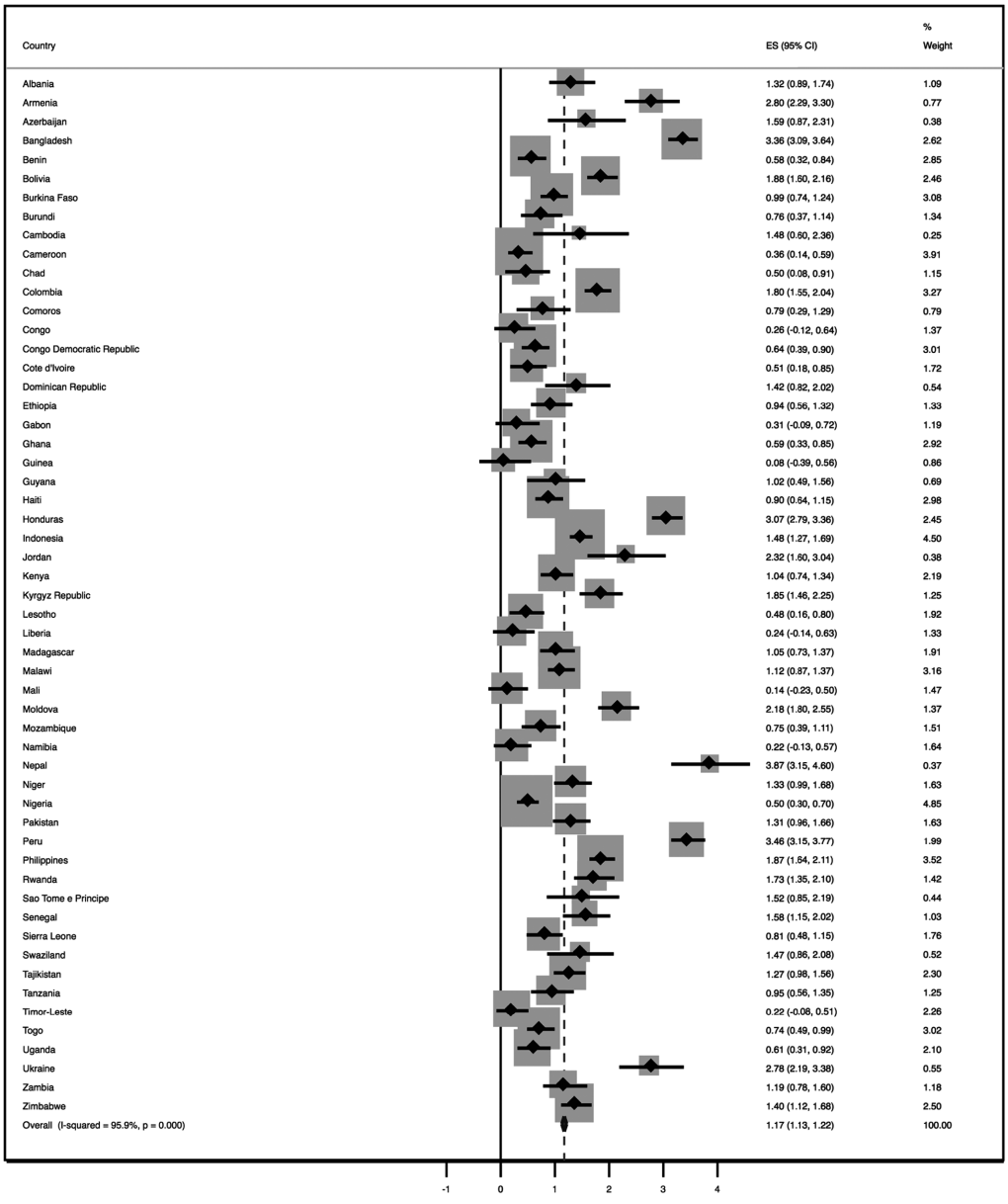
To assess the robustness of our results, we examined whether findings differed when using a cut-point of sex in the last week instead of the last four weeks. The conclusions were the same, although the pooled adjusted ORs were smaller in magnitude; 2.27 (95% CI 2.19–2.35) and 2.00 (95% CI 1.93–2.07) for spacing and limiting, respectively. We then examined the sensitivity of our findings to the inclusion of cohabiting women by conducting a subanalysis including only married women who otherwise met the inclusion criteria; results were similar. We additionally conducted separate sensitivity analyses including indicator variables for wealth quintile and marital duration and again found results were similar. Lastly, we ran the final model on the appended dataset using country-specific random effects and the overall

