

ORIGINAL RESEARCH ARTICLE

Return to Sexual Activity and Modern Family Planning Use in the Extended Postpartum Period: An Analysis of Findings from Seventeen Countries

Maria R Borda^{1*}, William Winfrey² and Catharine McKaig³

¹Futures Group, Washington DC, USA; ²Futures Institute, Glastonbury, Connecticut USA;

³Jhpiego, Baltimore, Maryland USA

*For correspondence: Email: mborda@mmconsult.net

Abstract

Unintended pregnancies can lead to poor maternal and child health outcomes. Family planning use during the first year postpartum has the potential to significantly reduce at least some of these unintended pregnancies. This paper examines the relationship of menses return, breastfeeding status, and postpartum duration on return to sexual activity and use of modern family planning among postpartum women. This paper presents results from a secondary data analysis of Demographic and Health Surveys from 17 countries. For postpartum women, the return of menses, breastfeeding status, and postpartum duration are significantly associated with return to sexual activity in at least 10 out of the 17 countries but not consistently associated with family planning use. Only menses return had a significant association with use of modern family planning in the majority of countries. These findings point to the importance of education about pregnancy risk prior to menses return (*Afr J Reprod Health* 2010; 14[4]: 75-82).

Résumé

Retour à l'activité sexuelle et l'emploi de la planification familiale dans le postpartum prolongé : une analyse des résultats recueillis de 17 pays. Les grossesses non voulues peuvent mener aux graves conséquences sur la santé maternelles et infantiles. L'emploi de la planification familiale au cours de la première année du postpartum a le potentiel de réduire sensiblement au moins certaines de ces grossesses non voulues. Cet article étudie le rapport entre le retour de la menstruation, l'état de l'allaitement et la durée du postpartum le moment du retour à l'activité sexuelle et l'emploi de la planification familiale moderne chez les femmes du postpartum. Cet article présente les résultats à partir d'une analyse des données secondaires des Enquêtes sur la Démographie et la santé de 17 pays. Pour les femmes du postpartum, le retour à la menstruation, l'état de l'allaitement et la durée du postpartum sont sensiblement liés au retour à l'activité sexuelle dans au moins 10 sur 17 pays, mais pas constamment liés à l'emploi de la planification familiale. Seul le retour à la menstruation était sensiblement lié à l'emploi de la planification familiale moderne dans la majorité des pays. Ces résultats montrent l'importance de l'éducation en ce qui concerne les risques avant le retour à la menstruation (*Afr J Reprod Health* 2010; 14[4]: 75-82).

Keywords: Postpartum, Family planning, Breastfeeding, Menses, Sexual activity

Introduction

More than one-third of the 205 million pregnancies that occur worldwide annually are unintended. The majority of these unintended pregnancies occur in developing countries where more than one-third of 182 million pregnancies are unintended.¹ Two-thirds of these unintended pregnancies occur among women who are not using a method of family planning (FP). Women are frequently fecund postpartum before they realize it. Thus, if a postpartum woman is sexually active and is not using an effective method of FP, she is at risk of becoming pregnant in the month before her first

menstruation. Unfortunately, many women do not initiate use of FP until after menstruation has resumed. FP use during the first year postpartum has the potential to significantly reduce at least some of these unintended pregnancies. Research has demonstrated a large unmet need among women in the postpartum period.^{2,3} Meeting these needs would substantially increase contraceptive prevalence as well as reduce maternal and child mortality.⁴

Some factors that contribute to a postpartum woman's vulnerability to pregnancy include return of menses, breastfeeding, postpartum abstinence, and uptake of contraception. For individual women in

different countries, the time of resumption of menstruation during the postpartum period is variable. Most non-breastfeeding women experience the return of menses within four to six weeks after a birth. Breastfeeding delays the resumption of ovulation and the return of menses. With “full” or “nearly full” breastfeeding, approximately 70 percent of women remain amenorrheic through six months, and only 37 percent through one year; nevertheless, the contraceptive efficacy at one year postpartum is about 92 percent.⁵ Also, the Bellagio consensus statement on the use of breastfeeding as an FP method states that amenorrheic women who are fully or nearly fully breastfeeding have 98 percent protection from pregnancy for six months postpartum.^{6,7} However, a study of fully breastfeeding women in Chile found that ovulation was experienced by 26 percent of subjects, and the cumulative probability of pregnancy was 9.4 percent by 6 months postpartum.⁸ The longer the return of menses is delayed, the more likely it is that ovulation will precede menses return.⁹ A lack of monthly menstruation does not imply that a woman has not begun ovulating.

