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# **Postpartum Family Planning Annotated Bibliography 2008–2014**

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## INTRODUCTION

Beginning in 2006, the ACCESS-FP program compiled an annotated bibliography of postpartum family planning literature to promote documented best practices and serve as a reference for both researchers and program managers. Updates to the original bibliography were made under ACCESS-FP in 2007, 2008, and 2010, and then again under the Maternal and Child Health Integrated Program, Family Planning team in 2011 and, finally, 2014. All of these updates have been compiled into one cohesive annotated bibliography.

The literature has been reorganized for this edition, and a new category for prenatal and newborn health has been added. Unless otherwise noted, the source of article annotations is each article's abstract. The literature categories are described in the following table.

	Categories	# of Studies	Pages
1.	Birth Spacing	30	1–13
2.	Community- and Facility-Inclusive Intervention Studies	31	14–27
3.	Descriptive Studies	42	28–48
4.	Family Planning Integration	7	49–53
5.	HIV and Family Planning: Prevention of Mother-to-Child Transmission	36	54–73
6.	LAM [Lactational Amenorrhea Method] and Breastfeeding with Contraception	46	74–96
7.	Postpartum Family Planning in Special Populations	15	97–104
8.	Postpartum IUD and Permanent Contraception	22	105–116
9.	Prenatal and Newborn Health	17	117–125
10.	Progestin-Only Contraception	8	126–130
11.	Program Approach and Other Postpartum Contraception	20	131–140
12.	Return to Fertility	5	141–143

## **METHODOLOGY**

This version focused primarily on journal articles published in 2010 or later with an emphasis on studies that were undertaken in developing countries. The literature review began with a search on Medline (2010–March 2014) using the following keywords: family planning services, family planning policy, contraception, birth intervals, prenatal care, postnatal care, postpartum period, maternal-child health, immunizations, and breastfeeding. This search was then repeated on CINAHL (a database for nursing and allied health) and EMBASE (a database of biomedical and pharmacological literature). Next, the reference lists of the selected articles were examined for appropriate articles that had not been captured with previous searches or by the 2011 version.

## I. BIRTH SPACING

**Abdel-Tawab, N., Youssef, H., Loza, S., Zaki, A., & Farag, S. (2006). *Helping Egyptian women achieve optimal birth spacing intervals through maximizing opportunities in antenatal and postpartum care (FRONTIERS Research Update No. 9)*. Cairo, Egypt: Population Council & USAID.**

Requests for this publication can be sent to <http://www.popcouncil.org/contact>.

Optimal birth spacing intervals (OBSI) of 3-5 years (as opposed to traditional recommendations of 2 years) are beneficial to mothers and their children (Abdel-Tawab, Youssef, Loza, Zaki, & Farag, 2006, p. 1). To explore OBSI intervention strategies in Egypt, FRONTIERS studied two models: "The first model involves provision of OBSI messages through health services to women during prenatal and postpartum periods while the second model involves the above plus an awareness raising IEC component that targets husbands and community influentials" (Abdel-Tawab, et al., 2006, p. 2). This article describes the research rationales, study design (focus groups) that led to the interventions of the models, and preliminary results, while results and analysis are pending another article in 2008 (Abdel-Tawab et al., 2006).

**Adam, I., Ismail, M. H., Nasr, A. M., Prins, M. H., & Smits, L. J. (2009). *Low birth weight, preterm birth and short interpregnancy interval in Sudan. Journal of Maternal-Fetal & Neonatal Medicine, 22(11), 1068–1071.***

**Objective:** To investigate whether short interpregnancy interval (IPI) is associated with increased risk of low birth weight and preterm labour.

**Methods:** The study was conducted in the labour ward of Khartoum hospital in Sudan during November 2007 through February 2008. Odds ratios (ORs) were adjusted for the confounding factors using multiple logistic regression models.

**Results:** Compared with IPI of 18-30 months, those women with intervals shorter than 18 months had an increased risk of low birth weight (OR = 1.9, 95% CI = 1.0-3.5, P = 0.04) and preterm labour (OR = 2.3, 95% CI = 1.1-4.7, P = 0.01).

**Conclusion:** In this study, IPI shorter than 18 months are independently associated with increased risk of adverse perinatal outcomes.

**Akter, S., Rahman, J. A., Rahman, M. M., & Abedin, S. (2010). *The influence of birth spacing on child survival in Bangladesh: A life table approach. World Health & Population, 12(1), 42–56.***

In this paper we have attempted to demonstrate the relationship between birth spacing and child survival in Bangladesh using data from the 2004 Bangladesh Demographic Health Survey (BDHS). We used standard life table techniques to estimate the probability of child survival and appropriate spacing of births. Logistic regression models were used to investigate the covariates, along with the birth interval that has significant influence on child survival. Study results showed that the probability of child survival was much lower when the preceding birth interval was less than 12 months, and it may be also impeded by a higher birth interval. Child survival probability was highest for a preceding birth interval of 5 years; thereafter, the probability declined. Results of the logistic regression model clearly showed that preceding birth interval was an important and strongly significant factor in explaining infant and child mortality. While education, current age,

breastfeeding status and birth order were substantial and highly significant factors both in infant and child mortality, socio-economic factors such as occupation and socio-economic status showed a significant effect only on child mortality. Postponing another child (for a birth interval of 5 years and above) and proper spacing of births would have a noticeable effect in reducing the level of mortality.

**Cecatti, J. G., Correa-Silva, E. P., Milanez, H., Morais, S. S., & Souza, J. P. (2008). The associations between inter-pregnancy interval and maternal and neonatal outcomes in Brazil. *Maternal and Child Health Journal*, 12(2), 275–281.**

**Objectives:** Global estimates of maternal and perinatal mortality have remained unchanged over the past 20 years, and strategies are being sought to decrease the occurrence of maternal and perinatal death. The objective of this study was to evaluate the association between inter-pregnancy interval and the occurrence of adverse maternal and perinatal outcomes.

**Methods: Design and setting:** Cross-sectional study of the obstetrical and perinatal records in an intra-hospital obstetrics database between 1986 and 2000 at a tertiary maternity hospital in Brazil.

**Participants:** A total of 14,930 records of parous women who delivered singleton infants.

**Main outcome measures:** Crude and adjusted odds ratio estimates of gestational outcome according to inter-pregnancy intervals.

**Results:** During the period of the study, 34.6% of records referred to women with an inter-pregnancy interval <18 months. After the adjustment performed for 11 confounding factors and assuming an inter-pregnancy interval of 18-23 months as reference, short intervals (<6 months) were observed to be associated with a greater risk of low birth weight (odds ratio: 1.74; 95% confidence interval: 1.18-2.55), and preterm birth (1.56; 1.01-2.46). On the other hand, long intervals were significantly associated with fewer C-sections (0.69; 0.56-0.82), and a greater risk of premature rupture of membranes (PROM) (1.57; 1.20-2.06) and low birth weight (1.46; 1.03-2.06).

**Conclusions:** Short inter-pregnancy intervals are associated with a higher risk of low birth weight and preterm birth, while long intervals are associated with a higher risk of PROM, low birth weight and a lower risk of C-section.

**Conde-Agudelo, A., Rosas-Bermudez, A., Castaño, F., & Norton, M. H. (2012). Effects of birth spacing on maternal, perinatal, infant, and child health: A systematic review of causal mechanisms. *Studies in Family Planning*, 43(2), 93–114.**

This systematic review of 58 observational studies identified hypothetical causal mechanisms explaining the effects of short and long intervals between pregnancies on maternal, perinatal, infant, and child health, and critically examined the scientific evidence for each causal mechanism hypothesized. The following hypothetical causal mechanisms for explaining the association between short intervals and adverse outcomes were identified: maternal nutritional depletion, folate depletion, cervical insufficiency, vertical transmission of infections, suboptimal lactation related to breastfeeding–pregnancy overlap, sibling competition, transmission of infectious diseases among siblings, incomplete healing of uterine scar from previous cesarean delivery, and abnormal remodeling of endometrial blood vessels. Women’s physiological regression is the only hypothetical causal mechanism that has been proposed to explain the association between long intervals and adverse outcomes. We found growing evidence supporting most of these hypotheses.

**Conde-Agudelo, A., Rosas-Bermudez, A., & Kafury-Goeta, A. C. (2005). Birth spacing and risk of adverse perinatal outcomes. *JAMA*, 295(15), 1809–1823.**

**Context:** Both short and long interpregnancy intervals have been associated with an increased risk of adverse perinatal outcomes. However, whether this possible association is confounded by maternal characteristics or socioeconomic status is uncertain.

**Objective:** To examine the association between birth spacing and relative risk of adverse perinatal outcomes.

**Data sources:** Studies published in any language were retrieved by searching MEDLINE (1966 through January 2006), EMBASE, ECLA, POPLINE, CINAHL, and LILACS, proceedings of meetings on birth spacing, and bibliographies of retrieved articles, and by contact with relevant researchers in the field.

**Study selection:** Included studies were cohort, cross-sectional, and case-control studies with results adjusted for at least maternal age and socioeconomic status, reporting risk estimates and 95% confidence intervals (or data to calculate them) of birth spacing and perinatal outcomes. Of 130 articles identified in the search, 67 (52%) were included.

**Data extraction:** Information on study design, participant characteristics, measure of birth spacing used, measures of outcome, control for potential confounding factors, and risk estimates was abstracted independently by 2 investigators using a standardized protocol.

**Data synthesis:** A random-effects model and meta-regression analyses were used to pool data from individual studies. Compared with interpregnancy intervals of 18 to 23 months, interpregnancy intervals shorter than 6 months were associated with increased risks of preterm birth, low birth weight, and small for gestational age (pooled adjusted odds ratios [95% confidence intervals]: 1.40 [1.24-1.58], 1.61 [1.39-1.86], and 1.26 [1.18-1.33], respectively). Intervals of 6 to 17 months and longer than 59 months were also associated with a significantly greater risk for the 3 adverse perinatal outcomes.

**Conclusions:** Interpregnancy intervals shorter than 18 months and longer than 59 months are significantly associated with increased risk of adverse perinatal outcomes. These data suggest that spacing pregnancies appropriately could help prevent such adverse perinatal outcomes.

**DaVanzo, J., Hale, L., Razzaque, A., & Rahman, M. (2007). Effects of interpregnancy interval and outcome of the preceding pregnancy on pregnancy outcomes in Matlab, Bangladesh. *BJOG*, 114(9), 1079–1087.**

**Objective:** To estimate the effects on pregnancy outcomes of the duration of the preceding interpregnancy interval (IPI) and type of pregnancy outcome that began the interval.

**Design:** Observational population-based study.

**Setting:** The Maternal Child Health-Family Planning (MCH-FP) area of Matlab, Bangladesh.

**Population:** A total of 66,759 pregnancy outcomes that occurred between 1982 and 2002.

**Methods:** Bivariate tabulations and multinomial logistic regression analysis.

**Main outcome measures:** Pregnancy outcomes (live birth, stillbirth, miscarriage [spontaneous fetal loss prior to 28 weeks], and induced abortion).

**Results:** When socio-economic and demographic covariates are controlled, of the IPIs that began with a live birth, those < 6 months in duration were associated with a 7.5-fold increase in the odds of

an induced abortion (95% CI 6.0-9.4), a 3.3-fold increase in the odds of a miscarriage (95% CI 2.8-3.9), and a 1.6-fold increase in the odds of a stillbirth (95% CI 1.2-2.1) compared with 27- to 50-month IPIs. IPIs of 6-14 months were associated with increased odds of induced abortion (2.0, 95% CI 1.5-2.6). IPIs  $\geq 75$  months were associated with increased odds of all three types of non-live-birth (NLB) outcomes but were not as risky as very short intervals. IPIs that began with a NLB were generally more likely to end with the same type of NLB.

**Conclusions:** Women whose pregnancies are between 15 and 75 months after a preceding pregnancy outcome (regardless of its type) have a lower likelihood of fetal loss than those with shorter or longer IPIs. Those with a preceding NLB outcome deserve special attention in counseling and monitoring.

**DaVanzo, J., Hale, L., Razzaque, A., & Rahman, M. (2008). The effects of pregnancy spacing on infant and child mortality in Matlab, Bangladesh: How they vary by the type of pregnancy outcome that began the interval. *Population Studies*, 62(2), 131–154.**

Using high-quality longitudinal data on 125,720 singleton live births in Matlab, Bangladesh, we assessed the effects of duration of intervals between pregnancy outcomes on infant and child mortality and how these effects vary over subperiods of infancy and childhood and by the type of outcome that began the interval. Controlling for other correlates of infant and child mortality, we find that shorter intervals are associated with higher mortality. Interval effects are greater if the interval began with a live birth than with another pregnancy outcome. In the first week of the child's life, the effects of short intervals are greater if the sibling born at the beginning of the interval died; after the first month, the effects are greater if that sibling was still alive. Many relationships found are consistent with the maternal depletion hypothesis, and some with sibling competition. Some appear to be due to correlated risks among births to the same mother.

**DeFranco, E. A., Ehrlich, S., & Muglia, L. J. (2014). Influence of interpregnancy interval on birth timing. *BJOG*. Advance online publication. doi:10.1111/1471-0528.12891**

**Objective:** To assess the influence of inadequate birth spacing on birth timing distribution across gestation.

**Design:** Population-based retrospective cohort study using vital statistics birth records.

**Setting:** Ohio, USA.

**Study population:** Singleton, non-anomalous live births  $\geq 20$  weeks to multiparous mothers, 2006–2011.

**Methods:** Birth frequency at each gestational week was compared following short IPIs of  $<6$ , 6–12 and 12–18 months versus referent group, normal IPI  $\geq 18$  months.

**Main outcome measures:** Frequency of birth at each gestational week; preterm  $<37$  weeks;  $<39$  and  $\geq 40$  weeks.

**Results:** Of 454 716 births, 87% followed a normal IPI  $\geq 18$  months, 10.7% had IPI 12–18 months and 2.2% with IPI  $<12$  months. The risk of delivery  $<39$  weeks was higher following short IPI  $<12$  months,  $_{adj}OR$  (odds ratio) 2.78 (95% CI 2.64, 2.93). 53.3% of women delivered before the 39th week after IPI  $<12$  months compared with 37.5% of women with normal IPI,  $P < 0.001$ . Likewise,



birth at  $\geq 40$  weeks was decreased (16.9%) following short IPI  $< 12$  months compared to normal IPI, 23.2%,  $_{adj}OR$  0.67 (95% CI 0.64, 0.71). This resulted in a shift of the frequency distribution curve of birth by week of gestation to the left for pregnancies following a short IPI  $< 12$  months and 12–18 months compared to, birth spacing  $\geq 18$  months.

**Conclusions:** While short IPI is a known risk factor for preterm birth, our data show that inadequate birth spacing is associated with decreased gestational age for all births. Pregnancies following short IPIs have a higher frequency of birth at all weeks of gestation prior to 39 and fewer births  $\geq 40$  weeks, resulting in overall shortened pregnancy duration.

**Desgrees-du-Lou, A., & Brou, H. (2005). Resumption of sexual relations following childbirth: Norms, practices and reproductive health issues in Abidjan, Cote d'Ivoire. *Reproductive Health Matters*, 13(25), 155–163.**

Before modern contraceptive methods were available in developing countries, post-partum sexual abstinence formed the backbone of birth spacing. With the changes occurring in African societies, how has post-partum sexual abstinence been affected? We conducted an exploratory study in 2000–2001 in Abidjan, Côte d'Ivoire with 23 women and 19 men who were parents of small children. Breastfeeding remains widespread and prolonged. Resumption of sexual relations after delivery was a mean of 11 months. Post-partum sexual abstinence was only distantly related to the traditional lactation taboo. Women expressed fears that their partner would seek elsewhere if they delayed sexual relations too long, and the risk of early pregnancy. Abstinence remained the main way to space births, given low contraceptive use. Mothers generally decided when to wean a child. Men usually made the first move to resume sexual relations, though most women negotiated timing and some insisted on condom use. Provision of condoms post-partum can play a contraceptive role for married couples and protect against STIs/HIV in extra-marital relationships, which are frequent post-partum. The duration of post-partum abstinence is in fact unclear because irregular sex may happen early and become regular only later. Women need post-partum information and services that address these issues.

**de Weger, F. J., Hukkelhoven, C. W., Serroyen, J., Te Velde, E. R., & Smits, L. J. (2011). Advanced maternal age, short interpregnancy interval, and perinatal outcome. *American Journal of Obstetrics & Gynecology* 204(5), 421.E1–E9. doi:10.1016/j.ajog.2010.12.008**

**Objective:** The purpose of this study was to evaluate whether the association between short interpregnancy intervals and perinatal outcome varies with maternal age.

**Study design:** We performed a retrospective cohort study among 263,142 Dutch women with second deliveries that occurred between 2000 and 2007. Outcome variables were preterm delivery ( $< 37$  weeks of gestation), low birthweight in term deliveries ( $< 2500$  g) and small-for-gestational age ( $< 10$ th percentile for gestational age on the basis of sex- and parity-specific Dutch standards).

**Results:** Short interpregnancy intervals ( $< 6$  months) was associated positively with preterm delivery and low birth weight, but not with being small for gestational age. The association of short interpregnancy interval with the risk of preterm delivery was weaker among older than younger women. There was no clear interaction between short interpregnancy interval and maternal age in relation to low birth weight or small for gestational age.

**Conclusion:** The results of this study indicate that the association of short interpregnancy interval with preterm delivery attenuates with increasing maternal age.

**Forste, R. (1995). Effects of lactation and contraceptive use on birth-spacing in Bolivia. *Social Biology*, 42(1–2), 108–123.**

Based on the 1989 Demographic and Health Survey of Bolivia, analysis of the joint effects of breastfeeding and contraceptive use on birth-spacing showed the IUD to be the most effective contraceptive method used to delay conception. Breastfeeding significantly lengthened the birth interval, but only following second and higher parity births. In addition, conditions of poverty appeared to further inhibit the return of fecundity and delay conception.

**Fotso, J., Cleland, J., Mbero, B., Mutua, M., & Elungata, P. (2013). Birth spacing and child mortality: An analysis of prospective data from the Nairobi Urban Health and Demographic Surveillance System. *Journal of Biosocial Science* 45, 779–798.**

**Summary:** The majority of studies of the birth spacing–child survival relationship rely on retrospective data, which are vulnerable to errors that might bias results. The relationship is re-assessed using prospective data on 13,502 children born in two Nairobi slums between 2003 and 2009. Nearly 48% were first births. Among the remainder, short preceding intervals are common: 20% of second and higher order births were delivered within 24 months of an elder sibling, including 9% with a very short preceding interval of less than 18 months. After adjustment for potential confounders, the length of the preceding birth interval is a major determinant of infant and early childhood mortality. In infancy, a preceding birth interval of less than 18 months is associated with a two-fold increase in mortality risks (compared with lengthened intervals of 36 months or longer), while an interval of 18–23 months is associated with an increase of 18%. During the early childhood period, children born within 18 months of an elder sibling are more than twice as likely to die as those born after an interval of 36 months or more. Only 592 children experienced the birth of a younger sibling within 20 months; their second-year mortality was about twice as high as that of other children. These results support the findings based on retrospective data.

**Gebreselassie, T., & Mishra, V. (2007). Spousal agreement on waiting time to next birth in sub-Saharan Africa (DHS Working Papers Series No. 35). Atlanta, GA: USAID & Macro International. Retrieved from [www.measuredhs.com/pubs/pdf/WP35/WP35.pdf](http://www.measuredhs.com/pubs/pdf/WP35/WP35.pdf)**

Decision-making regarding fertility and family planning involves a complex process of discussion and negotiation by married couples. This study investigates how various social, demographic, and economic factors influence spousal agreement on waiting time to next birth. We also explore how the practice of polygyny in the society affects spousal agreement on waiting time to next birth.

The study uses nationally-representative samples of matched cohabiting couples included in 14 recent Demographic and Health Surveys (DHS) in sub-Saharan Africa (Benin, Burkina Faso, Ghana, Mali, and Chad from west and central Africa; and Ethiopia, Kenya, Uganda, Rwanda, Malawi, Mozambique, Zimbabwe, Zambia, and Namibia from eastern and southern Africa), conducted during 1999 to 2004. We compare reported waiting time to next birth by the husband

and the wife to measure spousal agreement or disagreement. Couples where the difference is within +/- 2 months are defined as having agreement on waiting time to next birth. We examine the influence of selected social, economic, and demographic characteristics of couples on spousal agreement on waiting time to next birth, using binary logistic regression.

We find that in sub-Saharan Africa spousal agreement on waiting time to next birth is associated with wanting the next child sooner. When the spouses disagree on waiting time to next birth, the wives want to wait longer than their husbands in most cases. Additionally, we find that the demographic factors are the primary determinants of spousal agreement on waiting time to next birth, not the socioeconomic factors. The strongest predictor of waiting time to next birth is infecundability. In most countries, cohabiting couples with fewer children and couples with infecund wives are more likely to agree on waiting time to next birth. Wife's age is also positively associated with spousal agreement. Effects of socioeconomic factors, such as education, employment, and wealth status are generally weak and inconsistent. The separate analysis of pooled data for the low and high polygyny countries also shows strong effects of demographic factors, not socioeconomic.

The findings highlight some of the challenges in developing programs to promote spousal communication and birth spacing and underscore the need for the programs to be gender-sensitive.

**Gribble, J. N., Murray, N. J., & Menotti, E. P. (2009). Reconsidering childhood undernutrition: Can birth spacing make a difference? An analysis of the 2002-2003 El Salvador National Family Health Survey. *Maternal & Child Nutrition*, 5(1), 49–63.**

It is well understood that undernutrition underpins much of child morbidity and mortality in less developed countries, but the causes of undernutrition are complex and interrelated, requiring a multipronged approach for intervention. This paper uses a subsample of 3853 children under age 5 from the most recent family health survey in El Salvador to examine the relationship between birth spacing and childhood undernutrition (stunting and underweight). While recent research and guidance suggest that birth spacing of three to five years contributes to lower levels of infant and childhood mortality, little attention has been given to the possibility that short birth intervals have longer-term effects on childhood nutrition status. The analysis controls for clustering effects arising from siblings being included in the subsample, as well as variables that are associated with household resources, household structure, reproductive history and outcomes, and household social environment. The results of the multiple regression analyses find that in comparison to intervals of 36-59 months, birth intervals of less than 24 months and intervals of 24-35 months significantly increase the odds of stunting (<24 months Odds Ratio (OR) = 1.52; 95% confidence interval (CI): 1.21-1.92; 25-36 months OR = 1.30; 95% CI: 1.05-1.64). Other factors related to stunting and underweight include standard of living index quintile, child's age, mother's education, low birthweight, use of prenatal care, and region of the country where the child lives. Policy and program implications include more effective use of health services and outreach programs to counsel mothers on family planning, breastfeeding, and well child care.

**Grisaru-Granovsky, S., Gordon, E. S., Haklai, Z., Samueloff, A., & Schimmel, M. M. (2009). Effect of interpregnancy interval on adverse perinatal outcomes—a national study. *Contraception, 80(6), 512–518.***

**Background:** The interpregnancy interval (IPI) has been reported to influence the outcome of pregnancy and birth. We performed a national study in Israel to determine the impact of IPI on multiple adverse perinatal outcomes.

**Study design:** This longitudinal cohort study used birth certificates of siblings born to the same biological mother, with at least one previous birth and a subsequent singleton pregnancy. Adverse pregnancy outcomes included preterm delivery, very preterm birth, small for gestational age (SGA), very SGA (VSGA), early neonatal death and major congenital malformations. Multivariate logistic regression was performed for each outcome.

**Results:** The study included 440,838 of a total of 846,845 reported live births in Israel over 5 years; excluded were primiparas (32%), multifetal births (4.9%) and those with incomplete data (10.9%). For IPIs shorter than 6 months, there were significantly increased risks for preterm birth (OR=1.23), SGA (OR=1.14), VSGA (OR=1.15), early neonatal death (OR=1.62) and congenital malformations (OR=1.14). Intervals of 60 months or longer had higher risks for preterm birth (OR=1.39) and VSGA (OR=1.16).

**Conclusion:** Optimal IPI recommendation of >11 months is an accessible and low-cost means to improve multiple adverse perinatal outcomes.

**Hajian-Tilaki, K. O., Asnafi, N., & Aliakbarnia-Omrani, F. (2009). The patterns and determinants of birth intervals in multiparous women in Babol, northern Iran. *Southeast Asian Journal of Tropical Medicine and Public Health, 40(4), 852–860.***

The present study aimed to determine the patterns and factors associated with birth intervals in multiparous women in Babol, northern Iran. We conducted a cross-sectional study of 500 multiparous women at health centers and referred to the hospital for delivery in Babol, northern Iran in 2007. Data were collected using a questionnaire, including birth intervals, demographics, fertility variables, such as maternal education, maternal age at birth, gender of index child, history of still births, child status (infant mortality or still birth) of index child, parity, duration of breast feeding, residence area, contraception method used, and attendance at a family planning clinic. The data were analyzed using a logistic regression model. The mean (+/- SD) birth interval was 61 +/- 25.7 months. In 3.8% of women the birth interval was > or = 6 years. The majority of women (76.8%) were age 20-34 years old at the time of pregnancy. About one-fourth (22.4%) of women were > or = 35 years old at the time of pregnancy and 0.8% of women were < 20 years old at pregnancy. Maternal age, duration of breast feeding, sex of index child, history of still births, history of infant mortality of the index child, type of contraception used, regular attendance at a family planning clinics and parity showed a significant correlation with birth interval ( $p < 0.05$ ).

**Jansen, W. H. (2005). Existing demand for birth spacing in developing countries: Perspectives from household survey data. *International Journal of Gynecology and Obstetrics*, 89(Suppl. 1), 550–560.**

**Objective:** To identify the extent of demand for birth spacing, according to age and parity among married women of reproductive age (MWRA) in developing countries.

**Methods:** Secondary analysis of data from the Demographic and Health Surveys (DHS) using cross-tabulations. Data collected from nationally representative samples of MWRA in selected developing countries between 1990 and 2004.

**Results:** Demand for birth spacing is the most prevalent reason for an interest in family planning among married women aged 15-29 years in the majority of developing countries examined. In the 15-19-year age cohort, the demand for spacing is proportionally the most prevalent reason for a demand for family planning. A demand for spacing even exists among young, zero-parity married women in each country examined. Findings on the demand for spacing among zero-parity married women quantifies the expressed desire of some married women in developing countries to postpone a first birth or the timing of a first pregnancy.

**Conclusion:** The substantial demand for birth spacing among young, low- and zero-parity women suggests that family planning programs in developing countries may need to reevaluate how accessible services are for this cohort of potential contraception users. Currently, many service-delivery protocols, counseling practices and service provider training may not fully address the needs of younger, low- or zero-parity clients.

**Kozuki, N., Lee, A. C., Silveira, M. F., Victora, C. G., Adair, L., Humphrey, J., . . . Child Health Epidemiology Reference Group Small-for-Gestational-Age-Preterm Birth Working Group. (2013). The associations of birth intervals with small-for-gestational-age, preterm, and neonatal and infant mortality: A meta-analysis. *BMC Public Health*, 13(Suppl. 3). doi:10.1186/1471-2458-13-S3-S3**

**Background:** Short and long birth intervals have previously been linked to adverse neonatal outcomes. However, much of the existing literature uses cross-sectional studies, from which deriving causal inference is complex. We examine the association between short/long birth intervals and adverse neonatal outcomes by calculating and meta-analyzing associations using original data from cohort studies conducted in low-and middle-income countries (LMIC).

**Methods:** We identified five cohort studies. Adjusted odds ratios (aOR) were calculated for each study, with birth interval as the exposure and small-for-gestational-age (SGA) and/or preterm birth, and neonatal and infant mortality as outcomes. The associations were controlled for potential confounders and meta-analyzed.

**Results:** Birth interval of shorter than 18 months had statistically significant increased odds of SGA (pooled OR: 1.51, 95% CI: 1.31-1.75), preterm (pooled OR: 1.58, 95% CI: 1.19-2.10) and infant mortality (pooled OR: 1.83, 95% CI: 1.19-2.81) after controlling for potential confounding factors (reference 36-<60 months). It was also significantly associated with term-SGA, preterm-appropriate-for-gestational-age, and preterm-SGA. Birth interval over 60 months had increased risk of SGA (pooled OR: 1.22, 95% CI: 1.07-1.39) and term-SGA (pooled OR: 1.14, 95% CI: 1.03-1.27), but was not associated with other outcomes.

**Conclusions:** Birth intervals shorter than 18 months are significantly associated with SGA, preterm birth and death in the first year of life. Lack of access to family planning interventions thus

contributes to the burden of adverse birth outcomes and infant mortality in LMICs. Programs and policies must assess ways to provide equitable access to reproductive health interventions to mothers before or soon after delivering a child, but also address underlying socioeconomic factors that may modify and worsen the effect of short intervals.

**Ngianga-Bakwin, K., & Stones, R. W. (2005). Birth intervals and injectable contraception in sub-Saharan Africa. *Contraception*, 71(5), 353–356.**

**Objective:** The interval between births is associated with child survival in the developing world. We aimed to investigate associations between use of depot-medroxyprogesterone acetate and other reversible contraception and short birth intervals in sub-Saharan Africa.

**Methods:** Data from successive Demographic and Health Surveys undertaken in nine African countries were analyzed. Logistic regression was used to explain changes in the proportion of short birth intervals in four countries with relatively high use of reversible contraception.

**Findings:** The overall odds ratio for the trend was 0.90 (95% CI 0.84 to 0.95) and this was unaffected by adjusting for the other variables. The odds of a short birth interval were reduced by exclusive breastfeeding (OR 0.67, 95% CI 0.58 to 0.78) and increased by use of injectable contraception (OR 1.23, 95% CI 1.11 to 1.38).

**Conclusion:** The proportion of short birth intervals has changed little over the last decade in a context of very low use of the intrauterine device. Widespread adoption of injectable contraception is associated with greater odds of a short birth interval, thus not contributing favorable conditions for improved child health.

**Norton, M. (2005). New evidence on birth spacing: Promising findings for improving newborn, infant, child, and maternal health. *International Journal of Gynecology and Obstetrics*, 89(Suppl. 1), S1–S6.**

This editorial summarizes new evidence, some of which is published in this supplement, on birth spacing and newborn, infant, child and maternal health, as well as the demand for birth spacing services in the developing world. The article points to the high number of annual infant, child and maternal deaths, low birth weight infants and malnourished infants and children in developing countries. It highlights several new findings on birth spacing relevant to these conditions:

- for infants and children under five years of age, births spaced at least 36 months apart are associated with the lowest mortality risk;
- birth to conception intervals of less than 6 months, as well as abortion-pregnancy intervals of less than 6 months, are associated with increased risk of pre-term birth, low birth weight and small for gestational age;
- birth to conception intervals of less than 6 months are associated with increased risk of maternal mortality and morbidity.

It argues that, in light of the new evidence, birth spacing is an important, feasible and practical intervention to address these conditions and should be included in developing country health programs.

**Popkin, B. M., Guilkey, D. K., Akin, J. S., Adair, L. S., Udry, J. R., & Flieger, W. (1993). Nutrition, lactation, and birth spacing in Filipino women. *Demography*, 30(3), 333–352.**

The Cebu Longitudinal Health and Nutrition Survey is used to examine the roles of women's nutrition and infant feeding in determining time from birth to menses and time from menses to conception. The analysis sample includes 2,648 Filipino women followed for 24 months postpartum. Recently devised statistical estimation techniques to control for unobserved heterogeneity and endogeneity are employed in estimating a two-state hazard model. Low body mass index and lower dietary fat intake are associated with increased duration of postpartum amenorrhea. Contraceptive use, high dietary fat consumption, higher parity, and absence of spouse predict a longer waiting time to conception once menses have returned. Simulation of the hazard model is used to examine the effects of the key nutrition and lactation factors.

**RamaRao, S., Townsend, J., & Askew, I. (2006). *Correlates of inter-birth intervals: Implications of optimal birth spacing strategies in Mozambique*. USAID & Population Council. Retrieved from [www.popcouncil.org/pdfs/frontiers/FR\\_FinalReports/Mozam\\_OBSI.pdf](http://www.popcouncil.org/pdfs/frontiers/FR_FinalReports/Mozam_OBSI.pdf)**

Birth spacing benefits both mother and child. Through Mozambique Demographic Health Survey information and a review of terminology, this paper seeks to describe the implications of optimal birth spacing and outline demographic characteristics of various birth intervals. This information can help policy makers develop programs around the postponement of first births and the fostering of social acceptance of new findings.

**Rasheed, P., & Al-Dabal, B. K. (2007). Birth interval: Perceptions and practices among urban-based Saudi Arabian women. *Eastern Mediterranean Health Journal*, 13(4), 881–892.**

To determine perceptions towards birth spacing, actual birth interval and associated sociodemographic factors, we carried out a cross-sectional study on 436 mothers aged 15-50 years in Al-Khobar. All had had > or = 2 children within the previous 10 years. Only 5.2% preferred a birth interval of < 2 years, 28.2% preferred a 2 -< 3-year interval, while the rest favoured > or = 3 years. Education and employment status were predictors of birth spacing preference. About half were not aware of the physical benefits associated with longer birth interval. Only 26.3% had mean birth interval < 2 years. Age and employment status were significant positive predictors of longer birth interval. Oral contraception was the most popular method adopted for child spacing.

**Rutstein, S. O. (2011). *Trends in birth spacing (DHS Comparative Reports No. 28)*. Calverton, MD: ICF Macro.**

The purpose of this comparative report is to examine the levels and trends of birth intervals as documented in the Demographic and Health Surveys (DHS). The interval between births has been shown in numerous studies to substantially affect the mortality, birth size and weight, and nutritional status of children, and the risk of pregnancy complications for mothers. This report presents information on the lengths of actual and preferred birth intervals, trends in actual and preferred birth intervals, the difference between actual and preferred birth intervals, and trends in the

difference. Additionally, the report gives information on the desire for more children and met and unmet need for contraception for spacing births, at the time of the survey (Rutstein, 2011, p. xiii).

**Sebastian, M. P., Khan, M. E., & Roychowdhury, S. (2010). Promoting healthy spacing between pregnancies in India: Need for differential education campaigns. *Patient Education and Counseling*, 81(3):395–401**

**Objective:** Birth spacing intervals are relatively short in India. Healthy spacing of 3-5 years between births is an effective way to prevent maternal and child mortality and morbidities. Socio-cultural and structural barriers, including limited awareness, socio-cultural norms, and misconceptions need to be addressed for behavior change. Hence the objective was to understand these barriers and accordingly develop separate messages for young women, her husband and her mother-in-law.

**Methods:** Data were collected from young women, husbands and mothers-in-law using qualitative methods. Altogether 16 Focus Group Discussions and 30 in-depth interviews were conducted. Beliefs related to need of spacing, disadvantages of closely spaced pregnancies and messages considered suitable for different stakeholders were investigated. Messages were identified for women, husband and mother-in-law; communication aids prepared and community workers trained to appropriately communicate the messages to stakeholders. Quantitative data were collected to measure the effect of the intervention.

**Results:** Educational campaign resulted in higher use of contraceptives for spacing among registered pregnant women from experimental area compared to control area.

**Conclusion:** Differential audience specific educational campaign is feasible and effective.

**Practice implications:** For an effective communication in the community, workers should know how exactly to convey the different health messages to different target population.

**Williams, E. K., Hossain, M. B., Sharma, R. K., Kumar, V., Pandey, C. M., & Baqui, A. H. (2008). Birth interval and risk of stillbirth or neonatal death: Findings from rural north India. *Journal of Tropical Pediatrics*, 54(5), 321–327.**

Short birth intervals have been associated with adverse birth outcomes. This study examines the association between preceding interval and risk of stillbirth or neonatal death in rural north India (n = 80 164). Adjusted odds ratios (OR) and 95% confidence interval (CI) of stillbirth and neonatal mortality were calculated. The odds of stillbirth were significantly greater among birth intervals of 59 months (OR 1.44; CI 1.19-1.73), compared with intervals of 36-59 months. Neonatal death was associated with birth intervals of <18 months (OR 4.12; CI 3.74-4.55) and 18-35 months (OR 1.78; CI 1.63-1.94), compared to births spaced 36-59 months. Previous history of either stillbirth or neonatal death was significantly associated with risk of stillbirth and neonatal death, respectively, as were multiple births.

**Yadava, R. C., & Sharma, S. S. (2007). The distribution of consecutive closed birth intervals in females in Uttar Pradesh. *Journal of Biosocial Science*, 39(2), 189–199.**

Most studies of closed birth intervals are regarding their variation at specific orders among females. This paper attempts to study the nature of the distributions of consecutive closed birth intervals. Data from the Uttar Pradesh National Family Health Survey 1998-99 (NFHS-2) were analysed. It was found that, under certain assumptions, the postpartum amenorrhoea period and menstruating



interval are negatively associated, indicating that socio-cultural factors are affecting the menstruating interval.

**Yeakey, M. P., Muntifering, C. J., Ramachandran, D. V., Myint, Y., Creanga, A. A., & Tsui, A. O. (2009). How contraceptive use affects birth intervals: Results of a literature review. *Studies in Family Planning*, 40(3), 205–214.**

Short birth intervals can have adverse consequences for maternal and infant outcomes. Optimal birth spacing is often presumed to be achieved through the practice of family planning and use of contraceptives, yet most of the available research does not address explicitly the contribution of contraceptive-method use to birth spacing or maternal and infant survival. We conducted a systematic literature review to assess the body of evidence linking contraceptive use to birth-interval length. Fourteen studies published in English between 1980 and 2008 met our eligibility criteria for inclusion. The findings from these studies are mixed but suggest that the use of contraceptives is protective against short birth intervals. Although results are favorable, many of the studies and methodologies employed are dated. More current research is needed to determine the impact of contraceptive-method use on birth-interval length in order to inform the promotion of family planning for reducing maternal and infant morbidity and mortality through birth spacing.

**Yohannes, S., Wondafrash, M., Abera, M., & Girma, E. (2011). Duration and determinants of birth interval among women of child bearing age in Southern Ethiopia. *BMC Pregnancy and Childbirth*, 11(38). doi:10.1186/1471-2393-11-38**

**Background:** Longer intervals between consecutive births decrease the number of children a woman can have. This results in beneficial effects on population size and on the health status of mothers and children. Therefore, understanding the practice of birth interval and its determinants is helpful to design evidence based strategies for interventions.

**Objective:** The objective of this study was to determine duration and determinants of birth interval among women of child bearing age in Lemo district, southern Ethiopia in March 2010.

**Methods:** A community based cross sectional study design with stratified multistage sampling technique was employed. A sample of 844 women of child bearing age were selected by using simple random sampling technique after complete census was conducted in selected kebeles prior to data collection. Structured interviewer administered questionnaire was used for data collection. Actual birth interval was measured with the respondents' memory since majority of the women or their children in the area had no birth certificate.

**Results:** Majority (57%) of women were practicing short birth interval length with the median birth interval length of 33 months. Actual birth interval length is significantly shorter than preferred birth interval length. Birth interval showed significant variation by contraceptive use, residence, wealth index, breast feeding and occupation of husbands.

**Conclusion:** low proportion of optimal birth spacing practices with short actual birth interval length and longer preferred birth interval lengths were evident among the study subjects. Hence interventions to enhance contraceptive utilization behaviors among women in Lemo district would be helpful to narrow the gap between optimal and actual birth spacing.

## 2. COMMUNITY- AND FACILITY-INCLUSIVE INTERVENTION STUDIES

**Alvarado, R., Zepeda, A., Rivero, S., Rico, N., Lopez, S., & Diaz, S. (1999).** Integrated maternal and infant health care in the postpartum period in a poor neighborhood in Santiago, Chile. *Studies in Family Planning*, 30(2), 133–141.

An integrated postpartum health-care program was established by the Consultorio San Luis de Huechuraba (CSLH), a nongovernmental organization in a neighborhood of extreme poverty in Santiago, Chile. The main components were education, maternal and infant health care, support for the mothers, and active participation of women from the community served. The program was evaluated through indicators of contraceptive use, breastfeeding performance, infant growth and health, and a qualitative assessment of women's satisfaction. Controls were women of similar characteristics attending the nearby public clinic. Acceptability of contraceptive methods was similar but contraceptive options differed between clinics. The total number of pregnancies and of respondents lost to follow-up was significantly higher for the public clinic than for the CSLH. Breastfeeding duration was significantly longer and infant growth and health were found to be significantly better at the CSLH than at the public clinic. Women valued being treated with respect, receiving education and support, and being offered timesaving services and wider contraceptive choices at the CSLH. This study demonstrates that such interventions are possible for poor communities, providing significant advantages for women and children.

**Barber, S. L. (2007).** Family planning advice and postpartum contraceptive use among low-income women in Mexico. *International Family Planning Perspectives*, 33(1), 6–12.

**Context:** In Mexico, family planning advice has been incorporated into the clinical guidelines for prenatal care. However, the relationship between women's receipt of family planning advice during prenatal care and subsequent contraceptive use has not been evaluated.

**Methods:** Data were collected in 2003 and 2004 in 17 Mexican states from 2238 urban low-income women postpartum. Participating women reported on prenatal services received and contraceptive use. Logistic and multinomial logistic regression models evaluated whether receiving family planning advice during prenatal care predicted current contraceptive use, after quality of care in the community, service utilization, delivery characteristics, household socioeconomic characteristics, and maternal and infant characteristics were controlled for.

**Results:** Overall, 47% of women used a modern contraceptive method. Women who received family planning advice during prenatal care were more likely to use a contraceptive than were those who did not receive such advice (odds ratio, 2.2). Women who received family planning advice had a higher probability of using condoms (relative risk ratio, 2.3) and IUDs (5.2), and of undergoing sterilization (1.4), than of using no method.

**Conclusions:** Integrating family planning advice into prenatal care may be an important strategy for reaching women when their demand for contraception is high.

**Bashour, H. N., Kharouf, M. H., Abdulsalam, A. A., El Asmar, K., Tabbaa, M. A., & Cheikha, S. A. (2008). Effect of postnatal home visits on maternal/infant outcomes in Syria: A randomized controlled trial. *Public Health Nursing, 25*(2), 115–125.**

**Objective:** Early postpartum home visiting is universal in many Western countries. Studies from developing countries on the effects of home visits are rare. In Syria, where the postpartum period is rather ignored, this study aimed to assess whether a community-based intervention of postnatal home visits has an effect on maternal postpartum morbidities; infant morbidity; uptake of postpartum care; use of contraceptive methods; and on selected neonatal health practices.

**Design:** A randomized controlled trial was carried out in Damascus. Three groups of new mothers were randomly allocated to receive either 4 postnatal home visits (A), one visit (B), or no visit (C).

**Sample:** A total of 876 women were allocated and followed up.

**Intervention:** Registered midwives with special training made a one or a series of home visits providing information, educating, and supporting women.

**Results:** A significantly higher proportion of mothers in Groups A and B reported exclusively breastfeeding their infants (28.5% and 30%, respectively) as compared with Group C (20%), who received no visits. There were no reported differences between groups in other outcomes.