TABLE 3 Betas and associated 95% confidence interval bounds from multivariate logistic regressions of sex in the last four weeks given currently using contraception for spacing or limiting, by country (weighted)[a]

	Spacing			Limiting		
Country	**Beta**	**Lower bound**	**Upper bound**	**Beta**	**Lower bound**	**Upper bound**
Albania	1.32	0.89	1.74	1.46	1.15	1.76
Armenia	2.80	2.29	3.30	2.93	2.52	3.35
Azerbaijan	1.59	0.87	2.31	2.04	1.69	2.39
Bangladesh	3.36	3.09	3.64	2.83	2.57	3.10
Benin	0.58	0.32	0.84	0.23	–0.05	0.51
Bolivia	1.88	1.60	2.16	1.27	1.07	1.47
Burkina Faso	0.99	0.74	1.24	0.45	0.15	0.74
Burundi	0.76	0.37	1.14	0.57	0.05	1.09
Cambodia	1.48	0.60	2.36	1.39	0.47	2.32
Cameroon	0.36	0.14	0.59	0.36	0.06	0.65
Chad	0.50	0.08	0.91	–0.57	–1.13	–0.01
Colombia	1.80	1.55	2.04	1.56	1.35	1.77
Comoros	0.79	0.29	1.29	0.10	–0.57	0.78
Congo	0.26	–0.12	0.64	0.34	–0.17	0.85
Congo Democratic Republic	0.64	0.39	0.90	0.28	–0.05	0.61
Cote d'Ivoire	0.51	0.18	0.85	0.35	–0.18	0.88
Dominican Republic	1.42	0.82	2.02	0.75	0.20	1.30
Ethiopia	0.94	0.56	1.32	0.36	0.00	0.72
Gabon	0.31	–0.09	0.72	0.36	–0.18	0.90
Ghana	0.59	0.33	0.85	0.52	0.21	0.84
Guinea	0.08	–0.39	0.56	0.61	–0.11	1.33
Guyana	1.02	0.49	1.56	0.97	0.63	1.32
Haiti	0.90	0.64	1.15	0.90	0.69	1.11
Honduras	3.07	2.79	3.36	2.54	2.30	2.78
Indonesia	1.48	1.27	1.69	1.16	1.00	1.33
Jordan	2.32	1.60	3.04	2.12	1.72	2.53
Kenya	1.04	0.74	1.34	0.93	0.67	1.19
Kyrgyz Republic	1.85	1.46	2.25	1.42	0.89	1.96
Lesotho	0.48	0.16	0.80	0.29	0.04	0.54
Liberia	0.24	–0.14	0.63	0.32	–0.10	0.74
Madagascar	1.05	0.73	1.37	0.83	0.54	1.12
Malawi	1.12	0.87	1.37	0.65	0.43	0.87
Mali	0.14	–0.23	0.50	–0.10	–0.67	0.47
Moldova	2.18	2.18	2.18	1.89	1.89	1.89
Mozambique	0.75	0.39	1.11	0.29	–0.05	0.63
Namibia	0.22	–0.13	0.57	0.23	–0.12	0.57
Nepal	3.87	3.15	4.60	2.96	2.71	3.21
Niger	1.33	0.99	1.68	0.38	–0.20	0.95
Nigeria	0.50	0.30	0.70	0.41	0.20	0.62
Pakistan	1.31	0.96	1.66	0.97	0.76	1.18
Peru	3.46	3.15	3.77	2.91	2.66	3.16
Philippines	1.87	1.64	2.11	1.48	1.31	1.64
Rwanda	1.73	1.35	2.10	1.12	0.83	1.41
Sao Tome and Principe	1.52	0.85	2.19	0.76	0.14	1.39
Senegal	1.58	1.15	2.02	1.59	0.99	2.19
Sierra Leone	0.81	0.48	1.15	0.44	0.09	0.79
Swaziland	1.47	0.86	2.08	0.43	0.07	0.79
Tajikistan	1.27	0.98	1.56	0.72	0.47	0.97
Tanzania	0.95	0.56	1.35	0.65	0.22	1.09
Timor-Leste	0.22	–0.08	0.51	0.26	–0.06	0.58
Togo	0.74	0.49	0.99	0.34	0.07	0.61
Uganda	0.61	0.31	0.92	0.40	0.11	0.68
Ukraine	2.78	2.19	3.38	2.48	2.09	2.88
Zambia	1.19	0.78	1.60	0.65	0.25	1.05
Zimbabwe	1.40	1.12	1.68	1.11	0.83	1.38
Pooled	1.17	1.13	1.22	1.09	1.05	1.13

[a] Adjusted for age, education, parity, and residence, according to complex sampling design.