Another factor affecting pregnancy risk is the return to sexual activity during the postpartum period. Reported periods of abstinence from sexual activity after a birth vary greatly. Qualitative research indicates that among women practicing postpartum abstinence, irregular sexual activity may happen early, progressing to regular activity later.¹⁰ Despite speculation about changes in postpartum abstinence patterns as a result of modernity and social change¹¹, a review article reported no change in the length of postpartum abstinence among West and Central African countries.¹² There is limited information on factors that affect a woman’s return to sexual activity during the postpartum period.

Individual studies draw linkages between menses return and initiation of contraceptive use.² Becker and Ahmed found that FP use is most likely in the month following menses return.¹³ In summary, studies show that breastfeeding practices can affect return of menses. The return of menses has been shown to affect uptake of contraception. There is less evidence identifying factors that affect sexual activity during the postpartum period.

This paper identifies factors affecting return to sexual activity and use of modern FP among women in the extended postpartum period via secondary data analysis of 17 Demographic and Health Surveys (DHS). The results presented here are a culmination of several iterations of analyses prepared for the ACCESS-Family Planning Program (ACCESS-FP). ACCESS-FP was a five-year global program sponsored by the United States Agency for International Development (USAID) with the goal of responding to the significant unmet need for FP

among postpartum women. This program, which ended in July 2010, was implemented by Jhpiego in partnership with Save the Children, Futures Group, the Academy for Educational Development, the American College of Nurse-Midwives, and IMA World Health. This research¹ proved useful to ACCESS-FP, and the new information presented in this paper may contribute to other programs that intend to reach postpartum women with unmet need for FP services.

Methods

The Demographic and Health Survey program collects a wide range of data on population, health, and nutrition in developing countries. In general, the program implements questionnaires for particular populations including women, men, and the households they live in. This analysis uses the individual survey dataset, which provides data from the women’s survey. Among other things, the women’s survey includes information on birth history, reproductive health, FP, and maternal health. This analysis is limited to in-union women (i.e., married or living with a partner) who had a birth in the 12 months preceding the survey.² As shorthand, this sample population is referred to as “postpartum women” throughout the paper.

The analysis includes the following 17 countries: Bangladesh, the Democratic Republic of Congo, Ethiopia, Ghana, Guinea, Haiti, India, Kenya, Madagascar, Malawi, Mali, Nigeria, Pakistan, Rwanda, Tanzania, Uganda, and Zambia. Appendix Table 1 lists the sample sizes. The first column lists the sample size for each country’s individual recode file for women. In 15 of the 17 countries the survey was implemented among a sample of all women, and in two countries it was implemented among ever-married women. The second column lists the sample size of postpartum women who meet the sample requirements described above. Fifteen of the 17 countries are priority countries for the Office of Population and Health within USAID. Factors that contribute to priority status include unmet need, high-risk births, contraceptive use, and population pressures on land and water resources. Guinea and India are the two countries that are not priority countries for USAID; however, they are included in this analysis because ACCESS-FP had ongoing programs in these countries.

Return to sexual activity and use of modern FP are examined via bivariate and multivariate analyses. The bivariate analyses are weighted cross

¹ Funding for this research was provided by USAID through the ACCESS-FP Program Associate Cooperative Agreement #GPO-A-00-05-00025-00. The opinions herein are those of the authors and do not necessarily reflect the views of USAID.