**Conclusions:** While postpartum home visits significantly increased exclusive breastfeeding, other outcomes did not change. Further studies framed in a nonbiomedical context are needed. Other innovative approaches to improve postnatal care in Syria are needed.

**Bennett, I. M., Coco, A., Anderson, J., Horst, M., Gambler, A. S., Barr, W. B., & Ratcliffe, S. (2009). Improving maternal care with a continuous quality improvement strategy: A report from the Interventions to Minimize Preterm and Low Birth Weight Infants through Continuous Improvement Techniques (IMPLICIT) Network. *Journal of the American Board of Family Medicine: JABFM, 22*(4), 380–386.**

**Background:** Maternal medical care (prenatal and postpartum) involves a set of clinical interventions addressing risk factors associated with important maternal and infant outcomes. Programs to increase the rate of delivery of these interventions in clinical practice have not been widely implemented.

**Methods:** A practice-based research network focused on developing continuous quality improvement (CQI) processes for maternal care among 10 family medicine residency training sites in the northeastern United States (the IMPLICIT Network) from January 2003 through September 2007. Documented delivery of 5 standard maternal care interventions was assessed before and after initiating a program to increase their frequency. Proportion chart analyses were conducted comparing the period before and after implementation of the CQI interventions.

**Results:** Data were available for 3936 pregnancies during the course of the study period. Results varied across the clinical interventions. Significant improvement in care processes was seen for 3 screening activities: (1) prenatal depression symptomatology (by 15 weeks' gestation); (2) screening for smoking at 30 weeks' gestation; (3) and postpartum contraception planning. Screening for smoking by 15 weeks' gestation and testing for asymptomatic bacteriuria were already conducted >90% of the time during the baseline period and did not increase significantly after initiating the CQI program. Screening for postpartum depression symptomatology was recorded in 50% to 60% of women before the CQI program and did not increase significantly.

**Conclusions:** A practice-based research network of family medicine residency practices focused on CQI outcomes was successful in increasing the delivery of some maternal care interventions.

**Bolam, A., Manandhar, D. S., Shrestha, P., Ellis, M., & Costello, A. M. (1998). The effects of postnatal health education for mothers on infant care and family planning practices in Nepal: A randomised controlled trial. *BMJ*, 316(7134), 805–811.**

**Objectives:** To evaluate impact of postnatal health education for mothers on infant care and postnatal family planning practices in Nepal.

**Design:** Randomized controlled trial with community follow up at 3 and 6 months postpartum by interview. Initial household survey of study areas to identify all pregnant women to facilitate follow up.

**Setting:** Main maternity hospital in Kathmandu, Nepal. Follow up in urban Kathmandu and a periurban area southwest of the city.

**Subjects:** 540 mothers randomly allocated to one of four groups: health education immediately after birth and three months later (group A), at birth only (group B), at three months only (group C), or none (group D).

**Interventions:** Structured baseline household questionnaire; 20 minute, one to one health education at birth and three months later.

**Main outcome measures:** Duration of exclusive breast feeding, appropriate immunization of infant, knowledge of oral rehydration solution and need to continue breast feeding in diarrhea, knowledge of infant signs suggesting pneumonia, uptake of postnatal family planning.

**Results:** Mothers in groups A and B (received health education at birth) were slightly more likely to use contraception at six months after birth compared with mothers in groups C and D (no health education at birth) (odds ratio 1.62, 95% confidence interval 1.06 to 2.5). There were no other significant differences between groups with regards to infant feeding, infant care, or immunization.

**Conclusions:** Our findings suggest that the recommended practice of individual health education for postnatal mothers in poor communities has no impact on infant feeding, care, or immunization, although uptake of family planning may be slightly enhanced.

**Center for Development in Primary Health Care. (2003). *Improving postpartum care among low parity mothers in Palestine*. USAID & Population Council. Retrieved from [www.popcouncil.org/pdfs/frontiers/FR\\_FinalReports/West\\_Bank\\_LowParity.pdf](http://www.popcouncil.org/pdfs/frontiers/FR_FinalReports/West_Bank_LowParity.pdf)**

The Center for Development in Primary Health Care (CDPHC) from Al-Quds University in Jerusalem conducted a cluster randomized trial to quantify the impact of community health workers' (CHWs') postpartum visits for women in Palestine. The study authors note that Palestinian women experience gaps in postpartum care as a rationale for this study (CDPHC, 2003, p. 1). Both the intervention and control groups of postpartum women received visits at 2 to 3 days postpartum, but each member of the intervention group also received a visit from a CHW at 30 to 38 days postpartum. The intervention visit included standardized teaching about "maternal and newborn care," "[encouragement of] utilization of postpartum services" at 40 days postpartum, "social support during postpartum period" (focused on the social support from husbands for birth spacing), "knowledge and use of family planning" (including lactational amenorrhea method), and "breast and cervical awareness and prevention practices" (CDPHC, 2003, p. 12). Women who had been visited were more likely to visit the clinic at day 40 postpartum, a variable that did not predict family

planning habits. However, visited women breastfed longer and were more likely to have discussed birth spacing with their spouses. The authors call for home visits for mothers, education to encourage women to seek postpartum care, “improvement” of CHW performance during visits, inclusion of maternal care during postpartum visits (as opposed to mostly newborn care), “efforts...to involve the husbands of low parity women,” and the consideration of mass media as a tool for these efforts (CDPHC, 2003, pp. 29–30).

**Engin-Ustun, Y., Ustun, Y., Cetin, F., Meydanli, M. M., Kafkasli, A., & Sezgin, B. (2007). Effect of postpartum counseling on postpartum contraceptive use. *Archives of Gynecology and Obstetrics*, 275(6), 429–432.**

**Objective:** The aim of this study was to evaluate the effect of postpartum counseling on postpartum contraceptive use.

**Methods:** One hundred and forty-three women who delivered between 1 January 2004 and 31 September 2004 and counseled about postpartum contraception were included in the study. The participants were interviewed by telephone. Age, gravidity, parity, and mode of delivery of the participants were recorded. Their method of contraception before pregnancy, their decision on the contraceptive method after counseling and the method actually used were asked.

**Results:** Just after postpartum counseling, 47 women (32.9%) decided to use the intrauterine device (IUD), 23 (16.1%) condoms, 16 (11.2%) progestin injections, 7 (4.9%) oral contraceptives, and 7 (4.9%) coitus interruptus for contraception. Thirty-six women (25.2%) did not decide on any method of use. At the time of the telephone interview the actual method used was learned. Fifty-one women (35.7%) were using coitus interruptus, 45 women (31.5%) condoms, and 14 (9.8%) the IUD. Sixteen women (11.2%) were reported as not using any methods.

**Conclusion:** In spite of postpartum counseling, a high majority of the women appeared to use traditional and less effective contraception methods.

**Feldman, B. S., Zaslavsky, A. M., Ezzati, M., Peterson, K. E., & Mitchell, M. (2009). Contraceptive use, birth spacing, and autonomy: An analysis of the Oportunidades program in rural Mexico. *Studies in Family Planning*, 40(1), 51–62.**

Oportunidades, a conditional cash-transfer program instituted in Mexico in 1997, provides cash incentives to mothers to invest in the health and education of family members. Drawing from data gathered by Mexico's National Institute of Public Health, this study assesses the effect of the program on contraceptive use and birth spacing among titulares (female household heads) living in rural areas during the experimental period, 1998-2000, and during 2000-03, after incorporation of the control group. In 2000, titulares were more likely to use modern contraceptives than were women in the control group, although by 2003 all beneficiaries had the same probability of use. Change in autonomy was not a mediator, although baseline autonomy modified the program's influence on contraceptive use. Cox proportional hazard models produced estimates that birth spacing was similar between the beneficiaries and controls. Inconsistent findings may be the result of the way contraceptive use was defined in this study. Findings from this study may be useful for helping program planners better understand the role of conditional cash transfers in modifying family planning and fertility among poor rural women in Latin America.

**Fullerton, J. T., Killian, R., & Gass, P. M. (2005). Outcomes of a community- and home-based intervention for safe motherhood and newborn care. *Health Care for Women International*, 26(7), 561–576.**

Mothers and their home birth attendants residing in rural Uttar Pradesh (UP), India, were taught to recognize and take action to resolve selected maternal and neonatal life-threatening problems. Community mobilization efforts were designed to reduce delays in transport to emergency obstetric care (EOC) referral units and to increase use of family planning. Retention of knowledge and skills for recognition and intervention for maternal bleeding and newborn sepsis was enhanced when pictorial depictions of the problem or take action message or both were used as memory aids. Advocacy efforts for use of EOC facilities were less successful. The community health promotion and home-based life-saving skills education efforts tested are recommended for replication.

**Gennaro, S., Dugyi, E., Doud, J. M., & Kershbaumer, R. (2002). Health promotion for childbearing women in Rubanda, Uganda. *Journal of Perinatal and Neonatal Nursing*, 16(3), 39–50.**

A train-the-trainer intervention, based on the World Health Organization's Safe Motherhood Initiative, was successful in changing some health beliefs and health practices among village men and women of childbearing age in a remote area of Uganda. Specifically, more villagers reported attending postpartum care and beginning prenatal care earlier in pregnancy. Some beliefs were not changed (e.g., belief in bewitchment), but some beliefs (e.g., use of herbal medicines during labor) were not as widely held as a result of this cost-effective and easily sustainable program.

**Harper, C. C., Brown, B. A., Foster-Rosales, A., & Raine, T. R. (2010). Hormonal contraceptive method choice among young, low-income women: How important is the provider? *Patient Education and Counseling*, 81(3), 349–354.**

**Objectives:** Several new methods are available, but we know little about successful integration of contraceptive technologies into services. We investigated provider factors associated with the initiation of new hormonal methods among women at high risk of unintended pregnancy.

**Methods:** This cohort study enrolled 1387 women aged 15-24 starting hormonal contraception (vaginal ring, transdermal patch, oral contraceptive, or injectable) at four family planning clinics in low-income communities. We measured provider factors associated with method choice, using multinomial logistic regression.

**Results:** Ring and patch initiators were more likely than women starting oral contraceptives to report that they chose their method due to provider counseling ( $p < 0.001$ ). Contraceptive knowledge in general was low, but initiation of a new method, the ring, was associated with higher knowledge about all methods after seeing the provider ( $p < 0.001$ ). Method initiated varied with provider site ( $p < 0.001$ ). These associations remained significant, controlling for demographics and factors describing the provider-patient relationship, including trust in provider and continuity of care.

**Conclusion:** Women's reports of provider counseling and of their own contraceptive knowledge after the visit was significantly associated with hormonal method initiated.

**Practice implications:** More extensive counseling and patient education should be expected for successful integration of new hormonal methods into clinical practice.

**Huber, D., Saeedi, N., & Samadi, A. K. (2010). Achieving success with family planning in rural Afghanistan. *Bulletin of the World Health Organization*, 88(3), 227–231.**

**Problem:** Afghan women have one of the world's highest lifetime risks of maternal death. Years of conflict have devastated the country's health infrastructure. Total fertility was one of the world's highest, contraceptive use was low and there were no Afghan models of success for family planning.

**Approach:** We worked closely with communities, providing information about the safety and non-harmful side-effects of contraceptives and improving access to injectable contraceptives, pills and condoms. Regular interaction with community leaders, mullahs (religious leaders), clinicians, community health workers and couples led to culturally acceptable innovations. A positive view of birth spacing was created by the messages that contraceptive use is 300 times safer than pregnancy in Afghanistan and that the Quran (the holy book of Islam) promotes two years of breastfeeding. Community health workers initiated the use of injectable contraceptives for the first time.

**Local setting:** The non-for-profit organization, Management Sciences for Health, Afghan nongovernmental organizations and the Ministry of Public Health implemented the Accelerating Contraceptive Use project in three rural areas with different ethnic populations.

**Relevant changes:** The contraceptive prevalence rate increased by 24-27% in 8 months in the project areas. Men supported modern contraceptives once they understood contraceptive safety, effectiveness and non-harmful side-effects. Injectable contraceptives contributed most to increases in contraceptive use.

**Lessons learnt:** Community health workers can rapidly increase contraceptive use in rural areas when given responsibility and guidance. Project innovations were adopted as best practices for national scale-up.

**Huntington, D., & Aplogan, A. (1994). The integration of family planning and childhood immunization services in Togo. *Studies in Family Planning*, 25(3), 176–183.**

Improvements in the constellation of services in the African context are largely addressed through attaining better measures of service integration, which can be achieved through improved referral across categories of health programs. The use of an unobtrusive referral message that linked family planning and the Expanded Program of Immunizations (EPI) services was tested in an operations research study in Togo. The introduction of the referral message was accompanied by an 18-percent increase in awareness of available family planning services and an increase in the average monthly number of new family planning clients of 54 percent. These positive results indicate that the use of referral can have a significant and dramatic impact on family planning services in a relatively short time. In Togo, no evidence existed of a negative impact on EPI services, and a majority of the EPI providers reported satisfaction with the effect of the referral message at the close of the study.

**Ijadunola, K. T., Orji, E. O., & Ajibade, F. O. (2005). Contraceptive awareness and use among sexually active breast feeding mothers in Ile-Ife, Nigeria. *East African Medical Journal*, 82(5), 250–256.**

**Objective:** To assess the level of awareness and correlates of use of family planning services among sexually active breast feeding mothers attending an infant welfare clinic.

**Design:** Cross-sectional descriptive design.

**Setting:** Infant welfare clinic of the urban comprehensive health centre, Obafemi Awolowo University Teaching Hospital, Ile-Ife, Nigeria.

**Subjects:** Mothers of breast feeding infants aged 8-11 months attending the infant welfare clinic.

**Results:** Awareness of family planning was quite high (95.5%) while current family planning use was quite low (13%). Although the proportion of women who planned for future use of family planning in the sample was high (64%), all current non-users (86.6%) met the criteria for unmet need for family planning. Parity and the number of living children were the only socio-demographic correlates of the respondents that significantly influenced family planning acceptance ( $P < 0.05$ ).

**Conclusion:** There is a high level of contraceptive awareness but low contraceptive use among breast feeding mothers in Nigeria, with a majority of non-users depending on the perceived contraceptive effects of breast feeding.

**Jacobs, E., Brambila, C., & Vernon, R. (2002). *Reproductive health care in the postnatal period in Guatemala*. USAID & Population Council. Retrieved from [www.popcouncil.org/pdfs/frontiers/FR\\_FinalReports/Guatemala\\_Postnatal\\_Care.pdf](http://www.popcouncil.org/pdfs/frontiers/FR_FinalReports/Guatemala_Postnatal_Care.pdf)**

FRONTIERS and the Ministry of Health (MOH) developed and tested a service protocol to improve antenatal and postnatal care, and trained traditional birth attendants in its use. The intervention increased the likelihood that women will receive preventive services when they attend health facilities, particularly family planning services. The range of services received by both mothers and babies during postnatal visits increased. Women attending the experimental clinics also received more information about danger signs for the mother and baby. Postnatal visits increased 46 percent in experimental sites, but similar trends in the control group were observed.

**Jakobsen, M. S., Sodemann, M., Molbak, K., Alvarenga, I., & Aaby, P. (1999). Promoting breastfeeding through health education at the time of immunizations: A randomized trial from Guinea Bissau. *Acta Paediatrica*, 88(7), 741–747.**

**[Also see comment.—Ed.]**

As an intervention against diarrhea, promotion of breastfeeding has been suggested by the World Health Organization (WHO). In the present study from Guinea Bissau we tested the possibilities of promoting breastfeeding at a local health centre. A total of 1250 children were allocated randomly into two groups. Mothers in the intervention group were given health education according to WHO's recommendations; about exclusive breastfeeding for at least the first 4 mo, prolonged breastfeeding and family planning methods. At 4 mo of age introduction of weaning food was delayed in the intervention group (risk rate 1.18 (95% CI 1.03-1.38) and more mothers had an IUD inserted (risk rate 2.45 (1.27-4.70)). The median length of breastfeeding was 23 mos in both groups. There was no difference in the number of children weaned early. Although exclusive breastfeeding



was promoted by the intervention, early weaning of children in special risk groups was not avoided. An evaluation of the impact of the WHO recommendations in different settings is warranted.

**Kestler, E., Orozco Mdel, R., Palma, S., & Flores, R.(2011). Initiation of effective postpartum contraceptive use in public hospitals in Guatemala. *Revista Panamericana de Salud Pública, 29(2),103–107.***

**Objective:** Low frequency of effective contraceptive use remains a challenging problem. This article examines the frequency of effective postpartum contraception and the methods used before discharge in public hospitals in Guatemala. It also discusses the need to implement best practices in providing family-planning and contraceptive services.

**Methods:** In March 2006, a surveillance system was implemented to collect data on the initiation of effective contraceptive methods. Postpartum women were monitored in 34 public hospitals. Univariate and bivariate analyses were performed, and a chi-square test for linear trends was used to compare female surgical sterilization rates after vaginal delivery and cesarean section.

**Results:** Between 1 March 2006 and 31 December 2008, of the 218 656 women who had a postpartum event, 31% received an effective contraceptive method before hospital discharge. The frequency of initiation of effective postpartum methods varied across hospitals. Hospital results were consistent with national data on women of reproductive age. Among women who underwent surgical sterilization, differences between those who had delivered vaginally and those who had a cesarean section were statistically significant.

**Conclusions:** The overall frequency of initiation of effective postpartum contraceptive use is low in public hospitals in Guatemala. It is higher, however, in hospitals at lower health care levels with strong community ties. Routine data collection revealed specific areas for improvement, particularly the need to enhance health providers' knowledge of medical eligibility criteria for effective contraceptive use postpartum. The priority is to promote the provision of high-quality family-planning and contraceptive services in Guatemala's public health system.

**Koblinsky, M. A. (2005). *Community-based postpartum care: An urgent unmet need.* USAID & Catalyst Consortium. Retrieved from [www.pathfind.org/site/DocServer/Community-based\\_postpartum\\_care.pdf?docID=4881](http://www.pathfind.org/site/DocServer/Community-based_postpartum_care.pdf?docID=4881)**

This report identifies and summarizes descriptive and research studies of existing community-based postpartum programs that provide counseling, services, and education on self-care. The literature review identified three models of community-based postpartum care: (1) home visits by professional health care providers, (2) home visits by community workers, and (3) home visits by community workers with referral or health facility support (Koblinsky, 2005, p. 3). It also defines programmatic and research issues for further follow-up.

**Malarcher, S., Meirik, O., Lebetkin, E., Shah, I., Spieler, J., & Stanback, J. (2011). Provision of DMPA by community health workers: What the evidence shows. *Contraception, 83(6), 495–503.***

**Background:** To reduce a large unmet need for family planning in many developing countries, governments are increasingly looking to community health workers (CHWs) as an effective service delivery option for health care and as a feasible option to increase access to family planning services.

This article synthesizes evidence on the feasibility, safety and effectiveness of community-based delivery of the injectable contraceptive depot-medroxyprogesterone acetate (DMPA).

**Study design:** Manual and electronic search and systematic review of published and unpublished documents on delivery of contraceptive injectables by CHWs.

**Results:** Of 600 identified documents, 19 had adequate information on injectables, almost exclusively intramuscular DMPA, provided by CHWs. The data showed that appropriately trained CHW demonstrate competency in screening clients, providing DMPA injections safely and counseling on side effects, although counseling appears equally suboptimal in both clinic and community settings. Clients and CHWs report high rates of satisfaction with community-based provision of DMPA. Provision of DMPA in community-based programs using CHWs expanded access to underserved clients and led to increased uptake of family planning services.

**Conclusions:** We conclude that DMPA can be provided safely by appropriately trained and supervised CHWs. The benefits of community-based provision of DMPA by CHWs outweigh any potential risks, and past experiences support increasing investments in and expansion of these programs.

**Medina, R., Vernon, R., Mendoza, I., & Aguilar, C. (2001). *Expansion of postpartum/postabortion contraception in Honduras*. Retrieved from [http://www.popcouncil.org/uploads/pdfs/frontiers/FR\\_FinalReports/Honduras\\_Contraception.pdf](http://www.popcouncil.org/uploads/pdfs/frontiers/FR_FinalReports/Honduras_Contraception.pdf)**

Based on the success of an earlier project at the largest hospital in Honduras, this study aimed to introduce postpartum/postabortion contraceptive services at five additional hospitals in the country. FRONTIERS, the Ministry of Health, and the Hospital Escuela collaborated to train staff to provide family planning counseling and methods to postpartum and postabortion women. The proportion of women receiving this information doubled and the proportion of women who received a contraceptive method tripled (Medina, Vernon, Mendoza, & Aguilar, 2001, p. 11).

**Saowakontha, S., Pongpaew, P., Vudhivai, N., Tungtrongchitr, R., Sanchaisuriya, P., Mahaweerawat, U., . . . Schelp, F. P. (2000). *Promotion of the health of rural women towards safe motherhood—an intervention project in northeast Thailand*. *Southeast Asian Journal of Tropical Medicine and Public Health*, 31(Suppl. 2), 5–21.**

An intervention project focusing on the health of women in the reproductive age was conducted in three districts of Khon Kaen Province, northeast Thailand between 1991 and 1996. Main emphasis was placed on improving reproductive health, the nutritional status including the iron deficiency anemia (IDA) as well as iodine deficiency disorders (IDD), and the parasitic diseases liver fluke (*Opisthorchis viverrini*) and hookworm. For implementation a community based Primary Health Care approach was used including the training of health officials in health matters, primary health care workers and villagers as well as enhancing health education and the dissemination of health information. The health delivery system was encouraged to take appropriate actions such as in the treatment of parasitic diseases and the control of IDA and IDD. Monitoring was done on a regular basis. The outcome of the project was assessed by comparing baseline data compiled from a random sample of the target population with the results of the final evaluation. An attempt to compare results obtained from villages within and outside of the project area failed most probably because of

spill over effects. A number of important indicators on family planning and mother and child health care improved during the time the project was implemented; this included practicing family planning, and participation in antenatal care. Also the proportion of females becoming pregnant for the first time when 20 years or older increased. Child-raising also improved in that almost all females gave colostrum to their babies by this time. Almost 75% of the women breast-fed their children. Improvements occurred in the nutritional status as far as the micronutrients iron and iodine were concerned, however the overall nutritional status of females did not change, but a rather high proportion of females were found to be overnourished. The project failed in reducing abortion and the proportion of females becoming pregnant when they are 18 years old or younger. It was also not possible to improve the usage of postnatal care. As anticipated, the results achieved so far are most suitable in serving as a training ground and providing a favorable example to improve family planning, mother- and child health care, and also the general health of females in the region, particularly in neighboring countries such as Lao PDR, Cambodia and Vietnam.

**Senanayake, H., Seneviratne, S. A., & Kariyawasam, V. (2006). Knowledge, attitudes and practices regarding postpartum contraception among 100 mother-father pairs leaving a Sri Lankan maternity hospital after childbirth. *Ceylon Medical Journal*, 51(1), 41.**

Researchers from the University of Colombo in Sri Lanka inferred from previous studies that “a deficiency in family planning in the postpartum period and in families with young children” was present in Sri Lanka, as evidenced by the high abortion rate and reported rationales for abortions that included lack of birth spacing (Senanayake, Seneviratne, & Kariyawasam, 2006, p. 41). Analysis of this study’s questionnaire revealed a general lack of education about postpartum education (especially in fathers), and the researchers conclude that education “could contribute to reducing the high abortion rate in Sri Lanka” (Senanayake et al., 2006, p. 41).

**Senarath, U., Fernando, D. N., & Rodrigo, I. (2006). Factors determining client satisfaction with hospital-based perinatal care in Sri Lanka. *Tropical Medicine and International Health*, 11(9), 1442–1451.**

**Objectives:** To describe mothers’ satisfaction with perinatal care received during hospitalization for delivery, and to identify sociodemographic and health-care-related factors associated with satisfaction.

**Method:** A cross-sectional study of 446 mother-newborn pairs from five hospitals in Puttalam district, Sri Lanka, was carried out by stratified randomization. Client satisfaction was measured using a 16-item survey instrument with high internal consistency (Cronbach’s alpha = 0.81), through exit interview.

**Results:** The proportion of mothers who were fully satisfied varied from 10.8% to 31.4% for interpersonal aspects, and from 10.1% to 28.9% for technical aspects of care. The satisfaction rates were lower with physical environment (6.1 – 10.1%) and higher with outcome of care (41.0 – 48.0%). Multivariate analyses indicated that mothers were more satisfied with the services available from lower level hospitals. Multiparae were more satisfied than primiparae. Determinants of satisfaction included providing immediate mother-newborn contact, information after examination

and counseling on family planning. Higher satisfaction with the physical environment was associated with being Moor or Tamil as opposed to Sinhalese and with lower family income.

**Conclusions:** The factors associated with client satisfaction identified in this study may be helpful in improving quality of care. Hospital staff should ensure that these are addressed and develop interpersonal relationships, especially with the first-time mothers and in higher level hospitals. Maternity units of lower level institutions should be upgraded with essential facilities.

**Smith, K. B., van der Spuy, Z. M., Cheng, L., Elton, R., & Glasier, A. F. (2002). Is postpartum contraceptive advice given antenatally of value? *Contraception*, 65(3), 237–243.**

In response to the concept that a good postpartum program should begin prenatally, this study was designed to determine whether the provision of expert contraceptive counseling during the antenatal period would have an impact on contraceptive uptake, patterns of contraceptive usage, and pregnancy rates during the first year after childbirth. Over 500 women attending antenatal clinics in each of three centers (Edinburgh, Scotland; Shanghai, People's Republic of China; Cape Town, South Africa) were randomized to receive expert contraceptive advice (participants,  $n = 771$ ) or the standard advice routinely given in that setting (controls,  $n = 866$ ). Follow-up was by postal or interviewer-administered questionnaires at 16 and 52 weeks after childbirth. There were no significant differences in the prevalence of contraceptive use at one year (over 79% in all centers) between participants and controls. In Edinburgh, participants were more likely to undergo sterilization ( $p < 0.01$ ) than controls, otherwise there were no differences among Edinburgh, Shanghai, or Cape Town in either the methods of contraception chosen or in the methods used over time. Contraceptive counseling delivered antenatally appeared to have no impact on the pregnancy rate during the first year after childbirth. In Shanghai, over 11% of women in both groups underwent termination of pregnancy in the year of follow-up. In conclusion, although women in all centers said they found the opportunity to discuss contraception antenatally was useful, it had very little effect on contraceptive use or on subsequent pregnancy rates.

**Soliman, M. H. (1999). Impact of antenatal counseling on couples' knowledge and practice of contraception in Mansoura, Egypt. *East Mediterranean Health Journal*, 5(5), 1002–1013.**

The impact of antenatal counseling on couples' knowledge and practice of contraception was investigated. An interview questionnaire was used before and after conducting counseling sessions with 200 pregnant women and 100 spouses. The participants were followed up immediately after delivery and 3 months later. Both the control and study groups displayed a lack of knowledge of contraception. Counseling sessions improved the couples' knowledge and practice in the study group. Involving husbands in family planning counseling sessions led to joint decisions being made and encouraged women's use of contraception. The majority of couples retained most of the information given. Integrating family planning counseling into antenatal care in all facilities and involving the husband are recommended.

**Stephenson, P., Donnay, F., Frolova, O., Melnick, T., & Worzala, C. (1998).** *Improving women's health services in the Russian Federation: Results of a pilot project (World Bank Technical Paper No. 404).* Washington, DC: The World Bank. Retrieved from [www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2000/02/24/000009265\\_3980624143648/Rendered/PDF/multi\\_page.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2000/02/24/000009265_3980624143648/Rendered/PDF/multi_page.pdf)

To address reproductive health problems in the Russian Federation, recommendations for changes in clinical practice and the organization of service delivery formed the basis for two women's health activities involving the World Bank: a "field test" in two women's consultations and one maternity home in Lubertsy of revised clinical protocols in antepartum, intrapartum, postpartum and family planning. This report summarizes the current situation with regard to health status of women and service organization in the Russian Federation and presents the results of the Lubertsy Field Test (Stephenson, Donnay, Frolova, Melnick, & Worzala, 1998, p. v). The Lubertsy Field Test demonstrated that positive changes in clinical practice, use of contraceptives, and quality of services can be achieved through an emphasis on provider training (Stephenson et al., 1998, p. 20).

**Tawfik, Y., Rahimzai, M., Ahmadzai, M., Clark, P., & Kamgang, E. (2014).** *Integrating family planning into postpartum care through modern quality improvement: Experience from Afghanistan. Global Health: Science and Practice 2(2), 226–233. doi:10.9745/GHSP-D-13-00166*

To address low contraceptive use in Afghanistan, we supported 2 large public maternity hospitals and 3 private hospitals in Kabul to use modern quality improvement (QI) methods to integrate family planning into postpartum care. In 2012, QI teams comprising hospital staff applied root cause analysis to identify barriers to integrated postpartum family planning (PPFP) services and to develop solutions for how to integrate services. Changes made to service provision to address identified barriers included creating a private counseling space near the postpartum ward, providing PPFP counseling training and job aids to staff, and involving husbands and mothers-in-law in counseling in person or via mobile phones. After 10 months, the proportion of postpartum women who received family planning counseling before discharge in the 5 hospitals increased from 36% to 55%, and the proportion of women who received family planning counseling with their husbands rose from 18% to 90%. In addition, the proportion of postpartum women who agreed to use family planning and left the hospital with their preferred method increased from 12% to 95%. Follow-up telephone surveys with a random sample of women who had received PPFP services in the 2 public hospitals and a control group of postpartum women who had received routine hospital services found significant differences in the proportion of women with self-reported pregnancies: 3% vs. 15%, respectively, 6 months after discharge; 6% vs. 22% at 12 months; and 14% vs. 35% at 18 months ( $P < .001$ ). Applying QI methods helped providers recognize and overcome barriers to integration of family planning and postpartum services by testing changes they deemed feasible.

**Turan, J. M., Nalbant, H., Bulut, A., & Sahip, Y. (2001).** *Including expectant fathers in antenatal education programmes in Istanbul, Turkey. Reproductive Health Matters, 9(18), 114–125.*

In this article we present the results of three studies investigating methods for including men in antenatal education in Istanbul, Turkey. Participants were first-time expectant parents living in low

and middle-income areas. After a formative study on the roles of various family members in health during the period surrounding a first birth, an antenatal-clinic-based education programme for women and for couples was carried out as a randomized, controlled study. Based on the results, separate community-based antenatal education programmes for expectant mothers and expectant fathers were tested. There was demand among many pregnant women and some of their husbands for including expectant fathers in antenatal education. In the short term, these programmes seemed to have positive effects on women and men's reproductive health knowledge, attitudes and behaviors. In the clinic-based programme the positive effects of including men were mainly in the area of post-partum family planning, while in the community-based programme positive effects among men were also seen in the areas of infant health, infant feeding and spousal communication and support. Free antenatal education should be made available to all expectant mothers and when possible, men should be included, either together with their wives or in a culture such as that of Turkey, in separate groups.

**Vernon, R., Lopez-Canales, J. R., Carcamo, J. A., & Galindo, J. (1993). The impact of perinatal reproductive health programs in Honduras. *International Family Planning Perspectives*, 19(3), 103–109.**

To improve perinatal service delivery at the Hospital Materno-Infantil in Tegucigalpa, the Honduran Social Security System created a reproductive health program with five main components: a prenatal education program, a reproductive health counseling service, an expansion of contraceptive options offered in the postpartum period, a postpartum clinic for women to visit on the 40th day after birth, and an improved perinatal data collection system. The prenatal education program, attended by approximately half of more than 6,000 women who delivered at the hospital during a 15-month period, significantly increased the women's knowledge about such topics as reproductive risk factors, warning signs during pregnancy, breastfeeding and infant care. Rates of acceptance of postpartum family planning increased significantly and rapidly, from 9% of women who delivered in December 1990 to 47% in February 1992. Over a 10-month period, the number of women seeking family planning and reproductive health counseling increased from 33 per month to 296 per month. The proportion of women who returned for a checkup 40 days postpartum increased from 15% to almost 40%.

**Vikhlyaeva, E., Nikolaeva, E., & Brandrup-Lukanow, A. (2001). Contraceptive use and family planning after labor in the European part of the Russian Federation: 2-year monitoring. *European Journal of Contraception and Reproductive Health Care*, 6(4), 219–226.**

**Objectives:** To explore the main determinants of the reproductive behavior of nursing mothers, all inhabitants of the central part of the European region of the Russian Federation, their use of modern contraceptive methods and their attitude to future family planning.

**Methods:** Open cohort multicenter study of 1200 nursing mothers aged 16–42 years interviewed at 3–5 days' postpartum, with subsequent longitudinal monitoring of the majority in the local family planning centers during the 2 years after labor.

**Results:** The main determinants of the reproductive behavior of this cohort of women are an early debut of sexual activity, several partners in their reproductive history, relatively early marriage with a

motivation to have one child in their family and the tendency to use induced abortion as one of the methods of birth regulation. Our experience of postpartum counseling demonstrated positive changes in the women's attitudes to modern contraceptive methods. The data reveal that the induced abortion rate among 639 mothers regularly followed-up during the first year postpartum was 4.4%, and among 606 during the second year was 5.1%. The corresponding rates among 129 women who did not visit the family planning centers and who were only interviewed 2 years after labor were 9.3% and 8.5%, respectively.

**Conclusions:** Our data show that the unmet needs are remarkably concentrated among women who have given birth within the last year or two, and who need augmented attention from the family planning and reproductive health services.

**Warren, C., Mwangi, A., Oweya, E., Kamunya, R., & Koskei, N. (2010). Safeguarding maternal and newborn health: Improving the quality of postnatal care in Kenya. *International Journal for Quality in Health Care*, 22(1), 24–30.**

**Objective:** To assess changes in the quality of care following the introduction of a new postnatal package.

**Design:** Using a pre-test, post test design to observe client-provider interactions with women 0-6 weeks postpartum.

**Setting:** Four health facilities in a rural district, eastern Kenya.

**Participants:** Health providers and postpartum women.

**Intervention:** Introduction of comprehensive postnatal package of care, with three targeted assessments within 48 h of birth, 1-2 weeks and 6 weeks, to providers working in maternity and maternal and child health clinics. Main outcome measure Improved quality of postnatal counselling.

**Results:** Increased mean scores for counselling on danger signs in the newborn (0.24-1.39) and infant feeding (1.33-2.19) were noted. The total quality of care index for the newborn increased overall but remained lower than desired (from 3.37 to 6.45 out of 11). Essential maternal care index improved (3.4-8.72 out of 23). More women accepted a family planning method at 6 weeks (35-63%).

**Conclusions:** The introduction of new comprehensive postnatal care package improved performance of providers in counselling in maternal and newborn complications, infant feeding and family planning. Additional studies looking at the postpartum family planning needs for women living with HIV would also be useful. However, providers would benefit from additional clinical skills for managing maternal and newborn complications during the critical period following childbirth.

### 3. DESCRIPTIVE STUDIES

**Adegbola, O., & Okunowo, A. (2009).** Intended postpartum contraceptive use among pregnant and puerperal women at a university teaching hospital. *Archives of Gynecology and Obstetrics*, 280(6), 987–992.

**Objective:** To assess the intention to use postpartum contraceptives and factors influencing use.

**Method:** A total of 423 consecutive consenting women attending the pregnancy and puerperal clinics at Lagos University Teaching Hospital (LUTH), Lagos, Nigeria, were interviewed using structured questionnaire.

**Results:** The prevalence of previous contraceptive use was 35.5%. Fifty-four percent of the respondents intended to use contraceptives after delivery, though 3% were yet to decide. Condoms (38.3%) followed by intrauterine contraceptive device (IUCD) 11.5%, were the most preferred choice of postpartum contraceptives. However, spermicide (0.4%) was the least preferred. Advanced age and high parity significantly predicted intention to use postpartum contraceptives ( $P = 0.02$  and  $0.01$ , respectively). Also high level of respondent's education and family planning counseling by doctors and nurses increased the intention to use postpartum contraceptives ( $P = 0.03$  and  $0.01$ , respectively).

**Conclusion:** Family planning counseling and education play a vital role in increasing the use of contraceptives in the postpartum period.

**Adeyemi, A. B., Ijadunola, K. T., Orji, E. O., Kuti, O., & Alabi, M. M. (2005).** The unmet need for contraception among Nigerian women in the first year postpartum. *European Journal of Contraception and Reproductive Health Care*, 10(4), 229–234.

**Objective:** To determine the level of Unmet need for Contraception among women in the first year post-delivery in Ile-Ife, Nigeria.

**Methods:** A prospective study of 256 women attending antenatal clinic of the OAUTHC, Ile-Ife, Nigeria was carried out 9–10 months post-delivery. Using a semi-structured questionnaire, the respondents were interviewed for socio-demographic characteristics; obstetric, sexual, and contraception history were also taken. The data were analyzed using descriptive and inferential statistical methods.

**Results:** There was a high level of unmet need (59.4%) in the sample of Nigerian women despite a high level of awareness of common methods of contraception. Education and parity had no significant effect on usage of contraception ( $p > 0.05$ ). No reason was given for non-usage in the largest proportion (30.3%) of the non-users. Only one-third of the respondents could correctly report the 'at-risk' period for getting pregnant in the post-partum period.

**Conclusion:** There is a need to study in more detail the social and cultural factors that determine contraceptive utilization before success can be achieved in closing the gap of unmet need, as it has become evident that increasing the awareness and knowledge of contraception is not enough to achieve the objectives of family-planning programs.



**Adinma, J. I., Agbai, A. O., & Nwosu, B. O. (1998). Contraceptive choices among Nigerian women attending an antenatal clinic. *Advances in Contraception*, 14(2), 131–145.**

The factors determining the choice of contraception were studied among 230 pregnant women attending the antenatal clinic at Nnewi, Nigeria. There were 174 (52.1%) choices for the natural methods of contraception, 86 (25.7%) for the traditional methods, and 74 (22.2%) for the artificial methods. The most commonly chosen contraceptive methods were rhythm, 95 (28.4%) and Billings, 79 (23.5%), while the least was surgical contraception, 4 (1.2%). The barrier method was not chosen at all. The most common reason given for choice of contraception was safety, 28.7%, followed by dislike of artificial methods, 25.2%; the no-response rate was 29.1%. Other reasons given were ease of use, 10%; husband's decision, 1.3%; fear of the complications of the artificial methods, 13%; dislike of foreign body, 2.6%; the method most understood, 24.8%; need for further counseling, 7%; and long-lasting, 2.6%. The most common reason given against the use of the artificial methods of contraception was fear of its complications, 31.9%, followed by preference for the natural methods, 22.3%. Condom use decreased with increasing age, being highest at 16–20 years, 37.5%, and lowest at 31–35 years, 5.9%. When compared with other parity groups, the grandmultipara group (> or = 5) used the IUD, 14.3%; injectable contraception, 4.8%; and other traditional methods (breastfeeding and abstinence), 28.5%, and did not use the rhythm method. Women of the lowest social class most commonly chose other traditional methods, 57.1%, and never chose the Billings method. Women who desired 1 to 3 children most commonly chose the pill, 23.5%, or withdrawal method, 23.5%, while women who desired 4 to 10 children most commonly chose the rhythm and Billings methods. There was no difference in choice of method of contraception for the various religious denominations, although the artificial methods were less commonly chosen by Catholics, 14.1%, compared with Anglicans, 33%, and other Christian denominations, 33.3%. The physician was the most common source of information for the choosers of the condom, 18.9%; surgical contraception, 2.7%; and the pill, 8.1%; the nurse for injectable contraception, 4.9%, while the commonest source of information among choosers of the rhythm method was the electronic media, 40.5%; print media, 34.9%; and peer group, 34.4%. Lecture/sex instruction was the commonest source of information among choosers of the Billings, 35.5%, and withdrawal, 22.6%, methods, while the no-response rate on source of information on contraception was highest among choosers of the Billings method. There is a need to bridge the gap in contraceptive information by redirecting counseling strategies and restructuring family planning programs to dispel negative perceptions and encourage informed choice of effective family planning methods.

**Atan, S. U., Kavlak, O., Kulak, E., & Bozkaya, M. (2011). Attitudes towards family planning among women seeking induced abortion in Izmir, Turkey. *European Journal of Contraception and Reproductive Health Care*, 16(3), 194–200.**

**Objectives:** To assess contraceptive knowledge, use of emergency contraception (EC) and the motives of women seeking induced abortion.

**Methods:** A descriptive and cross-sectional study conducted at the T. C. Izmir Dr. Hayri Ekrem Ustundag Gynaecology and Maternity Hospital and the Izmir Ataturk Research and Teaching Hospital, Turkey. The research sample consisted of 440 women who requested an abortion between January and May 2010, and voluntarily agreed to participate.

**Results:** Sixty-two percent of the women became pregnant while using family planning (FP) methods. The contraceptive used by 42% was the condom, and 45% believed that they had become pregnant because of improper use of the contraceptive. Ninety-three percent had never used EC. Thirty-seven percent wanted their pregnancy terminated because they did not want another child, whereas 26% viewed induced abortion as a method of FP. Sixty-nine percent of the women received FP counseling from health professionals, and 80% found the information provided adequate.

**Conclusion:** The women assessed were insufficiently knowledgeable about FP in general and EC in particular. Many had become pregnant as a result of inaccurate information.

**Audu, B. M., Yahya, S. J., & Bassi, A. (2006). Knowledge, attitude and practice of natural family planning methods in a population with poor utilization of modern contraceptives. *Journal of Obstetrics and Gynaecology*, 26(6), 555–560.**

Sub-Saharan Africa has one of the highest fertility rates in the world, which is further promoted by the low utilisation of modern contraceptive methods. Yet, many communities claim to have traditional methods of family planning that pre-date the introduction of modern contraceptives, implying that contraception is a culturally acceptable norm. It was therefore postulated that the study population would have a high level of awareness and practice of natural methods of family planning. We aimed to obtain an insight into the extent and correctness of knowledge about natural family planning methods, and its practice as a guide to the general acceptance of contraception as a concept. Pre-tested structured questionnaires were administered to women of childbearing age in households properly numbered for primary healthcare activities. The level of awareness of natural family planning methods was significantly less than awareness for modern methods of contraception. The awareness rate for rhythm method, lactational amenorrhoea method and coitus interruptus was 50.7%, 42.1% and 36.1%, respectively. For all three natural [natural—Ed.] family planning methods, there is a steady decline between awareness, correct description of method and utilisation, a difference that was statistically significant in all cases. The sociodemographic factors of the responders had varying influence on utilisation of all three natural family planning methods studied. Rural dwellers practised the lactational amenorrhoea method significantly more often than urban dwellers. Significantly more Muslims than Christians with four children or more practised coitus interruptus or the rhythm method, while the use of lactational amenorrhoea method was significantly increased with the number of living children in both religious groups. There is a relatively low level of awareness of natural family planning methods in the study population, poor utilisation and wrong use of methods. Therefore, improving the correct level of information on natural family planning methods is likely to improve the use of both natural family planning and modern contraceptive methods.