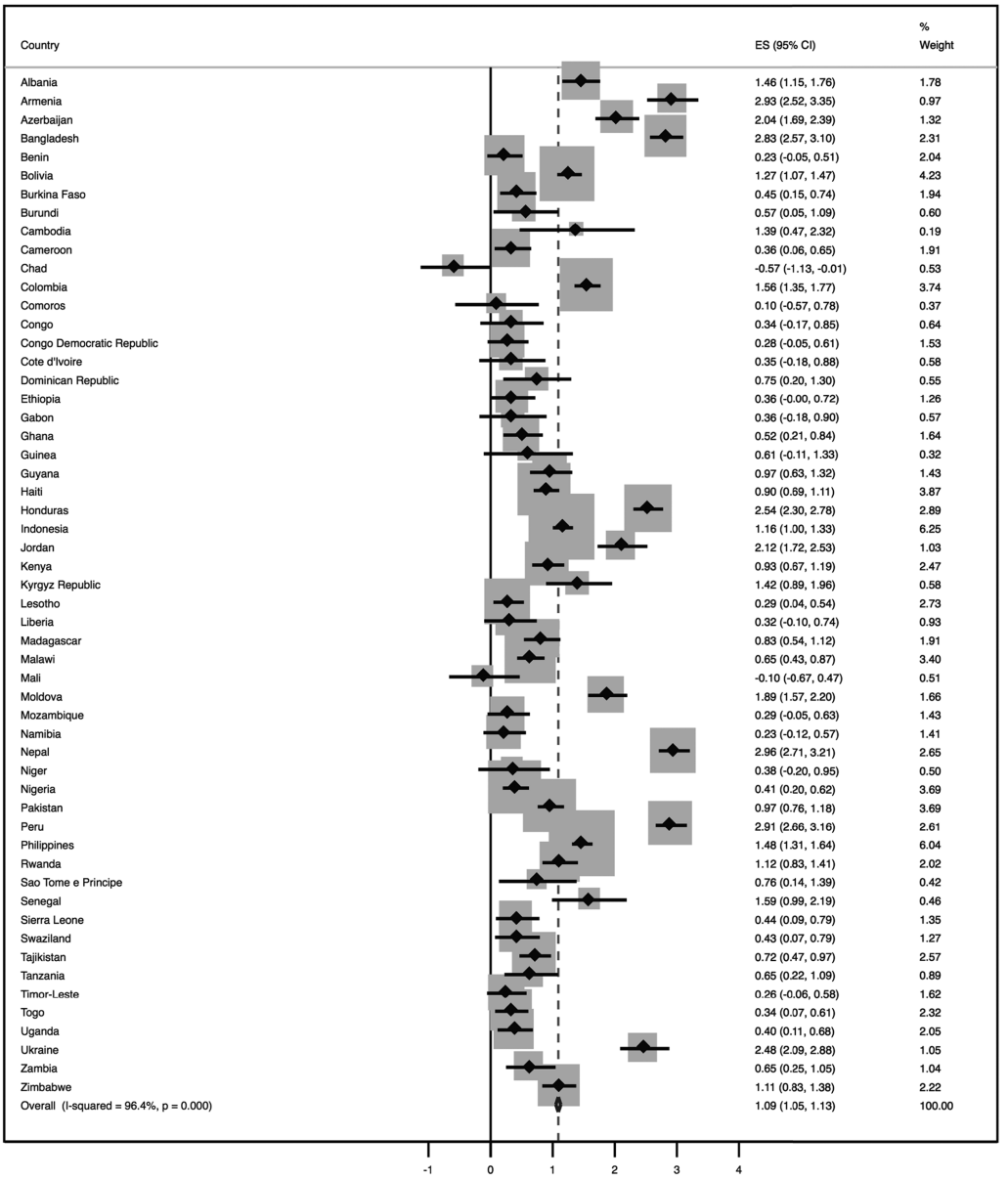
FIGURE 2 Log odds ratio of sex in the last four weeks among women with met need for spacing compared to those with unmet need, 55 DHS countries



NOTE: Adjusted for age, education, parity, and residence, according to complex sampling design.

ORs were again similar: 3.42 (95% CI 3.33–3.56) and 2.92 (95% CI 2.83–3.02) for spacing and limiting, respectively. The associated *rho* indicated that less than 5 percent of the observed variability in sex in the last four weeks is attributable to intra-country variability. Results from these sensitivity analyses are available upon request.

FIGURE 3 Log odds ratio of sex in the last four weeks among women with met need for limiting compared to those with unmet need, 55 DHS countries



NOTE: Adjusted for age, education, parity, and residence, according to complex sampling design.