² Additionally the child must still be alive and living with the mother.

tabulations of the return to sexual activity and use of modern FP versus the number of months postpartum. The postpartum period (i.e., number of months postpartum) is defined in four three-month intervals (0 to 2.9 months, 3.0 to 5.9 months, 6.0 to 8.9 months, and 9.0 to 11.9 months). A woman is assigned to a single three-month interval based on the number of months she is postpartum at the time of the survey. Disaggregating the postpartum period into such tranches runs the risk of small sample sizes. For each of the countries in this study, the sample size within each of the postpartum trimesters exceeds 100 women. It also incurs a potential bias from censoring.

In addition to disaggregation by the postpartum period, modern FP use is examined on the basis of whether a woman's menses has returned at the time of the survey. This information will help establish whether the return of menses is a factor that spurs a woman to use family planning or, from a slightly different perspective, whether women believe that family planning is not necessary until menses return. Since return of menses is strongly linked to the duration of the postpartum period, the use of family planning by menses return status is presented for specific postpartum intervals.

The dependent variables in the bivariate tables are return to sexual activity and use of a modern FP method. Return to sexual activity is based on the response to the question, Have you begun to have sexual intercourse since the birth of *name of child*?³ Use of a modern FP method is based on whether a woman indicates she is using an FP method and, if yes, whether it is defined as a modern method by the DHS team.⁴ Women who reported they did not know were excluded from the analysis.

Beyond the number of months that a woman is postpartum, many socio-demographic, behavioral, and biological factors potentially influence the return to sexual activity and uptake of FP in the postpartum period. To adjust for these potentially confounding factors, multivariate logistic regressions were conducted for each country's data. Two logistic regression equations were estimated—one for return to sexual activity among postpartum women and one for current use of modern FP among postpartum women. Thirty-two regression models, in total, were estimated.⁵

The first set of multivariate analyses looks at the return to sexual activity among all postpartum

³ The tabulation in this analysis used a DHS standard recode variable for duration of postpartum abstinence, which is based on the variable just described.

⁴ Usually these methods include oral contraceptives, intra-uterine devices, injectables, implants, male sterilization, female sterilization, diaphragms, and condoms. Although the lactational amenorrhea method and the standard days method are both modern, they are infrequently reported.

⁵ Sample sizes are too small to report results for regressions on modern family planning use in Ghana and Guinea.

women. The outcome variable "return to sexual activity" is the same variable as was used for the cross-tabulation analyses. The variable is coded dichotomously: women who had and had not resumed sexual activity. The second multivariate analysis looks at the uptake of modern FP among sexually active postpartum women. This variable is also treated dichotomously: women who are or are not currently using a modern method of FP. In the second multivariate analysis, we limit the sample to women who are sexually active in order to differentiate the factors associated with the woman's return to sexual activity from those that influence her uptake of FP.

Both sets of regressions use the same independent variables. The operational definitions of the independent variables are described below:

- **Breastfeeding status:** Postpartum women who restricted infant feeding to breast milk or water at the time of the survey are defined as breastfeeding. All other postpartum women are in the reference category.
- **Return of menses:** Postpartum women whose menses had returned at the time of the survey are defined as having menses returned. All other postpartum women including those who did not know are in the reference category.
- **Postpartum period:** Based on the three-month partitioning described earlier, three dummy variables were created, one for each category: 3.0 to 5.9 months, 6.0 to 8.9 months, and 9.0 to 11.9 months. Women are classified in one of the categories according to their postpartum status. The reference category for this series of variables is women who are 0 to 2.9 months postpartum.

The regressions also included the following control variables:

- **Desire to space or limit births:** Fertility intention has three categories, each dichotomously coded. The first is *limiter*, which takes on a value of one if a woman does not want any more children and zero otherwise. The second is *spacer*, which takes on the value of one if a woman wants more children and she wants the birth more than two years from the time of the survey or is uncertain. The third, serving as the reference category, is women who want their next birth within the next two years.
- **Location:** Women living in urban areas are defined as being urban. Rural women are the reference category.