**Bradley, J., Lynam, P., Gachara, M., Matwale, E., & Dwyer, J. (1995). Unmet family planning demand: Evidence from two sites in Kenya. *Journal of Obstetrics and Gynaecology of Eastern and Central Africa*, 11(1), 20–23.**

A total of 400 antenatal, 200 postpartum, 400 child welfare clinic attenders and 69 staff were interviewed in two hospitals by trained medical students. This study demonstrated a huge unmet need and demand for family planning information and services at all stages of pregnancy, delivery

and in the postpartum period. Women reported that they would be receptive to family planning services during antenatal and child welfare visits when they are in the hospital or after delivery.

**Bradley, S. E. K., Croft, T. N., & Rutstein, S. O. (2011). *The impact of contraceptive failure on unintended births and induced abortions: Estimates and strategies for reduction (DHS Analytical Studies No. 22)*. Calverton, MD: ICF Macro.**

This study investigates the impact of contraceptive failure on unintended births and induced abortions. The study analyzes contraceptive failure rates and simulates levels of unintended births and induced abortions that could be achieved if current family planning users adopted more effective contraceptive methods.

This report analyzes data from 20 recent Demographic and Health Surveys (DHS) conducted since 2002 that collected data on contraceptive failure in the DHS calendar and wantedness status of each resulting live birth: Armenia 2005, Azerbaijan 2006, Bangladesh 2004, Colombia 2010, Dominican Republic 2002, Egypt 2008, India 2005-06, Indonesia 2007, Jordan 2007, Kenya 2003, Malawi 2004, Moldova 2005, Morocco 2003-04, Peru 2004-08, Philippines 2003, Tanzania 2004-05, Turkey 2003, Ukraine 2007, Vietnam 2002, and Zimbabwe 2005-06. In six surveys (Armenia, Azerbaijan, Moldova, Turkey, Ukraine, and Vietnam), data were additionally collected on whether each conception resulted in an induced abortion. Multiple-decrement life tables were used to calculate failure rates and simulate the impact of altering the contraceptive method mix in each country (Bradley, Croft, & Rutstein, 2011, p. ix).

**Brown, M. (2007). *When ancient meets modern: The relationship between postpartum non-susceptibility and contraception in sub-Saharan Africa*. *Journal of Biosocial Science*, 39(4), 493–515.**

Extended durations of postpartum non-susceptibility (PPNS) comprising lactational amenorrhoea and associated taboos on sex have been a central component of traditional reproductive regimes in sub-Saharan Africa. In situations of rising contraceptive prevalence this paper draws on data from the Demographic Health Surveys to consider the neglected interface between ancient and modern methods of regulation. The analysis reports striking contrasts between countries. At one extreme a woman's natural susceptibility status appears to have little bearing on the decision to use contraception in Zimbabwe, with widespread 'double-protection.' By contrast, contraceptive use in Kenya and Ghana builds directly onto underlying patterns of PPNS. Possible explanations for the differences and the implications for theory and policy are discussed.

**Bulut, A., & Turan, J. M. (1995). *Postpartum family planning and health needs of women of low income in Istanbul*. *Studies in Family Planning*, 26(2), 88–100.**

This study was designed to learn what types of postpartum health and family planning services are most appropriate for couples with low incomes living in Istanbul, Turkey. The methods used included focus groups, site visits, questionnaires for postpartum women, and a self-administered questionnaire for health-care providers. By five months postpartum, 86 percent of the women surveyed were using some method of family planning. Many couples used withdrawal, starting immediately upon resumption of intercourse after childbirth, intending to use a medical method after menses resumed. However, only 34 percent of users had begun to use a medical method by five

months after childbirth. The health facilities visited provide little information and counseling about the postpartum period. Women said that they wanted information on infant care, breast-feeding, and family planning, either before becoming pregnant or while they are pregnant. Most women prefer that postpartum services address the needs of the whole family, not only those of the baby or the mother. Recommendations for the timing, mode, and content of postpartum health and family planning services are made based on the study's findings.

**Cleland, J., Bernstein, S., Ezeh, A., Faundes, A., Glasier, A., & Innis, J. (2006). Family planning: The unfinished agenda. *Lancet*, 368(9549), 1810–1827.**

Promotion of family planning in countries with high birth rates has the potential to reduce poverty and hunger and avert 32% of all maternal deaths and nearly 10% of childhood deaths. It would also contribute substantially to women's empowerment, achievement of universal primary schooling, and long-term environmental sustainability. In the past 40 years, family-planning programmes have played a major part in raising the prevalence of contraceptive practice from less than 10% to 60% and reducing fertility in developing countries from six to about three births per woman. However, in half the 75 larger low-income and lower-middle income countries (mainly in Africa), contraceptive practice remains low and fertility, population growth, and unmet need for family planning are high. The cross-cutting contribution to the achievement of the Millennium Development Goals makes greater investment in family planning in these countries compelling. Despite the size of this unfinished agenda, international funding and promotion of family planning has waned in the past decade. A revitalisation of the agenda is urgently needed. Historically, the USA has taken the lead but other governments or agencies are now needed as champions. Based on the sizeable experience of past decades, the key features of effective programmes are clearly established. Most governments of poor countries already have appropriate population and family-planning policies but are receiving too little international encouragement and funding to implement them with vigour. What is currently missing is political willingness to incorporate family planning into the development arena.

**Cleland, J. G., Ndugwa, R. P., & Zulu, E. M. (2011). Family planning in sub-Saharan Africa: Progress or stagnation? *Bulletin of the World Health Organization*, 89(2), 137–143.**

**Objective:** To review progress towards adoption of contraception among married or cohabiting women in western and eastern Africa between 1991 and 2004 by examining subjective need, approval, access and use.

**Methods:** Indicators of attitudes towards and use of contraception were derived from Demographic and Health Surveys, which are nationally representative and yield internationally comparable data. Trends were examined for 24 countries that had conducted at least two surveys between 1986 and 2007.

**Findings:** In western Africa, the subjective need for contraception remained unchanged; about 46% of married or cohabiting women reported a desire to stop and/or postpone childbearing for at least two years. The percentage of women who approved of contraception rose from 32 to 39 and the percentage with access to contraceptive methods rose from 8 to 29. The proportion of women who were using a modern method when interviewed increased from 7 to 15% (equivalent to an average annual increase of 0.6 percentage points). In eastern African countries, trends were much more

favourable, with contraceptive use showing an average annual increase of 1.4 percentage points (from 16% in 1986 to 33% in 2007).

**Conclusion:** In western Africa, progress towards adoption of contraception has been dismally slow. Attitudinal resistance remains a barrier and access to contraceptives, though improving, is still shockingly limited. If this situation does not change radically in the short run, the United Nations population projections for this subregion are likely to be exceeded. In eastern Africa, the prospects for a future decline in fertility are much more positive.

**Day, T., Raker, C. A., & Boardman, L. A. (2008). Factors associated with the provision of antenatal contraceptive counseling. *Contraception, 78(4), 294–299.***

**Background:** A chart review was conducted to evaluate patient and provider characteristics associated with having a documented antenatal plan regarding future contraception.

**Study design:** A retrospective chart review of 528 parturients delivering between January and August 2002 was performed. Data obtained from chart review included demographics, antecedent pregnancy outcome, number of prenatal visits, provider type and documentation of an antenatal plan for postpartum contraception.

**Results:** Non-Hispanic white women, as compared to other racial/ethnic groups, were more likely to have documented counseling plans (OR 1.5, 95% CI 0.9-2.3), while non-English-speaking women were significantly less likely to have contraceptive plans recorded (OR 0.5, 95% CI 0.3-0.8).

Women with recorded antenatal plans attended more prenatal visits (median 10 vs. 8,  $p < .001$ ). Nurse practitioners were significantly more likely to document antenatal contraceptive counseling than were residents (OR 3.7, 95% CI 2.4-5.5). In the adjusted analysis, the factors most strongly being positively correlated with antenatal documentation included attending > 10 prenatal visits (adjusted OR 6.2, 95% CI 2.9-13.2), being seen by a nurse practitioner (adjusted OR 4.5, 95% CI 2.9-7.0) and being non-English speaking (adjusted OR 0.6, 95% CI 0.3-1.0).

**Conclusion:** The provision of antenatal contraceptive counseling is associated with certain characteristics, including the patient's primary language, the number of prenatal visits and type of provider seen.

**Dehne, K. L. (2003). Knowledge of, attitudes towards, and practices relating to child-spacing methods in northern Burkina Faso. *Journal of Health, Population and Nutrition, 21(1), 55–66.***

This study was carried out to document current trends in knowledge of, attitudes towards, and practices relating to traditional and modern child-spacing methods in a remote area in northern Burkina Faso. Information on sexual abstinence, weaning, and contraception was elicited from 296 women of reproductive age, involving 413 postpartum intervals. A number of older women and key informants were also interviewed. The findings depicted significant diversity in that durations of individual postpartum sexual abstinence varied between 40 days and 3 years, with shorter durations associated with stricter adherence to Islamic beliefs and, possibly, a trend towards a less collective and, for the family unit, more labor intensive, agro-pastoral subsistence economy. Although durations of amenorrhea were relatively short at between (median) 9 and 11 months, they determined the length of non-susceptible periods in almost 90% of cases. The median timing of weaning was stable at 24 months across all three main ethnic groups. However, changes in the

frequency and type of complementary feeds may have impacted on the duration of amenorrhea. Both demand for modern contraception and contraceptive prevalence (< 1%) were very low. The creation of new child-spacing norms and the promotion of modern contraceptive methods are likely to be successful in areas like this one only, if the population can be sensitized to the idea that Islam does not necessarily discourage contraception.

**Do, M., & Hotchkiss, D. (2013). Relationships between antenatal and postnatal care and post-partum modern contraceptive use: Evidence from population surveys in Kenya and Zambia. *BMC Health Services Research*, 13, 6. doi:10.1186/1472-6963-13-6**

**Background:** It is often assumed, with little supportive, empirical evidence, that women who use maternal health care are more likely than those who do not to use modern contraceptives. This study aims to add to the existing literature on associations between the use of antenatal (ANC) and post-natal care (PNC) and post-partum modern contraceptives.

**Methods:** Data come from the most recent Demographic and Health Surveys (DHS) in Kenya (2008–09) and Zambia (2007). Study samples include women who had a live birth within five years before the survey (3,667 in Kenya and 3,587 in Zambia). Multivariate proportional hazard models were used to examine the associations between the intensity of ANC and PNC service use and a woman's adoption of modern contraceptives after a recent live birth.

**Results:** Tests of exogeneity confirmed that the intensity of ANC and PNC service use and post-partum modern contraceptive practice were not influenced by common unobserved factors. Cox proportional hazard models showed significant associations between the service intensity of ANC and PNC and post-partum modern contraceptive use in both countries. This relationship is largely due to ANC services; no significant associations were observed between PNC service intensity and post-partum FP practice.

**Conclusions:** While the lack of associations between PNC and post-partum FP use may be due to the limited measure of PNC service intensity, the study highlights a window of opportunity to promote the use of modern contraceptives after childbirth through ANC service delivery. Depending on the availability of data, further research should take into account community- and facility-level factors that may influence modern contraceptive use in examining associations between ANC and PNC use and post-partum FP practice.

**Duong, D. V., Lee, A. H., & Binns, C. W. (2005). Contraception within six-month postpartum in rural Vietnam: Implications on family planning and maternity services. *European Journal of Contraception and Reproductive Health Care*, 10(2), 111–118.**

**Objectives:** This longitudinal study documents contraception practice and factors influencing contraception decision within the first six months postpartum, amongst women residing in the rural Northern Central region of Vietnam.

**Methods:** A sample of 463 rural women who gave birth during August–October 2002 were recruited and interviewed at one, 16 and 24 weeks postpartum.

**Results:** The proportion of contraceptive users at weeks 16 and 24 were 17% and 43% respectively. At week 24, of contraceptive users, 57% used IUD, 25% used condom, and 14% used traditional

methods. Logistic regression analysis found age, sufficient knowledge on contraceptives and husband/partner opinion can significantly affect the contraception decision.

**Conclusions:** In order to improve the situation, health authorities should be encouraged to provide counseling on postpartum contraceptive methods during ante- and postnatal care visits. Health education on family planning and breastfeeding should also involve the husband/partner group taking into account local socio-cultural features.

**Glazer, A. B., Wolf, A., & Gorby, N. (2011). Postpartum contraception: Needs vs. reality. *Contraception*, 83(3), 238–241.**

**Background:** The postpartum time is a unique time to address patient's contraceptive needs and provide education. There are little data to suggest the best approach to provide information about contraception after delivery.

**Study design:** Postpartum patients in an urban university hospital were asked to complete a written survey on postpartum contraception. Participants were asked about contraception counseling offered both antepartum and postpartum. Participants were also asked if they would have elected to have an intrauterine device (IUD) inserted immediately after delivery. Participants were contacted 4-6 months after delivery regarding ongoing contraceptive use.

**Results:** One hundred seventy-five surveys were completed; 77% (134) reported discussing contraception antepartum, and 87% (153), postpartum. Thirty percent of women reported discussing IUD insertion at an antepartum visit and 31% reported discussing it in the hospital prior to discharge. Twenty-three percent (39) of women would have elected immediate post-placental IUD placement if available. Of the 59 patients who were able to be contacted 4-6 months after delivery, 5% reported using an IUD. Twenty-two percent (13) of the participants contacted at follow-up still desired an IUD, of which 62% would have elected postplacental placement, if available. Twenty-nine percent of women reported using no contraceptive method and 32% reported using a method which is not highly effective.

**Conclusions:** Prenatal visits and postpartum contact with providers create an opportunity to discuss family planning and contraception and most patients report receiving counseling. However, significantly fewer reported continued contraceptive use at 4-6 months postpartum. Initiation of postplacental IUD placement would be acceptable and would increase contraceptive use at 6 months postpartum.

**Haider, S., Todd, C., Ahmadzai, M., Rahimi, S., Azfar, P., Morris, J. L., & Miller, S. (2009). Childbearing and contraceptive decision making amongst Afghan men and women: A qualitative analysis. *Health Care for Women International*, 30(10), 935–953.**

Afghanistan has one of the highest maternal mortality ratios and lowest contraceptive prevalence rates globally. Limited information is known regarding Afghan men and women's attitudes toward childbearing, child spacing, and contraceptive use, which is essential for delivery of appropriate services. We conducted a qualitative study among postpartum couples enrolled at maternity hospitals in Kabul, Afghanistan. We identified important themes that highlight the complex inter-relationship between acknowledged risks of childbearing, desire for family planning, rationales for limited contraceptive use, and sociocultural barriers to contraceptive use. We offer practical

recommendations for application of findings toward family planning and maternal mortality reduction programs.

**Jackson, E. (2011). Controversies in postpartum contraception: When is it safe to start oral contraceptives after childbirth? *Thrombosis Research*, 127(Suppl. 3), S35–S39.**

The timely initiation of contraception postpartum is an important consideration for breastfeeding and non-breastfeeding women; many women prefer oral contraceptive pills to other methods. In breastfeeding women, combined hormonal pills are not recommended prior to 6 weeks postpartum, due to effects on milk production. Although progestogen-only pills do not adversely affect milk, lack of data regarding possible effects on infants exposed to progestogens in breast milk renders timing of initiation of this method controversial. In non-breastfeeding women, elevated risk of venous thromboembolism restricts use of combined hormonal pills prior to 21 days postpartum. From 21 to 42 days, use of combined hormonal pills should be assessed based on a woman's personal venous thromboembolism risk profile; after 42 days postpartum there is no restriction in the use of combined hormonal pills for otherwise healthy women. Non-breastfeeding women may safely use progestogen-only pills at any time during the postpartum.

**Kershaw, T., Niccolai, L. M., Ickovics, J. R., Lewis, J. B., Meade, C. S., & Ethier, K. A. (2003). Short and long-term impact of adolescent pregnancy on postpartum contraceptive use: Implications for prevention of repeat pregnancy. *Journal of Adolescent Health*, 33(5), 359–368.**

**Objectives:** To describe patterns and changes in contraceptive use among pregnant adolescents in early and later postpartum compared with nonpregnant adolescents.

**Methods:** One-hundred-seventy-six pregnant and 187 nonpregnant adolescents, recruited through community clinics, were interviewed three times (baseline, 6-month follow-up, 12-month follow-up) about their condom and hormonal contraceptive practices. Changes in contraception use and patterns of consistent hormonal and/or condom use were examined. Statistical analyses included General Estimating Equations (GEE) and multinomial regression.

**Results:** Pregnant adolescents increased hormonal contraceptive use from baseline to early postpartum, but decreased use from early postpartum to late postpartum. Nonpregnant adolescents did not change their hormonal contraceptive use over time. Pregnant adolescents were more likely to be consistent dual users and hormonal-only users during the 6-month follow-up compared with non-pregnant adolescents. These findings persisted at the 12-month follow-up, although there was a decline in hormonal contraception use.

**Conclusions:** Adolescents change their contraceptive use during the postpartum period. Given the slight decline in contraceptive use in late postpartum in this sample, more work is necessary to maintain motivation to continue these positive postpartum trends.



**Khalaf, I. A., Abu-Moghli, F., Callister, L. C., Mahadeen, A. I., Kaawa, K., & Zomot, A. F. (2009). Jordanian health care providers' perceptions of post-partum health care. *International Nursing Review*, 56(4), 442–449.**

**Purpose:** This qualitative descriptive study explored Jordanian health care providers' perceptions of the health care that they provide for post-partum mothers.

**Methods:** Thirty Jordanian health care providers (physicians, nurses and midwives) participated in three focus group discussions. A content analysis approach was used to analyse the data as appropriate for descriptive qualitative inquiry.

**Findings:** Health care providers indicated that the care they deliver includes breastfeeding, family planning, childcare and laboratory tests. Health care providers reflected confidence in the care given but indicated the need for continuing education, more resources and expressions of appreciation.

**Conclusions:** Findings provide insights into Jordanian health care providers' perspectives on post-partum health care and emphasized the importance of enhancing utilization of such care in Jordan. It is suggested that the Jordanian Ministry of Health develop a comprehensive plan of educational offerings for providers, with a standardized educational programme for post-partum women. It is essential that all health care facilities provide high-quality post-partum health care that meets the needs of the maternal/infant dyad. Like all qualitative descriptive studies, generalizability of the results may be limited to similar situations and cultures.

**Khalaf, I. A., Abu-Moghli, F. A., Mahadeen, A. I., Callister, L. C., & Al-Hadidi, M. (2007). Jordanian women's perceptions of post-partum health care. *International Nursing Review*, 54(3), 288–294.**

**Purpose:** This qualitative descriptive study aimed to explore Jordanian childbearing women's perceptions of their needs for health care and the post-partum healthcare services they received.

**Methods:** Twenty-four Jordanian childbearing women participated in the focus groups. Discussions focused on infant and maternal health concerns, access to postpartum health care, including family-planning services, the characteristics and behavior of health care providers, and suggestions for the provision of quality maternal post-partum health care.

**Findings:** The majority of the women indicated that most of the services perceived and provided during the postnatal period were related to child care. They indicated that they attend post-natal visits mostly for treatment, family planning and/or child care and stated that they have not been told about the post-natal visits during pregnancy, or after giving birth.

**Conclusions:** Study findings provided insight and understanding of women's perspectives on post-partum health care and implied a need to translate qualitative findings into clinical practice guidelines. It is suggested that the Jordanian Ministry of Health develops a comprehensive plan to improve educational offerings for post-partum women, and ensure that all health care facilities offer affordable and high-quality post-partum health care.

**Krepelka, P., Hanacek, J., & Hrdlicka, D. (2009). Praxe v pouzivani kontracepcnich metod u zen v obdobi pred porodem a po porodu [Contraceptive methods used by women in the period before and after giving birth]. Ceska Gynekologie / Ceska Lekarska Spolecnost J. Ev. Purkyne, 74(3), 211–218.**

**Goal of the study:** To provide information on the knowledge and practices involving the use of the contraceptive methods employed by women of a fertile age, especially in the period of lactation.

**Design:** A cross-section, descriptive study.

**Setting:** Institute for the Care of Mother and Child, Prague.

**Methodology:** The method involved a written questionnaire in a structured form. The investigation was undertaken in two phases; the first round took place directly after giving birth, while the second took place 6 months after giving birth. The group consisted of 4535 women who gave birth at the Institute for the Care of Mother and Child in the period between 15. 11. 2006 - 15. 11. 2007.

**Results:** 2540 women (56.0%) answered the questions in the first round; 85% of them were in the 26-35 age group, 44.3% were secondary school graduates and 36.7% were university graduates. 61.3% were first-time mothers, 32.3% were second-time mothers and 5.4% were third-time mothers. Contraception used before current gravidity: (n=2540) oral hormonal contraception 59.7%, a condom 11.1%, intrauterine contraception 1.0% and 20.6% of the women used no contraceptive method. The users of oral hormonal contraception (n=1517) were most frequently prescribed (12.8% of the women) a preparation containing 20 microg ethinylestradiol and 150 eLg desogestrel (Mercilon). The contraception used during the course of lactation after a birth in the group of mothers of more than one child (n=982): oral hormonal contraception 19.6%, a condom 17.1%, intrauterine contraception 1.3%, no contraceptive method 54.5%. Breastfeeding users of oral hormonal contraception (n=192) were most frequently prescribed (20.3% of women) a preparation containing 500 microg lynestrenol (Exluton) and a preparation containing 75 microg desogestrel (Cerazette) (16.1% of women). The contraceptive methods planned by women after birth (n=2540): oral hormonal contraceptive 36.5%, a condom 18.8%, intrauterine contraception 18.8%, no method 20.1%. 1440 women (56.7%) answered the questions in the second round; 83.5% of them were in the 26-35 age group, 45.0% were secondary school graduates and 37.0% were university graduates. 64.4% were first-time mothers, 30.6% were second time mothers and 4.2% were third-time mothers. 74.6% of women were still breastfeeding 6 months after giving birth. Contraception used by breastfeeding women (n=1074): oral hormone contraception 27.6%, a condom 21.8%, an intrauterine system with levonorgestrel 2.8%, intrauterine contraception 2.4%, no method 39.5%. Contraception used by non-breastfeeding women (n=366): oral hormonal contraception 42.1%, a condom 15.0%, an intrauterine system with levonorgestrel 2.7%, intrauterine contraception 2.7%, no method 31.4%. In both groups of women, the users of oral hormonal contraception were most frequently prescribed a preparation containing 75 pg desogestrel (Cerazette); this accounted for 99.3% of the breastfeeding women and 18.8% of those not breastfeeding. 40.0% of breastfeeding and 48.4% of non-breastfeeding women are planning to use hormonal contraception in the coming period. The self-evaluation of the knowledge of contraception methods (n=2540): 61.6% of women evaluated their knowledge as good, but 77.6% of women did not know a suitable hormonal contraceptive for the period of lactation. According to 80.7% of the women, their main source of expert information in the area of family planning is their gynaecologist.

**Conclusion:** The prevalence of breastfeeding women 6 months after giving birth is high in the monitored group. Oral hormonal contraceptives are the most frequently used contraceptive method in general, including during the lactation period when women prefer a preparation containing 75 microg desogestrel regardless of whether or not they are breastfeeding. The women's knowledge of suitable methods of contraception during the period of lactation is unsatisfactory and represents a challenge for healthcare providers to improve the amount of information available to women in this area.

**Lance, A., McGuire, J. J., & Dalton, V. (2010). Predictors of patient use of highly effective post-partum contraception. *Contraception*, 82(2), 191.**

**Objectives:** To identify patient and health service factors associated with using highly effective contraception post-partum.

**Method:** Women delivering at a university hospital in Michigan were recruited for participation. We used a combination of a patient survey and medical record review to identify predictors of highly effective contraception use post-partum. Bivariate relationships were examined using t-tests and chi-square. Logistic regression will be used to identify predictors of highly effective contraception use at 3 months postpartum.

**Results:** We enrolled 185 women, representing a participation rate of 72%. Seventy-six percent of participants reported antenatal counseling about postpartum contraception, and 56% reported an antenatal plan to use highly effective contraception post-partum. At 3 months post-partum, 40% of these patients had no documentation of method provision. Patient age, parity, and insurance type were associated with planning to use highly effective contraception ( $p < .001$ ). Provider type and antenatal counseling by a health care provider were associated with planning to use an effective method, and with actual method provision at their postpartum visit ( $p < .001$ ). Although most patients reported that the best time to discuss contraception is during the antenatal period, almost 20% reported that the best time was while they were in the hospital postpartum. Logistic regression will be used to further characterize factors associated with post-partum contraception use patterns.

**Conclusions:** Helping women make choices about postpartum contraception may increase the use of effective methods. Recognizing that other women may prefer to delay this decision, adequate counseling should be provided at other times to accommodate variation in patient preferences.

**Lathrop, E., Telemague, Y., Goedken, P., Andes, K., Jamieson, D. J., & Cwiak, C. (2011). Postpartum contraceptive needs in northern Haiti. *International Journal of Gynecology and Obstetrics*, 112(3), 239–242.**

**Objective:** To assess the knowledge of, attitudes toward, and practices regarding postpartum contraception among healthcare providers and postpartum women in northern Haiti.

**Methods:** Six focus groups were conducted with postpartum patients and 3 were conducted with maternity service providers; a structured questionnaire was then administered to postpartum patients.

**Results:** In total, 282 postpartum women were included in the present study: 249 in the survey and 33 in focus groups. Although 97.9% of women expressed a desire for family-planning counseling before discharge from the postpartum ward, only 6.0% of women received such counseling. Most women wanted to space or limit their pregnancies; 79.8% of women, including those with only 1

child, wanted to choose a contraceptive method before discharge. Providers expressed concern for the volume of induced abortions and maternal deaths within the hospital, which many felt could be averted by improving postpartum family planning. However, there was no postpartum contraceptive counseling or method provision in the present setting, and no providers had experience in initiating methods immediately postpartum.

**Conclusion:** Efforts to integrate family planning into postpartum care services could help to reduce the unmet need for family planning, and help patients and providers reach their goals.

**Mbekenga, C. K., Christensson, K., Lugina, H. I., & Olsson, P. (2011). Joy, struggle and support: Postpartum experiences of first-time mothers in a Tanzanian suburb. *Women and Birth, 24(1), 24–31.***

**Objectives:** To explore and describe postpartum experiences of first-time mothers in a Tanzanian, multiethnic, low-income suburb.

**Methods:** Individual qualitative interviews with 10 first-time mothers, 4-10 weeks postpartum in Ilala suburb, Dar es Salaam, Tanzania.

**Results:** The first-time mothers enjoyed motherhood and the respectful status it implied. To understand and handle the infant's needs and own bodily changes were important during postpartum. The tradition of abstaining from sex up to 4 years during breastfeeding was a concern as male's faithfulness was questioned and with HIV a threat to family health. Partner relationship changed towards shared parental and household work and the man's active participation was appreciated. Support from family members and others in the neighbourhood were utilised as a resource by the mothers. In instances of uncertainties on how to handle things, their advice was typically followed. The new mothers generally had good experiences of health care during the childbearing period. However, they also experienced insufficiencies in knowledge transfer, disrespectful behaviour, and unofficial fees.

**Key conclusions and implication for practice:** The mothers' perspective of postpartum revealed that they actively searched for ways to attain infants' and own health needs, and family health in general. Prolonged sexual abstinence was considered a risk for the partner having other sexual partners and contracting HIV. The mothers relied heavily on the informal support network, which sometimes meant risking family health due to misinformation and harmful practices. Health care and informal support systems should complement each other to attain adequate support for the families postpartum.

**Navarro Núñez, C., Gutiérrez Suazo, D., Alvarez González, G., & Aguayo Godínez, A. (2002). Causes of non-use of contraceptives in the immediate postpartum period [Spanish]. *Ginecología y Obstetricia de México, 70, 566–571.***

**Objective:** To determine the causes of non use of contraceptive during immediate postpartum period.

**Methodology:** Cross-section observational descriptive study. We include women that went for attention of obstetric event, we identified those were in immediate postpartum period, and we selected the women which not started contraceptive use. Data were collected directly with an interview; the causes of not use of contraceptive were classified in three groups. Group I: causes be derived by patient: personal, religious, moral, families, culture, etc. reasons, when they received

information, and advice or when they did not attend to educational actions. Group II: causes be derived by the hospital: technique administrative factors, insufficient educational communication activities by service provider. Group III: Medic Indication: presence of risk factors for health women. We found 2,593 women, we identified 1,493 (57.5%) in immediate postpartum period, 478 (32%) not started contraceptive use. In 349 (73%) women the causes were group I, in 91 (19%) group II, and 38 (8%) group III.

**Conclusion:** Is necessary more research to know users concerns, ideas and perspectives in relation with methods of contraception, contraceptive counseling, informants, advisers, and with health service institution, to improve educational communication strategies; and to unify medical criterions for not use contraceptive during immediate postpartum period.

**Newmann, S. J., Goldberg, A. B., Aviles, R., Molina de Perez, O., & Foster-Rosales, A. F. (2005). Predictors of contraception knowledge and use among postpartum adolescents in El Salvador. *American Journal of Obstetrics and Gynecology*, 192(5), 1391–1394.**

**Objective:** This study was undertaken to describe demographics and contraceptive familiarity and use among postpartum adolescents in El Salvador.

**Study design:** Questionnaire-guided interviews were conducted in Spanish with 50 postpartum adolescents at an urban, public hospital in El Salvador. Open-ended questions included assessments of education, partnership status, and contraceptive knowledge and use patterns.

**Results:** The median age of subjects was 17 years, 84% were nulliparous, 80% had partners, and 6% were married. Eighty-four percent of the women reported contraception knowledge and 18% reported contraception use. Educational experience and literacy predicted contraceptive knowledge ( $P = .008$  and  $.001$ , respectively), but not use. After delivery and postpartum contraception education, 58% of the subjects stated intention to use contraception. Having a partner and living with him were predictors of intent to use contraception ( $P = .001$  and  $.002$ , respectively). Being single negatively predicted intention to use contraception ( $P = .001$ ).

**Conclusion:** Education and literacy predicted contraceptive knowledge; however, contraceptive knowledge did not predict contraceptive use. Adolescent contraception use depends on more than just contraceptive knowledge.

**Rahmanpour, H., Mousavinasab, S. N., Hosseini, S. N., & Shoghli, A. (2010). Preferred postpartum contraception methods and their practice among married women in Zanjan, Iran. *Journal of Pakistan Medical Association*, 60(9), 714–718.**

**Objectives:** To explore the preferences of women; once at the time of delivery and then three months later, in using contraceptive methods during postpartum period.

**Methods:** A sample of 575 women who gave birth during July 2007 and February 2008 in Vali-Asre teaching hospital of Zanjan, were recruited and interviewed once after delivery and then three months later. The interview questions included demographic characteristic and questions assessing the tendency of mothers to use the contraceptives they preferred at time of delivery and three months later.

**Results:** According to 537 (93.4%) of interviewed mothers, they intended using at least one contraceptive after getting discharged from the hospital. This figure dropped to 438 (76.1%) three

months after delivery. Women who expressed the desire to use minipill after delivery were 169 (29.3%). However this value rose to 187 (32.2%) three months later. The difference was not statistically significant. There was significant relationship between type of contraceptives used and women's age, number of children, place of residence and level of education three months following delivery.

**Conclusion:** Results suggest that health care must focus extensively on giving necessary information and consultation to pregnant women also their partners to help to improve selection of most favourite and safe method of contraception.

**Romero-Gutierrez, G., Garcia Vazquez, G. M., Huerta Vargas, L. F., & Ponce de Leon, A. L. (2001). Factors influencing contraceptive acceptance or refusal in puerperium [Spanish]. *Ginecologia y Obstetricia de Mexico*, 69, 406–412.**

Throughout a cross-section observational descriptive study, 1,010 postpartum patients were included. Data were collected directly with a survey, and women were divided into two groups: 507 (50.20%) women who accept postpartum contraceptive use and 503 (49.80%) women, which did not accept postpartum contraceptive use. Variables with statistical significance related with postpartum contraceptive acceptance or refusal were: patient age ( $P < 0.05$ ), marital status ( $P < 0.001$ ), pregnancies number ( $P < 0.001$ ), parity ( $P < 0.01$ ), cesarean section number ( $P < 0.001$ ) and previous contraceptive use ( $P < 0.001$ ). Postpartum contraceptives more accepted were: intrauterine device (67.85%), and tubal section (28.20%). Main reasons for postpartum contraceptive acceptance were: desire of no more children (27.02%), satisfaction with previous contraceptive methods (21.4%) and gynecologist counseling during prenatal care and delivery room (18.55%). Main reasons for postpartum contraceptive refusals were: husband's rejection of postpartum contraceptive use (33.6%), and delay in postpartum contraceptive use after finishing postpartum (32.0%). It was concluded that according to presence of significant differences between both groups in some variables, these variables should be kept in mind by physicians in promoting contraceptive methods in a personalized manner during prenatal care. Likewise, owing to husband's rejection of postpartum contraceptive use is needed to incorporate the husbands systematically to the prenatal care and to try convincing them of accepting postpartum contraceptive use.

**Romero-Gutierrez, G., Garcia-Vazquez, M. G., Huerta-Vargas, L. F., & Ponce-Ponce de Leon, A. L. (2003). Postpartum contraceptive acceptance in Leon, Mexico: A multivariate analysis. *European Journal of Contraception and Reproductive Health Care*, 8(4), 210–216.**

**Objectives:** The aim of the present study was to identify the reasons for the acceptance or rejection of contraceptive methods among postpartum women at the Hospital of Obstetrics and Gynecology in Leon, Mexico.

**Methods:** A prospective cross-sectional study of 1025 postpartum women was undertaken. Reasons for acceptance or refusal of contraceptives were registered in a written survey. Twelve sociodemographic variables were included as predictors in a logistic regression analysis; the acceptance or refusal was the dependent variable, and statistical significance was set at 0.05.

**Results:** There were 513 patients who accepted contraceptives (50.0%) and 512 (50.0%) who refused them. The main reasons for accepting contraceptives were definitive desire for no more

children (17.0%) and satisfaction with previous contraceptive methods (21.5%). The main contraceptive methods chosen were intrauterine device (67.7%) and tubal sterilization (28.5%). Reasons for contraceptive refusal were husband's rejection (33.2%) and delaying contraceptive use until after finishing the postpartum period (31.8%). In the logistic regression model, the variables previous deliveries ( $p < 0.001$ ), number of Cesarean sections ( $p < 0.001$ ) and women's level of education ( $p < 0.02$ ) were included as predictors of acceptance.

**Conclusions:** Previous deliveries, previous Cesarean sections and women's level of education were significant in contraception acceptance. The rejection of contraceptives was mainly attributed to husbands.

**Ross, J. A., & Winfrey, W. L. (2001). Contraceptive use, intention to use and unmet needs during the extended postpartum period. *International Family Planning Perspectives*, 27, 20–27.**

**Context:** The year after a woman gives birth presents a rising risk of an unwanted conception and an often frustrated desire for contraceptive protection. At present, contraceptive use levels during this period fall short, resulting in unplanned pregnancies and unwanted childbearing.

**Methods:** Data from 27 surveys conducted as part of the Demographic and Health Surveys series between 1993 and 1996 are analyzed to assess intentions to practice contraception and unmet need for it, both in the first year after birth. Unmet need is partly redefined here to focus on future wishes rather than on past pregnancies and births.

**Results:** Across the 27 countries, there is much unsatisfied interest in, and unmet need for, contraception. Unweighted country averages indicate that two-thirds of women who are within one year of their last birth have an unmet need for contraception, and nearly 40% say they plan to use a method in the next 12 months but are not currently doing so. Moreover, of all unmet need, on average nearly two-fifths falls among women who have given birth within the past year. Similarly, nearly two in five women intending to use a method are within a year of their last birth. The two groups—those with an unmet need and those intending to use a method—overlap; their common members include nearly all of those intending to use a method and about two-thirds of those with an unmet need (which is the larger group of the two). Only trivial proportions of both of these groups want another birth within two years. Between 50% and 60% of pregnant women make prenatal visits or have contact with health care providers at or soon after delivery, and additional contacts occur for infant care and other health services.

**Conclusions:** Women who have recently given birth need augmented attention from family planning and reproductive health programs if they are to reduce their numbers of unwanted births and abortions and to lengthen subsequent birth intervals. Prenatal visits, delivery services and subsequent health system contacts are promising avenues for reaching postpartum women with an unmet need for and a desire to use family planning services.

**Salway, S., & Nurani, S. (1998). Postpartum contraceptive use in Bangladesh: Understanding users' perspectives. *Studies in Family Planning*, 29(1), 41–57.**

Qualitative and quantitative data are used to explore postpartum contraceptive use in two populations in Bangladesh. Findings from in-depth interviews with contraceptive users illustrate that women are primarily concerned with their own and their newborn child's health and well-being in

the period following childbirth. In addition, women are aware of a diminished risk of pregnancy during the period of postpartum amenorrhoea. These perceptions, plus a belief that modern methods of contraception are “strong” and potentially damaging to health, mean that the majority of women are reluctant to adopt family planning methods soon after birth, despite a desire to avoid closely spaced pregnancies. Supplementation of the child's diet is also shown to be an important factor determining the timing of postpartum contraceptive initiation. The findings suggest that current policies promoting contraception to women in the immediate postpartum period are inappropriate for many Bangladeshi women.

**Salway, S., & Nurani, S. (1998). Uptake of contraception during postpartum amenorrhoea: Understandings and preferences of poor, urban women in Bangladesh. *Social Science and Medicine*, 47(7), 899–909.**

In urban Bangladesh, as in many other settings, an immediate postpartum family planning strategy prevails, where providers seek to promote and provide contraception at 40–45 days following birth to women regardless of their breastfeeding or menstrual status. Despite such practices, the majority of women choose to delay the initiation of contraception until menses resumes, often several months after birth. The present paper seeks to explain this discrepancy by describing poor, urban women's understandings regarding the chances of conception and the risks associated with contraceptive use in the postpartum period. Findings from in-depth interviews reveal that the majority of women perceive no personal risk of pregnancy during amenorrhoea, though most do not recognise an association between this diminished risk of conception and breastfeeding. In addition, the data illustrate that women are primarily concerned with their own and their newly born child's health and well-being in the period following childbirth, both of which are perceived to be extremely vulnerable. These perceptions, plus an understanding that modern methods of contraception are “strong” and potentially damaging to the health, mean that the majority of women are reluctant to adopt family planning methods soon after birth, particularly during postpartum amenorrhoea. The paper advocates that, since breastfeeding affords good protection against pregnancy for six to nine months following birth, efforts should be made to actively incorporate lactational amenorrhoea into postpartum family planning strategies in Bangladesh. Recommendations are also made for ways in which women may be encouraged to adopt contraception during amenorrhoea beyond the period of high natural protection. The paper highlights the importance of taking the client's perspective into consideration in attempts to improve the quality and effectiveness of family planning programmes.

**Sannisto, T., & Kosunen, E. (2009). Initiation of postpartum contraception: A survey among health centre physicians and nurses in Finland. *Scandinavian Journal of Primary Health Care*, 27(4), 244–249.**

**Objective:** To examine self-reported professional practices of postpartum contraceptive counselling at Finnish community health centres.

**Design:** A survey study with self-administered online questionnaires.

**Setting:** All local municipalities (n = 107) in the Expert Responsibility Area of Tampere University Hospital in Western Finland in 2005.

**Subjects:** A total of 69 (64% of 107) health centre physicians and 80 (75%) nurses performing postpartum check-ups.



**Main outcome measures:** Contraceptive method most often initiated or recommended to breastfeeding women at postpartum visit; timing of postpartum initiation of hormonal and intrauterine contraceptive methods in relation to breastfeeding and resumption of menses.

**Results:** The most common contraceptive method initiated or recommended to breastfeeding women by both physicians (41%) and nurses (45%) was the condom, followed by progestin-only pills and intrauterine contraception. Few professionals recommended breastfeeding (lactational amenorrhea) as the only contraceptive method. Only eight (12%) physicians inserted a copper-releasing intrauterine device and five (7%) a levonorgestrel-releasing intrauterine system typically at the postpartum visit; the majority delayed the insertions until the resumption of menses. Fifty-three (77%) physicians initiated combined oral contraceptives mostly when breastfeeding was terminated and menses had returned. Over half of the municipalities involved in the study did not provide any medical contraceptives free of charge postpartum.

**Conclusion:** Professionals' reports indicate that initiation of effective contraceptive methods is delayed after childbirth. In order to promote better postpartum contraception practices, updated evidence-based guidelines are needed.

**Sonalkar, S., Mody, S., & Gaffield, M. E. (2014.) Outreach and integration programs to promote family planning in the extended postpartum period. *International Journal of Gynecology and Obstetrics*, 124(3), 193–197. doi:10.1016/j.ijgo.2013.09.021**

**Background:** WHO recommends birth spacing to improve the health of the mother and child. One strategy to facilitate birth spacing is to improve the use of family planning during the first year postpartum.

**Objectives:** To determine from the literature the effectiveness of postpartum family-planning programs and to identify research gaps.

**Search strategy:** PubMed and the Cochrane Central Register of Controlled Trials were systematically searched for articles published between database inception and March 2013. Abstracts of conference presentations, dissertations, and unpublished studies were also considered.

**Selection criteria:** Published studies with birth spacing or contraceptive use outcomes were included.

**Data collection and analysis:** Standard abstract forms and the US Preventive Services Task Force grading system were used to summarize and assess the quality of the evidence.

**Main results:** Thirty-four studies were included. Prenatal care, home visitation programs, and educational interventions were associated with improved family-planning outcomes, but should be further studied in low-resource settings. Mother-infant care integration, multidisciplinary interventions, and cash transfer/microfinance interventions need further investigation.

**Conclusions:** Programmatic interventions may improve birth spacing and contraceptive uptake. Larger well-designed studies in international settings are needed to determine the most effective ways to deliver family-planning interventions.

**Speidel, J. J., & Grossman, R. A. (2011). Addressing global health, economic, and environmental problems through family planning. *Obstetrics & Gynecology, 117*(6), 1394–1398.**

Although obstetrician-gynecologists recognize the importance of managing fertility for the reproductive health of individuals, many are not aware of the vital effect they can have on some of the world's most pressing issues. Unintended pregnancy is a key contributor to the rapid population growth that in turn impairs social welfare, hinders economic progress, and exacerbates environmental degradation. An estimated 215 million women in developing countries wish to limit their fertility but do not have access to effective contraception. In the United States, half of all pregnancies are unplanned. Voluntary prevention of unplanned pregnancies is a cost-effective, humane way to limit population growth, slow environmental degradation, and yield other health and welfare benefits. Family planning should be a top priority for our specialty.

**Susu, B., Ransjo-Arvidson, A. B., Chintu, K., Sundstrom, K., & Christensson, K. (1996). Family planning practices before and after childbirth in Lusaka, Zambia. *East African Medical Journal, 73*(11), 708–713.**

A total of 408 randomly selected normally delivered women who had given birth to healthy infants were recruited from a postnatal ward at the University Teaching Hospital (UTH) in Lusaka, Zambia. Family planning practices before and after pregnancy and delivery were investigated among 376 of these women. The interviews were conducted in their homes or at the postpartum clinic at the UTH at the end of puerperium. The remaining 32 women, mainly primiparae, were lost to follow-up. Thirty four percent of the women had used a family planning method before the present childbirth. Most of those (90%) had used modern methods. Women with eight and more years of education used modern contraceptive methods more often than those with less education. One year after delivery, 64% of the women were using modern or traditional family planning methods. Of those who used traditional methods, 15% relied on lactational amenorrhea. Of those who did not use any method, 39% indicated that their husbands did not allow them. Fifty-six per cent of the teenagers stated that they had no knowledge of family planning, whereas 84% of the single teenagers had not used contraceptives before. In view of this, teenagers and single mothers need a special focus in the development of family planning programmes. We also recommend that more research should focus on views of both men and women on contraceptive use.