DISCUSSION

Our findings indicate a significant, negative correlation between unmet need for contraception and recent sexual activity in our ecological analysis. We confirm this by finding a significant, positive association between met need for contraception and recent sexual activity in our individual-level analyses. One interpretation is that the tempo of marital coital frequency

is determined jointly with the choice of contraception in a context that varies due to social norms, attitudes, culture, and modern contraceptive availability. A couple's demand for contraceptives is established together with expectations of coital frequency. Reduced coital frequency could be a rational response to coping with unmet need. Couples who want to have sex would have a rational interest in being more diligent in meeting their unmet contraceptive needs. It is notable that 72 percent of women who had unmet need had had sex in the last four weeks, compared with 89 percent of women using contraception. So there appear to be limits in couples' commitment to embracing marital abstinence as a substitute for modern contraception. It could be that some portion of the 72 percent of women with unmet need who had sex in the last four weeks only had sex once or only had sex when the risk of conception was low (i.e., unreported use of rhythm method), as opposed to the 89 percent of women using contraception who may have had sex more frequently and without regard to their monthly cycle. Unfortunately, the data do not allow investigation of these phenomena. It is also possible that women and couples who have infrequent sex are simply willing to accept a certain level of risk with regard to unintended pregnancy and choose to forego regular use of modern contraception given their limited exposure to sex. A recent study by Machiyama and Cleland (2014) provides evidence that reduced coital frequency is being deployed by women and couples in Ghana as an alternative to modern contraception. There is also the likelihood that some of these women do not fully appreciate the risk or cumulative risk of unintended pregnancy associated with repeated exposure to unprotected sex and thus are making a decision not to use contraception based on an incorrect perception of their risk. Further research is needed to understand these women's motivation for nonuse of modern contraception and how their contraceptive needs could best be met given their coital frequency.

Findings also point to a potential framing issue with regard to whether the respondent/partner is currently taking any measures to prevent pregnancy. The question becomes ambiguous if a woman is not having sex currently. Additionally, a recent follow-up study using a subsample of the 2014 Ghana DHS found that 18.2 percent of nonpregnant respondents reported using abstinence or infrequent sex with the intent of avoiding pregnancy, i.e. it was being used as a method of family planning (Staveteig 2016). Yet these women had previously been categorized as having unmet need in the DHS survey. Additionally, 31.0 percent of nonpregnant women identified as having unmet need in the Ghana DHS subsequently reported using a traditional method when probed by interviewers in the follow-up study. These women initially reported no current family planning method, but when interviewers asked specifically about rhythm or withdrawal, respondents indicated they were using one of these methods but had interpreted the original question as only being in reference to modern methods (Staveteig 2016). This is an area of potential refinement in the DHS survey instruments.

Since we have studied only nonexperimental cross-sectional data, we cannot establish whether greater contraceptive supply will cause changes in coital frequency. Future research could investigate changes in unmet need over time within countries and whether the proportion of women who have had recent sexual activity changes in tandem as expected. In addition, the unmet need variable is intended to provide a demographic

indicator at the population level, thus using it as a key variable in our individual-level analysis is problematic.

Even interpreted as a statistical association, these results illustrate that current estimates of unmet need might exaggerate the prevalence of women at risk of an unintended pregnancy because coital frequency is not uniform with respect to unmet need status. This finding corroborates recent results from a sensitivity analysis of unmet need illustrating that unmet need estimates would be lower if recent sexual activity was taken into account (Bradley and Casterline 2014). In their sensitivity analysis, Bradley and Casterline assumed that all married women who said they have no or infrequent sex cannot have unmet need. After excluding these women, the estimated percentage of currently married women with unmet need for contraception dropped by an average of 3.4 percentage points (Bradley and Casterline 2014). The countries whose unmet need estimates were most affected by excluding these women were Nepal (17.5 percentage point decrease) and Bangladesh (6.2 percentage point decrease) (Bradley and Casterline 2014). These results are in line with our findings, where women in Nepal and Bangladesh who were currently using contraception for either spacing or limiting had among the highest odds of having had sex in the last four weeks. Bradley and Casterline (2014) posit that this is due to the high level of labor migration and/or terminal abstinence at relatively young ages in these countries.