- **Education:** A woman's educational level is coded into three categories: none (reference category), primary education, and secondary or higher.
- **Economic status:** Economic status is assessed by the wealth index as constructed by the DHS.¹⁴ The wealth index is based on a factor analysis of household assets, construction materials, sanitation facilities, water source, and availability of electricity, and the score is partitioned into quintiles. Each quintile is treated dichotomously, with the first (poorest) set as the reference category.
- **Age:** A woman's age is classified into one of three groups: 15 to 24 years (reference category), 25 to 34 years, and 35 to 49 years.

Results

The cross tabulations of the percentage of postpartum in-union women who have resumed sexual activity and FP use disaggregated by the duration of the postpartum period are presented in Tables 1 and 2. The tables do not show cumulative probabilities but rather the percentage of women with the outcome of interest at the time of the survey. In Table 1 for all 17 countries the percentage of women who are sexually active during the 0 to 2.9 months postpartum period is less than the percentage of women who are sexually active in the other postpartum periods. This table shows that in 13 of the 17 countries the majority of

women (i.e., greater than 50 percent) who are 3.0 to 5.9 months postpartum have resumed sexual activity. Furthermore, in 13 of the 17 countries more than three-quarters of the women who are 9 to 11.9 months postpartum are sexually active. By a wide margin, Guinea has the smallest percentage of women resuming sexual activity across all postpartum periods.

Table 2 addresses the question of whether postpartum women are using FP. In all but one (Madagascar) of the 17 countries, women are more likely to be using modern FP at the end of the postpartum period (9.0 to 11.9 months) than at the beginning (0 to 2.9 months) and all but two (Haiti and Madagascar) at the middle (3.0 to 5.9 months). In Bangladesh, Ghana, India, Kenya, Malawi, Tanzania, and Zambia, use of modern FP at the end of the postpartum period (9.0 to 11.9 months) is more than 10 percentage points higher than use at the middle of the postpartum period (3.0 to 5.9 months). The research literature suggests that postpartum women do not perceive themselves as vulnerable to pregnancy during the postpartum period because they are breastfeeding or menses has not returned. Table 3 presents the percentage of women who were using modern FP at two postpartum periods, disaggregated by whether menstruation had resumed. Results are shown only for women who are 6.0 to 8.9 and 9.0 to 11.9 months postpartum because the sample sizes for women under 6 months postpartum were too few for robust analysis in many countries. The first column under the heading 6.0 to 8.9 months shows the percentage of women using modern FP among

Table 1: Percentage of in-union postpartum women who are sexually active by postpartum period

Country/ Survey year	0 to 2.9 months		3.0 to 5.9 months		6.0 to 8.9 months		9.0 to 11.9 months		Postpartum women
	%	N	%	N	%	N	%	N	Total N
Bangladesh 2007	33.0	215	88.2	289	93.7	330	93.7	256	1,090
Congo, DRC 2007	16.3	392	48.7	451	64.8	399	72.5	366	1,608
Ethiopia 2005	27.0	452	73.1	517	87.4	493	93.2	361	1,823
Ghana 2003	3.0	150	23.8	171	39.4	193	58.6	173	687
Guinea 2005	2.2	370	5.3	332	11.5	295	10.6	247	1,244
Haiti 2005-2006	11.8	234	68.2	311	89.0	282	91.8	256	1,083
India 2005-2006	28.7	1,965	71.2	2,615	87.3	2,577	91.1	2,255	9,412
Kenya 2003	27.0	247	73.7	256	83.8	261	91.9	251	1,015
Madagascar 2003-04	20.5	206	66.4	214	86.7	238	92.6	206	864
Malawi 2004	9.2	488	36.3	509	69.2	525	83.9	494	2,016
Mali 2006	28.7	651	76.5	738	82.0	672	86.9	614	2,675
Nigeria 2003	21.3	264	62.0	318	68.8	327	74.5	254	1,163
Pakistan 2006-2007	26.0	430	84.1	516	85.5	438	92.6	358	1,742
Rwanda 2005	73.6	381	94.3	389	96.6	351	98.2	354	1,475
Tanzania 2004-2005	21.9	359	58.0	370	73.9	390	80.7	375	1,494
Uganda 2006	31.8	354	77.2	345	87.3	345	93.9	321	1,365
Zambia 2007	13.3	243	60.2	266	82.3	262	85.8	255	1,026