**Tehrani, F. R., Farahani, F. K., & Hashemi, M. (2001). Factors influencing contraceptive use in Tehran. *Family Practice, 18*(2), 204–208.**

**[Also see comments.—Ed.]**

**Background:** Despite reluctance to conceive, approximately 30% of couples do not use any method of contraception. Health concerns, side effects, failure of the method and some demographic issues such as education, age, residential region and number of living children have a major effect on contraceptive use.

**Objective:** The aim of the present study was to determine those factors which influence contraceptive use in Tehran.

**Methods:** Data from the project “The Study of the Effectiveness of Postpartum Consultation about Family Planning on Contraceptive Practice during 2 years after Parturition in University Hospitals

of Tehran in 1996” were applied for the analysis of those factors which influence contraceptive use by Iranian couples. A total of 4177 women of reproductive age who gave birth in one of the 12 hospitals in Tehran during the 24 hours following the interview of the initial study and had at least one living child were enrolled in the present study. The questionnaire used included some questions about socio-demographic status, fertility history, knowledge of contraceptives and the source of this knowledge, and previous contraception practice and its effectiveness.

**Results:** Using a logistic regression model, it was found that age, women's level of education, their husbands' level of education and previous familiarity with contraceptive methods were the most significant factors influencing contraceptive use.

**Conclusions:** It is suggested that health policy makers strengthen the family planning services through providing appropriate counseling in family planning clinics.

**Thapa, S., Kumar, S., Cushing, J., & Kennedy, K. (1992). Contraceptive use among postpartum women: Recent patterns and programmatic implications. *International Family Planning Perspectives, 18*(3), 83–92.**

This study of postpartum women, based on Demographic and Health Surveys in 25 developing countries, reveals that the proportion of women who are exposed to the risk of pregnancy within two years after childbirth ranges from one-third in Sub-Saharan Africa to nearly two-thirds in Latin America and the Caribbean. More than half of postpartum women are current contraceptive users. Women exposed to the risk of pregnancy are more likely than unexposed women to be using reversible methods, usually the pill. Among women who are unexposed to the risk of pregnancy as a result of abstinence or amenorrhea associated with breastfeeding, 19% are using a contraceptive method, usually sterilization. The proportion of contraceptive users who initiate use of a modern method before menses returns ranges from 27–57% among countries in Latin America and the Caribbean and Asia, and from 24–46% among African countries. Smaller proportions of hormonal contraceptive users initiate use before the return of menses. About one-fifth of exposed women are not using any contraceptive method. Of this group, more than one-third want no more children and another one-third want to space their next pregnancy.

**Yee, L., & Simon, M. (2011). Urban minority women's perceptions of and preferences for postpartum contraceptive counseling. *Journal of Midwifery & Women's Health, 56*(1), 54–60.**

**Introduction:** Focused antenatal contraceptive counseling about postpartum contraception may reduce the risk of contraceptive nonuse and misuse, although the optimal timing, content, and communication style of such counseling remain controversial. This study used an in-depth, qualitative approach in a population of young, postpartum, urban, minority group women in order to examine women's perspectives toward the optimal provision of comprehensive contraceptive counseling.

**Methods:** Brief surveys and semistructured interviews were conducted with 30 consenting postpartum women. In-person, one-on-one interviews were then reviewed for themes, by using an iterative process. Qualitative analysis techniques identifying emergent themes were applied to interview data.

**Results:** In this cohort of African American (63%) and Hispanic (37%) women (median age 26 y), 73% had unplanned pregnancies. Women preferred frequent, short sessions of provider-initiated comprehensive contraceptive counseling throughout the antepartum period with reinforcement of decisions during the postpartum period. Participants valued patient-centered counseling that was inclusive of all appropriate methods and personalized to individual needs.

**Discussion:** We recommend that frequent, provider-initiated, multiple-modality discussions of appropriate postpartum contraceptive options should take place throughout pregnancy in an open, individualized manner. Further work should address the long-term effects of improved patient-centered antenatal contraceptive counseling on rates of unintended pregnancy.

**Zahumensky, J., Sykorova, J., Sottner, O., Zmrhalova, B., Vojtech, J., Menzlova, E., . . . Halaska, M. (2010). Postpartum examination, breastfeeding, and contraception in the postpartum period in the Czech Republic. *Central European Journal of Medicine, 6(1), 76–82.***

In the majority of recent textbooks of obstetrics, a routine follow-up examination at the end of the postpartum period is recommended. To date, no studies have been done in the Czech Republic addressing use of contraception and follow-up care in the postpartum period. Questionnaires were sent to 672 participants who gave birth in the year 2008, inquiring about follow-up examinations in the postpartum period and use of contraception. In total, 458 (68.2%) questionnaires were returned. 430 women (93.9%) underwent routine examinations at 6 weeks into the postpartum period. At the time of examination, 36 women were asked about their particular health problems (8.4%). In 130 instances, the question most often addressed by the outpatient gynecologist concerned use of contraception (30.2%). However, only 34 physicians expressed concern about changes in sexual life or other sexually related problems. 426 women (93.0%) were sexually active and 310 women (72.8%) did not use any contraception with the exception of breastfeeding. The current practice of outpatient gynecological visits at 6 weeks postpartum and advice on contraception both seem inadequate.

**Zerai, A., & Tsui, A. O. (2001). The relationship between prenatal care and subsequent modern contraceptive use in Bolivia, Egypt and Thailand. *African Journal of Reproductive Health, 5(2), 68–82.***

Determinants of modern contraceptive use are usually examined in isolation of the effect of exposure to other aspects of health care systems. Maternal interaction with organized health service provision during post-conception and postpartum stages of reproduction can provide an opportunity to transfer contraceptive service information and counseling. We found that living in a community in which women have widespread health service contact is related to both prenatal care use and subsequent modern contraceptive use. After controlling for effects of living in high health service contact areas and various demographic and background factors, our results suggest that prior use of prenatal care has a strong influence on subsequent use of modern contraception in Bolivia, Egypt and Thailand.

## 4. FAMILY PLANNING INTEGRATION

**Bhutta, Z. A., Lassi, Z. S., Blanc, A., & Donnay, F. (2010). Linkages among reproductive health, maternal health, and perinatal outcomes. *Seminars in Perinatology*, 34(6), 434–445.**

Some interventions in women before and during pregnancy may reduce perinatal and neonatal deaths, and recent research has established linkages of reproductive health with maternal, perinatal, and early neonatal health outcomes. In this review, we attempted to analyze the impact of biological, clinical, and epidemiologic aspects of reproductive and maternal health interventions on perinatal and neonatal outcomes through an elucidation of a biological framework for linking reproductive, maternal and newborn health (RHMNH); care strategies and interventions for improved perinatal and neonatal health outcomes; public health implications of these linkages and implementation strategies; and evidence gaps for scaling up such strategies. Approximately 1000 studies (up to June 15, 2010) were reviewed that have addressed an impact of reproductive and maternal health interventions on perinatal and neonatal outcomes. These include systematic reviews, meta-analyses, and stand-alone experimental and observational studies. Evidences were also drawn from recent work undertaken by the Child Health Epidemiology Reference Group (CHERG), the interconnections between maternal and newborn health reviews identified by the Global Alliance for Prevention of Prematurity and Stillbirth (GAPPS), as well as relevant work by the Partnership for Maternal, Newborn and Child Health. Our review amply demonstrates that opportunities for assessing outcomes for both mothers and newborns have been poorly realized and documented. Most of the interventions reviewed will require more greater-quality evidence before solid programmatic recommendations can be made. However, on the basis of our review, birth spacing, prevention of indoor air pollution, prevention of intimate partner violence before and during pregnancy, antenatal care during pregnancy, Doppler ultrasound monitoring during pregnancy, insecticide-treated mosquito nets, birth and newborn care preparedness via community-based intervention packages, emergency obstetrical care, elective induction for postterm delivery, Cesarean delivery for breech presentation, and prophylactic corticosteroids in preterm labor reduce perinatal mortality; and early initiation of breastfeeding and birth and newborn care preparedness through community-based intervention packages reduce neonatal mortality. This review demonstrates that RHMNH are inextricably linked, and that, therefore, health policies and programs should link them together. Such potential integration of strategies would not only help improve outcomes for millions of mothers and newborns but would also save scant resources. This would also allow for greater efficiency in training, monitoring, and supervision of health care workers and would also help families and communities to access and use services easily.

**Liambila, W., Askew, I., Mwangi, J., Ayisi, R., Kibaru, J., & Mullick, S. (2009). Feasibility and effectiveness of integrating provider-initiated testing and counselling within family planning services in Kenya. *AIDS*, 23(Suppl. 1), S115–S121.**

**Objective:** To assess an intervention for increasing access to and use of HIV testing among family planning clients through provider-initiated testing and counselling for HIV.

**Design:** Two versions of the intervention were prospectively compared using a prepost intervention only design. Health facilities were purposively selected and family planning consultations randomly selected.

**Setting:** Twenty-three public-sector hospitals, health centres and dispensaries in two districts of Central Province, Kenya.

**Participants:** One group of 28 family planning providers were trained in the integrated family planning-HIV counselling intervention and in providing HIV testing and counselling to family planning clients requesting a test during the consultation and another group of 47 family planning providers were trained in the intervention and in referring clients interested in an HIV test. Samples of family planning clients willing to be observed and interviewed were randomly selected (538 preintervention, 520 postintervention) and their informed consent obtained to observe their consultation.

**Intervention:** All family planning providers were trained in an algorithm that integrates HIV/sexually transmitted infection prevention counselling, including offering HIV testing and counselling, with family planning counselling. Clients choosing to be tested were either referred or tested during the consultation by a trained family planning provider.

**Main outcome measures:** The proportion of family planning clients with whom HIV testing was discussed; the proportion offered HIV testing; and the proportion choosing to have a test.

**Results:** The proportion of consultations in which HIV prevention counselling was provided and HIV testing offered increased significantly. The proportion of clients requesting an HIV test increased from 1 to 26%; approximately one third of these had never been tested previously.

**Conclusion:** Provider-initiated testing and counselling is feasible and acceptable in family planning services, does not adversely affect the quality of the family planning consultation and increases access to and use of HIV testing in a population who would benefit from knowing their status.

**Maynard-Tucker, G. (2009). HIV/AIDS and family planning services integration: Review of prospects for a comprehensive approach in sub-Saharan Africa. *African Journal of AIDS Research*, 8(4), 465–472.**

In most parts of the world, family planning and HIV-related services are usually offered separately. Family planning services, especially those that are government-supported, primarily serve married women and couples of reproductive age, while HIV-related services target individuals at higher-risk of exposure to HIV. However, the integration of family planning into HIV/AIDS programmes, or vice versa, would permit women of reproductive age who are infected or affected by HIV to benefit from family planning and/or HIV-prevention counselling and services. Sub-Saharan Africa is characterized by low modern contraceptive prevalence (below 20%), along with unmet needs for contraception, high use of abortion and the feminisation of HIV. Furthermore, the majority of children infected by HIV live in this region. The use of contraception would permit HIV-positive women to avoid unintended pregnancies and would reduce the number of children who are born with the virus. However, funding for family planning has decreased steadily over the last decade; the UNFPA recently reported that current assistance is less than half the amount needed. Donors more often support responses to HIV and AIDS, rather than other health interventions. This article reviews the difficulties and limitations facing the integration of family planning and HIV-related services. In addition, it suggests strategies to promote information for women and men of reproductive age about family planning, HIV prevention and referrals, including outside the context of health facilities.

**Spaulding, A. B., Brickley, D. B., Kennedy, C., Almers, L., Packel, L., Mirjahangir, J., . . . Mbizvo, M. (2009). Linking family planning with HIV/AIDS interventions: A systematic review of the evidence. *AIDS, 23*(1), 79–88.**

**Objective:** To conduct a systematic review of the literature and examine the effectiveness, optimal circumstances, and best practices for strengthening linkages between family planning and HIV interventions.

**Design:** Systematic review of peer-reviewed articles and unpublished program reports ('promising practices') evaluating interventions linking family planning and HIV services.

**Methods:** Articles were included if they reported post-intervention evaluation results from an intervention linking family planning and HIV services between 1990 and 2007. Systematic methods were used for searching, screening, and data extraction. Quality assessment was conducted using a 9-point rigor scale.

**Results:** Sixteen studies were included in the analysis (10 peer-reviewed studies and six promising practices). Interventions were categorized into six types: family planning services provided to HIV voluntary counseling and testing (VCT) clients, family planning and VCT services provided to maternal and child health clients, family planning services provided to people living with HIV, community health workers provided family planning and HIV services, VCT provided to family planning clinic clients, and VCT and family planning services provided to women receiving postabortion care. Average study design rigor was low (3.25 out of 9). Most studies reported generally positive or mixed results for key outcomes; no negative results were reported.

**Conclusion:** Interventions linking family planning and HIV services were generally considered feasible and effective, though overall evaluation rigor was low.

**Speizer, I. S., Fotso, J. C., Okigbo, C., Faye, C. M., & Seck, C. (2013). Influence of integrated services on postpartum family planning use: A cross-sectional survey from urban Senegal. *BMC Public Health, 13*, 752. doi:10.1186/1471-2458-13-752**

**Background:** Although the majority of postpartum women indicate a desire to delay a next birth, family planning (FP) methods are often not offered to, or taken up by, women in the first year postpartum. This study uses data from urban Senegal to examine exposure to FP information and services at the time of delivery and at child immunization appointments and to determine if these points of integration are associated with greater use of postpartum FP.

**Methods:** A representative, household sample of women, ages 15–49, was surveyed from six cities in Senegal in 2011. This study focuses on women who were within two years postpartum (n = 1879). We also include women who were surveyed through exit interviews after a visit to a high volume health facility in the same six cities; clients included were visiting the health facility for delivery, post-abortion care, postnatal care, and child immunization services (n = 794). Descriptive analyses are presented to examine exposure to FP services among postpartum women and women visiting the health facility. Logistic regression models are used to estimate the effect of integrated services on postpartum FP use in the household sample of women. Analyses were conducted using Stata version 12.

**Results:** Among exit interview clients, knowledge of integrated services is high but only a few reported receiving FP services. A majority of the women who did not receive FP services indicated an interest in receiving such information and services. Among the household sample of women up to two-years postpartum, those who received FP information at the time of delivery are more likely to be using modern FP postpartum than their counterparts who also delivered in a facility but did not

receive such information. Exposure to FP services at an immunization visit was not significantly related to postpartum FP use. Another key finding is that women with greater self-efficacy are more likely to use a modern FP method.

**Conclusion:** This study's findings lend strong support for the need to improve integration of FP services into maternal, newborn, and child health services with the goal of increasing postpartum women's use of FP methods in urban Senegal.

**Wallace, A., Dietz, V., & Cairns, K. L. (2009). Integration of immunization services with other health interventions in the developing world: What works and why? Systematic literature review. *Tropical Medicine & International Health*, 14(1), 11–19.**

**Objective:** To assess benefits, challenges and characteristics of integrating child and maternal health services with immunization programmes.

**Methods:** Literature review using journal databases and grey literature. Papers meeting the inclusion criteria were rated for the quality of methodology and relevant information was systematically abstracted.

**Results:** Integrated services were vitamin A supplementation, bednet distribution, deworming tablet distribution, Intermittent Preventive Therapy for infants and referrals for family planning services. Two key characteristics of success were compatibility between interventions and presence of a strong immunization service prior to integration. Overburdened staff, unequal resource allocation and logistical difficulties were mentioned as risks of integration, whereas rapid uptake of the linked intervention and less competition for resources were listed as two key benefits of integration.

**Conclusion:** The theoretical strengths of integrating other health services with immunization services remain to be rigorously proved in practice. When additional interventions are carefully selected for compatibility and when they receive adequate support, coverage of these interventions may improve, provided immunization coverage is already high. Evidence for the effectiveness of integration in increasing efficiency of resource use was insufficient and most benefits and challenges were not statistically quantified. More substantive information about the costs of integrated vs. vertical programmes and full documentation of the impacts of integration on immunization services should be published.

**Wallace, A. S., Ryman, T. K., & Dietz, V. (2012). Experiences integrating delivery of maternal and child health services with childhood immunization programs: Systematic review update. *Journal of Infectious Diseases*, 205(Suppl. 1), S6–S19. doi:10.1093/infdis/jir778**

**Background:** The World Health Organization and the United Nations Children's Fund promote integration of maternal and child health (MCH) and immunization services as a strategy to strengthen immunization programs. We updated our previous review of integrated programs and reviewed reports of integration of MCH services with immunization programs at the service delivery level.

**Methods:** Published and unpublished reports of interventions integrating MCH and immunization service delivery were reviewed by searching journal databases and Web sites and by contacting organizations.



**Results:** Among 27 integrated activities, interventions included hearing screening, human immunodeficiency virus services, vitamin A supplementation, deworming tablet administration, malaria treatment, bednet distribution, family planning, growth monitoring, and health education. When reported, linked intervention coverage increased, though not to the level of the corresponding immunization coverage in all cases. Logistical difficulties, time-intensive interventions ill-suited for campaign delivery, concern for harming existing services, inadequate overlap of target age groups, and low immunization coverage were identified as challenges.

**Conclusions:** Results of this review reinforce our 2005 review [refers to Wallace, Dietz, & Cairns, 2009—Ed.] findings, including importance of intervention compatibility and focus on immunization program strength. Ensuring proper planning and awareness of compatibility of service delivery requirements were found to be important. The review revealed gaps in information about costs, comparison to vertical delivery, and impact on all integrated interventions that future studies should aim to address.

## 5. HIV AND FAMILY PLANNING: PREVENTION OF MOTHER-TO-CHILD TRANSMISSION

**Achana, F. S., Debpuur, C., Akweongo, P., & Cleland, J. (2010). Postpartum abstinence and risk of HIV among young mothers in the Kassena-Nankana District of Northern Ghana. *Culture, Health & Sexuality*, 12(5), 569–581.**

This study explored the role and shaping of postpartum abstinence on young mothers' sexual conduct and vulnerability to HIV infection in a rural setting of Northern Ghana. Young mothers in their mid-twenties to early-thirties and men married to young mothers were purposively selected for repeated semi-structured interviews. The interviews were tape-recorded, transcribed and Nvivo software was used to organize and manage the data for analysis. In this setting, postpartum abstinence was perceived as a risk period for STIs due to increased male infidelity during this period. Yet, women's urge to take action to mitigate the risk of STIs is compromised by childbearing obligations. More assertive women, however, employ crafty and nifty protective strategies including the masturbation of their male partner when they perceive themselves at risk. We conclude that the advent of HIV and AIDS, coupled with improved access to sexual and reproductive health information and modern contraception, has eroded the logic of observance of postpartum abstinence in the Kassena-Nankana District of Northern Ghana. Efforts should be made to facilitate easy access to modern contraceptives and HIV protection by rural women.

**Allen, S., Serufulira, A., Gruber, V., Kegeles, S., Van de Perre, P., Carael, M., & Coates, T. J. (1993). Pregnancy and contraception use among urban Rwandan women after HIV testing and counseling. *American Journal of Public Health*, 83(5), 705–710.**

**Objectives:** This study examined hormonal contraceptive use and pregnancy in urban Rwandan women, following human immunodeficiency virus (HIV) antibody testing and counseling.

**Methods:** A sample of 1458 childbearing urban Rwandan women aged 18 to 35 years was tested and followed for 2 years.

**Results:** At enrollment, 17% of 998 HIV-negative women and 11% of 460 HIV-positive women were pregnant, and 17% vs. 23%, respectively, were using hormonal contraceptives. One year later, half of the HIV-positive and one third of the HIV-negative hormonal-contraceptive users had discontinued use. The 2-year incidence of pregnancy was 43% in HIV-positive and 58% in HIV-negative women. HIV-positive women with fewer than four children were more likely to become pregnant than those with four or more; this association persisted in multivariate analyses but was not noted among HIV-negative women. At the end of the study, over 40% of non-users said that they would use hormonal contraception if it was provided at the study clinic, but 40% of HIV-positive women desired more children.

**Conclusions:** Research is needed to identify the practical and psychosocial obstacles to effective long-term contraception among HIV-positive women. HIV counseling programs must specifically address the issue of childbearing.

**Balkus, J., Bosire, R., John-Stewart, G., Mbori-Ngacha, D., Schiff, M. A., Wamalwa, D., . . . Farquhar, C. (2007). High uptake of postpartum hormonal contraception among HIV-1-seropositive women in Kenya. *Sexually Transmitted Diseases*, 34(1), 25–29.**

**Objectives:** The objectives of this study were to determine patterns of contraceptive utilization among sexually active HIV-1-seropositive women postpartum and to identify correlates of hormonal contraception uptake.

**Goal:** The goal of this study was to improve delivery of family planning services to HIV-1-infected women in resource-limited settings.

**Study design:** HIV-1-infected pregnant women were followed prospectively in a perinatal HIV-1 transmission study. Participants were referred to local clinics for contraceptive counseling and management.

**Results:** Among 319 HIV-1-infected women, median time to sexual activity postpartum was 2 months and 231 (72%) women used hormonal contraception for at least 2 months during follow-up, initiating use at approximately 3 months postpartum (range, 1-11 months). Overall, 101 (44%) used DMPA, 71 (31%) oral contraception, and 59 (25%) switched methods during follow-up. Partner notification, infant mortality, and condom use were similar between those using and not using contraception.

**Conclusions:** Using the existing healthcare infrastructure, it is possible to achieve high levels of postpartum hormonal contraceptive utilization among HIV-1-seropositive women.

**Behets, F. M. T. F., Matendo, R., Vaz, L. M. E., Kilese, N., Nanlele, D., Kokolomami, J., . . . Van Rie, A. (2006). Preventing vertical transmission of HIV in Kinshasa, Democratic Republic of the Congo: A baseline survey of 18 antenatal clinics. *Bulletin of the World Health Organization*, 84(12), 969–975.**

**Objective:** To assess the content and delivery of essential antenatal services before implementation of programmes for prevention of mother-to-child transmission (PMTCT) of human immunodeficiency virus (HIV).

**Methods:** We assessed 18 antenatal care centres (eight public units and ten managed by nongovernmental organizations) in Kinshasa, Democratic Republic of the Congo. We used a survey to capture information about the number and type of antenatal health workers, infrastructure capacity and the delivery of basic antenatal care services such as: nutritional counseling; tetanus toxoid vaccination; prevention and management of anaemia, malaria, sexually transmitted infections, and tuberculosis; and counseling for postpartum contraception.

**Findings:** Antenatal care units differed with respect to size, capacity, cost, service delivery systems and content. For instance, 17 of the 18 sites offered anaemia screening but only two sites included the cost in the card that gives access to antenatal care. Nine of the clinics (50%) reported providing the malaria prophylaxis sulfadoxine pyrimethamine as per national policy. Four (22%) of the sites offered syphilis screening.

**Conclusion:** Scaling up PMTCT programmes in under-resourced settings requires evaluation and strengthening of existing basic antenatal service delivery.

**Bii, S. C., Otieno-Nyunya, B., Siika, A., & Rotich, J. K. (2008). Family planning and safer sex practices among HIV infected women receiving prevention of mother-to-child transmission services at Kitale District Hospital. *East African Medical Journal*, 85(1), 46–50.**

**Objectives:** To determine the usage of family planning services and safer sex practices among HIV infected mothers who had gone through the prevention of mother to child transmission (PMTCT) process.

**Design:** Descriptive cross-sectional study.

**Setting:** The maternal and child health and family planning (MCH-FP) clinics in Kitale District Hospital, Western Kenya.

**Results:** A total of 146 respondents were recruited for this study. Only 44% of the respondents were using some form of family planning. The most popular method of contraception was the hormonal injectable contraceptives. Although 73% of respondents were no longer planning to have more babies, only 45% of them were using a family planning method. Only 38% of respondents reported condom use with their partners for safe sex. Married women and those who had revealed their HIV status to their partners were more likely to use condoms ( $p < 0.05$ ).

**Conclusions:** Usage of family planning services in this study was low. A large percentage of the women were still planning to have more babies and very few women were using condoms for safe sex. Women who had informed their partners about their HIV status were more likely to use condoms than those who had not. Male partner involvement is crucial in decisions-pertaining to family planning use and safe sex practices.

**Brou, H., Viho, I., Djohan, G., Ekouévi, D. K., Zanou, B., Leroy, V., . . . pour le groupe Ditrane Plus ANRS 1202/1201/1253. (2009). Contraceptive use and incidence of pregnancy among women after HIV testing in Abidjan, Ivory Coast [French]. *Revue d'Epidémiologie et de Santé Publique*, 57(2), 77–86.**

**Background:** Within the framework of programs for the prevention of mother-to-child HIV transmission, women who discover their HIV-infection during their pregnancy receive perinatal interventions in order to reduce the risk of HIV transmission to the child. They also receive family planning counselling and free contraceptives in order to avoid a new pregnancy. In this study, we compared contraceptive use and pregnancy incidence between HIV-positive and HIV-negative women who were offered HIV counselling and testing during a program of prevention of mother-to-child HIV transmission.

**Methods:** In the Ditrane Plus program in Abidjan, 546 HIV-positive and 393 HIV-negative women were HIV-tested prenatally and followed up 2 years after delivery. At each post-partum visit, proportions of contraceptive use were noted, by method. The pregnancy incidence was calculated as the number of pregnancies for 100 women-years at risk. Factors related to the arrival of a new pregnancy were analyzed by Cox model.

**Results:** Between 6 and 24 months post-partum, proportions of women using modern contraception varied from 52 to 65% among HIV-positive women, and from 65 to 75% among HIV-negative women. Pregnancy incidence for 100 women-years at risk was 5.70 (95%CI: 4.17-7.23) and 4.37 (95%CI : 2.83-5.91) ( $p = 0.237$ ) and unwanted pregnancy incidence was 1.07 (95%CI: 0.41-1.73) and 2.39 (95%CI: 1.25-3.53) ( $p = 0.023$ ), respectively among HIV-positive and HIV-negative women. The end of post-partum abstinence, the death of the index child and the

end of breastfeeding were positively linked to the arrival of a new pregnancy in the post-partum period.

**Conclusion:** Among these women prenatally HIV-tested, family planning counselling and regular follow-up was accompanied by a high rate of contraceptive use after delivery, and consecutively to a low pregnancy incidence irrespective of serostatus. In particular, HIV-positive women had fewer unwanted pregnancies than HIV-negative women. Integration of adequate family planning services in the post-partum follow-up in prevention programs plays an important role in reducing the risk of mother-to-child transmission, by reducing pregnancies among HIV-positive women.

**Cleland, J. G., Ali, M. M., & Capo-Chichi, V. (1999). Post-partum sexual abstinence in West Africa: Implications for AIDS-control and family planning programmes. *AIDS, 13*(1), 125–131.**

**Objective:** To assess whether the custom of prolonged post-partum sexual abstinence in Benin is associated with an increased incidence of extra-marital sexual contacts by husbands.

**Design:** Cross-sectional survey of adult men and women.

**Methods:** Data obtained from men on their extra-marital sexual behavior in the past 12 months were linked to data on post-partum abstinence over the same time interval reported by wives. Multivariate analysis was applied to assess the association between conjugal abstinence and husband's extra-marital sex, net of the effects of possible confounders.

**Results:** Approximately half of married men experienced post-partum abstinence in the past 12 months. In this group, 32% reported one or more extra-marital sexual contacts compared with 20% among those who experienced no abstinence (OR = 1.8,  $P < 0.001$ ). This association is essentially unchanged after controlling for marriage type, age, education, urban-rural residence, income and household wealth. Age, income and wealth are also significant predictors of the probability of extra-marital sex. The effects of income and wealth largely disappear when attention is restricted to extra-marital sex without using a condom on the most recent occasion.

**Conclusions:** The potentially protective effect of prolonged abstinence after childbirth in Benin (and probably in much of West Africa) is offset by an increased probability that husbands will seek extra-marital partners without using condoms. Although not quantifiable, the enhanced longer-term risks of sexually transmitted diseases/HIV infection for wives probably outweigh the short-term benefits. Family planning practitioners in this region should not hesitate to recommend the early resumption of sex and suitable methods of post-partum contraception for women who express concern or uncertainty about their husband's behavior.

**Coovadia, H. M., Rollins, N. C., Bland, R. M., Little, K., Coutsoodis, A., Bennish, M. L., & Newell, M. L. (2007). Mother-to-child transmission of HIV-1 infection during exclusive breastfeeding in the first 6 months of life: An intervention cohort study. *Lancet, 369*(9567), 1107–1116.**

**Background:** Exclusive breastfeeding, though better than other forms of infant feeding and associated with improved child survival, is uncommon. We assessed the HIV-1 transmission risks and survival associated with exclusive breastfeeding and other types of infant feeding.

**Methods:** 2722 HIV-infected and uninfected pregnant women attending antenatal clinics in KwaZulu Natal, South Africa (seven rural, one semiurban, and one urban), were enrolled into a

non-randomised intervention cohort study. Infant feeding data were obtained every week from mothers, and blood samples from infants were taken monthly at clinics to establish HIV infection status. Kaplan-Meier analyses conditional on exclusive breastfeeding were used to estimate transmission risks at 6 weeks and 22 weeks of age, and Cox's proportional hazard was used to quantify associations with maternal and infant factors.

**Findings:** 1132 of 1372 (83%) infants born to HIV-infected mothers initiated exclusive breastfeeding from birth. Of 1276 infants with complete feeding data, median duration of cumulative exclusive breastfeeding was 159 days (first quartile [Q1] to third quartile [Q3], 122–174 days). 14.1% (95% CI 12.0–16.4) of exclusively breastfed infants were infected with HIV-1 by age 6 weeks and 19.5% (17.0–22.4) by 6 months; risk was significantly associated with maternal CD4-cell counts below 200 cells per  $\mu\text{L}$  (adjusted hazard ratio [HR] 3.79; 2.35–6.12) and birthweight less than 2500 g (1.81, 1.07–3.06). Kaplan-Meier estimated risk of acquisition of infection at 6 months of age was 4.04% (2.29–5.76). Breastfed infants who also received solids were significantly more likely to acquire infection than were exclusively breastfed children (HR 10.87, 1.51–78.00,  $p=0.018$ ), as were infants who at 12 weeks received both breastmilk and formula milk (1.82, 0.98–3.36,  $p=0.057$ ). Cumulative 3-month mortality in exclusively breastfed infants was 6.1% (4.74–7.92) versus 15.1% (7.63–28.73) in infants given replacement feeds (HR 2.06, 1.00–4.27,  $p=0.051$ ).

**Interpretation:** The association between mixed breastfeeding and increased HIV transmission risk, together with evidence that exclusive breastfeeding can be successfully supported in HIV-infected women, warrant revision of the present UNICEF, WHO, and UNAIDS infant feeding guidelines.

**Credé, S., Hoke, T., Constant, D., Green, M. S., Moodley, J., & Harries, J. (2012). Factors impacting knowledge and use of long acting and permanent contraceptive methods by postpartum HIV positive and negative women in Cape Town, South Africa: A cross-sectional study. *BMC Public Health*, 12, 197. doi:10.1186/1471-2458-12-197**

**Background:** The prevention of unintended pregnancies among HIV positive women is a neglected strategy in the fight against HIV/AIDS. Women who want to avoid unintended pregnancies can do this by using a modern contraceptive method. Contraceptive choice, in particular the use of long acting and permanent methods (LAPMs), is poorly understood among HIV-positive women. This study aimed to compare factors that influence women's choice in contraception and women's knowledge and attitudes towards the IUD and female sterilization by HIV-status in a high HIV prevalence setting, Cape Town, South Africa.

**Methods:** A quantitative cross-sectional survey was conducted using an interviewer-administered questionnaire amongst 265 HIV positive and 273 HIV-negative postpartum women in Cape Town. Contraceptive use, reproductive history and the future fertility intentions of postpartum women were compared using chi-squared tests, Wilcoxon rank-sum and Fisher's exact tests where appropriate. Women's knowledge and attitudes towards long acting and permanent methods as well as factors that influence women's choice in contraception were examined.

**Results:** The majority of women reported that their most recent pregnancy was unplanned (61.6% HIV positive and 63.2% HIV negative). Current use of contraception was high with no difference by HIV status (89.8% HIV positive and 89% HIV negative). Most women were using short acting methods, primarily the 3-monthly injectable (Depo Provera). Method convenience and health care

provider recommendations were found to most commonly influence method choice. A small percentage of women (6.44%) were using long acting and permanent methods, all of whom were using sterilization; however, it was found that poor knowledge regarding LAPMs is likely to be contributing to the poor uptake of these methods.

**Conclusions:** Improving contraceptive counselling to include LAPM and strengthening services for these methods are warranted in this setting for all women regardless of HIV status. These study results confirm that strategies focusing on increasing users' knowledge about LAPM are needed to encourage uptake of these methods and to meet women's needs for an expanded range of contraceptives which will aid in preventing unintended pregnancies. Given that HIV positive women were found to be more favourable to future use of the IUD it is possible that there may be more uptake of the IUD amongst these women.

**De Schacht, C., Mabunda, N., Ferreira, O. C., Calú, N., Santos, I., Hoffman, H. J., . . . Jani, I. V. (2014). High HIV incidence in the postpartum period sustains vertical transmission in settings with generalized epidemics: A cohort study in Southern Mozambique. *Journal of the International AIDS Society*, 17(1), 18808. doi:10.7448/IAS.17.1.18808**

**Introduction:** Acute infection with HIV in the postpartum period results in a high risk of vertical transmission through breastfeeding. A study was done to determine the HIV incidence rate and associated risk factors among postpartum women in Southern Mozambique, where HIV prevalence among pregnant women is 21%.

**Methods:** A prospective cohort study was conducted in six rural health facilities in Gaza and Maputo provinces from March 2008 to July 2011. A total of 1221 women who were HIV-negative on testing at delivery or within two months postpartum were recruited and followed until 18 months postpartum. HIV testing, collection of dried blood spot samples and administration of a structured questionnaire to women were performed every three months. Infant testing by DNA-PCR was done as soon as possible after identification of a new infection in women. HIV incidence was estimated, and potential risk factors at baseline were compared using Poisson regression.

**Results:** Data from 957 women were analyzed with follow-up after the enrolment visit, with a median follow-up of 18.2 months. The HIV incidence in postpartum women is estimated at 3.20/100 women-years (95% CI: 2.30–4.46), with the highest rate among 18- to 19-year-olds (4.92 per 100 women-years; 95% CI: 2.65–9.15). Of the new infections, 14 (34%) were identified during the first six months postpartum, 11 (27%) between 6 and 12 months and 16 (39%) between 12 and 18 months postpartum. Risk factors for incident HIV infection include young age, low number of children, higher education level of the woman's partner and having had sex with someone other than one's partner. The vertical transmission was 21% (95% CI: 5–36) among newly infected women.

**Conclusions:** Incidence of HIV is high among breastfeeding women in Southern Mozambique, contributing to increasing numbers of HIV-infected infants. Comprehensive primary prevention strategies targeting women of reproductive age, particularly pregnant and postpartum women and their partners, will be crucial for the elimination of paediatric AIDS in Africa.

**Desgrées-Du-Loû, A., Msellati, P., Viho, I., Yao, A., Yapi, D., Kassi, P., . . . Ditrane Study Group. (2002). Contraceptive use, protected sexual intercourse and incidence of pregnancies among African HIV-infected women. DITRAME ANRS 049 Project, Abidjan 1995–2000. *International Journal of STD and AIDS*, 13(7), 462–468.**

The aim of this paper is to describe the adherence of African HIV+ women to the counseling provided after announcement of the result of the HIV test during pregnancy, focusing on early weaning to reduce post-natal transmission, protected sexual intercourse to avoid sexual transmission, and contraceptive use to avoid unexpected pregnancies. In 1999–2000, a questionnaire on sexual and reproductive behaviors was administered to 149 HIV+ women followed in post-partum, informed and counseled in the ANRS 049 DITRAME project in Abidjan, Cote d'Ivoire. Duration of breastfeeding, post-partum amenorrhea and abstinence, contraceptive use and condom use were measured. Incidence of pregnancies during the first 24 months postpartum was estimated and modeled by a Cox regression model. Average duration of breastfeeding was 7.9 months, average duration of postpartum abstinence was 12.0 months, and 39% of women used contraceptives at the time of the survey. Frequency of condom use was 13%. Incidence of pregnancies was 16.5 per 100 women-years at risk. Half of these pregnancies were not desired and a third were terminated by induced abortion. The significant determinants of the pregnancy occurrence were the death of the previous child, the cessation of breastfeeding, the cessation of the postpartum abstinence, and higher education. In conclusion, if counseling on early weaning can be followed by the HIV+ women, it is not easily the case for condom and contraceptive use. Hence, pregnancy incidence in the post-partum follow-up was high. The main strategy of these HIV+ women to avoid unexpected pregnancies as well as sexual transmission of HIV seems to be an increase of the duration of post-partum abstinence. The most educated women who cannot easily adopt this strategy are particularly exposed to unwanted pregnancies.

**Dhont, N., Ndayisaba, G. F., Peltier, C. A., Nzabonimpa, A., Temmerman, M., & van de Wijgert, J. (2009). Improved access increases postpartum uptake of contraceptive implants among HIV-positive women in Rwanda. *European Journal of Contraception & Reproductive Health Care*, 14(6), 420–425.**

**Background:** Long-acting reversible contraceptives (LARCs) and sterilisation are the most cost-effective methods of contraception but are rarely used in sub-Saharan Africa partly due to limited access.

**Study design:** HIV-positive pregnant women attending two urban clinics in Rwanda were followed prospectively in a perinatal HIV transmission cohort study. Women attending one clinic were referred to public family planning (FP) services for all contraceptive methods (Site A) and women attending the other clinic (Site B) were offered implants and intrauterine devices (IUDs) on-site.

**Results:** Fifty three percent of the pregnant women reported an intention to use a LARC or to be sterilised after delivery. The uptake of implants was significantly higher at Site B (38%) than at Site A (6%). The IUD uptake was extremely low at both sites (2%). Twenty-eight of the 39 women at Site B who had intended to start using a LARC actually did so as compared to only one of 23 at Site A.

**Conclusion:** When access to LARC was provided, a substantial number of HIV-positive women started using hormonal implants, but not IUDs, in the postpartum period. HIV and FP services should consider improving access to implants to reduce the number of unintended pregnancies.



**Duerr, A., Hurst, S., Kourtis, A. P., Rutenberg, N., & Jamieson, D. J. (2005). Integrating family planning and prevention of mother-to-child HIV transmission in resource-limited settings. *Lancet*, 366(9481), 261–263.**

This *Lancet* viewpoint paper presents the case for the integration of family planning and prevention of mother-to-child HIV transmission programs. The authors review the varied contraceptive options available for HIV-infected women and discuss how the integration of programs may provide more integrated health care, although they recognize that “we lack documentation of the effectiveness of integrating family planning services with mother-to-child transmission prevention programmes” (Duerr, Hurst, Kourtis, Rutenberg, & Jamieson, 2005, p. 262). However, while the current practice is to use antiretrovirals to protect against vertical transmission of HIV to the newborn, the authors postulate that it may be just as effective to guard against vertical transmission by preventing pregnancies in the first place through postpartum contraception (Duerr et al., 2005).

**Elul, B., Delvaux, T., Munyana, E., Lahuerta, M., Horowitz, D., Ndagije, F., . . . Asiimwe, A. (2009). Pregnancy desires, and contraceptive knowledge and use among prevention of mother-to-child transmission clients in Rwanda. *AIDS*, 23(Suppl. 1), S19–S26.**

**Objective:** To understand pregnancy intentions and contraception knowledge and use among HIV-positive and negative women in the national prevention of mother-to-child transmission (PMTCT) program in Rwanda.

**Design:** A cross-sectional survey of 236 HIV-positive and 162 HIV-negative postpartum women interviewed within 12 months of their expected delivery date in 12 randomly selected public-sector health facilities providing PMTCT services.

**Methods:** Bivariate analyses explored fertility intentions, and family planning knowledge and use by HIV status. Multivariate analysis identified socio-demographic and service delivery-related predictors of reporting a desire for additional children and modern family planning use.

**Results:** HIV-positive women were less likely to report wanting additional children than HIV-negative women (8 vs. 49%,  $P < 0.001$ ), and although a majority of women reported discussing family planning with a health worker during their last pregnancy (HIV-positive 79% vs. HIV-negative 69%,  $P = 0.057$ ), modern family planning use remained low in both groups (HIV-positive 43% vs. HIV-negative 12%,  $P < 0.001$ ). Condoms were the most commonly used method among HIV-positive women (31%), whereas withdrawal was most frequently reported among HIV-negative women (19%). In multivariate analysis, HIV-negative women were 16 times more likely to report wanting additional children and nearly 85% less likely to use modern family planning. Women who reported making two or less antenatal care visits were 77% less likely to use modern family planning.

**Conclusion:** Our results highlight success in provision of family planning counseling in PMTCT services in Rwanda. As family planning use was low among HIV-positive and negative women, further efforts are needed to improve uptake of modern methods, including dual protection, in Rwandan PMTCT settings.

**Family Health International. (2006.) *Contraception cost-effective for preventing mother-to-child transmission of HIV.* USAID & Family Health International. Retrieved from <http://www.fhi360.org/sites/default/files/media/documents/ContraceptionforPMTCTenrh.pdf>**

#### **Summary**

Most efforts to reduce mother-to-child transmission of HIV focus on increasing HIV counseling and testing services and services that provide antiretroviral drugs, like nevirapine, to HIV-infected mothers and their newborns. But another strategy is to increase contraceptive use among sexually active women who wish to avoid pregnancy. Family Health International has developed a model to assess the cost-effectiveness of this strategy—preventing unintended pregnancies—as an HIV prevention approach. When the model was applied to a hypothetical population in sub-Saharan Africa, reducing unmet need for contraception was more cost-effective for preventing HIV-positive births than was the current programmatic emphasis on HIV counseling and testing coupled with nevirapine provision. These results emphasize the central role that contraception can and should play in HIV prevention.