Despite these limitations, this investigation provides a new perspective on unmet need in a sexual context. These findings are also a reminder that using unmet need as an indicator of those who need and should be using contraception is not an appropriate interpretation of the variable. Some women defined as having unmet need for contraception may be choosing to forego modern contraception due to a preference to regulate fertility via reductions in coitus. The contraceptive prevalence rates and met need that we measure are about averting births, but they are also capturing women's willingness to use certain modern methods within a given social context (Johnson-Hanks 2002). Whether programmatic interventions can reduce an individual woman's unmet need depends on her reason for nonuse (Casterline and Sinding 2000). Women's reported reasons for nonuse are increasingly side effects/health risks and infrequent/no sexual activity (Sedgh et al. 2007; Cleland, Harbison, and Shah 2014; Machiyama and Cleland 2014; Sedgh and Hussain 2014). Discontinued users constitute a growing proportion of women with unmet need, thus negative experiences with previous modern contraceptive use may be a motivating experience for current nonuse as well (Cleland, Harbison, and Shah 2014; Machiyama and Cleland 2014). Given these concerns and reasons for nonuse, it may be that as unmet need declines around the world, the women remaining with unmet need for contraception are increasingly comprised of women choosing not to use a modern method of contraception and instead opting to reduce their risk of pregnancy through more traditional means. Our results suggest that, despite being categorized as having unmet need, many women may still be taking measures to control their fertility through regulating the tempo of marital coitus, thus reducing their risk for an unintended pregnancy. Additionally, our results suggest that women with met need for contraception are having more frequent sex. If future research is able to establish a causal link from exogenous contraceptive availability to coital frequency, then findings like these would imply that reductions in unmet need could lead to increased sexual activity for couples worldwide.

APPENDIX 1

Country datasets used including survey year, subpopulation sample size, and StatCompiler weighted estimates of unmet need for family planning and recent sexual activity in the last four weeks used in Figure 1

Country	Survey year	Subpopulation (N)	Unmet need for family planning	Recent sexual activity in last 4 weeks
Albania	2008	3,874	12.9	58.5
Armenia	2010	2,666	13.5	51.6
Azerbaijan	2006	3,686	15.4	53.4
Bangladesh	2014	10,796	12.0	78.1
Benin	2012	4,311	32.6	42.3
Bolivia	2008	6,559	20.1	48.2
Burkina Faso	2010	4,418	24.5	48.9
Burundi	2010	2,364	32.4	51.8
Cambodia	2014	5,991	12.5	56.5
Cameroon	2011	3,671	23.5	51.0
Chad	2014	2,697	22.9	58.6
Colombia	2010	12,617	8.0	58.6
Comoros	2012	1,462	32.3	47.9
Congo	2011	3,456	18.4	58.7
Congo Democratic Republic	2013	4,069	27.7	54.2
Cote d'Ivoire	2012	2,235	27.1	54.1
Dominican Republic	2013	1,870	10.8	57.3
Ethiopia	2011	4,300	26.3	51.0
Gabon	2012	2,071	26.5	55.8
Ghana	2014	2,346	29.9	43.4
Guinea	2012	869	23.7	41.3
Guyana	2009	1,790	28.5	53.8
Haiti	2012	4,651	35.3	46.6
Honduras	2011	7,430	10.7	51.7
Indonesia	2012	20,837	11.4	58.9
Jordan	2012	6,934	11.7	84.9
Kenya	2014	14,625	17.5	51.3
Kyrgyz Republic	2012	2,742	18.0	57.2
Lesotho	2014	2,373	18.4	40.6
Liberia	2013	2,253	31.1	56.8
Madagascar	2008	6,196	19.0	64.1
Malawi	2010	7,654	26.2	54.5
Mali	2012	2,465	26.0	60.9
Moldova	2005	3,276	11.4	57.7
Mozambique	2011	2,621	23.9	53.0
Namibia	2013	2,423	17.5	40.8
Nepal	2011	4,791	27.5	49.1
Niger	2012	2,445	16.0	62.2
Nigeria	2013	7,209	16.1	60.4
Pakistan	2012	5,675	20.1	66.9
Peru	2012	9,988	9.3	55.0
Philippines	2013	5,800	17.5	45.6
Rwanda	2015	4,424	18.9	49.6
Sao Tome and Principe	2008	1,092	37.6	59.4
Senegal	2014	2,141	25.6	43.2
Sierra Leone	2013	2,945	25.0	51.6
Swaziland	2006	1,233	24.7	42.0
Tajikistan	2012	3,038	22.9	44.7
Tanzania	2010	2,652	22.3	57.6
Timor-Leste	2009	3,783	31.5	45.6
Togo	2013	2,661	33.6	47.5
Uganda	2011	2,505	34.3	51.0
Ukraine	2007	3,123	10.1	62.0
Zambia	2013	2,051	21.1	56.1
Zimbabwe	2010	3,578	14.6	50.4

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