Table 2: Percentage of in-union postpartum women using modern family planning by postpartum period

Country/Survey year	0 to 2.9 months	3.0 to 5.9 months	6.0 to 8.9 months	9.0 to 11.9 months
Bangladesh 2007	7.2	29.3	34.5	45.7
Congo, DRC 2007	2.2	5.2	4.8	11.1
Ethiopia 2005	1.2	7.9	7.9	9.6
Ghana 2003	0.6	4.1	15.1	15.3
Guinea 2005	3.9	4.5	4.7	5.4
Haiti 2005-2006	16.5	24.1	15.3	20.5
India 2005-2006	7.6	18.7	24.5	29.3
Kenya 2003	2.4	17.4	21.5	27.5
Madagascar 2003-04	14.9	16.5	11.0	13.2
Malawi 2004	4.3	17.6	27.9	38.4
Mali 2006	1.8	6.8	7.2	9.4
Nigeria 2003	5.8	10.2	10.4	13.3
Pakistan 2006-2007	2.8	13.1	18.7	21.4
Rwanda 2005	1.7	5.4	9.7	10.1
Tanzania 2004-2005	5.0	9.6	20.7	22.5
Uganda 2006	2.1	10.0	14.2	13.4
Zambia 2007	10.8	34.3	42.3	45.3

Table 3: Percentage of in-union postpartum women using modern family planning at 6.0 to 8.9 and 9.0 to 11.9 months postpartum by menstrual status

Country/ Survey year	6.0 to 8.9 months				9.0 to 11.9 months			
	Menses not returned	N	Menses returned	N	Menses not returned	N	Menses returned	N
Bangladesh 2007	5.0	156	60.2	179	6.9	83	63.1	185
Congo, DRC 2007	3.2	281	9.2	102	9.2	197	13.7	149
Ethiopia 2005	4.5	481	24.9	97	6.2	339	21.2	97
Ghana 2003	8.7	128	29.9	56	7.5	86	25.2	68
Guinea 2005	3.9	235	7.9	62	5.7	174	4.8	80
Haiti 2005-2006	8.9	173	27.0	95	9.7	99	29.2	122
India 2005-2006	18.3	1,491	31.0	1,404	19.0	868	35.5	1,443
Kenya 2003	13.2	147	33.5	102	11.5	150	46.9	123
Madagascar 2003-2004	2.9	167	24.2	102	0.8	111	27.5	96
Malawi 2004	20.0	396	55.0	115	30.8	289	49.0	208
Mali 2006	4.8	492	14.6	163	4.5	367	16.7	242
Nigeria 2003	9.3	226	12.9	103	8.1	177	22.9	95
Pakistan 2006-2007	5.0	136	24.9	301	9.4	100	25.9	267
Rwanda 2005	4.5	279	28.2	79	6.2	261	20.4	99
Tanzania 2004-2005	11.2	280	43.1	120	14.0	232	34.9	160
Uganda 2006	2.9	249	43.1	97	5.9	201	26.8	112
Zambia 2007	34.8	190	60.2	80	36.4	153	57.9	108

women whose menses has returned. The third column shows the percentage of women using modern FP among women whose menses have not returned. The percentages in the columns do not sum to 100 percent because the results show the percentage of women using FP by menstrual status categories. In all countries, women whose menses

had returned were more likely to be using modern FP than women whose menses had not yet returned. In Bangladesh and Uganda, the percentage of women at 6.0 to 8.9 months postpartum whose menses had returned who reported using FP was about 10 times higher than the percentage of women whose menses had not

returned. In Bangladesh, among women who were 6.0 to 8.9 months postpartum and whose menses had not returned, 5.0 percent reported using modern FP; however, 60.2 percent of women whose menses had returned reported using modern FP. Similarly for Uganda, 2.9 percent of women whose menses had not returned reported using modern FP compared to 43.1 percent of women whose menses had returned. These results are in line with the literature regarding the effect of the return of menses on uptake of FP. A large proportion of women do not start using FP until menses has returned.