**Farquhar, C., Kiarie, J. N., Richardson, B. A., Kabura, M. N., John, F. N., Nduati, R. W., . . . John-Stewart, G. C. (2004). Antenatal couple counseling increases uptake of interventions to prevent HIV-1 transmission. *Journal of Acquired Immune Deficiency Syndromes*, 37(5), 1620–1626.**

To determine effect of partner involvement and couple counseling on uptake of interventions to prevent HIV-1 transmission, women attending a Nairobi antenatal clinic were encouraged to return with partners for voluntary HIV-1 counseling and testing (VCT) and offered individual or couple posttest counseling. Nevirapine was provided to HIV-1-seropositive women and condoms distributed to all participants. Among 2104 women accepting testing, 308 (15%) had partners participate in VCT, of whom 116 (38%) were couple counseled. Thirty-two (10%) of 314 HIV-1-seropositive women came with partners for VCT; these women were 3-fold more likely to return for nevirapine ( $P = 0.02$ ) and to report administering nevirapine at delivery ( $P = 0.009$ ). Nevirapine use was reported by 88% of HIV-infected women who were couple counseled, 67% whose partners came but were not couple counseled, and 45% whose partners did not present for VCT ( $P$  for trend = 0.006). HIV-1-seropositive women receiving couple counseling were 5-fold more likely to avoid breast-feeding ( $P = 0.03$ ) compared with those counseled individually. Partner notification of HIV-1-positive results was reported by 138 women (64%) and was associated with 4-fold greater likelihood of condom use ( $P = 0.004$ ). Partner participation in VCT and couple counseling increased uptake of nevirapine and formula feeding. Antenatal couple counseling may be a useful strategy to promote HIV-1 prevention interventions.

**Grossman, D., Onono, M., Newmann, S. J., Blat, C., Bukusi, E. A., Shade, S. B., . . . Cohen, C. R. (2013). Integration of family planning services into HIV care and treatment in Kenya: A cluster-randomized trial. *AIDS, 27*(Suppl. 1), S77–S85. doi:10.1097/QAD.000000000000035**

**Objective:** To determine whether integrating family planning services into HIV care is associated with increased use of more effective contraceptive methods (sterilization, intrauterine device, implant, injectable or oral contraceptives).

**Design:** Cluster-randomized trial.

**Setting:** Eighteen public HIV clinics in Nyanza Province, Kenya.

**Participants:** Women aged 18–45 years receiving care at participating HIV clinics; 5682 clinical encounters from baseline period (December 2009–February 2010) and 12 531 encounters from end-line period (July 2011–September 2011, 1 year after site training).

**Intervention:** Twelve sites were randomized to integrate family planning services into the HIV clinic, whereas six clinics were controls where clients desiring contraception were referred to family planning clinics at the same facility.

**Main outcome measures:** Increase in use of more effective contraceptive methods between baseline and end-line periods. Pregnancy rates during the follow-up year (October 2010–September 2011) were also compared.

**Results:** Women seen at integrated sites were significantly more likely to use more effective contraceptive methods at the end of the study [increased from 16.7 to 36.6% at integrated sites, compared to increase from 21.1 to 29.8% at controls; odds ratio (OR) 1.81, 95% confidence interval (CI) 1.24–2.63]. Condom use decreased non-significantly at intervention sites compared to controls (OR 0.64, 95% CI 0.35–1.19). No difference was observed in incident pregnancy in the first year after integration comparing intervention to control sites (incidence rate ratio 0.90; 95% CI 0.68–1.20).

**Conclusions:** Integration of family planning services into HIV care clinics increased use of more effective contraceptive methods with a non-significant reduction in condom use. Although no significant reduction in pregnancy incidence was observed during the study, 1 year may be too short a period of observation for this outcome.

**Hayford, S. R., & Agadjanian, V. (2010). Providers' views concerning family planning service delivery to HIV-positive women in Mozambique. *Studies in Family Planning, 41*(4), 291–300.**

This study explores challenges and obstacles in providing effective family planning services to HIV-positive women as described by staff of maternal and child health (MCH) clinics. It draws upon data from a survey of service providers carried out from late 2008 to early 2009 in 52 MCH clinics in southern Mozambique, some with and some without HIV services. In all clinics, surveyed providers reported that practical, financial, and social barriers made it difficult for HIV-positive clients to follow protocols to prevent mother-to-child transmission of the virus. Likewise, staff were skeptical of their seropositive clients' ability to adhere to recommendations to cease childbearing and to use condoms consistently. Providers' recommendations to HIV-positive clients and their assessment of barriers to adherence did not depend on availability of HIV services. Although integration of HIV and reproductive health services is advancing in Mozambique, service providers do not feel that they can influence the behaviors of HIV-positive women effectively.

**Hladik, W., Stover, J., Esiru, G., Harper, M., & Tappero, J. (2009). The contribution of family planning towards the prevention of vertical HIV transmission in Uganda. *PloS One*, 4(11), E7691. doi:10.1371/journal.pone.0007691**

**Background:** Uganda has one of the highest total fertility rates (TFR) worldwide. We compared the effects of antiretroviral (ARV) prophylaxis for the prevention of mother-to-child HIV transmission (PMTCT) to that of existing family planning (FP) use and estimated the burden of pediatric HIV disease due to unwanted fertility.

**Methodology/principal findings:** Using the demographic software Spectrum, a baseline mathematical projection to estimate the current pediatric HIV burden in Uganda was compared to three hypothetical projections: 1) without ARV-PMTCT (to estimate the effect of ARV-PMTCT), 2) without contraception (effect of existing FP use), 3) without unwanted fertility (effect of unmet FP needs). Key input parameters included HIV prevalence, ARV-PMTCT uptake, MTCT probabilities, and TFR. We estimate that in 2007, an estimated 25,000 vertical infections and 17,000 pediatric AIDS deaths occurred (baseline projection). Existing ARV-PMTCT likely averted 8.1% of infections and 8.5% of deaths. FP use likely averted 19.7% of infections and 13.1% of deaths. Unwanted fertility accounted for 21.3% of infections and 13.4% of deaths. During 2008-2012, an estimated 131,000 vertical infections and 71,000 pediatric AIDS deaths will occur. The projected scale up of ARV-PMTCT (from 39%-57%) may avert 18.1% of infections and 24.5% of deaths. Projected FP use may avert 21.6% of infections and 18.5% of deaths. Unwanted fertility will account for 24.5% of infections and 19.8% of deaths.

**Conclusions:** Existing FP use contributes as much or more than ARV-PMTCT in mitigating pediatric HIV in Uganda. Expanding FP services can substantially contribute towards PMTCT.

**Hopkins, K., Maria Barbosa, R., Riva Knauth, D., and Potter, J. E. (2005). The impact of health care providers on female sterilization among HIV-positive women in Brazil. *Social Science and Medicine*, 61(3), 541–554.**

This paper explores the reproductive preferences and outcomes of HIV-positive women in two cities in Brazil. We used three types of data, all drawn from women who delivered in public sector hospitals: (1) clinical records of 427 HIV-positive women; (2) pre- and postpartum in-depth interviews with 60 HIV-positive women; and (3) a prospective survey carried out among 363 women drawn from the general population. The HIV-positive samples were collected on women who had prenatal care between July 1999 and June 2000, and the general population survey was conducted with women who started prenatal care between April 1998 and June 1999. Among the women in the clinic sample, we found dramatic differences in the proportion sterilized postpartum: 51% in Sao Paulo vs. 4% in Porto Alegre, compared to 3.4% and 1.1%, respectively, of women in the general population. Our qualitative data suggest that HIV-positive women in this study had strong preferences to have no more future children and that female sterilization was the preferred way to achieve this end. Therefore, we conclude that the large difference in rates is mainly due to HIV-positive women's differential access to sterilization in the two settings. In-depth interviews revealed that women in Sao Paulo were often encouraged by clinic staff to be sterilized postpartum. In contrast, HIV-positive women in Porto Alegre clinics were not offered sterilization as an option and those who requested it were repeatedly put off. The striking difference found in the frequency with which doctors provide postpartum sterilization to seropositive women in our study sites deserves attention and discussion in the respective medical communities. At the higher level of

national policy on reproductive rights, there may be grounds for reopening discussion about the norms regarding postpartum procedures, and for devoting far more resources to expanding contraceptive options.

**Humphrey, J. H., Marinda, E., Mutasa, K., Moulton, L. H., Iliff, P. J., Ntozini, R., . . . ZVITAMBO study group. (2010). Mother to child transmission of HIV among Zimbabwean women who seroconverted postnatally: Prospective cohort study. *British Medical Journal*, 341, c6580. doi:10.1136/bmj.c6580**

**Objectives:** To estimate the rates and timing of mother to infant transmission of HIV associated with breast feeding in mothers who seroconvert postnatally, and their breast milk and plasma HIV loads during and following seroconversion, compared with women who tested HIV positive at delivery.

**Design:** Prospective cohort study.

**Setting:** Urban Zimbabwe.

**Participants:** 14 110 women and infants enrolled in the Zimbabwe Vitamin A for Mothers and Babies (ZVITAMBO) trial (1997-2001).

**Main outcome measures:** Mother to child transmission of HIV, and breast milk and maternal plasma HIV load during the postpartum period.

**Results:** Among mothers who tested HIV positive at baseline and whose infant tested HIV negative with polymerase chain reaction (PCR) at six weeks (n=2870), breastfeeding associated transmission was responsible for an average of 8.96 infant infections per 100 child years of breast feeding (95% CI 7.92 to 10.14) and varied little over the breastfeeding period. Breastfeeding associated transmission for mothers who seroconverted postnatally (n=334) averaged 34.56 infant infections per 100 child years (95% CI 26.60 to 44.91) during the first nine months after maternal infection, declined to 9.50 (95% CI 3.07 to 29.47) during the next three months, and was zero thereafter. Among women who seroconverted postnatally and in whom the precise timing of infection was known ( $\leq 90$  days between last negative and first positive test; n=51), 62% (8/13) of transmissions occurred in the first three months after maternal infection and breastfeeding associated transmission was 4.6 times higher than in mothers who tested HIV positive at baseline and whose infant tested HIV negative with PCR at six weeks. Median plasma HIV concentration in all mothers who seroconverted postnatally declined from 5.0 log<sub>10</sub> copies/mL at the last negative enzyme linked immunosorbent assay (ELISA) to 4.1 log<sub>10</sub> copies/mL at 9-12 months after infection. Breast milk HIV load in this group was 4.3 log<sub>10</sub> copies/mL 0-30 days after infection, but rapidly declined to 2.0 log<sub>10</sub> copies/mL and <1.5 log<sub>10</sub> copies/mL by 31-90 days and more than 90 days, respectively. Among women whose plasma sample collected soon after delivery tested negative for HIV with ELISA but positive with PCR (n=17), 75% of their infants were infected or had died by 12 months. An estimated 18.6% to 20.4% of all breastfeeding associated transmission observed in the ZVITAMBO trial occurred among mothers who seroconverted postnatally.

**Conclusions:** Breastfeeding associated transmission is high during primary maternal HIV infection and is mirrored by a high but transient peak in breast milk HIV load. Around two thirds of breastfeeding associated transmission by women who seroconvert postnatally may occur while the mother is still in the "window period" of an antibody based test, when she would test HIV negative using one of these tests.

**Illif, P. J., Piwoz, E. G., Tavengwa, N. V., Zunguza, C. D., Marinda, E. T., Nathoo, K. J., . . . ZVITAMBO study group. (2005). Early exclusive breastfeeding reduces the risk of postnatal HIV-1 transmission and increases HIV-free survival. *AIDS, 19*(7), 699–708.**

**Objectives:** The promotion of exclusive breastfeeding (EBF) to reduce the postnatal transmission (PNT) of HIV is based on limited data. In the context of a trial of postpartum vitamin A supplementation, we provided education and counseling about infant feeding and HIV, prospectively collected information on infant feeding practices, and measured associated infant infections and deaths.

**Design and methods:** A total of 14 110 mother-newborn pairs were enrolled, randomly assigned to vitamin A treatment group after delivery, and followed for 2 years. At baseline, 6 weeks and 3 months, mothers were asked whether they were still breastfeeding, and whether any of 22 liquids or foods had been given to the infant. Breastfed infants were classified as exclusive, predominant, or mixed breastfed.

**Results:** A total of 4495 mothers tested HIV positive at baseline; 2060 of their babies were alive, polymerase chain reaction negative at 6 weeks, and provided complete feeding information. All infants initiated breastfeeding. Overall PNT (defined by a positive HIV test after the 6-week negative test) was 12.1%, 68.2% of which occurred after 6 months. Compared with EBF, early mixed breastfeeding was associated with a 4.03 (95% CI 0.98, 16.61), 3.79 (95% CI 1.40-10.29), and 2.60 (95% CI 1.21-5.55) greater risk of PNT at 6, 12, and 18 months, respectively. Predominant breastfeeding was associated with a 2.63 (95% CI 0.59-11.67), 2.69 (95% CI 0.95-7.63) and 1.61 (95% CI 0.72-3.64) trend towards greater PNT risk at 6, 12, and 18 months, compared with EBF.

**Conclusion:** EBF may substantially reduce breastfeeding-associated HIV transmission.

**Keogh, S. C., Urassa, M., Kumogola, Y., Mngara, J., & Zaba, B. (2009). Reproductive behaviour and HIV status of antenatal clients in northern Tanzania: Opportunities for family planning and preventing mother-to-child transmission integration. *AIDS, 23*(Suppl. 1), S27–S35.**

**Objectives:** To examine reproductive and contraceptive history and intentions by HIV status among women at antenatal clinics to help inform initiatives to integrate family planning into antenatal/preventing mother-to-child transmission services in Mwanza region, Tanzania.

**Design:** A questionnaire survey was carried out in antenatal clinics in Mwanza region, Tanzania in 2007-2008.

**Methods:** We interviewed 5284 pregnant women attending 15 antenatal clinics offering HIV testing in Mwanza City and Magu district, northern Tanzania. The questionnaires asked about reproductive and contraceptive history and intentions, and sexual behaviour. Subject to participants' consent, we collected blood to determine HIV status and linked these results to the questionnaire data through individual numbers.

**Results:** HIV prevalence was 8.9% overall, and family planning ever use was 26%. HIV-positive and HIV-negative women differed with respect to age, parity, length of last birth interval, child survival, childbearing intentions and intention to breastfeed. HIV-positive women were more likely to have used family planning, particularly hormonal methods. Patterns of family planning use and unmet

need for contraception yielded useful information for the design of family planning counselling services at antenatal clinics.

**Conclusion:** Our survey findings point to numerous potential benefits of offering family planning counselling as a part of antenatal services, particularly in clinics offering HIV testing. The differences in reproductive history and intentions between HIV-positive and HIV-negative women highlight the necessity of tailoring family planning counselling to their specific needs.

**King, R., Estey, J., Allen, S., Kegeles, S., Wolf, W., Valentine, C., Serupilira, A. (1995). A family planning intervention to reduce vertical transmission of HIV in Rwanda. *AIDS*, 9(Suppl. 1), S45–S51.**

**Objectives:** Since contraception is an effective way of preventing the vertical transmission of HIV, we evaluated the impact of a family planning intervention on hormonal contraceptive use and incident pregnancy in a group of HIV-positive and HIV-negative urban Rwandan women.

**Subjects and methods:** In a longitudinal cohort study, 502 women who were not pregnant or infertile and who had been previously HIV tested and counseled viewed an informational video about hormonal contraception followed by a facilitated discussion. They were given access to oral or injectable hormonal contraception and Norplant at the research clinic; those who used these methods were seen every 3 months.

**Results:** Of the 330 HIV-positive and 172 HIV-negative women who underwent the intervention, 120 either became new hormonal method users ( $n = 40$ ), continued their previous use of a hormonal method ( $n = 64$ ), or switched to another hormonal method ( $n = 16$ ) following the intervention. There was a shift to use of longer lasting hormonal methods, and the annualized attrition rate was  $< 15\%$ , compared to  $> 50\%$  prior to the intervention. Rates of oral and injectable contraceptive use were similar among HIV-positive and HIV-negative women. Nine per cent of HIV-positive women became pregnant in the year after the intervention compared to 22% in a prior 12 month period when contraceptives were not provided at the study site. The corresponding proportions for HIV-negative women were 20% after the intervention versus 30% before the intervention.

**Conclusions:** Access to and information about hormonal contraceptives resulted in increased use and reduced attrition among both HIV-positive and HIV-negative women in this study. The reduction in incident pregnancy was greatest among HIV-positive women, suggesting that factors other than access to hormonal contraceptives may have influenced fertility outcomes. Knowledge of HIV serostatus may have an important influence on family planning decisions.

**Kosgei, R. J., Lubano, K. M., Shen, C., Wools-Kaloustian, K. K., Musick, B. S., Siika, A. M., . . . Kiarie, J. (2011). Impact of integrated family planning and HIV care services on contraceptive use and pregnancy outcomes. *Journal of Acquired Immune Deficiency Syndromes*, 58(5), E121–E126. doi:10.1097/QAI.0b013e318237ca80**

**Objective:** To determine the impact of routine care (RC) and integrated family planning (IFP) and HIV care service on family planning (FP) uptake and pregnancy outcomes.

**Design:** Retrospective cohort study conducted between October 10, 2005, and February 28, 2009.

**Results:** Four thousand thirty-one women (1453 IFP; 2578 RC) were eligible. Among the IFP group, there was a 16.7% increase ( $P, 0.001$ ) [95% confidence interval (CI): 13.2% to 20.2%] in incidence of condom use, 12.9% increase ( $P, 0.001$ ) (95% CI: 9.4% to 16.4%) in incidence of FP

use including condoms, 3.8% reduction (P = 0.001) (95% CI: 1.9% to 5.6%) in incidence of FP use excluding condoms, and 0.1% increase (P = 0.9) (95% CI: -1.9% to 2.1%) in incidence of pregnancies. The attributable risk of the incidence rate per 100 person-years of IFP and RC for new condom use was 16.4 (95% CI: 11.9 to 21.0), new FP use including condoms was 13.5 (95% CI: 8.7 to 18.3), new FP use excluding condoms was -3.0 (95% CI: -4.6 to -1.4) and new cases of pregnancies was 1.2 (95% CI: -0.6 to 3.0).

**Conclusions:** Integrating FP services into HIV care significantly increased the use of modern FP methods but no impact on pregnancy incidence. HIV programs need to consider integrating FP into their program structure.

**Mephram S., Zondi Z., Mbuyazi A., Mkhwanazi N., & Newell M. L. (2011). Challenges in PMTCT antiretroviral adherence in northern KwaZulu-Natal, South Africa. *AIDS Care*, 23(6), 741–747.**

**Background:** Women living with HIV in sub-Saharan Africa face significant challenges in accessing HIV care and adhering to antiretroviral therapy. Most reports have focused on issues relating to long-term adherence such as those surrounding stigma and disclosure, hunger, cultural factors, lack of accurate health information, lack of social support, medication side effects and overcrowded health systems. Information related to the challenges facing pregnant women when taking antiretrovirals for prophylactic purposes is limited. The "Kesho Bora Study" is a multicentre prevention of mother-to-child transmission (PMTCT) trial in sub-Saharan Africa evaluating the PMTCT efficacy of triple therapy until cessation of breast feeding compared to short course zidovudine monotherapy in a predominantly breast feeding population. Following unexplained discrepancies during objective adherence assessments, a sub-study was conducted at one site to examine the underlying adherence issues.

**Methods:** The counselling and clinical notes of all 100 enrolled Zulu women were examined. Extracted information was supplemented by unstructured, free-ranging interviews conducted by trained adherence counsellors on 43 consecutive women attending the trial clinic over a two-week period. Adherence was defined as good (>95% adherence), or poor (<95% adherence).

**Results:** Reasons provided for sub-optimal adherence included therapy misconceptions/misunderstandings, antiretroviral use by relatives, domestic violence, poverty and issues relating to disclosure and stigma. About 61% (57/94) of antenatal women had good adherence with their PMTCT prophylaxis, with no significant difference shown between those taking the long and short course.

**Conclusion:** Antenatal women in northern rural KwaZulu-Natal face significant challenges in taking antiretroviral PMTCT prophylaxis.

**Peltzer, K., Chao, L. W., & Dana, P. (2009). Family planning among HIV positive and negative prevention of mother to child transmission (PMTCT) clients in a resource poor setting in South Africa. *AIDS and Behavior*, 13(5), 973–979.**

The purpose of this study was to investigate family planning needs, knowledge of HIV transmission and HIV disclosure in a cohort sample that had undergone PMTCT in a resource poor setting. Five public clinics implementing PMTCT from Qaukeni Local Service Area, O.R. Tambo District in the Eastern Cape. The sample at postnatal care consisted of 758 women with known HIV status. From



116 HIV positive women 76.3% and from 642 HIV negative women 85.2% got counseling on safe sex during pregnancy but only 65.8% and 62.3% of the women respectively practiced safe sex during pregnancy, which did not differ by HIV status. Postnatally, almost all women received counseling on family planning, yet use of contraceptives and condoms were low. Among HIV positive women PMTCT knowledge and younger age of the mother were associated with pregnancy desire, and among HIV negative women HIV disclosure to the partner, younger age of the mother and having a lower number of children were associated with pregnancy desire. High pregnancy desires (yet lower than for HIV negative women); low contraceptive and condom use were found among HIV positive women. HIV prevention and family planning must acknowledge the reproductive desires of HIV positive women and men.

**Polis, C. B., & Curtis, K. M. (2013). Use of hormonal contraceptives and HIV acquisition in women: A systematic review of the epidemiological evidence. *Lancet Infectious Diseases* 13(9), 797–808. doi:10.1016/S1473-3099(13)70155-5**

Whether or not the use of hormonal contraception affects risk of HIV acquisition is an important question for public health. We did a systematic review, searching PubMed and Embase, aiming to explore the possibility of an association between various forms of hormonal contraception and risk of HIV acquisition. We identified 20 relevant prospective studies, eight of which met our minimum quality criteria. Of these eight, all reported findings for progestin-only injectables, and seven also reported findings for oral contraceptive pills. Most of the studies that assessed the use of oral contraceptive pills showed no significant association with HIV acquisition. None of the three studies that assessed the use of injectable norethisterone enanthate showed a significant association with HIV acquisition. Studies that assessed the use of depot-medroxyprogesterone acetate (DMPA) or non-specified injectable contraceptives had heterogeneous methods and mixed results, with some investigators noting a 1.5–2.2 times increased risk of HIV acquisition, and others reporting no association. Thus, some, but not all, observational data raise concern about a potential association between use of DMPA and risk of HIV acquisition. More definitive evidence for the existence and size of any potential effect could inform appropriate counselling and policy responses in countries with varied profiles of HIV risk, maternal mortality, and access to contraceptive services.

**Polis, C. B., Gray, R. H., Lutalo, T., Nalugoda, F., Kagaayi, J., Kigozi, G., . . . Wawer, M. J. (2011). Trends and correlates of hormonal contraceptive use among HIV-infected women in Rakai, Uganda, 1994–2006. *Contraception*, 83(6), 549–555.**

**Background:** Little is known about what factors correlate with hormonal contraceptive (HC) use in HIV-infected women in sub-Saharan Africa.

**Methods:** We assessed the trends in HC use among HIV-infected women in Rakai, Uganda; determined factors associated with HC use and considered whether those factors changed over time.

**Results:** HC use among HIV-infected women in Rakai increased from 5.7% in 1994 to 19.2% in 2006, but nearly half of all pregnancies in this population were unintended. Variables associated with increased HC use included higher education, socioeconomic status, parity, sexual frequency, being currently married or in a relationship, discussion of family planning with a partner and receipt of HIV results. Variables negatively associated with HC use included symptoms suggestive of

opportunistic infections, having no sex partner in the past year, condom use, breastfeeding and older age. Most associations remained stable over time.

**Conclusion:** Although contraceptive use by HIV-infected women has increased three-fold in this rural population, unintended pregnancies persist, placing women and their children at risk of adverse consequences.

**Richardson, B. A., Otieno, P. A., Mbori-Ngacha, D., Overbaugh, J., Farquhar, C., & John-Stewart, G. C. (2007). Hormonal contraception and HIV-1 disease progression among postpartum Kenyan women. *AIDS, 21(6), 749–753.***

**Objective:** To assess the immediate and longer-term effects of the use of hormonal contraception on the progression of HIV-1 disease in postpartum women.

**Design:** A prospective cohort study.

**Methods:** Information on contraceptive use, breastfeeding and intercurrent illnesses was obtained from HIV-infected postpartum Kenyan women monthly in the first year postpartum and quarterly in the second year. Blood was collected for T-cell subset analyses and HIV-1-RNA levels at months 1, 3, 6, 9, 12, 18, and 24 postpartum. The immediate effect of the initiation of oral contraceptive pills (OCP) and depot medroxyprogesterone acetate (DMPA) was assessed using Loess curves and linear mixed effects models to compare changes over the first 24 months postpartum in these same disease progression markers.

**Results:** There were no significant immediate or longer-term effects of the use of OCP or DMPA on HIV-1-RNA plasma viral loads and CD4 T-cell counts in this cohort of HIV-infected postpartum Kenyan women.

**Conclusion:** Comprehensive contraceptive counseling for HIV-1-infected women requires an understanding of the effects of various contraceptive methods on HIV-1 disease progression. In this study, hormonal contraception reassuringly had no immediate or longer-term effects on the rate of disease progression in chronically HIV-1-infected postpartum women. This highly effective family planning method may provide a useful and safe option for the prevention of mother-to-child transmission of HIV-1.

**Rutenberg, N., & Baek, C. (2005). Field experiences integrating family planning into programs to prevent mother-to-child transmission of HIV. *Studies in Family Planning, 36(3), 235–245.***

This article reviews field experiences with provision of family planning services in prevention of mother-to-child transmission (PMTCT) programs in ten countries in Africa, Asia, and Latin America. Family planning is a standard component of most antenatal care and maternal-child health programs within which PMTCT programs are offered. Yet PMTCT sites often miss opportunities to provide HIV-positive clients with family planning counseling. Demand for family planning among HIV-positive women varies depending on the extent of communities' openness about HIV/AIDS, fertility norms, and knowledge of PMTCT programs. In Kenya and Zambia, no differences were observed in use of contraceptives between HIV-positive and HIV-negative women in the study communities, but HIV-positive women have more affirmative attitudes about condoms and use them significantly more frequently than do their HIV-negative counterparts. In the Dominican Republic, India, and Thailand, where HIV prevalence is low and sterilization rates are high, HIV-

positive women are offered sterilization, which most women accept. This article draws out the policy implications of these findings and recommends that policies be based on respect for women's right to informed reproductive choice in the context of HIV/AIDS.

**Semrau, K., Kuhn, L., Vwalika, C., Kasonde, P., Sinkala, M., Kankasa, C., . . . Thea, D. M. (2005.) Women in couples antenatal HIV counseling and testing are not more likely to report adverse social events. *AIDS, 19(6), 603–609.***

**Background:** Couple counseling has been promoted as a strategy to improve uptake of interventions to prevent mother-to-child HIV transmission (pMTCT) and to minimize adverse social outcomes associated with disclosure of HIV status.

**Objectives:** We tested whether women counseled antenatally as part of a couple were more likely to accept HIV testing and nevirapine in a pMTCT program, and whether they would be less likely to experience later adverse social events than women counseled alone.

**Methods:** A pMTCT program that included active community education and outreach to encourage couple counseling and testing was implemented in two antenatal clinics in Lusaka, Zambia. A subset of HIV-positive women was asked to report their experience of adverse social events 6 months after delivery. Couple-counseled women were compared with individual-counseled women stratified by whether or not they had disclosed their HIV status to their partners.

**Results:** Nine percent (868) of 9409 women counseled antenatally were counseled with their husband. Couple-counseled women were more likely to accept HIV testing (96%) than women counseled alone (79%); however uptake of nevirapine was not improved. Six months after delivery, 28% of 324 HIV-positive women reported at least one adverse social event (including physical violence, verbal abuse, divorce or separation). There were no significant differences in reported adverse social events between couple- and individual-counseled women.

**Conclusions:** Couple counseling did not increase the risk of adverse social events associated with HIV disclosure. Support services and interventions to improve social situations for people living with HIV need to be further evaluated.

**Shelton, J. D., & Fuchs, N. (2004). Opportunities and pitfalls in integration of family planning and HIV prevention efforts in developing countries. *Public Health Reports, 119(1), 12–15.***

Shelton, of the US Agency for International Development, and Fuchs discuss in this article why the clinic may be a “weak platform” for the integration of HIV prevention efforts and family planning, as well as why community-based family planning efforts may dovetail nicely with some programmatic HIV efforts (such as prevention of mother-to-child transmission, voluntary counseling and testing, and long-term antiretroviral therapy) (Shelton & Fuchs, 2004, p. 12).

**Walusimbi, J., Birabwa, E., Nabankema, E., AnneMarie, A., Lutalo, I., & Nakiwooga, A. (2010). Pregnancy decisions and contraceptive use among HIV-positive women: A study in a large urban clinic in sub-Saharan Africa [Poster abstract]. *Journal of the International AIDS Society, 13(Suppl. 4), P164.* doi:10.1186/1758-2652-13-S4-P164**

**Background:** The IDI is an HIV treatment and research centre in Kampala, Uganda with over 24000 patients of whom 9000 are on antiretroviral therapy.

**Purpose of the study:** We conducted a study in March 2007 to determine the accessibility and utilization of Sexual Reproductive Health (SRH) services among female clients.

**Methods:** Using a structured questionnaire, a cross-sectional survey of female clients aged 18-49 years attending the IDI clinic was conducted. SPSS version 12.0 was used to fit a logistic regression model to determine the following outcomes; pregnancy decisions, desire for children and pregnancy risk behaviour among sexually active female clients.

**Results:** Of 493 respondents, 322 (65%) were sexually active at the time of the survey. Over 30% of the respondents had become pregnant after knowing their sero-status, 66% of the pregnancies were unintended of which 39% ended in abortions. Over 52% of the pregnancies were due to the influence of the husband, 33% was a result of mutual agreement between the clients and their partners while 15% of them were because of the client's decision. Of the women who made their own decision about pregnancy, 57% had a secondary level of education. Among married 40% of the pregnancies were a result of mutual agreement while relatives influenced 45% of the pregnancies among the singles. Of the participants 96% reported awareness of family planning methods; however, the level of utilization was at 40%. Overall 31% of the women stated a desire for children. 41% engaged in pregnancy risk behaviour and of these 63% did not desire children. Women aged 24-34 years had the highest desire to have children. The husbands made pregnancy decisions for 62% of the women who did not want more children.

**Conclusions:** Family planning utilization is low even among those females who have no desire for more children resulting in unwanted pregnancies. Despite their HIV status women remain sexually active and have a desire for more children. A level of education had no bearing on contraceptive use but was important for decision making about pregnancy.

**Wanyenze, R. K., Tumwesigye, N. M., Kindyomunda, R., Beyeza-Kashesya, J., Atuyambe, L., Kansiime, A., . . . Mirembe, F. (2011). Uptake of family planning methods and unplanned pregnancies among HIV-infected individuals: A cross-sectional survey among clients at HIV clinics in Uganda. *Journal of the International AIDS Society*, 14, 35. doi:10.1186/1758-2652-14-35**

**Background:** Prevention of unplanned pregnancies among HIV-infected individuals is critical to the prevention of mother to child HIV transmission (PMTCT), but its potential has not been fully utilized by PMTCT programmes. The uptake of family planning methods among women in Uganda is low, with current use of family planning methods estimated at 24%, but available data has not been disaggregated by HIV status. The aim of this study was to assess the utilization of family planning and unintended pregnancies among HIV-infected people in Uganda.

**Methods:** We conducted exit interviews with 1100 HIV-infected individuals, including 441 men and 659 women, from 12 HIV clinics in three districts in Uganda to assess the uptake of family planning services, and unplanned pregnancies, among HIV-infected people. We conducted multivariate analysis for predictors of current use of family planning among women who were married or in consensual union and were not pregnant at the time of the interview.

**Results:** One-third (33%, 216) of the women reported being pregnant since their HIV diagnoses and 28% (123) of the men reported their partner being pregnant since their HIV diagnoses. Of these, 43% (105) said these pregnancies were not planned: 53% (80) among women compared with 26% (25) among men. Most respondents (58%; 640) reported that they were currently using family planning methods. Among women who were married or in consensual union and not pregnant,

80% (242) were currently using any family planning method and 68% were currently using modern family planning methods (excluding withdrawal, lactational amenorrhoea and rhythm). At multivariate analysis, women who did not discuss the number of children they wanted with their partners and those who did not disclose their HIV status to sexual partners were less likely to use modern family planning methods (adjusted OR 0.40, range 0.20-0.81, and 0.30, range 0.10-0.85, respectively).

**Conclusions:** The uptake of family planning among HIV-infected individuals is fairly high. However, there are a large number of unplanned pregnancies. These findings highlight the need for strengthening of family planning services for HIV-infected people.

**Xu, F., Kilmarx, P. H., Supawitkul, S., Manopaiboon, C., Yanpaisarn, S., Limpakarnjanarat, K., . . . Mastro, T. D. (2002). Incidence of HIV-1 infection and effects of clinic-based counseling on HIV preventive behaviors among married women in northern Thailand. *Journal of Acquired Immune Deficiency Syndromes*, 29(3), 284–288.**

To determine the incidence of and risk factors for HIV-1 infection among married women in northern Thailand, we enrolled 779 seronegative women from family planning clinics and a postpartum ward in Chiang Rai, Thailand, from 1998 through 1999. Women were tested for HIV antibodies at 6 and 12 months after enrollment. They received HIV prevention counseling at enrollment and at each follow-up visit. Counseling covered partner communication, partner HIV testing, and condom use by steady partners. Effects of counseling were measured using standardized questionnaires. Follow-up rates were 94% at 6 months and 92% at 12 months. Only 1 woman seroconverted during the follow-up period, yielding an overall HIV incidence of 0.14 per 100 person-years. After receiving counseling, women reported significantly increased communication with husbands concerning HIV risk, HIV testing, and condom use during the first 6 months after enrollment; communication remained high for 6 to 12 months. Women reported a modest increase in HIV testing and consistent condom use by husbands. The risk for HIV transmission to women in steady relationships is low in northern Thailand. Although HIV prevention counseling promoted partner communication, its effects on HIV preventive behaviors were limited.

## 6. LAM AND BREASTFEEDING WITH CONTRACEPTION

**Afifi, M. (2007). Lactational amenorrhoea method for family planning and women empowerment in Egypt. *Singapore Medical Journal*, 48(8), 758–762.**

**Introduction:** This study aims to assess the potential for the lactational amenorrhoea method (LAM) and passive LAM among women with children below six months of age, and to examine its association with women empowerment in household decisions.

**Methods:** Data from the Egypt Demographic Health Survey 2000 was downloaded from the Demographic and Health Surveys website. A sub-sample of women fulfilling all four criteria were selected: (1) women whose last birth was less than three years ago; (2) currently married; (3) not sterilized; and (4) currently breastfeeding their children. Accordingly, only 3447 women entered into the statistical analysis, of whom 1141 had children below six months of age.

**Results:** Passive LAM users constituted 82 percent of the women who met LAM criteria, 57.1 percent of exclusive breastfeeding mothers, and 32.9 percent of all nursing mothers of children below six months of age. 11.8 percent of women who met the LAM criteria were under double coverage of family planning methods. In the logistic regression model where all variables were adjusted, women empowerment in household decisions, significantly and independently, inversely predicted passive LAM along with increase in child age (Odds ratio [OR] of 0.86 and 0.43 respectively). Women with higher birth order children were more likely to use passive LAM (OR 1.11).

**Conclusion:** Women of low empowerment index in household decisions were more likely to use passive LAM. Passive LAM users could be subjected to discontinuation or double coverage of contraceptives.

**Aksu, H., Kucuk, M., & Duzgun, G. (2011). The effect of postnatal breastfeeding education/support offered at home 3 days after delivery on breastfeeding duration and knowledge: A randomized trial. *Journal of Maternal-Fetal and Neonatal Medicine*, 24(2), 354–361.**

**Objective:** The aim of this study was to determine the effects of breastfeeding education/support offered at home on day 3 postpartum on breastfeeding duration and knowledge.

**Methods:** The study included a total of 60 women who gave birth at Zbeyde Hanim Maternity Hospital located in Aydin, Turkey. In addition to a standard breastfeeding education in the first few hours after delivery, which was provided to all women in this "baby-friendly initiative" (BFI) hospital, the mothers in the intervention group received breastfeeding education at home on day 3 postpartum from supporters.

**Results:** Both groups were comparable in terms of maternal and neonatal characteristics. The breastfeeding education/support offered during a home visit on day 3 postpartum was associated with a significant increase in the percentage of exclusively breastfed infants both at 2 weeks and 6 weeks, and at 6 months, and was also associated with a significant increase in exclusive breastfeeding and in total breastfeeding duration. In addition, increased breastfeeding knowledge scores were observed in the intervention group at 2 weeks and at 6 weeks after delivery, when compared with the respective scores in the control group.

**Conclusion:** Breastfeeding education offered at home on day 3 postpartum was effective in increasing the breastfeeding duration and breastfeeding knowledge.

**Ali, S., Ali, S. F., Imam, A. M., Ayub, S., & Billoo, A. G. (2011). Perception and practices of breastfeeding of infants 0-6 months in an urban and a semi-urban community in Pakistan: A cross-sectional study. *Journal of the Pakistan Medical Association*, 61(1), 99–104.**

**Objective:** To investigate mother's perception and practices about breastfeeding and their socio-demographic correlate in infants equal to or less than 6 months.

**Methods:** A cross-sectional study was carried out on 200 mother-infant pairs who visited the health care centers, Bilal Colony (semi-urban) and the Aga Khan University (urban), for their well-baby follow-ups and vaccination using convenient sampling. Frequencies and percentages were computed and Chi-square was used to find associations between socio-demographics of mothers and their perception and practices about breastfeeding.

**Results:** Exclusive breastfeeding was reported by about 54% of the mothers. Thirty-five percent of the mothers gave prelacteal feed, 14% discarded colostrum and 43% woke up their infant to feed if time had exceeded 2 hours. Majority of the females were aware of the advantages (92%) and the disadvantages (85%) of breastfeeding. However, the awareness of positive feedback relationship of milk production and sucking was lacking and breast feeding was considered to cause weakness in mothers.

**Conclusion:** Despite the efforts of health policy makers, the results show a situation that is not improving. Women were aware of the advantages and disadvantages of breast and bottle feeding but a disparity was observed between their perception and practices.

**Becker, S., & Ahmed, S. (2001). Dynamics of contraceptive use and breastfeeding during the post-partum period in Peru and Indonesia. *Population Studies*, 55(2), 165–179.**

This paper examines the interaction between contraceptive use and breastfeeding in relation to resumption of intercourse and duration of amenorrhea post-partum. We used data from the month-by-month calendar of reproductive events from Demographic and Health Surveys (DHS) in Peru and Indonesia. The analyses show that breastfeeding women were less likely than non-breastfeeding women to have resumed sexual intercourse in the early months post-partum in both countries. In Peru, but not in Indonesia, breastfeeding women had a significantly lower odds than non-breastfeeding women of adopting contraception. Although the likelihood of contraceptive adoption was highest in the month women resumed menstruation in both countries, about ten per cent of subsequent pregnancies occurred to women before they resumed menses. These results emphasize the importance of integrating breastfeeding counseling and family planning services in programmes serving post-partum women, as a means of enabling those who wish to space their next birth to avoid exposure to the risk of a pregnancy that may precede the return of menses.

**Bongiovanni, A., Samam'h, M. A., Al'Sarabi, R. H., Masri, S. D., Zehner, E. R., & Huffman, S. L. (2005). *Promoting the Lactational Amenorrhea Method (LAM) in Jordan increases modern contraception use in the extended postpartum period*. Washington, DC: The Linkages Project & Academy for Educational Development. Retrieved from [http://pdf.usaid.gov/pdf\\_docs/Pnadh002.pdf](http://pdf.usaid.gov/pdf_docs/Pnadh002.pdf)**

This document reports on LINKAGE's research in Jordan with LAM. "LINKAGES is USAID's Breastfeeding, LAM, Related Complementary Feeding, and Maternal Nutrition Program managed by the Academy for Educational Development (AED)" (Bongiovanni et al, 2005, p. ii).

Interventions included service provider training, educational materials for clients, and public media messages, and took place from 1998 to 2003. Next, information about LAM use was gathered by survey in 2004. Not only was LAM found to be effective, but "increasing the proportion of BFFP [breastfeeding for family planning] users who know and act upon the six month criterion [of LAM] would result in a substantial increase in effective LAM use" in Jordan (Bongiovanni et al., 2005, p.ii). In other words, exclusively breastfeeding women who did not know about LAM were at risk for not transitioning to another method of contraception at six months postpartum, while women who were aware of LAM criteria were likely to transition appropriately. The authors included a discussion of child health as a benefit of LAM (Bongiovanni et al., 2005).

**Centers for Disease Control and Prevention. (2000). *Lactation and postpartum contraception*. In *Family planning methods and practice: Africa* (2nd ed.; pp. 261–294). Atlanta, GA: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Division of Reproductive Health. Retrieved from <http://stacks.cdc.gov/view/cdc/I2090>**

This book is for health care providers working in Africa. The chapter entitled "Lactation and Postpartum Contraception" opens with a short vignette about a physician who "made certain they [postpartum patients] had contraceptive supplies at home well before the baby's 6-month birthday" (Centers for Disease Control and Prevention [CDC], 2000, p. 261). Topics include the characteristics and physiology of lactation, the benefit of breastfeeding to mother and baby, and information about breastfeeding as it pertains to HIV. Lactational amenorrhea is discussed, and a practical lactation guide to common breastfeeding complications is included. The chapter concludes with an overview of contraceptive choices and timing for the postpartum woman, and tips for the integration of family planning services with breastfeeding assistance.

**Cooney, K. A., Nyirabukeye, T., Labbok, M. H., Hoser, P. H., & Ballard, E. (1996). *An assessment of the nine-month lactational amenorrhea method (MAMA-9) in Rwanda*. *Studies in Family Planning*, 27(3), 102–171.**

This report presents a secondary data analysis based on prospectively collected records gathered during a field assessment that was carried out in Rwanda in August 1993. The assessment used service statistics and follow-up interviews to evaluate the efficacy of a modified lactational amenorrhea method (LAM) as a nine-month introductory postpartum natural family planning method. The program, carried out by Action Familiale Rwandaise (AFR), reflects high efficacy of the method in a compliant sample that sought this method followed by another form of family planning. These results are promising and provide guidance for the extended use of LAM past six



months. Programmatic findings suggest that studies be conducted of the contribution of extended LAM to improved weaning practices, the high efficacy of continued reliance on substantial lactation and amenorrhea beyond nine months, and male involvement in LAM and breastfeeding.

**Díaz, S., Aravena, R., Cárdenas, H., Casado, M. E., Miranda, P., Schiappacasse, V., & Croxatto, H. B. (1991). Contraceptive efficacy of lactational amenorrhea in urban Chilean women. *Contraception*, 43(4), 335–352.**

The contraceptive efficacy of breastfeeding was assessed in 236 healthy urban women who were followed at monthly intervals during the first postpartum year. Proportional hazard models were used to evaluate the influence of time postpartum, menstrual status and breastfeeding pattern upon the risk of pregnancy. Time and menstrual status had a highly significant effect on this risk. Those women who remained in amenorrhea had cumulative probabilities of pregnancy of 0.9% and 17% at 6 and 12 months postpartum, respectively. In those who recovered menstrual cycles, the risk rose to 36% and 55% at 6 and 12 months, respectively. Milk supplementation also increased significantly the risk when considered alone but not when time and/or menstrual status were included in the analysis. However, amenorrheic women who introduced bottle feeding, had a higher risk of pregnancy after 6 months postpartum than those who remained fully nursing. The analysis was unable to detect a significant influence of the nursing frequency. The results confirm that lactational amenorrhea is an effective contraceptive during the first six months postpartum. The first postpartum bleeding marks a great increase in the risk of pregnancy. Supplementation also increases the risk, particularly in amenorrheic women.