To examine the influence of women's background characteristics on return to sexual activity and on use of modern FP during the postpartum period, the authors conducted multivariate logistic regression analyses. The regression models are adjusted for fertility intentions, residence, education, wealth asset quintile, and age. An adjusted odds ratio accompanied by an asterisk is statistically significant at $p < 0.025$ using a two-tailed test.

In 10 of the 17 countries, full breastfeeding (where the mother restricts infant feeding to plain water or breast milk) has a statistically significant association with whether a woman has resumed sexual activity (Table 4). Women who are breastfeeding at the time of survey are less likely to have resumed sexual activity. In 16 of the 17 countries, the return of menses is significantly associated with whether the woman has resumed sexual activity by the time of survey. In 14 countries, the return of menses more than doubles the odds of having resumed sexual activity. Not surprisingly, relative to the 0 to 2.9 month reference period, the duration of the postpartum period is significantly associated with whether a woman has resumed sexual activity.⁶ In every country except Zambia two or more of the postpartum intervals are statistically significant. Although the results are not surprising, the postpartum interval variable is important as a control for the return to menses and breastfeeding variables since the latter could plausibly be argued to be proxies for postpartum duration.

Only the return of menses variable is significantly associated with use of modern FP in a preponderance of the regression models (13 of 15 country models,⁷ Nigeria and DR Congo being the exceptions) (Table 5). The duration of the postpartum period was significantly associated with

⁶ In some cases (e.g., Haiti) the odds ratios for the postpartum period variables are extremely high, primarily due to a small number of cases in these categories. Alternative definitions of the postpartum duration were tried, with the one used offering the most comparable interpretability across the full range of 17 countries.

⁷ The data sets for Ghana and Guinea had too few observations on sexually active women to produce robust results. Therefore, only 15 regression models were estimated.

modern FP use only in India. Breastfeeding was significantly related to modern FP use only in Haiti, Madagascar, Pakistan, and Tanzania.

In most analyses of FP use, improved education and economic status are key drivers in the uptake of FP services. Although not reported here, none of the economic, demographic, and social control variables were consistently and significantly associated with the outcomes of interest across the countries.

Discussion

Our analyses examined the relationship between postpartum behaviors and use of modern FP methods and resumption of sexual activity across 17 countries in the developing world. The findings in this paper suggest that women in many countries wait for the return of menses to begin using contraception and resuming sexual activity. The bivariate analyses showed a strong differential in FP use between those whose menses had and had not returned. The multivariate analysis, after controlling for social, economic, and demographic characteristics of the woman, also found significant associations between return of menses and uptake of FP. In fact, after including return of menses as a covariate, the woman's education and economic status were significantly associated with uptake of FP in only a few countries. Current breastfeeding status had a strong negative association with resumption of sexual activity in most countries. Not surprisingly, it was not significantly related to the uptake of modern FP.

This analysis has several limitations that should be mentioned. The study design is descriptive, and neither causality nor strength of effect can be ascertained. The results do not adjust for censoring among mothers who have not passed through the entire postpartum period. The proportions shown are not cumulative survival probabilities but rather proportions having a particular status at specified points in the postpartum period. Finally, the results are based on a selection of surveys conducted in countries participating in the DHS program.

Conclusions

Given that the return of menses was the most significant factor associated with postpartum uptake of contraception, FP programs can consider developing adequate public messages to educate couples about pregnancy risk prior to return of menses and encourage FP use. Although not regularly an official part of FP programs, postpartum abstinence has a clear and direct effect on fertility.