**Egbunu, I., Ezechukwu, C. C., Chukwuka, J. O., & Ikechebelu, J. I. (2005). Breast-feeding, return of menses, sexual activity and contraceptive practices among mothers in the first six months of lactation in Onitsha, South Eastern Nigeria. *Journal of Obstetrics and Gynaecology*, 25(5), 500–503.**

The objective of this study was to determine the exclusive breast-feeding practices, return of menstruation, sexual activity and contraceptive practices among breast-feeding mothers in the first six months of lactation. The study was based in Onitsha, South Eastern Nigeria. A structured questionnaire was used to obtain data from breast-feeding mothers on their age, educational attainment, breast-feeding practices, return of menstruation, sexual activity and contraceptive practices within the first six months of lactation at intervals of 6 weeks, 10 weeks 14 weeks and 6 months post delivery. Analysis of the information obtained showed that out of the 178 mothers who participated in the study 81% of the mothers were within the ages of 20–34 years. While all the mothers had formal education, the majority (59%) had secondary education. Seventy-three percent initiated breast-feeding within one hour of delivery. On discharge from hospital, all of them had already established breast-feeding which continued up to six weeks and dropped to 97.8% at six months. Exclusive breast-feeding which was practiced by 100% on discharge dropped to 3.9% at six months. The feeding regimen was on demand as practiced by 98.9% of the mothers. Menstrual flow had returned in 33.8% of the mothers by 6 weeks of lactation, and had risen to 70.2% at six months. There was more prolonged lactational amenorrhea in exclusively breast-feeding mothers than in those who were not. By 6 weeks post delivery 31.6% of the mothers had resumed sexual activity and this rose to 93.6% at six months. With the resumption of sexual activity only 5% of the

mothers resorted to contraceptive practices other than lactational amenorrhea and this increased to 54% at six months. There was no pregnancy in any of these women during the six months period. While appreciating the role of lactational amenorrhea in child spacing and considering the early return of sexual activity among the mothers the practice of introducing contraceptive practices needs to be encouraged especially in women whose menstruation has returned.

**Espey, E., Ogburn, T., Leeman, L., Singh, R., Ostrom, K., & Schrader, R. (2012). Effect of progestin compared with combined oral contraceptive pills on lactation. *Obstetrics & Gynecology* 119(1), 5–13. doi:10.1097/AOG.0b013e31823dc015**

**Objective:** To estimate the effective of progestin-only compared with combined hormonal contraceptive pills on rates of breastfeeding continuation in postpartum women. Secondary outcomes include infant growth parameters, contraceptive method continuation, and patient satisfaction with breastfeeding and contraceptive method.

**Methods:** Postpartum breastfeeding women who desired oral contraceptives were randomly assigned to progestin-only and combined hormonal contraceptive pills. At 2 and 8 weeks postpartum, participants completed in-person questionnaires that assessed breastfeeding continuation and contraceptive use. Infant growth parameters including weights, length, and head circumference were assessed at 8 weeks postpartum. Telephone questionnaires assessing breastfeeding, contraceptive continuation, and satisfaction were completed at 3-7 weeks and 4 and 6 months. Breastfeeding continuation was compared between groups using Cox proportional hazards regression. Differences in baseline demographic characteristics and in variables between the two intervention groups were compared using chi-squared testes, Fisher exact tests, or two-sample t tests as appropriate.

**Results:** Breastfeeding continuation rates at 8 weeks (progestin-only 63.5%; combined hormonal 64.1%), contraceptive continuation, and infant growth parameters did not differ between users of progestin-only and combined hormonal contraceptive pills. Infant formula supplementation and maternal perception of inadequate milk supply were associated with decreased rates of breastfeeding in both groups.

**Conclusion:** Choice of combined hormonal or progestin-only contraceptive pills administered 2 weeks postpartum did not adversely affect breastfeeding continuation.

**Gray, R. H., Campbell, O. M., Apelo, R., Eslami, S. S., Zacur, H., Ramos, R. M., . . . Labbok, M. H. (1990). Risk of ovulation during lactation. *Lancet*, 335(8680): 25–29.**

60 breastfeeding mothers in Baltimore and 41 in Manila recorded their infant feeding patterns daily, and gave additional information at weekly interviews. Ovarian activity was monitored by assays for hormone metabolites in daily urine samples. On average, women in Baltimore breastfed less often but for longer at each feed than women in Manila, and the mean times until ovulation were 27 and 38 weeks postpartum. 41% of first ovulations had luteal phase defects. Anovular first menses were common (45.1%) during the first 6 months postpartum but the rate fell greatly thereafter. The risk of ovulation was reduced by a higher frequency of breastfeeds, longer duration of each feed, and less supplementary feeding. During the first 6 months postpartum, amenorrhoeic women had low risks of ovulation (below 10%) with partial breastfeeding, and exclusive breastfeeding reduced the risk to 1-5% with either frequent short feeds or infrequent longer feeds. However, if the woman started

menstruating before 6 months postpartum, or if she continued breastfeeding beyond 6 months, the risk of ovulation rose, and contraception would be needed.

**Gray, R. H., Campbell, O. M., Zacur, H. A., Labbok, M. H., & MacRae, S. L. (1987). Postpartum return of ovarian activity in nonbreastfeeding women monitored by urinary assays. *Journal of Clinical Endocrinology and Metabolism*, 64(4), 645–650.**

Assays of first morning urine samples for pregnanediol-3 alpha-glucuronide (PdG), estradiol-17 beta-glucuronide (E2G), and LH were used to monitor endocrine function in 16 regularly cycling women and 22 postpartum nonbreastfeeding women. Twice weekly blood samples were also obtained from the postpartum group. Ovulation was inferred by a significant rise in LH and PdG, and reversal of the E2G to PdG ratio. Luteal phase PdG excretion was measured by the peak of smoothed PdG levels and the area under the smoothed luteal phase PdG curve. The lower limits of normal established in 16 cycling women were a peak luteal phase PdG of 4 micrograms/ml and an area under the PdG curve of 20 micrograms/ml. In the postpartum women, 32% of first cycles were anovulatory, and among ovulatory cycles, 73% had abnormally low luteal phase PdG excretion or short luteal phases. In second and subsequent cycles, 15% were anovulatory and 26% had luteal phase abnormalities. There was a progressive increase in luteal PdG excretion from the first to third cycles. The mean delay before first ovulation was 45.2 days, and no woman ovulated before 25 days after delivery. The correlations between blood and urinary hormone levels were 0.78 for PdG, 0.65 for E2G, and 0.55 for LH. We conclude that assays of daily early morning urine samples provide reliable information on ovulation and luteal phase adequacy, and that there is gradual recovery of pituitary ovarian function after parturition.

**Gurtcheff, S. E., Turok, D. K., Stoddard, G., Murphy, P. A., Gibson, M., & Jones, K. P. (2011). Lactogenesis after early postpartum use of the contraceptive implant: A randomized controlled trial. *Obstetrics & Gynecology*, 117(5), 1114–1121.**

**Objective:** To evaluate lactogenesis after early postpartum insertion of the etonogestrel contraceptive implant.

**Methods:** Healthy peripartum women with healthy, term newborns who desired the etonogestrel implant for contraception were randomly assigned to early (1-3 days) or standard (4-8 weeks) postpartum insertion. The primary outcomes, time to lactogenesis stage II and lactation failure, were documented by a validated measure. The noninferiority margin for the mean difference in time to lactogenesis stage II was defined as 8 additional hours. Secondary data (device continuation and contraceptive use, breast milk analysis, supplementation rates, side effects, and bleeding patterns) were collected at periodic intervals for 6 months.

**Results:** Sixty-nine women were enrolled. Thirty-five were randomly assigned to early insertion and 34 to standard insertion. There were no statistically significant differences between the groups in age, race, parity, mode of delivery, use of anesthesia, or prior breastfeeding experience. Early insertion was demonstrated to be noninferior to standard insertion in time to lactogenesis stage II (early: [mean±standard deviation] 64.3±19.6 hours; standard: 65.2±18.5 hours, mean difference, -1.4 hours, 95% confidence interval [CI] -10.6 to 7.7 hours). Early insertion was also demonstrated to be noninferior to standard insertion in incidence of lactation failure (1/34 [3%] in the early insertion group, 0/35 [0%] in the standard insertion group [risk difference, 0.03, 95% CI -0.02 to 0.08]). Use

of formula supplementation was not significantly different between the groups. Milk composition at 6 weeks was not significantly different between the groups.

**Conclusion:** Breastfeeding outcomes were similar in women who underwent early compared with standard postpartum insertion of the etonogestrel implant.

**Hardy, E., Santos, L. C., Osis, M. J., Carvalho, G., Cecatti, J. G., & Faundes, A. (1998). Contraceptive use and pregnancy before and after introducing lactational amenorrhea (LAM) in a postpartum program. *Advances in Contraception, 14(1), 59–68.***

There is good evidence that lactational amenorrhea (LAM) is an effective method of fertility regulation during the first 6 months postpartum, provided no other food is given to the baby and the mother remains amenorrheic. However, although breast-feeding is strongly promoted in many maternity hospitals that also run postpartum family planning programs, LAM is rarely included among the contraceptive options being offered. This paper presents the results of an operational study which compared the prevalence of contraceptive use and the cumulative pregnancy rate at 12-months postpartum among 350 women observed before and 348 women studied after introducing LAM as an alternative contraceptive option offered to women following delivery at the Instituto Materno Infantil de Pernambuco (IMIP), in Recife, Brazil. The percentage of women not using any contraceptive method was significantly lower ( $p < 0.0001$ ) after the intervention (7.4%) than before (17.7%). This difference remained statistically significant after controlling for age, number of living children, marital status and years of schooling. The proportion pregnant one year postpartum was also significantly lower ( $p < 0.0001$ ) after the introduction of LAM (7.4%) than before (14.3%), but the difference was no longer significant after controlling for the same variables. It is concluded that LAM is a useful addition to family planning postpartum programs.

**Hight-Laukaran, V., Labbok, M. H., Peterson, A. E., Fletcher, V., von Hertzen, H., & Van Look, P. F. (1997). Multicenter study of the lactational amenorrhea method (LAM): II. Acceptability, utility, and policy implications. *Contraception, 55(6), 337–346.***

A multicenter study of the Lactational Amenorrhea Method (LAM) was carried out to determine acceptability, satisfaction, and utilization in 10 different populations, and to confirm the efficacy of the method. Efficacy data are presented in a companion paper. A protocol was designed at the Institute for Reproductive Health (IRH), Department of Obstetrics and Gynecology, Georgetown University Medical Center, and reviewed and modified in collaboration with the co-sponsors, the World Health Organization, the South-to-South Cooperation for Reproductive Health, and the principal investigators from each site. Data were gathered prospectively on LAM users at 11 sites. Data were entered and cleaned on-site, and further cleaned and analyzed at IRH, using country-level and pooled data to produce descriptive statistics. The overall satisfaction with LAM was 83.6%, and continuation with another method of family planning was shown to be 67.6% at 9 months postpartum, in most cases exceeding previous use of contraception prior to use of LAM. Knowledge and understanding of the method at discontinuation were high, ranging from 78.4 to 88.6% for the three criteria. LAM can be used with a high level of satisfaction and success by women in a variety of cultures, health care settings, socio-economic strata, and industrial and developing country settings.

The results confirm that LAM is acceptable and ready for widespread use, and should be included in the range of services available in maternal and child health, family planning, and other primary health care settings.

**Hight-Laukaran, V., Rutstein, S. O., Labbok, M. H., & Ballard, E. (1996). Contraceptive use during lactational amenorrhea. *International Journal of Gynecology and Obstetrics*, 54(2), 101–108.**

**Objective:** The study uses data from nationally representative sample surveys in developing countries to estimate the overlap between lactational amenorrhea and contraceptive use during the first 6 months postpartum.

**Method:** Secondary analyses of survey data were used to tabulate the proportion of the population in lactational amenorrhea among contraceptive users for all women, for postpartum women and for the country as a whole.

**Results:** Among postpartum women, the proportion in lactational amenorrhea was particularly high in Africa and the Near East and lower in Latin America and the Caribbean where breast-feeding practices have declined. The median duration of use for oral contraceptives is also presented as an aid to interpreting the significance of the findings.

**Conclusions:** The significance of the findings is considered in the context of planning reproductive health services in the postpartum period. Decisions about timing of contraceptive use for postpartum women, while arrived at on an individual basis, also result from program strategies that focus counseling immediately postpartum or at a later interval, such as when menses resume. On a national level the impact of postpartum contraception policies on use of commodities may be substantial.

**Huffman, S. L., & Labbok, M. H. (1994). Breastfeeding in family planning programs: A help or a hindrance? *International Journal of Gynecology and Obstetrics*, 47(Suppl.), S23–S32.**

Breastfeeding is a major contributor to child spacing and reproductive health, and as such, is a vital women's issue. Further, if breastfeeding levels were to decline, the increase in family planning services that would be required to replace the lost fertility impact would be prohibitive, both in terms of cost and difficulty. This concern places breastfeeding centrally as a family planning policy issues as well. This paper discusses how breastfeeding contributes to child spacing and reduced fertility; the appropriate and timely introduction of complementary family planning methods during breastfeeding; issues and controversies in the support of breastfeeding as a family planning issue in the context of women's concerns, including the concept of exclusive breastfeeding for 6 months, the encouragement and support to maintain breastfeeding after 6 months, and the use of the Lactational Amenorrhea Method (LAM) and other family planning methods in the early postpartum period; and the role of family planning programs in supporting women's informed reproductive health choices.

**Kapp, N., & Curtis, K. M. (2010). Combined oral contraceptive use among breastfeeding women: A systematic review. *Contraception*, 82(1), 10–16. doi:10.1016/j.contraception.2010.02.001**

**Background:** Postpartum women need effective contraception, but using hormonal contraceptives may affect breastfeeding performance and infant health outcomes.

**Study design:** We searched the MEDLINE and Cochrane databases for all articles published through May 2009 for primary research studies that investigated clinical outcomes among breastfeeding women who used hormonal contraception or their infants.

**Results:** Three randomized controlled trials reported decreased mean duration of breastfeeding and higher rates of supplemental feeding among combined oral contraceptive (COC) users than among nonusers, while one multicountry trial found no differences in these parameters. Only one study demonstrated lower average weights during the first year of life for infants whose mothers used COCs while breastfeeding. None of the eight studies, four of which were observational, included in this review documented adverse infant health outcomes.

**Conclusions:** Limited evidence demonstrates an inconsistent effect of COC on breastfeeding duration and success. The evidence is inadequate to determine whether a mother's use of these drugs affects breastfeeding duration or the infant's health.

**Kennedy, K. I., & Kotelchuck, M. (1998). Policy considerations for the introduction and promotion of the lactational amenorrhea method: Advantages and disadvantages of LAM. *Journal of Human Lactation*, 14(3), 191–203.**

US public health researchers consider the evidence of LAM since its inception as a programmatic option ten years previous to this study and examine “the advantages and disadvantages of LAM, and their implications for policy and use,” especially in consideration of varying world contexts (Kennedy & Kotelchuck, 1998, p. 191). Advantages of LAM are its efficacy, reliability, and expansion of “contraceptive options” for women; in addition, potential advantages may be realized if LAM is shown to “be an effective conduit to other modern methods” and if the method is shown to be “cost effective” (Kennedy & Kotelchuck, 1998, p. 201). Disadvantages include that LAM “affords no protection against STDs, it requires counseling from a well-informed provider, and intensive breastfeeding can make heavy demands on the woman’s time” (Kennedy & Kotelchuck, 1998, p. 201). In consideration of these findings, the researchers call for “research designed to determine what factors, if any, will maximize the uptake of a second modern contraceptive method after LAM protection expires . . . to compare this with other contraceptive strategies, and to evaluate the cost aspects” (Kennedy & Kotelchuck, 1998, p. 201).

**Kennedy, K. I., Kotelchuck, M., Visness, C. M., Kazi, A., & Ramos, R. (1998). Users’ understanding of the lactational amenorrhea method and the occurrence of pregnancy. *Journal of Human Lactation*, 14(3), 209–218.**

It is unknown whether a user's understanding of the Lactational Amenorrhea Method (LAM) is related to its successful use. A study of 876 LAM users in Pakistan and the Philippines collected information about women's understanding of LAM. The present analysis aims to determine: (1) the proportion of LAM users who understand the method, (2) whether any known factors can distinguish those who understand LAM from those who do not, and (3) whether an understanding

of LAM is related to subsequent pregnancy. Over 75% of LAM users could consistently recite the LAM guidelines correctly for a full year postpartum. However, 38% of users failed to display, at least once, an understanding of LAM during the first year postpartum mainly by failing to abstain, to use another method or to explain their nonuse of another method when their LAM protection expired. LAM understanding generally could not be predicted by sociodemographic factors. The occurrence of pregnancy during the first year postpartum was not related to LAM understanding, regardless of how LAM understanding was defined, nor could it be predicted by any other measured characteristic of the users.

**Kennedy, K. I., & Trussell, J. Postpartum contraception and lactation. In R. A. Hatcher, J. Trussell, F. Stewart, A. L. Nelson, W. Cates Jr., F. Guest, & D. Kowal, (2004). *Contraceptive technology* (18th rev. ed.; pp. 575–600). New York, NY: Ardent Media.**

This book is a reference for reproductive health and contraceptive options. Chapter 23, entitled “Postpartum Contraception and Lactation,” gives biological explanations for LAM and mechanisms of postpartum infertility; the explanations are used to support a list of evidence-based guidelines for counseling postpartum patients about breastfeeding. LAM is presented as an algorithm for the provider and postpartum client to evaluate whether LAM is an appropriate choice for her care. Next, an in-depth description of other forms of postpartum contraception is given, including information on the IUD. The topic of breastfeeding concludes the chapter, and evidence-based breastfeeding information is given and formatted for patient education.

**Kennedy, K. I., & Visness, C. M. (1992). Contraceptive efficacy of lactational amenorrhoea. *Lancet*, 339(8787), 227–230.**

Pregnancy is rare among breastfeeding women with lactational amenorrhoea. The lactational amenorrhoea method (LAM) is the informed use of breastfeeding as a contraceptive method by a woman who is still amenorrhoeic, and who is not feeding her baby with supplements, for up to 6 months after delivery. Under these three conditions, LAM users are thought to have 98% protection from pregnancy. It can be difficult, however, to determine when supplementation of the baby's diet begins. We have analysed data from nine studies of the recovery of fertility in breastfeeding women to assess the effectiveness of lactational amenorrhoea alone, irrespective of whether supplements have been introduced, as a fertility regulation method postpartum. Cumulative probabilities of ovulation during lactational amenorrhoea were 30.9 and 67.3 per 100 women at 6 and 12 months, respectively, compared with 27.2 at 6 months when all three criteria of the LAM were met. Cumulative pregnancy rates during lactational amenorrhoea were 2.9 and 5.9 per 100 women at 6 and 12 months, compared with 0.7 at 6 months for the LAM. The probability of pregnancy during lactational amenorrhoea calculated from these studies is similar to that of other modern contraceptive methods, and it seems reasonable for a woman to rely on lactational amenorrhoea without regard to whether she is fully or partly breastfeeding. So that amenorrhoea and fertility suppression can be maintained, counselling about good breastfeeding and weaning practices remains important.

**Khella, A. K., Fahim, H. I., Issa, A. H., Sokal, D. C., & Gadalla, M. A. (2004). Lactational amenorrhea as a method of family planning in Egypt. *Contraception*, 69(4), 317–322.**

Because of the potential importance of the lactational amenorrhea method (LAM) as a family-planning option in Egypt, we analyzed data from the 1995 Egyptian Demographic and Health Survey (EDHS) to study breastfeeding practices, use of contraception, reproductive history and sociodemographic factors for 5504 mothers with children under 3 years. According to the EDHS data, about 80% of Egyptian women breastfed for at least 6 months, and 40% breastfed for 15–18 months. Over half of breastfeeding mothers used no additional contraception. Thirty-six percent of mothers breastfeeding children younger than 6 months who reported using no additional contraception were exclusively breastfeeding and amenorrheic, but only 4% reported relying on breastfeeding for family planning. We also held eight focus group discussions with breastfeeding mothers from urban and rural Upper and Lower Egypt on their use of contraceptive methods, breastfeeding, lactational amenorrhea and LAM. Participants showed strong recognition of the contraceptive effects of breastfeeding but differed widely in their understanding of lactational infecundability and knowledge of LAM as a method. These results suggest that LAM would be widely acceptable to Egyptian women, but that an educational program about the method is needed.

**King, J. (2007). Contraception and lactation. *Journal of Midwifery & Women's Health*, 52(6), 614–620.**

The benefits of breastfeeding for both the infant and the mother are undisputed. Longer intervals between births decrease fetal/infant and maternal complications. Lactation is an effective contraceptive for the first 6 months postpartum only if women breastfeed exclusively and at regular intervals, including nighttime. Because a high percentage of women in the United States supplement breastfeeding, it is important for these women to choose a method of contraception to prevent unintended pregnancies. Both the method of contraception and the timing of the initiation of contraceptives are important decisions that a clinician must help the breastfeeding woman make. Ideally, the chosen method of contraception should not interfere with lactation. This article reviews the research on the effect of contraceptives, including hormonal contraceptives, on lactation.

**Kunwar, S., Faridi, M. M., Singh, S., Zahra, F., & Alizaidi, Z. (2010). Pattern and determinants of breast feeding and contraceptive practices among mothers within six months postpartum. *Bioscience Trends*, 4(4), 186–189.**

**Objective:** The present study aims to determine the patterns of breast feeding, return of menstruation, and contraceptive practices in the first six months postpartum in women visiting the outpatient department at a teaching hospital in Lucknow, Northern India.

**Study design:** Mothers of infants between six to eight months of age visiting the outpatient department of Era's Lucknow Medical College were interviewed regarding breast feeding practices, return of menstruation, sexual activity, and contraceptive practices within the first six months postpartum using a structured questionnaire.

**Results:** Of all women interviewed only 75.8% practiced exclusive breast feeding with the mean duration of exclusive breast feeding (EBF) being 3.5 months with only 41% practicing EBF for six months, 28% were sexually active within six weeks postpartum, 64.5% women had a return of



menstruation within six months. Contraception was practiced by only 54.4% women with a barrier method such as a condom, being the most common. Better education was the only factor significantly affecting EBF ( $p < 0.004$ ) and use of contraception ( $p < 0.027$ ). There were a total of 10 pregnancies within six months postpartum.

**Conclusion:** Optimal breast feeding practices are poor in this part of the country and lactational amenorrhoea cannot be effectively and reliably used as a method of contraception. Therefore, optimal breast feeding practices, timely introduction of contraception and institutional delivery need to be encouraged.

**Kuti, O., Adeyemi, A. B., & Owolabi, A. T. (2007). Breast-feeding pattern and onset of menstruation among Yoruba mothers of South-west Nigeria. *European Journal of Contraception and Reproductive Health Care*, 12(4), 335–339.**

**Objective:** To determine the breast-feeding practices and duration of lactational amenorrhoea among women within the first year of delivery in a Nigerian population.

**Method:** Cross-sectional study carried out between January 2005 and April 2006, among mothers within one year of delivery, who were attending the Infant Welfare Clinic at Wesley Guild Hospital, Ilesa, Nigeria. Using a semi-structured questionnaire, mothers were interviewed to obtain information regarding their socio-demographic characteristics, parity, breast-feeding habits, use of contraception and onset of menstruation after delivery. Information obtained was analysed using the Statistical Package for Social Sciences (SPSS) software version 11.

**Results:** All 268 (100%) mothers interviewed breast-fed their babies, 261 (97.4%) of which for at least 6 months. Most (71.6%) suckled exclusively for 6 months and more; only 10 (3.7%) never carried out exclusive breast-feeding. Age, parity and educational level did not affect the duration of exclusive breast-feeding. Lactational amenorrhoea lasted 3 months or more in 229 (85.5%) of the mothers. Of the 174 who exclusively breast-fed for 6 months, 109 (62.6%) remained amenorrhoeic during that time and, hence, met the criteria for use of LAM contraception.

**Conclusion:** Exclusive breast-feeding among nursing mothers is highly prevalent among Yoruba mothers of South-west Nigeria. Since lactational amenorrhoea lasts 6 months in about two-thirds of the women nursing for that period of time, there is a great potential for the application of LAM for contraception.

**Labbok, M. H., Hight-Laukaran, V., Peterson, A. E., Fletcher, V., von Hertzen, H., & Van Look, P. F. (1997.) Multicenter study of the lactational amenorrhea method (LAM): I. Efficacy, duration, and implications for clinical application. *Contraception*, 55(6), 327–336.**

A multicenter study of the Lactational Amenorrhea Method (LAM) was carried out to test the acceptability and efficacy of the method. Additionally, the data are used to test new constructs for improvement of method criteria. A protocol was designed at the Institute for Reproductive Health (IRH), Department of Obstetrics and Gynecology, Georgetown University Medical Center, a World Health Organization (WHO) Collaborating Center, and was reviewed and modified in collaboration with the co-sponsors, the World Health Organization and the South to South Cooperation for Reproductive Health, and the principal investigators from each site. Data were gathered prospectively on LAM acceptors at 11 sites. Data were entered and cleaned on-site and further

cleaned and analyzed at IRH, using country-level and pooled data to produce descriptive statistics and life tables. The 98+% efficacy of LAM is confirmed in a wide variety of settings. In addition, the results yield insight on the possibility of continued use beyond 6 months. LAM is found to be highly effective as an introductory postpartum method when offered in a variety of cultures, health care settings, socio-economic strata, and industrial and developing country locales. In addition, LAM acceptance complements breastfeeding behaviors without ongoing breastfeeding support services. The parameters studied yield high efficacy and method continuation. Therefore, the basic tenets of the 1995 Bellagio consensus on LAM is reconfirmed and it is recommended that LAM be incorporated into hospital, maternity, family planning, maternal and child health, and other primary health care settings.

**Lopez-Martinez, M. G., Romero-Gutierrez, G., & Ponce-Ponce De Leon, A. L. (2006). Acceptance of lactational amenorrhoea for family planning after postpartum counseling. *European Journal of Contraception and Reproductive Health Care*, 11(4), 297–301.**

**Objective:** To determine the impact of postpartum counseling on the acceptance of lactational amenorrhoea method (LAM) for family planning.

**Methods:** In a prospective cross-sectional study 1490 postpartum women were included. Women who accepted or refused LAM for family planning were identified by means of a written survey. Twelve socio-demographic and clinical variables were included as predictors in a logistic regression analysis, the acceptance or refusal of LAM was the dependent variable; an Alpha level was set at 0.05.

**Results:** There were 807 (54.2%) women who accepted LAM as a contraceptive method; 683 (45.8%) refused it. Main reasons for accepting LAM were: conviction following counseling (54.4%) and use of LAM initially before switching to another modality (18.3%). Main reasons for LAM refusal were: belief that the method was unsafe (62.2%) and fear of some undesirable effect on health (15.8%). In the logistic regression analysis the variables *occupation outside the home* ( $P=0.01$ ) and *previous knowledge of LAM* ( $P<0.001$ ) emerged as predictors of LAM acceptance.

**Conclusions:** Postpartum counseling of LAM had a very positive impact on its acceptance. Although it is recommended that information about LAM be given antenatally, in some settings postpartum counseling could improve its acceptance rate.

**McNeilly, A. S. (2001). Lactational control of reproduction. *Reproduction, Fertility and Development*, 13(7–8), 583–590.**

In most mammalian species lactation suppresses fertility. There is no doubt that it is the suckling stimulus that provides the controlling signal, and, in human reproduction, this is the only truly physiological signal that suppresses fertility in normally nourished, healthy women. In breastfeeding women, the return of normal fertility follows a relatively well-defined path progressing through: an almost complete inhibition of gonadotrophin-releasing hormone/luteinizing hormone (GnRH/LH) pulsatile secretion in the early stages of lactation; return of erratic pulsatile secretion with some ovarian follicle development associated with increases in inhibin B and oestradiol; a resumption of apparently normal follicle growth associated with a normal increase in oestradiol, but often an absence of ovulation, or formation of an inadequate corpus luteum; and a return to normal ovulatory menstrual cycles. A key element in controlling the rate of this progression is the impact of

the suckling stimulus on the GnRH pulse generator, a common feature of lactation in those species for which there is information. The variability in the duration of lactational amenorrhoea between women is related to the variation in the strength of the suckling stimulus, a unique situation between each mother and baby. Full breastfeeding can provide a reliable contraceptive effect in the first 6 to 9 months, but the precise mechanisms whereby the suckling stimulus affects GnRH pulsatile secretion remain unknown. Many studies on the hypothalamic pathways that might be involved in the translation of the neural suckling stimulus to suppression of hypothalamic GnRH secretion have been undertaken, principally in rats. In women, suckling increases the sensitivity of the hypothalamus to the negative feedback effect of oestradiol on suppressing the GnRH/LH pulse generator, a mechanism that appears to be common across species. In contrast, the role of prolactin in the control of GnRH appears to be species-dependent, with the importance varying from none to an important role in late or throughout lactation. In women, there is little evidence for a role of leptin, opioids or dopamine, although this may merely reflect the ethical dilemma of being able to give sufficient drug to test the system in the mother since these drugs will pass through the breast milk to the baby. Regardless of mechanism, practical guidelines for using breastfeeding as a natural contraceptive have been developed, which allows mothers to utilize the only natural suppressor of fertility in women as an effective means of spacing births.

**Moura, E. R., de Freitas, G. L., Pinheiro, A. K., Machado, M. M., da Silva, R. M., & de Oliveira Lopes, M. V. (2011). Lactational amenorrhea: Nurses experience and the promotion of this alternative method of contraception [Portuguese]. *Revista da Escola de Enfermagem da USP*, 45(1), 40–46.**

This is a cross-sectional, field study that used a quantitative approach with the objectives to identify nurses' personal experiences with breastfeeding and with the Lactational Amenorrhea Method (LAM); learn the reasons for not adhering to breastfeeding or adhering to mixed feeding; establish the relationship between nurses' personal experience with the LAM and their giving orientations about this contraceptive method to users of the Primary Health Care Center. Participants were 137 nurses with the Family Health Strategy in Fortaleza, Ceará, Brazil, and data collection was performed through interviews. Most participants were female; i.e., 121 participants (88.3%). The age range was 26 to 59 years, with an average of 38.3 years. Sixty-six participants (94.2%) had a previous experience with breastfeeding, 61 (92.4%) of which adhered to Exclusive Breastfeeding (EB), 5 (7.6%) to Mixed Feeding (MF); and 4 (5.8%) did not breastfeed. The time of EB ranged from one to six months, with an average 4.31 months. Twelve nurses (19.6%) followed the LAM. The study showed that the nurses' personal experience with the LAM did not affect the promotion of this method to the clientele that they assist.

**Panzetta, S. (2011). Lactational amenorrhea method contraception: Improving knowledge. *Community Practitioner*, 84(10), 35–37. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmed/22096835>**

Lactational amenorrhea method (LAM) is a reliable form of contraception for up to six months following childbirth, provided the mother's periods have not returned and she is breastfeeding exclusively with sufficient feeds and no dummy or bottle use. This paper considers how LAM works and how it may be supported in practice, and provides a local example involving the use of

information provision and training to overcome barriers to its understanding and use. An information leaflet was provided based on national guidance and with input from local practitioners and women. Brief training was also used to help ensure that women receive consistent and up-to-date information from health professionals.

**Perez, A., Labbok, M. H., & Queenan, J. T. (1992). Clinical study of the lactational amenorrhoea method for family planning. *Lancet*, 339(8799), 968–970.**

The effect of breastfeeding on fertility is well known; however, its use as a method of family planning was, until recently, untested. In 1988, the Bellagio Consensus Conference proposed guidelines that became the basis for a method of family planning called the lactational amenorrhoea method (LAM). The principle of LAM is that a woman who continues to fully or nearly fully breastfeed her infant and who remains amenorrhoeic during the first 6 months postpartum is protected from pregnancy during that time. We have assessed this method in the context of a breastfeeding support intervention study of 422 middle-class women in urban Santiago, Chile. The cumulative 6-month life-table pregnancy rate was 0.45% among women who relied on LAM as their only family planning method (1 woman pregnant in month 6). The findings indicate that LAM, with its high acceptance and efficacy, is a viable method of family planning and can safely serve as an introductory method for breastfeeding women.

**Peterson, A. E., Pérez-Escamilla, R., Labbok, M. H., Hight, V., von Hertzen, H., & Van Look, P. (2000). Multicenter study of the lactational amenorrhea method (LAM) III: Effectiveness, duration, and satisfaction with reduced client-provider contact. *Contraception*, 62(5), 221–230.**

The objective of this effort was to assess the use and efficacy of the Lactational Amenorrhea Method (LAM) with reduced numbers of client–provider contacts. A co-sponsored multicenter study of LAM was performed to test the efficacy and acceptability of the method under “post-marketing” conditions, with investigator-initiated contact occurring only twice: at the time of intake and then again at month 7 of postpartum. These data are assumed to provide an assessment of LAM’s use, efficacy, and performance that more closely reflects the prevailing conditions of these populations during normal use. Three hundred and sixty-two subjects were recruited through centers that had participated in the previous, more contact-intensive studies. Using a cooperatively developed protocol, data were gathered prospectively on at least 10 and up to 50 LAM acceptors at nine sites, and entered and cleaned on site. Data were further cleaned and analyzed at the Georgetown University Institute for Reproductive Health (IRH) and the Department of Nutrition at the University of Connecticut. Using country-level and pooled data, descriptive statistics and life tables were produced. LAM efficacy in this sample is 100% because there were no pregnancies at any of the participating sites. Satisfaction with the method was high, and the rate of continuation on to another method after LAM was 66.7% at 7 months postpartum. Of the women who had never used family planning prior to LAM, 63.0% went on to use another method of family planning in a timely manner. LAM can be highly effective as an introductory postpartum family planning method when offered in a variety of cultures, health care settings, and industrial and developing country locales. Under conditions of limited client–provider contact, LAM remains effective and leads to acceptance

of another method by about two-thirds of the acceptors. Women are able to use LAM effectively without extensive counseling or follow-up, with a high level of user satisfaction.

**Ravera, M., Ravera, C., Reggiori, A., Cocozza, E., Cianta, F., Riccioni, G., & Kleimayr, R. (1995). A study of breastfeeding and the return of menses in Hoima District, Uganda. *East African Medical Journal*, 72(3), 147–149.**

The effect of breastfeeding on reestablishment of ovulation and fertility and on birth spacing are now well known. A study was conducted on lactational amenorrhoea (LAM) at 180 days in Hoima District, Uganda in order to understand whether and how LAM could be applied in fertility control and birth spacing. Since the introduction of supplementary food by Ugandan women does not replace or substitute for breastfeeding, a study was designed to determine if LAM was effective irrespective of supplementation of infant's diet. One hundred and fifty four mother/child pairs were entered into the study and 134 women completed the sixth month of the study. At the end of the period, eighty four women (62.7%) were amenorrhoeic of whom only 33 (39.3%) were exclusively breastfeeding and no woman had dropped out of the study because of pregnancy or the use of other family planning methods other than LAM. The study confirmed that LAM could be applicable in Uganda to the majority of the breastfeeding women (62.7%). It is expected that if health workers increase the intensity of breastfeeding support as well as the women's knowledge and motivation to use LAM for family planning, this would contribute to children's health as well as to birth spacing that is one of the major factors related to infant deaths. According to data from this study, the return of menses is irrespective of whether supplements have been introduced and their frequency.

**Romero-Gutierrez, G., Vaca-Ortiz, N., Ponce-Ponce de Leon, A .L., & Guadalupe Lopez-Martinez, M. (2007). Actual use of the lactational amenorrhoea method. *European Journal of Contraception and Reproductive Health Care*, 12(4), 340–344.**

**Objective:** The lactational amenorrhoea method (LAM) is an effective contraceptive option in developing countries. Post-partum, of the women who accept to apply LAM, many never do. Our aim was to determine the actual use of LAM.

**Methods:** A group of 326 post-partum women who accepted LAM use were recruited. After 6 months, they were asked if they actually had applied the method or not. In a logistic regression analysis, nine socio-demographic and clinical variables were studied as predictors of actual LAM use. An alpha level was set at 0.05.

**Results:** Overall, of the 326 women, only 61 (18.7%) actually applied LAM. The mean duration of LAM use was 4.3 +/- 0.2 months. The main reason for not applying LAM was that women thought the method was ineffective (66.0%). The variable time of menses resumption emerged as a predictor of LAM use ( $p = 0.001$ ).

**Conclusions:** Despite post-partum acceptance, most women did not actually apply LAM. In our setting as well as in other developing countries, regular contacts with a health care provider could improve LAM use.

**Shaaban, O. M., & Glasier, A. F. (2008). Pregnancy during breastfeeding in rural Egypt. *Contraception*, 77(5), 350–354.**

**Background:** Breastfeeding does not reliably protect against pregnancy except during the first 6 months postpartum and only then if accompanied by amenorrhea. Reluctance to use other methods of contraception during lactation may result in unplanned pregnancy. The aims of this study were to describe, among women in rural Egypt attending for antenatal care the prevalence of pregnancy during breastfeeding, contraceptive practice and unintended pregnancy. Finally, the study assessed women's impressions of the effect of conception during breastfeeding on breast milk and on the health of the breastfed infant.

**Study design:** A descriptive study using an interviewer-administered structured questionnaire for 2617 parous women attending a hospital in Egypt for antenatal care.

**Results:** More than 95% of women breastfed the child before their current pregnancy; 25.3% conceived while breastfeeding. Conception occurred during the first 6 months postpartum in 4.4%, before resumption of menstruation in 15.1% and while exclusively or almost exclusively breastfeeding in 28.1%. Only 10 pregnancies (1.5%) occurred when all the prerequisites of the lactational amenorrhea method of contraception (LAM) were present. Twenty-nine percent of pregnancies conceived during breastfeeding were unintended, 10% of women had considered terminating their pregnancy while 4.4% of them reported trying to do so.

**Conclusions:** Pregnancy during breastfeeding is common in Egypt and is often unintended. There is great potential for using LAM, but it must be properly taught, and women should be encouraged to start using effective contraception as soon as any of the prerequisites of LAM expires.

**Shaaban, O. M., Hassen, S. G., Nour, S. A., Kames, M. A., & Yones, E. M. (2013). Emergency contraceptive pills as a backup for lactational amenorrhea method (LAM) of contraception: A randomized controlled trial. *Contraception*, 87(3), 363–369. doi:10.1016/j.contraception.2012.07.013**

**Background:** The use of breastfeeding as a method of birth spacing occasionally ends in “unplanned pregnancy.” This is due to unexpected expiration of one or more of the lactation amenorrhea method (LAM) prerequisites. The current study tests a new concept that the in-advance provision of single packet of progestogen emergency contraception (EC) pills during the postpartum LAM counseling may decrease the incidence of unplanned pregnancy during breastfeeding.

**Study design:** This was a registered two-armed randomized controlled trial (NCT 01111929). Women intending to breastfeed and to postpone pregnancy for 1 year or more were approached. They received adequate postpartum contraceptive counseling. Women intending to use LAM were randomly assigned to one of two groups. The LAM-only group received the proper LAM counseling and did not receive counseling about EC. The LAM-EC group received counseling for both LAM and EC with in-advance provision of one packet of EC pills. They were advised to use these pills if one of the prerequisites of LAM expires and sexual relation has occurred before the initiation of another regular contraceptive protection. All the participants were advised that they need to use another regular method upon expiration of any of the LAM prerequisites.

**Results:** Eligible women were 1158 parturients randomized into two equal groups. Forty-four percent of the women provided with EC used them. Significantly more women in the LAM-EC group initiated regular contraception within or shortly after the first 6 months postpartum when compared with those in the LAM-only group (30.5% vs. 7.3%, respectively;  $p=.0004$ ). Pregnancy

occurred in 5% of the LAM-only group as compared with 0.8% in the LAM-EC group ( $p=.005$ ). Minimal side effects were reported after EC use.

**Conclusion:** In-advance provision of EC pills can increase the rate of initiation of regular contraception once one or more of the prerequisites of LAM expire. Consequently, the use of EC pills as a temporary backup of LAM can decrease the incidence of unplanned pregnancy during breastfeeding. The use of progestogen EC pill during lactation is safe and tolerable.

**Tommaselli, G. A., Guida, M., Palomba, S., Barbato, M., & Nappi, C. (2000). Using complete breastfeeding and lactational amenorrhoea as birth spacing methods. *Contraception, 61*(4), 253–257.**

The aim of this study was to evaluate the effectiveness of lactational amenorrhoea and to determine the relationship between extended breastfeeding and the return of fertility. Breastfeeding pattern, basal body temperature, cervical mucus, salivary ferning, vaginal blood discharge, frequency of sexual intercourse, and the presence of ovulation in the first cycle after the resumption of menses with ultrasonography were evaluated in 40 women. All subjects completed the study with only one case of incomplete breastfeeding. No pregnancies were observed. The mean number of feeding sessions and mean interval between sessions decreased significantly ( $p < 0.01$ ) during the first six months postpartum (7.5 +/- 1.3 after 60 days postpartum vs. 5.7 +/- 2.1 after 180 days, and 3.6 +/- 0.8 vs. 5.1 +/- 0.9, respectively). Eight women (20%) menstruated before weaning, but none had an adequate thermal shift, while 32 (80%) had their first vaginal bleeding after weaning with 12 (37.5%) registering an adequate thermal shift. Both basal body temperature and salivary ferning proved to be suggestive of ovarian activity, while mucus characteristics were not reliable in identifying fertile periods. Our study showed that breastfeeding associated with lactational amenorrhoea proved to be a good method of postpartum fertility control. Since the importance of supplementation is still debated, it is recommended that a "complete" breastfeeding program be used.

**Türk, R., & Terzioglu, F. (2010). P173 The effects of Turkish and Islamic culture on lactational amenorrhea [Poster abstract]. *European Journal of Contraception and Reproductive Health Care, 15*(Suppl. 1), 155–156.**

Culture is shared by individuals of community and has been learned in process of social interaction. Individuals' behaviour is affected by community's cultural values. On the other hand, religion could affect the cultural values, too, especially for the community under control of traditions. In line with this, effect of religion can be seen in all area of community.

Islamic religion is internalized by majority of the population of Turkey. Belief in association with Islamic religion can affect culture and life style. This manner has influence especially on Muslim women. To understand Quran and Sunna and to live convenient to them is a most determinant factor of Islamic culture. Quran especially promote woman for breast-feeding. For example: in Ramadan month, fasting is an obligatory cult and eating and drinking is forbidden for Muslims in daytime. However, the Prophet Muhammad stated that breastfeeding women may not fast. But the women have to fulfil the religion task, which is obligatory for all Muslim, after lactation period. On the other hand, the breastfeeding or pregnant women who have deep religious belief mostly don't

take into consideration this detail and can continue to fast in Ramadan month. This manner can affect negatively both mother's and child's health.