Table 4: Adjusted odds ratios for current breastfeeding status, menses return status, and duration postpartum from logistic regression of return to sexual activity for in-union postpartum women

Country/ Survey year	Breastfeeding at time of survey	Menses returned by time of survey	Months Postpartum (0-2.9 months is reference)		
			3.0 to 5.9 months	6.0 to 8.9 months	9.0 to 11.9 months
Bangladesh 2007	0.67	3.35*	11.7*	22.9*	20.6*
Congo, DRC 2007	0.63*	2.93*	3.21*	5.05*	6.38*
Ethiopia 2005	0.59*	2.46*	5.43*	10.61*	13.05*
Ghana 2003	0.58*	3.02*	6.79*	11.58*	18.36*
Guinea 2005	0.54*	4.80*	1.70	2.83*	2.18*
Haiti 2005-2006	0.65	2.13*	15.27*	40.92*	55.78*
India 2005-2006	0.82*	2.31*	5.44*	12.82*	16.59*
Kenya 2003	0.56*	1.63*	7.49*	12.19*	20.05*
Madagascar 2003-2004	0.67	2.80*	6.54*	15.55*	20.98*
Malawi 2004	0.56*	2.63*	4.12*	12.66*	26.73*
Mali 2006	0.72*	2.30*	7.90*	10.70*	12.73*
Nigeria 2003	0.74	2.63*	5.55*	6.41*	7.53*
Pakistan 2006-2007	0.68*	2.93*	9.87*	10.00*	16.27*
Rwanda 2005	0.90	2.24	5.29*	11.18*	14.11*
Tanzania 2004-2005	1.42	2.43*	5.57*	11.19*	17.54*
Uganda 2006	0.43*	4.69*	5.28*	8.32*	14.49*
Zambia 2007	0.73	1.76*	1.77	1.18	1.52

Note: Women beyond 12.0 months postpartum are not included in these regressions. Odds ratios adjusted for fertility intentions, residence, education, wealth asset quintile, and age. An asterisk indicates significance at $p < .025$ with a two-tailed test.

Table 5: Adjusted odds ratios for current breastfeeding status, menses return status, and duration postpartum from logistic regression of modern family planning use for in-union postpartum women

Country/ Survey year	Breast feeding at time of survey	Menses returned by time of survey	Months Postpartum (0 to 2.9 months is reference)		
			3.0 to 5.9 months	6.0 to 8.9 months	9.0 to 11.9 months
Bangladesh 2007	0.73	19.56*	1.35	1.30	1.25
Congo, DRC 2007	1.59	1.26	0.90	0.65	1.19
Ethiopia 2005	0.82	5.06*	2.73	2.58	2.92
Ghana 2003	x	x	x	x	x
Guinea 2005	x	x	x	x	x
Haiti 2005-2006	3.73*	3.74*	1.14	0.75	1.02
India 2005-2006	0.99	2.08*	1.28	1.39*	1.67*
Kenya 2003	0.58	3.98*	2.13	1.96	2.72
Madagascar 2003-2004	2.29*	3.74*	1.08	1.12	1.26
Malawi 2004	0.99	1.85*	1.37	1.71	2.20
Mali 2006	0.85	3.46*	1.49	1.25	1.26
Nigeria 2003	1.22	0.78	0.94	0.88	1.41
Pakistan 2006-2007	1.58*	2.43*	1.02	1.51	1.48
Rwanda 2005	0.90	4.78*	1.88	2.23	2.53
Tanzania 2004-2005	0.40*	2.55*	1.12	1.43	1.58
Uganda 2006	1.04	7.12*	1.97	2.57	1.83
Zambia 2007	0.73	1.76*	1.77	1.18	1.52

Note: "X" denotes insufficient observations for analysis. Women beyond 12.0 months postpartum are not included in these regressions. Odds ratios adjusted for fertility intentions, residence, education, wealth asset quintile, and age. An asterisk indicates significance at $p < .025$ with a two-tailed test.

In countries where the period of postpartum abstinence is particularly long, FP programs need to educate couples about what can be done to space births after sexual activity resumes, since such women are not protected against pregnancy beyond

the period of abstinence. The results of the analysis here underscore the importance of encouraging the adoption of a modern FP method, before the risk of pregnancy returns, thus before menses return for sexually active women.

Appendix Table 1: Summary of overall and analytic samples of Demographic and Health Surveys of 17 countries, 2003-2007

Country/Survey year	Total number of women, aged 15-49 interviewed	Number of postpartum women, in-union, aged 15-49
Bangladesh 2007	10,996*	1,090
Congo, DRC 2007	9,995	1,608
Ethiopia 2005	14,070	1,823
Ghana 2003	5,691	687
Guinea 2005	7,954	1,244
Haiti 2005-2006	10,757	1,083
India 2005-2006	124,385	9,412
Kenya 2003	8,195	1,015
Madagascar 2003-2004	7,949	864
Malawi 2004	11,698	2,016
Mali 2006	14,583	2,675
Nigeria 2003	7,620	1,163
Pakistan 2006-2007	10,023*	1,742
Rwanda 2005	11,321	1,475
Tanzania 2004-2005	10,329	1,494
Uganda 2006	8,531	1,365
Zambia 2007	7,146	1,026

Note: An asterisk denotes ever-married women.

References

- Guttmacher Institute. In brief: facts on induced abortion worldwide. Washington DC: Guttmacher Institute, 2009. Available from: http://www.guttmacher.org/pubs/fb_IAW.pdf. Accessed on June 18, 2009.
- Ross JA, Winfrey WL. Contraceptive use, intention to use, and unmet need during the extended postpartum period. *Int Fam Plan Perspect* 2001;27(1):20-27.
- Adeyemi AB, Ijadunola KT, Orji EO, Kuti O, Alabi MM. The unmet need for contraception among Nigerian women in the first year postpartum. *Eur J Contracep Repr* 2005;10(4):229-234.
- Cleland J, Bernstein S, Ezeh A, Faundes A, Glasier A, Innis J. Family planning: the unfinished agenda. *Lancet* 2006;368(9549):1810-1817.
- Labbok MH, Hight-Laukaran V, Peterson AE, Fletcher V, von Hertzen, Van Look PF. Multicenter study of the lactational amenorrhea method (LAM): efficacy, duration, and implication for clinical application. *Contraception* 1997;55(6):327-36.
- Family Health International. Breastfeeding as a family planning method. *Lancet* 1988;2(8621):1204-05.
- Kennedy KI, Rivera R, McNeilly AS. Consensus statement on the use of breastfeeding as a family planning method. *Contraception* 1989;39(5):477-96.
- Diaz S, Rodriguez G, Peralta O, et al. Lactational amenorrhea and the recovery of ovulation and fertility in fully nursing Chilean women. *Contraception* 1988;38(1):53-67.
- Kennedy K, Trussell J. Postpartum contraception and lactation. In: Hatcher RA, Trussell J, Nelson AL, Cates W Jr, Stewart FH, Kowal D, eds. *Contraceptive technology*, 18th ed. New York: Ardent Media Inc., 2004.
- Desgrees-du-Lou A, Brou H. Resumption of sexual relations following childbirth: norms, practices and reproductive health issues in Abidjan, Cote d'Ivoire. *Reprod Health Matters* 2005;13(25):155-163.
- Benefo KD. The determinants of the duration of postpartum sexual abstinence in West Africa: a multilevel analysis. *Demography* 1995;32(2):139-157.
- Cleland JG, Ali MM, Capo-Chichi V. Postpartum sexual abstinence in West Africa: implications for AIDS control and family planning programs. *AIDS* 1999;13(1):125-131.
- Becker S, Ahmed S. Dynamics of contraceptive use and breastfeeding during the post-partum period in Peru and Indonesia. *Population Stud* 2001;55:165-179.
- Rutstein Shea O, Johnson K. The DHS wealth index. *DHS Comparative Reports* 2004; 6.