97.8% of infant has been breastfed in postpartum period in Turkey. Women's breastfeeding behaviour is promoted by both community and family. Breastfeeding is seen as a task of women in Islamic culture and this also supports the incentive behaviour. For developing and developed countries, World Health Organization regards breastfeeding as a potential family planning method for mother and child health programs. This method can protect mother from pregnancy in postpartum period at 98% ratio if some criteria are obeyed.

In Islamic religion, there are different comments on family planning method usage. However, in general, family planning method usage is not assented. In addition, it is emphasized that contraception methods are contrary to Islamic religion's essential principle and essence. Because of that, in Turkey, 16% of the women use Lactational Amenorrhea Method (LAM) as a natural protective method against pregnancy.

Consequently, under impact of religious beliefs, if women or partner prefer LAM as contraception, the responsibilities of health worker, national and international institution are to support to arrange education and counselling program on this subject and to give consultation and educational services which are related to how to use this method most effectively in both prenatal and postpartum period. Thus, we think that unwanted pregnancies and health problems concerning this could be prevented.

**Turk, R., Terzioglu, F., & Eroglu, K. (2010). The use of lactational amenorrhea as a method of family planning in eastern Turkey and influential factors. *Journal of Midwifery & Women's Health, 55(1), E1–E7.***

Although the lactational amenorrhea method (LAM) is commonly used for contraception, it frequently fails and pregnancy ensues. This descriptive study was conducted to determine the status of the use of breastfeeding as a method of family planning and the influential factors that may have contributed to the success or failure of LAM. The research sample was comprised of 188 women with 6-month-old infants in eastern Turkey. A semistructured interview form was used for data collection in face-to-face meetings with the women during visits in their homes. In this study, 34% of the women used LAM to prevent pregnancy after childbirth. However, it was observed that only 17.2% of women using LAM fulfilled the LAM criteria with success, and 82.8% did not fulfill one or more of the LAM criteria. The pregnancy rate of women using this method was 32.8%. Two of the three basic criteria necessary for LAM to be effective were not met by the women: having menses (43.8%) and starting supplemental feeding (70.3%). Prenatal and postnatal counseling services need to be integrated and include information and education about the criteria that are necessary for LAM to be used effectively. These services should be given to women who choose to use LAM for contraception.



**Valeggia, C., & Ellison, P. (2004). Lactational amenorrhoea in well-nourished Toba women of Formosa, Argentina. *Journal of Biosocial Science*, 36(5), 573–595.**

The proximate causes of the contraceptive effect of lactation are still a matter of productive debate. This study sought to disentangle the relative impact that intense breast-feeding practices and maternal nutrition have on the regulation of ovarian function in nursing women. A mixed-longitudinal, direct-observational, prospective study was conducted of the return to postpartum fecundity in 113 breast-feeding, well-nourished Toba women. A sub-sample of 70 women provided data on nursing behavior, daily activities, diet quality and urinary levels of oestrone and progesterone metabolites. Well-nourished, intensively breast-feeding Toba women experienced a relatively short period of lactational amenorrhea (10.2 +/- 4.3 months) and a high lifetime fertility (TFR = 6.7 live births/woman). Duration of lactational amenorrhoea was not correlated with any of the nursing parameters under study or with static measures of maternal nutritional status. The results indicated that the pattern of resumption of postpartum fertility could be explained, at least partly, by differences in individual metabolic budgets. Toba women resumed postpartum ovulation after a period of sustained positive energy balance. As the relative metabolic load hypothesis suggests, the variable effect of lactation on postpartum fertility may not depend on the intensity of nursing per se but rather on the energetic stress that lactation represents for the individual mother.

**Van der Wijden, C., Kleijnen, J., & Van Den Berk, T. (2003). Lactational amenorrhea for family planning. *Cochrane Database of Systematic Reviews*, (4), CD001329. doi:10.1002/14651858.CD001329**

**Background:** 50 % of pregnancies are unwanted. For several reasons including difficulty in obtaining contraceptives, no or ineffective contraception is used to prevent these unwanted pregnancies. The Lactational Amenorrhoea Method (LAM) however is a contraceptive method available and accessible for many women.

**Objectives:** To assess in fully breastfeeding women, staying amenorrheic, the efficacy of the Lactational Amenorrhoea Method as a contraceptive method. The efficacy of LAM, as defined in 1988 in Bellagio, was compared with alternative definitions of LAM; the outcomes were measured using pregnancy and menstruation life tables.

**Search strategy: Data sources:** MEDLINE searches from 1966 until 2002 and EMBASE from 1988 until 2002; reference lists of studies and review articles; books related to LAM; published abstracts from breastfeeding, reproductive health, contraceptive conferences; and e-mail communication with coordinators of such studies.

**Selection criteria:** From 454 potentially relevant studies 154 investigated the risk of pregnancy during LAM or lactational amenorrhea. Two reviewers applied the following inclusion criteria: prospective study, cases and -if available- controls had to be sexually active, pregnancy had to be confirmed by physical examination or a pregnancy test. Life table menstruation rates and life table pregnancy rates were taken as endpoints. Thirteen publications, reporting on 9 intervention groups and 2 control groups, met the inclusion criteria and were included in this systematic review. Their quality was assessed.

**Data collection and analysis:** Two reviewers independently extracted data, disagreements were resolved through discussion. Because of the heterogeneity of the included studies, the studies were analyzed using narrative methods.

**Main results:** For the outcome two controlled studies of LAM users reported life table pregnancy rates at 6 months of 0.45 and 2.45 percent and 5 uncontrolled studies of LAM users reported 0-7.5 percent. Life table pregnancy rates of women fully breastfeeding and amenorrheic but not using any contraceptive method were 0.88 in one study and 0.9-1.2 percent (95% CI 0. 0-2.4 ) in a second study, depending on the definition of menstruation used. The life table menstruation rate at 6 months in all studies varied between 11.1-39.4 percent.

**Reviewer's conclusions:** No clear difference in life table pregnancy rates was found between women using LAM and supported in doing so, and fully breastfeeding, amenorrheic women not using any method. Because the length of lactation amenorrhoea of women using LAM is too different between populations studied, and population specific, it is uncertain whether LAM extends lactational amenorrhoea.

**Van Wouwe, J. P., Lanting, C. I., Van Dommelen, P., Treffers, P. E., & Van Buuren, S. (2009). Breastfeeding duration related to practised contraception in the Netherlands. *Acta Paediatrica (Oslo, Norway : 1992)*, 98(1), 86–90.**

**Aim:** The aim of this study was to gain insight into contraception practised and related to breastfeeding duration.

**Methods:** Mothers with infants up to 6 months received a questionnaire on infant feeding (breast or formula feeding) and contraception (hormonal or non-hormonal methods). Estimates of the time interval between resuming contraception and cessation of lactation was calculated by Chained Equations Multiple Imputation.

**Results:** Of all women (n = 2710), 30% choose condoms, 22% the combined oral contraceptive pill (OCP) and few other methods. Breastfeeding was started by 80%, and 18% continued up to 6 months. Of the breastfeeding mothers, 5% used hormonal contraception; 7% of women who used hormonal contraception practised breastfeeding. After adjustment for background variables, the use of OCP is strongly associated with formula feeding: after delivery to the third month postpartum, the crude OR being 17.5 (95% CI: 11.3-27.0), the adjusted OR 14.5 (9.3-22.5); between the third and sixth month postpartum, respectively, 13.1 (95% CI: 8.6-19.9) and 11.7 (7.6-17.9). Of all breastfeeding women, 20-27% resumed OCP at 25 weeks postpartum and 80% introduced formula feeding. The time lag between these events is 6 weeks. Hormonal contraception was resumed after formula introduction.

**Conclusion:** Mothers avoid hormonal contraception during lactation; they change to formula feeding 6 weeks before they resume the OCP. To effectively promote longer duration of breastfeeding, the BFHI needs to address contraception as practiced.

**Vural, B., Vural, F., Erk, A., & Karabacak, O. (1999). Knowledge of lactational amenorrhea and contraception in Kocaeli, Turkey. *East African Medical Journal*, 76(7), 385–389.**

**Objective:** To determine the knowledge of women about lactational amenorrhea and contraceptive properties of breastfeeding.

**Design:** A prospective, randomized descriptive study.

**Setting:** Kocaeli University School of Medicine, Department of Obstetrics and Gynecology.

**Subjects or participants:** Nine hundred and twenty-two women in their reproductive ages.

**Intervention:** A questionnaire was filled by doctors or nurses during face to face interview.

**Main outcome measures:** There was significantly less knowledge for the importance of frequency and duration of suckling ( $p < 0.0001$ ). The education increases the knowledge of lactational amenorrhea as a interruptus contraceptive method.

**Results:** More than fifty-three per cent of women were using one of the modern contraceptive methods, 23.86% were using natural methods and 22.78% not using any family planning method. Intrauterine devices (30.15%), coitus interruptus (21.69%) and condom (16.48%) were the most common contraceptive methods. Nearly fifty-two per cent of women were not aware of the contraceptive property of breastfeeding, 25.68% of women knew lactation had a protective effect from pregnancy, 48.16%, did not know the importance of frequency and duration of suckling on fertility reducing effect of lactation.

**Conclusion:** The level of knowledge on lactational amenorrhea and frequency of suckling was significantly low in our study, especially in the illiterate group. Since efficacy of natural family planning depends on the compliance of women, education of women about lactation is very important. Family planning programmes should be focused on breastfeeding and type of breastfeeding practices used, especially where there are no contraceptive alternatives.

**Wade, K. B., Sevilla, F., & Labbok, M. H. (1994). Integrating the lactational amenorrhea method into a family planning program in Ecuador. *Studies in Family Planning*, 25(3), 162–175.**

This paper reports the results of a 12-month implementation study documenting the process of integrating the Lactational Amenorrhea Method (LAM) into a multiple-method family planning service-delivery organization, the Centro Médico de Orientación y Planificación Familiar (CEMOPLAF), in Ecuador. LAM was introduced as a family planning option in four CEMOPLAF clinics. LAM was accepted by 133 breastfeeding women during the program's first five months, representing about one-third of postpartum clients. Seventy-three percent of LAM acceptors were new to any family planning method. Follow-up interviews with a systematic sample of 67 LAM users revealed that the method was generally used correctly. Three pregnancies were reported, none by women who were following LAM as recommended. Service providers' knowledge of LAM resulted in earlier IUD insertions among breastfeeding women. Relationships with other maternal and child health organizations and programs were also established.

**Zhang, L. Y., Liu, Y. R., Shah, I. H., Tian, K. W., & Zhang, L. H. (2002). Breastfeeding, amenorrhea and contraceptive practice among postpartum women in Zibo, China. *European Journal of Contraception and Reproductive Health Care*, 7(3), 121–126.**

This paper reports a hospital-based longitudinal study that was conducted in Zibo, China, in June 1996. The objective was to investigate the existing patterns of breastfeeding, amenorrhea and contraceptive use among postpartum women in urban areas of China. Information was obtained from 492 newly parturient women. Follow-up interviews were done at 42 days, 4 months and 1 year after delivery. The results showed that the full breastfeeding rate (including exclusive and almost exclusive breastfeeding) was 78% and 43% at 42 days and 4 months after delivery, respectively. The mean reported length of abstinence from sexual intercourse after delivery was 71 days. The mean

reported time to menses resumption was 184 days. Ninety-three per cent of women had resumed sexual intercourse at 4 months after delivery. Seventy-three per cent of women were using contraceptive methods when they resumed sexual activity after delivery. After childbirth, the majority of the women interviewed used condoms within 3 months. Thereafter, most of them switched to intrauterine device (IUD)). Life table analysis shows that the continuation rates of full breastfeeding and amenorrhea at 4 months after delivery were 35% and 68%, respectively. This implies that if the full breastfeeding rate can be prolonged, it is feasible to use the lactational amenorrhea method (LAM) among Chinese postpartum women. The policy implications of this study are that quality care on contraceptive services and information for postpartum women in urban areas need to be improved further.

## 7. POSTPARTUM FAMILY PLANNING IN SPECIAL POPULATIONS

**Beydoun, H. A., Beydoun, M. A., & Tamim, H. (2009). How does gestational diabetes affect postpartum contraception in nondiabetic primiparous women? *Contraception, 79(4), 290–296.***

**Background:** The aim of the study is to explore the effect of gestational diabetes mellitus (GDM) on postpartum contraception among nondiabetic primiparous women.

**Study design:** Secondary analyses of 2004–2005 Pregnancy Risk Assessment Monitoring System data from Michigan and Oregon.

**Methods:** Analyses were performed on 2332 women, taking complex survey design into consideration. Crude and adjusted odds ratios (cOR; aOR) and their 95% confidence intervals (CI) were obtained using logistic regression analyses.

**Results:** Postpartum use of hormonal (aOR=1.12, 95% CI: 0.68–1.83) and nonhormonal (aOR=1.18, 95% CI: 0.73–1.92) contraception were not influenced by GDM after controlling for confounders. Female sterilization was more frequently adopted (cOR=4.99, 95% CI: 1.13–22.17) and depot medroxyprogesterone acetate (DMPA) (cOR=0.53, 95% CI: 0.23–1.18), diaphragm/cervical cap/sponge (cOR=0.13, 95% CI: 0.016–0.95) and cervical ring (cOR=0.13, 95% CI: 0.017–0.98) were less frequently adopted by women reporting GDM diagnosis.

**Conclusion:** With few exceptions, GDM does not appear to affect postpartum hormonal and nonhormonal contraception.

**Chin, J. R., Swamy, G. K., Ostbye, T., & Bastian, L. A. (2009). Contraceptive use by obese women 1 year postpartum. *Contraception, 80(5), 463–468.***

**Background:** Obese women have higher rates of pregnancy complications, making the prevention of unintended pregnancies in this group of particular importance.

**Study design:** We performed a secondary analysis of data from Active Mothers Postpartum (AMP), a randomized controlled trial aimed at postpartum weight reduction. We assessed contraceptive use among 361 overweight/obese women 12 months postpartum. Logistic regression was used to model the effect of body mass index (BMI) categories on effective contraceptive use (intrauterine, hormonal or sterilization methods) while adjusting for potential confounders including age, race, parity, breastfeeding, education and chronic illness.

**Results:** Effective contraceptive use was reported by 45% of women. In the multivariable model, women with a BMI  $\geq 35$  kg/m<sup>2</sup> were less likely to use effective contraception than women with a BMI  $< 30$  kg/m<sup>2</sup> (OR 0.5, 95% CI 0.3–0.8). There was a trend towards less use of effective contraception among women with a BMI 30–34.9 kg/m<sup>2</sup> as compared to women with a BMI  $< 30$  kg/m<sup>2</sup>.

**Conclusion:** At 12 months postpartum, obese women were less likely to use effective contraceptive methods than overweight women. Although certain contraceptive methods may be preferred over others in this population, providers should reinforce the importance of effective contraception to avoid unintended pregnancies in obese women.

**Gerhardt, A., Chor, J., & Cowett, A. (2010). Provision of postpartum contraception in women with chronic medical conditions. *Contraception*, 82(2), 201.**

**Objectives:** Because chronic medical conditions can worsen in pregnancy and adversely affect maternal and fetal health, family planning in this population is important. Prenatal care provides an opportunity for contraceptive counseling. In women with medical diseases, contraceptive counseling may be over-shadowed by management of their conditions and by the complexity of counseling. We sought to compare postpartum contraception methods prescribed to women with and without chronic medical conditions.

**Method:** We conducted a retrospective cohort study using a database of patients who delivered between July 2004 and September 2007. Women with diabetes, chronic hypertension, cardiac disease, pulmonary embolism or venous thromboembolism were compared to matched controls. chi-Square and t tests were used to compare data between the two groups.

**Results:** Total sample size was 8314 women, 752 with chronic medical conditions and 7562 controls. 81% of women with medical conditions versus 86% of controls received postpartum contraception. ( $p < .001$ ). Women with diabetes (83%,  $p = .04$ ), hypertension (80%,  $p < .001$ ) and heart disease (75%,  $p < .01$ ) were less likely than their matched controls to receive postpartum contraception. Progesterone only methods were the most commonly prescribed contraception for both cohorts (28%) and controls (30%). Nine percent of cohort versus four percent of controls underwent postpartum sterilization ( $p < .001$ ).

**Conclusions:** At an urban university hospital, women with chronic medical conditions, specifically diabetes, hypertension and heart disease, were less likely than their healthy peers to receive postpartum contraception upon hospital discharge.

**Glass T. L., Tucker K., Stewart R., Baker T. E., & Kauffman R. P. (2010). Infant feeding and contraceptive practices among adolescents with a high teen pregnancy rate: A 3-year retrospective study. *Journal of Women's Health*, 19(9), 1659–1663.**

**Background:** Adolescents consistently demonstrate the lowest rates of breastfeeding among women of reproductive age despite well-documented benefits of breastfeeding. In Amarillo, Texas, a medium-sized community with a perennially high teen pregnancy rate, we sought (1) to determine breastfeeding practices among adolescent females immediately after delivery and again at 6 weeks and (2) to identify contraceptive choices among the same teen population.

**Methods:** This was a retrospective chart review focused on adolescents between the ages of 13 and 18 coming to a university-based obstetrical service between January 1, 2006, and December 31, 2008. Data on breastfeeding and contraceptive practices were analyzed.

**Results:** Five hundred forty-three cases were analyzed. At hospital discharge, 59.3% initiated breastfeeding, but this dropped to 22.2% at the 6-week postpartum appointment. Over 27% of all study subjects failed to appear for postpartum evaluation. Multiparity was the only outcome variable associated with failure to initiate breastfeeding. Depot-medroxyprogesterone acetate, the levonorgestrel intrauterine device (IUD), and combination oral contraceptives were the most popular contraceptive choices, but 16% elected to forego any form of contraception at the postpartum visit.

**Conclusions:** Adolescent women living in an area of Texas with a high teen pregnancy rate reported relatively low breastfeeding rates immediately postpartum, with a >50% decrease in breastfeeding in

any form by 6 weeks postpartum. A substantial number failed to initiate any form of contraception at the postpartum visit. These findings support the critical need for additional breastfeeding support and contraceptive education in this at-risk adolescent population.

**Guazzelli, C. A., de Queiroz, F. T., Barbieri, M., Torloni, M. R., & de Araujo, F. F. (2010). Etonogestrel implant in postpartum adolescents: bleeding pattern, efficacy and discontinuation rate. *Contraception*, 82(3),256–259.**

**Background:** The increasing rate of teenage pregnancies is a challenge to health professionals. New contraceptive methods have been developed to try to improve adherence in this group of patients. The study was conducted to evaluate the bleeding pattern, efficacy and discontinuation rate of etonogestrel implant (68 mg) inserted in postpartum adolescents.

**Study design:** The study population comprised 44 postpartum adolescents managed at the Family Planning Sector of São Paulo Federal University. The implant was inserted, on average, 102 days after delivery. Patients were followed prospectively during four 90-day periods.

**Results:** All 44 patients completed the 12 months of follow-up, resulting in a study discontinuation rate of 0%. No implants were removed. There were no pregnancies during the study. After 1 year of use, frequent and prolonged bleeding were reported by less than 5% of the patients and amenorrhea occurred in 38.6% of the users. Laboratory parameters indicated a significant increase in hemoglobin and hematocrit among users.

**Conclusion:** These findings suggest that the etonogestrel implant is a safe and effective contraceptive method that is well accepted by adolescents after a pregnancy.

**Gutierrez, G. R., Villanueva, S. O., & de Leon, A. L. (2009). Aceptacion de anticonceptivos durante el puerperio en embarazos no planeados [Acceptance of contraceptives in the postpartum period in unplanned pregnancies]. *Ginecologia y Obstetricia de Mexico*, 77(11), 499–503.**

**Background:** In spite the high rate of contraceptives use, the unplanned pregnancies still frequently occur. It is unknown the amount of women with unplanned pregnancies who accept contraceptive methods at immediate postpartum.

**Objective:** To determine the frequency of women with unplanned pregnancies who accept contraceptives at immediate postpartum and the associated factors with its acceptance.

**Material and method:** In a cross-sectional study, women at immediate postpartum were recruited. They were asked if their pregnancy was planned or unplanned; if at postpartum [they—Ed.] accepted some contraceptive method and reasons for acceptance or not. The statistical analysis included arithmetic mean, standard error, percentages, chi<sup>2</sup>, Student t test; and logistic analysis regression for determining the associated factors with the acceptance of contraceptives. An alpha value was set at 0.05.

**Results:** Of 1,024 women 566 (55.3%) had a planned pregnancy and 457 of them (80.7%) accepted contraceptives. The remaining 458 women (44.7%) had an unplanned pregnancy and 402 (87.8%) accepted contraceptives,  $p = 0.003$ . The significant factor associated with the acceptance of contraceptives was the multiparity,  $p = 0.034$ .

**Conclusion:** There is more acceptance of contraception in women with unplanned pregnancy. In these women the multiparity is associated with higher acceptance of contraceptive methods. It is recommended to reinforce the contraceptive counselling in this group of women.

**Huang, Y.-M., Merkatz, R., Kang, J.-Z., Roberts, K., Hu, X.-Y., Di Donato, F., . . . Cheng, L.-N. (2012). Postpartum unintended pregnancy and contraception practice among rural-to-urban migrant women in Shanghai. *Contraception*, 86(6), 731–738. doi:10.1016/j.contraception.2010.04.091**

**Background:** Rural-to-urban migrant women in Shanghai have poor reproductive health; the incidence of postpartum unintended pregnancy and contraceptive practices has not been adequately studied in this population.

**Study design:** This retrospective study examined the incidence of postpartum unintended pregnancy and associated factors among migrant women and included a medical records reviews, telephone interviews and in-depth face-to-face interviews.

**Results:** The incidence of unintended pregnancy during the first and second years postpartum was 12.8 and 12.9 per 100 women-years, respectively. Eighty-six percent resulted from nonuse of contraception, and 88% ended in induced abortions. Median times of sexual activity resumption and contraception initiation were 2 months and 7.5 months postpartum, respectively. Approximately 17% of women did not adopt effective contraceptive methods until undergoing induced abortion.

**Conclusions:** Concentrated efforts, including contraception counseling prior to discharge and early postpartum visits, are required to increase early use of effective contraception among rural-to-urban migrant women in Shanghai and to reduce their high level of postpartum unintended pregnancy.

**Kerlan, V. (2010). Postpartum and contraception in women after gestational diabetes. *Diabetes and Metabolism*, 36(6 Pt. 2), 566–574.**

Women who have had gestational diabetes mellitus must be monitored in the immediate postpartum period to ensure that blood glucose levels return to normal without further treatment. In the few studies performed specifically in these women, those that breastfed did not have a different metabolic profile, at least during the period of breastfeeding; the metabolic profiles of children born to women that had gestational diabetes and that breastfed also did not differ from those that were not breastfed. The choice of contraception must mainly take into consideration the associated risk factors. The studies, even if few have specifically focused on women with a history of gestational diabetes, have not demonstrated a significant disturbance of glucose metabolism while using hormonal contraception, whether combined oral oestrogen/progestogen or progestogen-only contraception. However, the presence of obesity, hypertension, or dyslipidaemia must direct the choice of contraception towards one without cardiovascular consequences. In these cases, the intrauterine device is an excellent choice.



**Lewis, L. N., Doherty, D. A., Hickey, M., & Skinner, S. R. (2010). Implanon as a contraceptive choice for teenage mothers: A comparison of contraceptive choices, acceptability and repeat pregnancy. *Contraception, 81(5), 421–426.***

**Background:** This study was conducted to compare the incidence of repeat teenage pregnancy over a 24-month period postpartum among users of Implanon, the combined oral contraceptive pill (COCP) or depot medroxyprogesterone acetate (DMPA) and barrier methods or nothing (barrier/none). Contraceptive continuation rates 24 months postpartum for Implanon and COCP/DMPA were also compared.

**Study design:** A prospective cohort study was conducted. Comparison groups were postpartum teenagers (12-18 years old) who self-selected Implanon (n=73), COCP/DMPA (n=40) and barrier/none (n=24). Questionnaires were used to gather data at recruitment and postpartum at 6 weeks and then 3 monthly intervals for 2 years.

**Results:** At 24 months postpartum, 48 (35%) teenagers had conceived. Implanon users became pregnant later than other contraceptive groups (p=.022), with mean time to first repeat pregnancy of 23.8 months [95% confidence interval (CI), 22.2-25.5], compared to 18.1 months (95% CI, 15.1-20.7) for COCP/DMPA and 17.6 months (95% CI, 14.0-21.3) for barrier/none. Implanon users were more likely to continue their use at 24 months than COCP/DMPA (p<.001) users. The mean duration for Implanon users was 18.7 months (95% CI, 17.0-20.3) compared to 11.9 months (95% CI, 9.5-14.3) for COCP/DMPA.

**Conclusion:** Teenagers who choose Implanon are significantly less likely to become pregnant and were found to continue with this method of contraception 24 months postpartum compared to those who choose COCP or DMPA and barrier methods or nothing.

**Morales Martínez, C., Lamelas Suárez-Pola, M. L., Tejuca Somoanoa, S., & Álvarez Miranda, I. (2010). Anticoncepción posparto en mujeres con riesgo de exclusión social [Postpartum contraception in women at risk of social exclusion]. *Progresos de Obstetricia y Ginecología, 54(1), 16–20.***

**Objective:** Improve birth control rates in women from vulnerable populations, space time out between pregnancies and reduce the rate of abortions.

**Material and methods:** We gave 90 pregnant women at risk of social exclusion an appointment for a postpartum check- up a month and a half after their expected due date, with a SMS reminder 48 hours before the appointment and a phone number in case they failed to make the appointment. We strive to implement long-term methods on the day of appointment.

**Results:** 92% attended the postnatal visit. The overall rate of contraception was 86%, 68% were long-term methods: subdermal implants and IUDs.

**Conclusion:** Consultation with postpartum women from disadvantaged social groups can be very useful to facilitate contraceptive methods which are safe, effective and long-lasting. Flexibility and agility in the implementation of the methods are essential.

**Nelson, A. L., Le, M. H., Musherraf, Z., & Vanberckelaer, A. (2008). Intermediate-term glucose tolerance in women with a history of gestational diabetes: Natural history and potential associations with breastfeeding and contraception. *American Journal of Obstetrics and Gynecology*, 198(6), 699.E1–699.E8.**

**Objective:** This study investigated the natural history of glucose tolerance by using modern definitions in women after delivery of a pregnancy complicated by gestational diabetes. The association between deterioration of glucose metabolism and contraceptive methods was also studied.

**Study design:** Retrospective chart review of 592 indigent, primarily Latina women who had been diagnosed with gestational diabetes, monitored for up to 24 months' postpartum.

**Results:** At the first postpartum visit, 230 women (40.2%) had prediabetes or diabetes. Within the first 12 months, 26.4% experienced deterioration. Of the 89 women monitored for 12-24 months, another 38.5% had prediabetes (n = 13) or diabetes (n = 11) develop. About 22% of women by using only nonhormonal contraception experienced worsening of their glucose status, whereas 35% of combined hormonal contraceptive users and 34% of progestin-only users worsened.

**Conclusion:** Gestational diabetes is a sentinel event signaling the need for frequent testing postpartum.

**Nicoletti, A. (2010). Prescribing DMPA to teens. *Journal of Pediatric and Adolescent Gynecology*, 23(4), 259–260.**

Kara is a 15-year-old African American teen who is 2 weeks postpartum and has come today for birth control. Her body mass index (BMI) today is 32. The young man who fathered her child is no longer part of her life, but she has begun a new relationship with another young man. Her pregnancy resulted because of inconsistent oral contraceptive use, and she clearly is at risk for a repeat pregnancy because of the new relationship. For a variety of reasons, she has chosen to use depot medroxyprogesterone acetate (DMPA). Recent studies have revealed that it is not only possible to tailor DMPA prescribing practices to individual teen characteristics, but it may be medically indicated because of possible effects on future health.

**Schaefer, M., James, D., & Barrett, T. (2010). Contraceptive choices in patients with low literacy skills. *Contraception*, 82(2), 195.**

**Objectives:** Health literacy is the ability to apply reading skills to health-related materials such as prescriptions, appointment cards and medicine labels. The aim of the current study is to identify what contraceptive method patients with low health literacy are choosing and if they are attending the postpartum visit.

**Method:** A previously validated screening tool, the Test for Functional Health Literacy in Adults-Short Version, was given to all patients who presented for prenatal care at University Obstetrics Associates during a 9-week period in 2005. A retrospective chart review of these patients was performed and age, gravidity, parity, contraceptive choice and follow-up at the 6-week postpartum visit were recorded. Data were analyzed using chi-squared tests.

**Results:** Three hundred sixty-one patients presented for prenatal care during the study period, and 341 completed the literacy screen (94%). Eighteen percent of the English speaking patients and 53% of the Spanish speaking patients had compromised health literacy ( $p < .0001$ ). Thirty-six percent of the patients with compromised health literacy versus 28% with adequate health literacy chose Depo-

Provera for contraception ( $p=.242$ ). Sixty-two percent of patients with compromised health literacy versus 54% of patients with adequate health literacy followed up at the 6-week postpartum visit ( $p=.192$ ).

**Conclusions:** A high percentage of patients at University Obstetrics Associates have compromised health literacy. Spanish-speaking patients are more likely to have low health literacy. Health literacy is not related to choice of Depo-Provera as a contraceptive or attendance at the 6 week postpartum visit.

**Tocce, K., Sheeder, J., Python, J., & Teal, S. B. (2012). Long acting reversible contraception in postpartum adolescents: Early initiation of etonogestrel implant is superior to IUDs in the outpatient setting. *Journal of Pediatric and Adolescent Gynecology*, 25(1), 59–63. doi:10.1016/j.jpag.2011.09.003**

**Study objective:** To evaluate the outpatient initiation of postpartum long-acting reversible contraception (LARC).

**Design:** Prospective cohort study of pregnant adolescents' prenatal contraceptive intentions and successful postpartum initiation of LARC.

**Setting:** Urban, university hospital-affiliated, adolescent outpatient clinic

**Results:** 116 patients were enrolled; 75% intended LARC use postpartum. Of 38 implant-intenders, 14 received it within 14 days postpartum. All reported abstinence pre-placement. Mean time to insertion was 18 +/- 13 days. Of 37 IUD-intenders, only two received one by 8 weeks postpartum. By 14 weeks postpartum, 43% had received one. Over half reported intercourse prior to insertion; the only method of contraception used was condoms. Mean time to insertion was 70 +/- 11 days. Resumption of intercourse prior to initiation of the intended LARC method was significantly higher in IUD recipients compared to those who intended and received the implant (RR 8.8; CI 1.3-57.5).

**Conclusion:** In postpartum teens attending a clinic that prioritizes contraceptive use, the implant is far more likely to be received prior to resumption of sexual activity than the IUD. This may be due to more and earlier opportunities for placement, or waning commitment with time since delivery. Post-placental IUDs may be needed to equal the success of the implant in this patient population. Short-acting, reliable contraceptive methods should be implemented for postpartum adolescents preferring to wait for IUD insertion.

**Tsai, R., & Schaffir, J. (2010). Effect of depot medroxyprogesterone acetate on postpartum depression. *Contraception*, 82(2), 174–177.**

**Background:** Depot medroxyprogesterone acetate (DMPA) is commonly prescribed to women immediately postpartum due to its efficacy, convenience and lack of estrogen. It is unclear whether administering a progestin injection can affect the course of postpartum depression (PPD), which some suspect to be influenced by hormonal changes. In this retrospective study, the objective was to determine whether DMPA administered immediately postpartum influences the development of PPD.

**Study design:** A retrospective review of a total of 404 charts was conducted of clinic patients who were scheduled for 6-week postpartum visits at a major medical center, where all patients are routinely asked to complete the Edinburgh Postnatal Depression Scale (EPDS). The average scores on the EPDS at these visits were compared between patients who had received DMPA prior to

postpartum discharge from the hospital and patients who had not received any hormonal contraception by using an unpaired t test. In addition, the proportions of women diagnosed with PPD via the scale were compared via contingency tables.

**Results:** Fifty-five women who had received immediate DMPA were compared with 192 women with no hormonal contraception after delivery. The groups were similar in parity, race, mode of delivery and weight, but women receiving DMPA were significantly younger (24.2 vs. 26.2 years,  $p=.03$ ). Mean EPDS scores at 6 weeks postpartum were not statistically significant between the groups (5.02 vs. 6.17,  $p=.16$ ). Six patients (10.9%) who received immediate DMPA were diagnosed with PPD based on EPDS scores greater than or equal to 13, while 27 (14.1%) in the comparison group had PPD ( $p=.88$ ).

**Conclusion:** Administration of DMPA in the immediate postpartum period does not appear to predispose women to PPD.

## 8. POSTPARTUM IUD AND PERMANENT CONTRACEPTION

**Akkuzu, G., Vural, G., Eroglu, K., Dilbaz, B., Taskin, L., Akin, A., Haberal, A. (2009).** Reasons for continuation or discontinuation of IUD in postplacental/early postpartum periods and postpuerperal/interval periods: One-year follow-up. *Turkiye Klinikleri Journal of Medical Sciences*, 29(2), 353–360.

**Objective:** To compare postplacental and early postpartum intrauterine device (IUD) insertions with postpuerperal and interval IUD insertions regarding the reason for continuation and discontinuation.

**Material and methods:** A study of 130 women (84 postplacental and 46 postpartum) and a control group of 138 women (62 postpuerperal and 76 interval) who had T Cu 380A IUDs inserted were followed-up at 8 weeks and 6 and 12 months, and the data was analyzed.

**Results:** Continuation occurred in 38.6% of the study group and in 72.3% of the control group ( $p < 0.001$ ). The highest continuation rate was in interval, postpuerperal and postplacental groups respectively ( $p < 0.05$ ). The reason for discontinuation was frequently partial expulsion in the study group (52.6%) and displacement in the control group (27.8%). The insertion time of IUD most frequently discontinued was postplacental in the study group (55.2%) and interval in the control group (31.3%).

**Conclusion:** The results of this study suggest that the postplacental and early postpartum IUD insertion techniques should be re-evaluated in units that offer this service to decrease the rate of discontinuation due to complications.

**Celen, S., Sucak, A., Yildiz, Y., & Danisman, N. (2011).** Immediate post-placental insertion of an intrauterine contraceptive device during cesarean section. *Contraception*, 84(3), 240–243.

**Background:** An intrauterine device (IUD) is an effective reversible form of contraception. We determined the efficacy and safety of immediate post-placental IUD insertion during cesarean section.

**Study design:** Two hundred forty-five women with term pregnancies delivering by cesarean section between September 2006 and December 2007 were included in the study. A copper IUD (TCu 380A) was inserted using a ring forceps within 10 min of removing the placenta. The participants were examined before hospital discharge and at 6 weeks, 6 months and 12 months postpartum.

**Results:** None of the patients were lost to follow-up. There was one case of an unplanned pregnancy (0.4%). There were no serious complications associated with immediate IUD insertion during cesarean section. The cumulative rates of expulsion, removal for bleeding/pain and other medical reasons were 17.6, 8.2 and 2.4 per 100 women per year, respectively. The continuation rates were 81.6% and 62% at 6 and 12 months, respectively.

**Conclusion:** Immediate post-placental IUD insertion during cesarean section provides adequate protection against pregnancy. However, greater than one fourth of the participants discontinued IUD use due to spontaneous expulsion or other medical reasons.

**Chen, B. A., Reeves, M. F., Creinin, M. D., & Schwarz, E. B. (2011). Postplacental or delayed levonorgestrel intrauterine device insertion and breast-feeding duration. *Contraception*, 84(5), 499–504. doi:10.1016/j.contraception.2011.01.022**

**Background:** The objective of this study was to assess the effect of timing of postpartum levonorgestrel-releasing intrauterine device (IUD) insertion on breast-feeding continuation.

**Study design:** Women interested in using a levonorgestrel IUD postpartum were randomized to immediate postplacental insertion (postplacental group) or insertion 6-8 weeks after vaginal delivery (delayed group). Duration and exclusivity of breast-feeding were assessed at 6-8 weeks, 3 months, and 6 months postpartum. Only women who received an IUD were included in this analysis.

**Results:** Breast-feeding was initiated by 32 (64%) of 50 of women receiving a postplacental IUD and 27 (58.7%) of 46 of women receiving a delayed IUD ( $p=.59$ ). More women in the delayed group compared with the postplacental group continued to breast-feed at 6-8 weeks (16/46 vs. 15/50,  $p=.62$ ), 3 months (13/46 vs. 7/50,  $p=.13$ ), and 6 months postpartum (11/46 vs. 3/50,  $p=.02$ ). The results did not differ when only women who initiated breast-feeding or only primiparous women with no prior breast-feeding experience were analyzed.

**Conclusions:** Immediate postplacental insertion of the levonorgestrel IUD is associated with shorter duration of breast-feeding and less exclusive breast-feeding. Further studies on the effects of early initiation of progestin-only methods on women's lactation experience are needed.

**Chen, B. A., Reeves, M. F., Hohmann, H. L., & Creinin, M. D. (2010). Comparing outcomes following immediate or delayed levonorgestrel-IUD insertion after dilation and curettage, dilation and evacuation and vaginal delivery. *Contraception*, 82(2), 192.**

**Objectives:** To compare outcomes in women undergoing immediate or delayed levonorgestrel-intrauterine device (IUD) insertion following first-trimester dilation and curettage (D and C), second-trimester dilation and evacuation (D and E) and vaginal delivery at term.

**Method:** We combined data from three studies that enrolled subjects concurrently at the University of Pittsburgh. In all three studies, women were randomized to immediate or delayed levonorgestrel-IUD insertion after D and C ( $n=243$ ), D and E ( $n=88$ ), and vaginal delivery ( $n=102$ ). We compared immediate and delayed insertion, expulsion, and 6-month IUD usage between studies. Expelled IUDs were replaced if desired. Subjects lost to follow-up were excluded from analysis of 6-month IUD usage. Outcomes were analyzed using chi-square and Fisher's exact tests as appropriate.

**Results:** Expulsion was more common with post-placental insertion (24%) compared to immediate insertion after D and C (3%) and D and E (7%), ( $p<.001$ ), but did not differ in the delayed arms (4%, 4% and 5%, respectively,  $p=1.0$ ). More women returned for delayed insertion after vaginal delivery (90%) compared to D and C (70%) or D and E (46%), ( $p<.001$ ). More women were lost to follow-up after D and E (39%) compared to D and C (20%) or vaginal delivery (12%), ( $p<.001$ ). With a strategy of immediate insertion, 93% (152/163) of women were using IUDs at 6 months compared to 77% (135/175) of women who were provided delayed IUDs ( $p<.001$ ).

**Conclusions:** Women undergoing immediate post-pregnancy IUD insertion are more likely to be using an IUD at 6 months. Return for delayed IUD insertion and expulsion are higher for postpartum women compared to women undergoing D and C or D and E. Loss to follow-up is high after D and E.

**El Beltagy, N. S., Darwish, E. A., Kasem, M. S., & Hefila, N. M. (2010). Comparison between Copper T380 IUD and Multiload 375 IUD in early post-partum insertion. *Middle East Fertility Society Journal*, 16(2), 143–148.**

**Objectives:** Comparison between Copper [copper—Ed.] T380 IUD (intrauterine device) and Multiload 375 IUD insertion in early postpartum period in regard to safety, efficacy, side effects, and complications.

**Methods:** A prospective randomized control trial enrolled 300 recently normally delivered females (within 48 h) in El-Shatby Maternity Hospital. The women were counseled for postpartum use of an IUD as a pre-discharge family planning method. Participants were randomly assigned to Copper T380 (Cu T380) or Multiload 375 IUD insertion. Kelly's forceps was used for insertion of a Cu T380 IUD in 150 women and a Multiload 375 IUD in another 150 females. All women were administered a questionnaire, received a clinical examination, and underwent ultrasonographic scanning at 6 weeks and 6 months following IUD insertion.

**Results:** The expulsion rates were relatively high for both IUDs, amounting to 15% in Cu T380 compared to 14.9% in Multiload 375 insertions. There was a direct relation between the incidence of IUD expulsion in early postpartum insertion and the IUD-endometrial distance of the uterine fundus measured by ultrasound with 10 mm as a cutoff point. Early postpartum IUD insertion did not increase the discontinuation rate or the incidence of PID (upper genital tract infection). There was no significant difference between the IUDs regarding the safety, efficacy, side effects (such as expulsion and bleeding), and complications (such as perforation).

**Conclusion:** Both the Cu T380 IUD and Multiload 375 IUD are safe and effective as a pre-discharge family planning method when inserted during the early postpartum period. To decrease postpartum expulsion of IUDs, there is a need to use ultrasound scanning to measure the IUD endometrial distance in Egyptian contraceptive programs.

**Eroglu, K., Akkuzu, G., Vural, G., Dilbaz, B., Akin, A., Taskin, L., & Haberal, A. (2006). Comparison of efficacy and complications of IUD insertion in immediate postplacental/early postpartum period with interval period: 1 year follow-up. *Contraception*, 74(5), 376–381.**

**Objective:** This study aimed to compare immediate postplacental (IPP) and early postpartum (EP) intrauterine device (IUD) insertions with interval (INT) IUD insertions with respect to efficacy and complications.

**Methods:** The study group consisted of 268 women in whom the following TCU 380A IUD insertions were performed: 84 IPP (less than 10 min), 46 EP (10 min to 72 h) and 138 INT (more than 6 weeks). The women were followed up 8 weeks, 6 months and 12 months after insertion. Complications and pregnancies encountered at the end of 1 year following IPP, EP and INT insertions were compared. The chi-square test and Fisher's Exact Test were used for the evaluation of the data.

**Results:** Complications developed in 40.4% of the women in the IPP group, in 74.4% of the women in the EP group and in 19.2% of the women in the INT group ( $p < .001$ ). Although no statistically significant difference was found between the groups for uterine perforation and infection ( $p > .001$ ), there was a statistically significant difference between the groups in the incidence of complete and partial expulsion according to the time of IUD insertion. The overall cumulative pregnancy rate and frequency of pregnancy were found to be higher ( $p > .05$  for both), which are both

insignificant for the EP group (2 of 43 women), as compared with the INT (4 of 130 women) and IPP groups (2 of 84 women), and pregnancy rates at 1 year for all groups was 3.1% (8 of 257 women).

**Conclusion:** IPP and EP insertion of the TCU 380A IUD is an effective and convenient procedure, and expulsion rates in these groups are higher than in the INT group. Further studies are necessary to determine the cause of the higher expulsion rates and to find ways to reduce such rates.

**Foreit, K. G., Foreit, F. R., Lagos, G., & Guzman, A. (1993). Effectiveness and cost-effectiveness of postpartum IUD insertion in Lima, Peru. *International Family Planning Perspectives*, 19(1), 19–24, 33.**

The effectiveness and cost-effectiveness of postpartum family planning service provision were assessed in a study of 1,560 women giving birth in 1988–1989 at the largest hospital of the Peruvian Social Security Institute (IPSS). Contraceptive counseling and temporary methods were offered to one ward of postpartum women, while a second ward, acting as a control group, was discharged without being offered comparable services. In the second half of the study period, almost 90% of the experimental group accepted family planning prior to discharge, and 25% of the women received an IUD. Six months after delivery, 82% of the members of the experimental group were using a contraceptive method, with 40% using an IUD; by comparison, 69% of controls were using a method, and 27% an IUD. Because in-patient IUD insertion was estimated to cost \$9.38 per woman, compared with \$24.16 for an interval insertion, implementing postpartum family planning services in all IPSS hospitals in Lima could save 3–5% of the annual projected IPSS family planning budget for Lima and free up 6% of the current outpatient delivery capacity.

**Grimes, D. A., Schulz, K. F., Van Vliet, H., Stanwood, N., & Lopez, L. M. (2001). Immediate post-partum insertion of intrauterine devices. *Cochrane Database of Systematic Reviews*, (2), CD003036. doi:10.1002/14651858.CD003036**

**Objectives:** To assess the efficacy and feasibility of IUD insertion immediately after expulsion of the placenta. Our a priori hypothesis was that this practice is safe but associated with higher expulsion rates than interval IUD insertion.

**Search strategy:** We used MEDLINE, Popline, EMBASE, and Cochrane Controlled Trials Register computer searches, supplemented by review articles and contact with investigators.

**Selection criteria:** We sought all randomized controlled trials that had at least one treatment arm that involved immediate post-partum (within ten minutes of placental expulsion) insertion of an IUD. Comparisons could include different IUDs, different insertion techniques, immediate vs. delayed post-partum insertion, or immediate vs. interval insertion (unrelated to pregnancy). Studies could include either vaginal or cesarean deliveries.

**Data collection and analysis:** We evaluated the methodological quality of each report and sought to identify duplicate reporting of data from multicenter trials. We abstracted data onto data collection forms. Principal outcome measures included pregnancy, expulsion, and continuation rates. Because the trials did not have uniform interventions, we were unable to aggregate them in a meta-analysis.

**Main results:** We found no randomized controlled trials that directly compared immediate post-partum insertion with either delayed post-partum or interval insertion. Modifications of existing



devices, such as adding absorbable sutures or additional appendages, did not appear beneficial. Most studies showed no important differences between insertions done by hand or by instruments. Lippes Loops and Progestasert devices did not perform as well as did copper devices.

**Reviewer's conclusions:** Immediate post-partum insertion of IUDs appeared safe and effective, though direct comparisons with other insertion times were lacking. Advantages of immediate post-partum insertion include high motivation, assurance that the woman is not pregnant, and convenience. However, expulsion rates appear to be higher than with interval insertion. The popularity of immediate post-partum IUD insertion in countries as diverse as China, Mexico, and Egypt support the feasibility of this approach. Early follow-up may be important in identifying spontaneous IUD expulsions.

**Kapp, N., & Curtis, K. M. (2009). Intrauterine device insertion during the postpartum period: A systematic review. *Contraception*, 80(4), 327–336. doi:10.1016/j.contraception.2009.03.024**

**Background:** Insertion of an intrauterine device (IUD) at different times or by different routes during the postpartum period may increase the risk of complications.

**Methods:** We searched Medline, Lilacs and Cochrane Collaboration databases for articles in any language, between database inception until December 2008, which compared outcomes of postpartum IUD insertion time intervals. Search terms included postpartum, puerperium, postcesarean delivery, cesarean section, IUD(s), IUCD(s), intrauterine device(s) and insertion.

**Results:** From 297 articles, we identified 15 for inclusion in this review: all studies examined the outcomes from copper IUD insertions within the postpartum time period compared to other time intervals or compared routes (vaginal or via hysterotomy) of postpartum insertion. No studies of levonorgestrel IUDs were identified. Immediate IUD insertion (within 10 min of placental delivery) was safe when compared with later postpartum time periods and interval insertion. Immediate postpartum IUD insertion demonstrated lower expulsion rates when compared with delayed postpartum insertion but with higher rates than interval insertion. Immediate insertion following cesarean delivery demonstrated lower expulsion rates than immediate insertion following vaginal delivery.

**Conclusion:** Poor to fair quality evidence from 15 articles demonstrated no increase in risk of complications among women who had an IUD inserted during the postpartum period; however, some increase in expulsion rates occurred with delayed postpartum insertion when compared to immediate insertion and with immediate insertion when compared to interval insertion. Postplacental placements during cesarean delivery are associated with lower expulsion rates than postplacental vaginal insertions, without increasing rate of postoperative complications.

**Khatun, H. A. (2009). P726 Postpartum IUCD—A new method in postpartum contraception [Poster abstract]. *International Journal of Gynecology and Obstetrics*, 107(Suppl. 2), 620.**

**Objectives:** To meet the unmet need with a safe, convenient and cost effective postpartum contraceptive method.

**Materials and methods:** Postpartum Intrauterine Contraceptive Device (PPIUCD) is inserted within 10 minutes after Normal Vaginal Delivery (NVD) and during Caesarean Section (CS) just

after removal of placenta, before closing of uterus and between 10 minutes and 48 hours after NVD by a Kelly Forceps. A client delivered in a hospital irrespective of her para with informed choice is eligible for a PPIUCD. Practical training is needed for doctors and nurses on PPIUCD along with infection prevention and counseling. Besides orientation on PPIUCD is needed for family planning workers and counselors. Cu-T 380A and Kelly Forceps are needed for PPIUCD along with other instruments and supplies.

**Results:** During March, 08-February, 2009, 24 clients received IUCD after NVD and 62 received during CS at AD-DIN Hospital, Dhaka. No major difficulties for insertion.

**Follow up:** We followed up the clients during PNC visits by history taking, physical examination and ultrasonography. There was one case on the process of expulsion, one client complained of slight irregular bleeding and another one complained of abdominal pain. Number of clients needed removal was 3.

**Conclusion:** PPIUCD is a long term, reversible, not affecting breast feeding and suitable method for a woman delivered in a hospital. For its sustainability, counseling to women on PPIUCD during ANC and availability of round the clock trained personnel with required equipment are necessary.

**Letti Muller, A. L., Lopes Ramos, J. G., Martins-Costa, S. H., Palma Dias, R. S., Valerio, E. G., Hammes, L. S., . . . Magalhães JA. (2005). Transvaginal ultrasonographic assessment of the expulsion rate of intrauterine devices inserted in the immediate postpartum period: A pilot study. *Contraception*, 72(3), 192–195.**

**Objective:** To compare the expulsion rates of intrauterine devices (IUDs) inserted in the immediate postpartum after vaginal birth and cesarean section.

**Methods:** Nineteen patients who had a vaginal birth and 19 patients who had a cesarean section at Hospital de Clínicas de Porto Alegre, Brazil, were selected for copper T 380A IUD insertion. With the aim of detecting clinically unnoticed dislodged devices, ultrasound examinations were performed at 1 month and between 3 and 12 months after delivery. The IUDs were considered completely expelled when found outside the endometrial cavity (e.g., in the cervical canal) or outside the uterus (in the vagina).

**Results:** Expulsion rates were statistically different between the two groups: after a vaginal birth, 50% (ultrasound only) + 27.8% (clinical examination); and post-cesarean section, 0% ( $p < .001$ ; OR 5.75, 95% CI 2.36-14.01).

**Conclusion:** Considering that the contraceptive efficacy of IUDs is associated with their intrauterine location, the high expulsion rates seen when they are inserted immediately after vaginal delivery contraindicate their use in this setting. The use of IUDs immediately after a cesarean section is still a reasonable alternative because its expulsion rate was zero. Ultrasound assessment of IUD positioning performed better than clinical examination, which failed to detect expulsion after postpartum insertion in 75% of the cases (9 from 12 cases).

**Levi, E., Cantillo, E., Ades, V., Banks, E., & Murthy, A. (2012). Immediate postplacental IUD insertion at cesarean delivery: A prospective cohort study. *Contraception*, 86(2), 102–105. doi:10.1016/j.contraception.2011.11.019**

**Background:** Immediate postplacental insertion of intrauterine devices (IUDs) during cesarean delivery could reduce a substantial barrier to access to long-term effective contraception. Initiating

IUD use prior to discharge from the hospital postpartum eliminates a 6-week postpartum waiting period and an additional office visit.

**Study design:** This was a prospective cohort study of 90 patients undergoing cesarean delivery. After delivery of the placenta, a copper T380A IUD was inserted into the endometrial cavity through the incision. The study participants were followed up at 6 weeks and 6 months postpartum. This study was conducted at the Weiler Division of the Montefiore Medical Center and at the Jacobi Medical Center in the Bronx, NY.

**Results:** Forty-three (48%) women returned for their 6-week follow-up visits, and among those, no expulsions were recorded. Forty-two (47%) women were reached for phone follow-up at 6 months postpartum, and 80% reported being “happy” or “very happy” with their IUD.

**Conclusions:** Immediate postplacental IUD insertion at the time of cesarean delivery is safe and acceptable.

**Lopez-Farfan, J. A., Maciel-Martínez, M., Velez-Machorro, I. J., & Vazquez-Estrada, L. (2010). P189 Application of Mirena® during caesarean section (CS) [Poster abstract]. *European Journal of Contraception and Reproductive Health Care*, 15(Suppl. 1), 165–166.**

**Introduction:** The levonorgestrel-releasing intrauterine system Mirena® is a long-acting, highly effective reversible method of contraception with the advantages of both hormonal and intrauterine contraception. The clinical advantages of Mirena® at time of caesarean section (CS) have been described including: improvement of uterine involution, decreasing lochia and dysfunctional bleeding; induction of persistence of amenorrhea or oligomenorrhea after cessation of breast-feeding during 5 years of use, providing long-term and reversible contraception with effectiveness similar to that of female Sterilization.

**Objectives:** With the aim to assess if Mirena® can be inserted during caesarean section (CS) to provide an immediate, reliable and safe contraception, a randomized, double blind study comparing Mirena® with our routinely practice of Cooper [routine practice of inserting copper—Ed.] T Intrauterine Device (IUD) CS insertion was done.

**Methods:** After signed informed consent, a total of 396 women were randomly allocated to the application of Mirena® IUS (198) or Cooper T 380 IUD (198) after the extraction of placenta, applying it manually through hysterotomy up to the uterine fundus and orienting the IUS or IUD strings to the cervical os. Follow up visits at the end of puerperium and 6 and 12 months after insertion were performed assessing the permanence of IUS/IUD in situ, maternal and babies' health conditions, menstrual patterns (by reference period of 90 days), serum ferritin levels, adverse effects and pregnancies if any. Differences between groups were analyzed by student's t, Fisher and X2 tests as appropriate.

**Results:** Demographic and baseline characteristics were similar in both groups of treatment (mean age 24.9 + 5.1 y.o.). All patients breastfed their babies at least for 3 months. After one year of follow up, no pregnancies were reported. Expulsion rates were 4.5% in both groups. Menstrual patterns with Mirena® were significantly scant and lighter than with Cooper T 380 ( $p < 0.0001$ ) with lower incidence of dysmenorrhea (3.1% vs. 24.9%  $p = 0.014$ ).

Proportion of patients with low ferritin serum levels ( $<12\text{mg/L}$ ) at the end of study were significant lower in Mirena® users (OR 0.25 95% CI 0.14-0.44).

No detrimental effects on breast-feeding were observed. Interestingly, babies' growth in Mirena® group was higher (above percentile 50th) when comparing body weights at 6 and 12 months of follow-up ( $p < 0.0001$ ).

Continuation rates were 91.5 and 90% for Mirena® and Cooper T groups respectively at first year of follow-up. Main reasons for discontinuation were prolonged bleeding (35%) in Cooper T Group and amenorrhea (11.7%) or infrequent bleeding (11.7%) in Mirena® Group. No serious adverse effects were observed.

**Conclusions:** Mirena® can be inserted during CS providing high efficacy contraception without negative effects on breastfeeding. Further benefits, mainly reduced menstrual bleeding, had positive impact on Iron metabolism and consequently may hasten recovery after CS improving mothers and babies general health condition.

**McGuire, J., Lance, A., & Dalton, V. (2010). Barriers to post-partum IUC use: Implications for patient contraceptive preferences and satisfaction with health services. *Contraception*, 82(2), 203.**

**Objectives:** To identify barriers to postpartum intrauterine contraception (IUC) placement and to explore patient preferences and satisfaction with contraceptive health services.

**Method:** Women delivering at a university hospital were recruited to participate in a survey addressing decision-making about post-partum contraception use. Additional information about health service utilization was gathered from a chart review. Women who reported an antenatal plan to use IUC post-partum were identified and followed to determine what proportion actually had IUC placed. Along with a chart review, a written survey is being administered at 6 months post-partum to identify reasons for not having it placed, patient contraception preferences and satisfaction with health services.

**Results:** Of the 185 women enrolled in the study, 28 reported that they planned to use IUC after delivery. There were no immediate post-placental placements. Missing the postpartum appointment, insurance issues and changing to hormonal methods were the most common reasons identified in the medical record. Participant follow-up written questionnaires are being used to further characterize barriers to post-partum IUC placement, to assess satisfaction with current method and to determine if any features of current services are particularly unsatisfactory. Three of the 28 became pregnant within 12 months after their index delivery.

**Conclusions:** Most women reporting a plan to use IUC post-partum did not actually have a device placed by 3 months postpartum. Women who desire IUC in the postpartum period might face multiple barriers to placement, many of which are modifiable.

**Mohamed, S. A., Kamel, M. A., Shaaban, O. M., & Salem, H. T. (2003). Acceptability for the use of postpartum intrauterine contraceptive devices: Assiut experience. *Medical Principles and Practice*, 12(3), 170–175.**

**Objectives:** To evaluate the acceptance of postpartum intrauterine contraceptive devices (PPIUCD) among the inhabitants of Assiut governorate, Egypt and to study the factors that influence this acceptance.

**Subjects and methods:** Contraceptive counseling was given to 3,541 clients: 1,880 and 1,661 during the antenatal visits and postpartum hospitalization, respectively. Acceptors during antenatal

counseling were to receive IUCDs via postplacental insertion in the case of vaginal delivery or transcesarean insertion in case of abdominal delivery. The clients who refused PPIUCD and chose interval IUCD insertion were referred to the Family Planning Clinic after the end of puerperium. Among postpartum counselees, PPIUCD acceptors received pre-discharge insertion within 48 h of delivery and the interval IUCD were referred to have IUCD inserted after the end of puerperium. The acceptance rate of both PPIUCD and interval IUCD and the percentage of actual insertions were recorded. The causes of both acceptance and refusal were also recorded.

**Results:** Of the 3,541 clients, 1,024 (28.9%) accepted the use of IUCD after delivery. Acceptance was approximately the same during antenatal and postpartum counseling: 26.4 and 31.8%, respectively. Verbal acceptance was higher among women with formal education than among illiterate women. Planning another pregnancy in the near future, preference for another contraceptive method, namely lactational infertility, and complications from previous use of IUCD were the most common reasons for refusing the use of IUCD. Of the 1,024 verbal acceptors, only 243 (23.7%) had the actual insertion of IUCD.

**Conclusion:** Both the acceptance and actual insertion of IUCD were low probably because the use of IUCD is a new concept in the community. For these women, the only opportunity to receive information about contraceptives is during childbirth when they are in contact with medical personnel. Hence, it is suggested that family planning should be integrated with maternal and child-care services in order to effectively promote the use of contraceptive devices in these women who otherwise would not seek the use of such a device.

**Morrison, C., Waszak, C., Katz, K., Diabate, F., & Mate, E. M. (1996). Clinical outcomes of two early postpartum IUD insertion programs in Africa. *Contraception*, 53(1), 17–21.**

Postpartum IUD insertion programs are new to Africa and few have been carefully evaluated. Also, data on the clinical outcomes of postpartum IUD insertions using the Copper T 380A IUD are sparse. Therefore, we conducted a study to evaluate introductory postpartum IUD programs using the Copper T 380A IUD in Kenya and Mali. Postpartum IUD acceptors in Kenya (n = 224) and Mali (n = 110) were interviewed at baseline and at 1, 3, and 6 months after delivery. We compared expulsion, medical removal, and discontinuation rates by insertion characteristics in each country. Six-month cumulative expulsion rates were lower for immediate insertions (those within 10 minutes of placental delivery) than for late insertions (generally between 10 minutes and 72 hours after placental delivery) in both Kenya (0.01 vs 0.05) and Mali (0.15 vs 0.27). Medical removals occurred in 1% and 7% of Kenyan and Malian acceptors, respectively, while pelvic infections were rare in both countries (< or = 2%). Differences in 6-month cumulative discontinuation rates between immediate and late insertions were not significant in either Kenya (0.05 vs 0.07) or in Mali (0.24 vs 0.32). This study suggests that postpartum IUD insertions can be performed safely with acceptable expulsion rates in African settings. Previous studies of other IUDs showed that expulsion rates are lower for immediate insertions compared with late postpartum insertions. This study suggests that these findings can be extended to the Copper T 380A IUD.

**Nelson, A. L., Chen, S., & Eden, R. (2009). Intraoperative placement of the copper T-380 intrauterine devices in women undergoing elective cesarean delivery: A pilot study. *Contraception, 80*(1), 81–83.**

**Background:** The purpose of this pilot project was to test the feasibility of a technique designed to place a copper intrauterine device (IUD) through the hysterotomy incision of an elective cesarean delivery to minimize possible contamination and to guarantee that tailstrings were visible in the vagina for easy removal should complications occur.

**Study design:** Women were monitored in the hospital for signs of infection or excessive blood loss. At the time of hospital discharge and at 2 and 6 weeks postpartum, they were examined to determine the status of the tailstrings. The position of the IUD was assessed by ultrasound at week 6.

**Results:** All seven of the subjects had successful placement. The sutures tied to the IUD strings were visible on vaginal examination in each case. The original tailstrings were visible in the vagina at 6 weeks and each IUD was fundally positioned.

**Conclusion:** Successful intraoperative placement of Copper T-380A IUDs through incision at the time of cesarean birth is possible.

**Seibel-Seamon, J., Visintine, J. F., Leiby, B. E., & Weinstein, L. (2009). Factors predictive for failure to perform postpartum tubal ligations following vaginal delivery. *Journal of Reproductive Medicine, 54*(3), 160–164.**

**Objective:** To identify patients requesting postpartum sterilization and compare those who underwent the procedure with those who did not.

**Study design:** A retrospective study of requested postpartum tubal ligations was completed. Demographics and clinical characteristics were analyzed. We analyzed whether the failure to obtain postpartum sterilization resulted in an interval laparoscopic tubal ligation or future pregnancy.

**Results:** A total of 135 women requested sterilization, but only 56% received the desired procedure. Time of delivery (OR 2.23, CI 1.08-4.58), body mass index (OR 2.38, CI 1.10-5.16) and gravidity (OR 0.80, CI 0.65-0.97) were significant variables that were different between the 2 groups. Of the women who left the hospital postpartum without a sterilization procedure, 44% received an interval laparoscopic tubal ligation and 18% later became pregnant.

**Conclusion:** Postpartum tubal ligations are often not performed despite patient request. Additional measures should be undertaken to ensure that patient requests for postpartum tubal ligation are implemented.

**Swende, T. Z., & Hwande, T. S. (2010). Female sterilization by tubal ligation at caesarean section in Makurdi, Nigeria. *Annals of African Medicine, 9*(4), 246–250.**

**Background:** Female sterilization is an important tool in reducing unplanned pregnancy and maternal mortality in our environment. The aim of this study was to determine the incidence, sociodemographic characteristics, technique, effectiveness and complications associated with female sterilization by bilateral tubal ligation at caesarean section.

**Method:** This was a retrospective analysis of the clinical records of 78 clients who had female sterilization out of 1,346 acceptors of contraceptive methods at the Federal Medical Centre, Makurdi, over a 5-year period between November 2002 and October 2007.

**Results:** Of the 1,346 acceptors of family planning methods, 78 clients had bilateral tubal ligation. The majority of the clients (37 [47.4%]) had sterilization at caesarean section, representing 2.7% of all acceptors of family planning methods. The mean age and parity of the clients were 34.3 years and 5.5, respectively. The majority of the clients (36 [97.3%]) had sterilization using the modified Pomeroy's technique. Contraceptive effectiveness was 100%. No complication specific to tubal ligation was noticed.

**Conclusion:** Majority of female sterilization were performed at caesarean section. The procedure was found to be safe and effective.

**Tang, J. H., Dominik, R., Re, S., Brody, S., & Stuart, G. S. (2013). Characteristics associated with interest in long-acting reversible contraception in a postpartum population. *Contraception*, 88(1), 52–57. doi:10.1016/j.contraception.2012.10.014**

**Background:** Short interpregnancy intervals lead to adverse perinatal outcomes and could be prevented with increased use of long-acting reversible contraception (LARC) in the postpartum period. The primary objective of this study was to assess which baseline characteristics are associated with the intent to use LARC among postpartum women.

**Study design:** This study was a sub-study of baseline data from a randomized controlled trial. Eight hundred women completed a pre-intervention survey of demographics and reproductive health history and intentions. We estimated adjusted relative risks (RRs) of intent to use LARC for baseline characteristics of interest.

**Results:** Three hundred three postpartum women (38%) intended to use LARC. Two out of 10 baseline characteristics were significantly associated with intent to use LARC: not trying for pregnancy at time of conception [adjusted RR, 1.6; 95% confidence interval (CI), 1.2–2.1] and no desire for another pregnancy within 2 years (adjusted RR, 1.9; 95% CI, 1.2–2.8).

**Conclusions:** High interest in LARC exists among postpartum women, particularly among women with a recent unintended pregnancy and women who do not desire pregnancy for at least 2 years. Past and future pregnancy intentions should be incorporated into future models and frameworks that evaluate postpartum contraceptive choice. Educational intervention studies are also needed to assess if LARC interest can be increased among postpartum women who are less likely to intend to use LARC but at risk for future adverse perinatal outcomes.

**Thurman, A. R., & Janecek, T. (2010). One-year follow-up of women with unfulfilled postpartum sterilization requests. *Obstetrics and Gynecology*, 116(5), 1071–1077.**

**Objective:** To track outcomes of women in three cohorts—those who requested postpartum tubal ligation and received the procedure (postpartum tubal ligation [PPTL] YES), those who requested postpartum tubal ligation but did not receive the procedure (PPTL NO), and a control group (those who did not request postpartum tubal ligation)—for 1 year postpartum.

**Methods:** This was a record review evaluating women who delivered a liveborn singleton between December 2007 and May 2008 at the University of Texas San Antonio. Those in the case group were monitored until 1 year post-delivery. The primary outcome was pregnancy within 1 year of the index delivery among women in the control group compared with those in the PPTL NO group. Secondary outcomes included birth control requested at obstetric-admission discharge, attendance at

a postpartum or other gynecology visit, contraceptive use between delivery and the postpartum visit, and request for contraception at the postpartum visit among the three cohorts.

**Results:** During the observation period, 429 of 1,460 women requested postpartum tubal ligation; 296 (69%) received the procedure and 133 (31%) did not. Within 1 year of the index delivery, 46.7% of women in the PPTL NO group became pregnant compared with 22.3% of those in the control group ( $P<.001$ ). Attendance at the postpartum visit was lowest for women in the PPTL YES group (12.8%;  $P=.004$ ) compared with the similarly low attendance among those in the PPTL NO (18.8%) and control groups (20.3%;  $P=.73$ ). Women in the PPTL NO group and those in the control group selected similar methods of postpartum contraception at hospital discharge.

**Conclusion:** Women who did not receive a requested postpartum tubal ligation were more likely to become pregnant within 1 year of delivery than were those in the control group (women not requesting permanent sterilization).

**Vernon, R., Solórzano, J., & Muñoz, B. (2007). Introducing sustainable vasectomy services in Guatemala. *International Family Planning Perspectives, 33*(4), 182–187.**

“From a public health perspective, it would be desirable for a greater proportion of couples to adopt vasectomy rather than female sterilization. Vasectomy has a lower rate of post-operative complications than female sterilization, and the client’s recovery time is shorter; it is also a less expensive procedure for the providing institution. Furthermore, vasectomy is the only long-term method that men can use to achieve their fertility ideals, and it allows for direct male involvement in reproductive decision making” (Vernon, Solórzano, & Muñoz, 2007, p. 182). “To increase the availability and use of vasectomies, the Ministry of Health and the Population Council’s Frontiers in Reproductive Health program (FRONTIERS) developed, tested and evaluated a model for the introduction of sustainable no-scalpel vasectomy services in Ministry hospitals and maternities” (Vernon et al., 2007, pp. 182–183). “This project demonstrated that vasectomy can be successfully introduced into the contraceptive method mix promoted by public-sector family planning programs. Our experience suggests the desirability of screening out health units that lack the motivation or ability to implement the required activities, the importance of including the trainee’s self-confidence in performing the procedure as a criterion for certification, the feasibility of conducting on-site training and the effectiveness of encouraging hospital employees to identify vasectomy candidates. Presenting—in the immediate post-partum period—vasectomy as an option to women who desire a permanent contraceptive method is also important” (Vernon et al., 2007, p. 186).



## 9. PRENATAL AND NEWBORN HEALTH

**Agho, K. E., Dibley, M. J., Odiase, J. I., & Ogbonmwan, S. M. (2011). Determinants of exclusive breastfeeding in Nigeria. *BMC Pregnancy and Childbirth*, 11(2). doi:10.1186/1471-2393-11-2**

**Background:** Exclusive breast feeding (EBF) has important protective effects on the survival of infants and decreases risk for many early-life diseases. The purpose of this study was to assess the factors associated with EBF in Nigeria.

**Methods:** Data on 658 children less than 6 months of age were obtained from the Nigeria Demographic and Health Survey (NDHS) 2003. The 2003 NDHS was a multi-stage cluster sample survey of 7864 households. EBF rates were examined against a set of individual, household and community level variables using a backward stepwise multilevel logistic regression method.

**Results:** The average EBF rate among infants younger than 6 months of age was 16.4% (95%CI: 12.6%-21.1%) but was only 7.1% in infants in their fifth month of age. After adjusting for potential confounders, multivariate analyses revealed that the odds of EBF were higher in rich (Adjusted Odds Ratios (AOR) = 1.15, CI = 0.28-6.69) and middle level (AOR = 2.45, CI = 1.06-5.68) households than poor households. Increasing infant age was associated with significantly less EBF (AOR = 0.65, 95%CI: 0.51-0.82). Mothers who had four or more antenatal visits were significantly more likely to engage in EBF (AOR = 2.70, 95%CI = 1.04-7.01). Female infants were more likely to be exclusively breastfed than male infants (AOR = 2.13, 95%CI = 1.03-4.39). Mothers who lived in the North Central geopolitical region were significantly more likely to exclusively breastfeed their babies than those mothers who lived in other geopolitical regions.

**Conclusions:** The EBF rate in Nigeria is low and falls well short of the expected levels needed to achieve a substantial reduction in child mortality. Antenatal care was strongly associated with an increased rate of EBF. Appropriate infant feeding practices are needed if Nigeria is to reach the child survival Millennium Development Goal of reducing infant mortality from about 100 deaths per 1000 live births to a target of 35 deaths per 1000 live births by the year 2015.

**Agrasada, G. V., Ewald, U., Kylberg, E., & Gustafsson, J. (2011). Exclusive breastfeeding of low birth weight infants for the first six months: Infant morbidity and maternal and infant anthropometry. *Asia Pacific Journal of Clinical Nutrition*, 20(1), 62–68.**

**Objective:** to report anthropometry and morbidity among term low birth weight infants and anthropometry of their first time mothers during the first six months in relation to breastfeeding practice.

**Study design:** we examined data from a randomized controlled trial in Manila, the Philippines. Of the 204 mothers randomized, 68 mothers received eight postpartum breastfeeding counseling sessions, the rest did not. Maternal and infant anthropometric data at birth, 2, 4 and 6 months were taken. During seven follow-up hospital visits, an independent interviewer recorded feeding data.

**Results:** the 24 infants exclusively breastfed from birth to six months did not have diarrhea compared to 134 partially breastfed (mean 2.3 days) and 21 non-breastfed infants (mean 2.5 days). Partially breastfed and non-breastfed infants compared to exclusively breastfed infants had more frequent, as well as more severe episodes of respiratory infections. At six months, neither overall gain

in infant weight, length and head circumferences nor mean maternal weight and body mass index differed significantly between the feeding groups.

**Conclusions:** exclusive breastfeeding for 6 months can be recommended in term low birth weight infants, who were protected from diarrhea, had fewer respiratory infections, required no hospitalization and had catch up growth. Exclusively breastfeeding mothers did not differ from mothers who breastfed partially or those who did not breastfeed with regard to weight changes at six months.

**Ahmed, S., Li, Q., Liu, L., & Tsui, A. O. (2012). Maternal deaths averted by contraceptive use: An analysis of 172 countries. *Lancet*, 380(9837), 111–125. doi:10.1016/S0140-6736(12)60478-4**

**Background:** Family planning is one of the four pillars of the Safe Motherhood Initiative to reduce maternal death in developing countries. We aimed to estimate the effect of contraceptive use on maternal mortality and the expected reduction in maternal mortality if the unmet need for contraception were met, at country, regional, and world levels.

**Method:** We extracted relevant data from the Maternal Mortality Estimation Inter-Agency Group (MMEIG) database, the UN World Contraceptive Use 2010 database, and the UN World Population Prospects 2010 database, and applied a counterfactual modelling approach (model I), replicating the MMEIG (WHO) maternal mortality estimation method, to estimate maternal deaths averted by contraceptive use in 172 countries. We used a second model (model II) to make the same estimate for 167 countries and to estimate the effect of satisfying unmet need for contraception. We did sensitivity analyses and compared agreement between the models.

**Findings:** We estimate, using model I, that 342,203 women died of maternal causes in 2008, but that contraceptive use averted 272,040 (uncertainty interval 127,937–407,134) maternal deaths (44% reduction), so without contraceptive use, the number of maternal deaths would have been 1.8 times higher than the 2008 total. Satisfying unmet need for contraception could prevent another 104,000 maternal deaths per year (29% reduction).

**Interpretation:** Numbers of unwanted pregnancies and unmet contraceptive need are still high in many developing countries. We provide evidence that use of contraception is a substantial and effective primary prevention strategy to reduce maternal mortality in developing countries.

**Funding:** Bill and Melinda Gates Foundation.

**Al-Sahab, B., Adair, L., Hamadeh, M. J., Ardern, C. I., & Tamim, H. (2011). Impact of breastfeeding duration on age at menarche. *American Journal of Epidemiology*, 173(9), 971–977.**

The study aims to assess the relation between breastfeeding duration and age at menarche. Analysis was based on a cohort of 994 Filipino girls born in 1983–1984 and followed up from infancy to adulthood by the Cebu Longitudinal Health and Nutrition Survey. The main outcome was self-reported age at menarche. Cox regression was used to investigate the relation between duration of exclusive and any breastfeeding with age at menarche with adjustment sequentially for specific sets of known socioeconomic, maternal, genetic, and prenatal confounders. The estimated median of age at menarche was 13.08 years. After adjustment for potential confounders of the association of breastfeeding with age at menarche, exclusive breastfeeding duration retained an independent and

significant association with age at menarche. An increase in 1 month of exclusive breastfeeding decreases the hazard of attaining earlier menarche by 6% (hazard ratio = 0.94, 95% confidence interval: 0.90, 0.98). Any breastfeeding duration was not associated with age at menarche. Although this is the first longitudinal study that reveals a negative association between exclusive breastfeeding and early menarche, the relation is still elusive. Further longitudinal studies within different contexts are warranted to assess the generalizability of these findings.

**Chisenga, M., Siame, J., Baisley, K., Kasonka, L., & Filteau, S. (2011). Determinants of infant feeding choices by Zambian mothers: A mixed quantitative and qualitative study. *Maternal and Child Nutrition, 7(2)*, 148–159.**

Choosing an infant feeding mode is complex for human immunodeficiency virus (HIV)-infected African women. We documented infant feeding choices by 811 mothers of infants aged less than 18 months enrolled in the Chilenje Infant Growth, Nutrition and Infection Study of fortified complementary or replacement foods. We also conducted 20 interviews and 4 focus group discussions among women and nurses to explore the issues in depth. Practices of most HIV-infected women did not closely follow national or international guidelines: 26% never initiated breastfeeding, and 55% were not breastfeeding by 6 months postpartum. Women of lower socio-economic status and those not meeting criteria for safe replacement feeding were more likely to initiate breastfeeding, to continue longer and to stop at 6 months when provided with free food within the trial. Most HIV-negative women and women of unknown HIV status continued breastfeeding into the infant's second year, indicating limited 'spillover' of infant feeding messages designed for HIV-infected women into the uninfected population. Qualitative work indicated that the main factors affecting HIV-infected women's infant feeding decisions were the cost of formula, the advice of health workers, influence of relatives, stigma and difficulties with using an exclusive feeding mode. Rapidly changing international recommendations confused both mothers and nurses. Many HIV-infected women chose replacement feeding without meeting criteria to do this safely. Women were influenced by health workers but, for several reasons, found it difficult to follow their advice. The recently revised international HIV and infant feeding recommendations may make the counselling process simpler for health workers and makes following their advice easier for HIV-infected women.

**Cleland, J., Conde-Agudelo, A., Peterson, H., Ross, J., & Tsui, A. (2012). Contraception and health. *Lancet, 380(9837)*, 149–156. doi:10.1016/S0140-6736(12)60609-6**

Increasing contraceptive use in developing countries has cut the number of maternal deaths by 40% over the past 20 years, merely by reducing the number of unintended pregnancies. By preventing high-risk pregnancies, especially in women of high parities, and those that would have ended in unsafe abortion, increased contraceptive use has reduced the maternal mortality ratio—the risk of maternal death per 100 000 livebirths—by about 26% in little more than a decade. A further 30% of maternal deaths could be avoided by fulfilment of unmet need for contraception. The benefits of modern contraceptives to women's health, including non-contraceptive benefits of specific methods, outweigh the risks. Contraception can also improve perinatal outcomes and child survival, mainly by lengthening interpregnancy intervals. In developing countries, the risk of prematurity and low birthweight doubles when conception occurs within 6 months of a previous birth, and children born

within 2 years of an elder sibling are 60% more likely to die in infancy than are those born more than 2 years after their sibling.

**Gouveri, E., Papanas, N., Hatzitolios, A. I., & Maltezos, E. (2011). Breastfeeding and diabetes. *Current Diabetes Reviews*, 7(2), 135–142.**

The present review outlines the role of breastfeeding in diabetes. In the mother, breastfeeding has been suggested to reduce the incidence of type 2 diabetes mellitus, the metabolic syndrome and cardiovascular disease. Moreover, it appears to reduce the risk of premenopausal breast cancer and ovarian cancer. In the neonate and infant, among other benefits, lactation confers protection from future both type 1 and type 2 diabetes. Whether lactation protects women with gestational diabetes mellitus and their offspring from future T2DM remains to be answered. Importantly, for diabetic mothers, antidiabetic treatment itself may affect breastfeeding. There is not enough data to allow the use of oral hypoglycaemic agents. Therefore, insulin currently remains the optimal antidiabetic treatment during lactation. In conclusion, breastfeeding could be considered a modifiable risk factor for the development of diabetes and even a potential protective lifestyle measure from future cardio-metabolic and malignant diseases. Therefore, health care professionals should encourage both women with and without diabetes to breastfeed their children.

**Jain, V., Gupta, N., Kalaivani, M., Jain, A., Sinha, A., & Agarwal, R. (2011). Vitamin D deficiency in healthy breastfed term infants at 3 months & their mothers in India: Seasonal variation & determinants. *Indian Journal of Medical Research*, 133(3), 267–273.**

**Background & objectives:** Vitamin D deficiency with a resurgence of rickets and tetany are increasingly being reported in young infants from temperate regions, African Americans and also from India. The data on vitamin D status of healthy term breastfed Indian infants and mothers are scant. Therefore, we undertook this study to determine the prevalence of vitamin D deficiency and insufficiency [serum 25 hydroxyvitamin D (25OHD)  $\leq$  15 ng/ml and 15-20 ng/ml, respectively] among healthy term breastfed 3 month old infants and their mothers, evaluate for clinical and radiological rickets in those infants having 25OHD  $<$  10 ng/ml, and check for seasonal variation and predictors of infants' vitamin D status.

**Methods:** A total of 98 infants aged 2.5 to 3.5 months, born at term with appropriate weight and their mothers were enrolled; 47 in winter (November- January) and 51 in summer (April-June). Details of infants' feeding, vitamin D supplementation, sunlight exposure and mothers' calcium and vitamin D intake were recorded. Serum calcium, phosphate, alkaline phosphatase, 25 hydroxyvitamin D (25OHD) and parathormone were estimated.

**Results:** Vitamin D deficiency was found in 66.7 per cent of infants and 81.1 per cent of mothers; and insufficiency in an additional 19.8 per cent of infants and 11.6 per cent of mothers. Radiological rickets was present in 30.3 per cent of infants with 25OHD  $<$  10 ng/ml. 25OHD did not show seasonal variation in infants but maternal concentrations were higher in summer [11.3 (2.5 - 31) ng/ml] compared to winter [5.9 (2.5-25) ng/ml,  $P=0.003$ ]. Intake of vitamin supplement, sunlight exposure and mother's 25OHD were predictors of infants' 25OHD levels.

**Interpretation & Conclusions:** Prevalence of vitamin D deficiency and insufficiency was found to be high in breastfed infants and their mothers, with radiological rickets in a third of infants with

25OHD < 10 ng/ml in this study. Studies with large sample need to be done in different parts of the country to confirm these findings.

**Limwattananon, S., Tangcharoensathien, V., & Prakongsai, P. (2010). Equity in maternal and child health in Thailand. *Bulletin of the World Health Organization*, 88(6), 420–427.**

**Objective:** To assess equity in health outcomes and interventions for maternal and child health (MCH) services in Thailand.

**Methods:** Women of reproductive age in 40 000 nationally representative households responded to the Multiple Indicator Cluster Survey in 2005-2006. We used a concentration index (CI) to assess distribution of nine MCH indicator groups across the household wealth index. For each indicator we also compared the richest and poorest quintiles or deciles, urban and rural domiciles, and mothers or caregivers with or without secondary school education.

**Findings:** CHILD UNDERWEIGHT (CI: -0.2192;  $P < 0.01$ ) and stunting (CI: -0.1767;  $P < 0.01$ ) were least equitably distributed, being disproportionately concentrated among the poor; these were followed by teenage pregnancy (CI: -0.1073;  $P < 0.01$ ), and child pneumonia (CI: -0.0896;  $P < 0.05$ ) and diarrhoea (CI: -0.0531;  $P < 0.1$ ). Distribution of the MCH interventions was fairly equitable, but richer women were more likely to receive prenatal care and delivery by a skilled health worker or in a health facility. The most equitably distributed interventions were child immunization and family planning. All undesirable health outcomes were more prevalent among rural residents, although the urban-rural gap in MCH services was small. Where mothers or caregivers had no formal education, all outcome indicators were worse than in the group with the highest level of education.

**Pannu, P. K., Giglia, R. C., Binns, C. W., Scott, J. A., & Oddy, W.H. (2011). The effectiveness of health promotion materials and activities on breastfeeding outcomes. *International Journal of Paediatrics*, 100(4), 534–537.**

**Aim:** To determine the effect of mothers receiving health promotion material and education antenatally and/or postnatally on breastfeeding outcomes in Perth, Western Australia.

**Methods:** A 12-month longitudinal study was conducted in two public maternity hospitals in Perth, Western Australia, between 2002 and 2003. Data were collected on a consecutive sample 587 mothers.

**Results:** The results showed that mothers who received an individual consultation or were involved in a discussion on breastfeeding antenatally with hospital staff were approximately 55% less likely to cease fully breastfeeding (HR 0.44; 95% CI 0.24-0.88) before 6 months, and 50% less likely to cease any breastfeeding before 12 months postnatally (HR 0.51; 95% CI 0.28-0.92). In the postnatal period, mothers who received instruction on positioning and attachment of the infant to the breast while in hospital were approximately 30% less likely to cease fully breastfeeding before 6 months (HR 0.66; 95% CI 0.45-0.99).

**Conclusion:** The results of this study suggest a positive association between receiving individualized breastfeeding information in both the antenatal and postnatal period, and breastfeeding outcomes.

**Pollard, D. L. (2011). Impact of a feeding log on breastfeeding duration and exclusivity. *Maternal and Child Health Journal*, 15(3), 395–400.**

Even with the gradual upward trends in breastfeeding initiation and duration, breastfeeding rates at 6 months continue to lag well behind the 50% target set for any breastfeeding and the 25% target set for exclusive breastfeeding by the Healthy People 2010 initiatives. Overall evidence is limited in identifying effective interventions that promote breastfeeding duration and more research needs to be focused on specific nursing strategies and their effect on breastfeeding outcomes. The aim of this study was to test the efficacy of a daily feeding log, guided by Bandura's social cognitive learning theory, on breastfeeding duration and exclusivity in primiparous mothers. The study used a randomized, controlled, two-group experimental design with a sample of 86 primiparous mothers. The experimental group completed a daily breastfeeding log for a minimum of 3 weeks and breastfeeding outcomes were examined over 6 months. The breastfeeding outcome variable was analyzed using survival analysis and Cox proportional hazards regression procedures. Subjects in the experimental group did not breastfeed significantly longer than the control group, however, a larger proportion of subjects in the experimental group reported full breastfeeding at 6 months as compared with subjects in the control group. Additional predictor variables were WIC enrollment, planned duration of breastfeeding, feeding frequency and feeding length at 1 week. The findings from the study suggest that the breastfeeding log may be a valuable tool in self-regulating breastfeeding and promoting a longer duration of full breastfeeding, but its acceptability may be impacted by socio-demographic variables.

**Stover, J., & Ross, J. (2013). Changes in the distribution of high-risk births associated with changes in contraceptive prevalence. *BMC Public Health*, 13(Suppl. 3), S4. doi:10.1186/1471-2458-13-S3-S4**

**Background:** Several birth characteristics are associated with high mortality risk: very young or old mothers, short birth intervals and high birth order. One justification for family planning programs is the health benefits associated with better spacing and timing of births. This study examines the extent to which the prevalence of these risk factors changes as a country transitions from high to low fertility.

**Methods:** We use data from 194 national surveys to examine both cross section and within-country variation in these risk factors as they relate to the total fertility rate.

**Results:** Declines in the total fertility rate are associated with large declines in the proportion of high order births, those to mothers over the age of 34 and those with multiple risk factors; as well as to increasing proportions of first order births. There is little change in the proportion of births with short birth intervals except in sub-Saharan Africa. The use of family planning is strongly associated with fertility declines.

**Conclusions:** The proportion of second and higher order births with demographic risk factors declines substantially as fertility declines. This creates a potential for reducing child mortality rates. Some of the reduction comes from modifying the birth interval distribution or by bringing maternal age at the time of birth into the 'safe' range of 18-35 years, and some comes from the actual elimination of births that would have a high mortality risk (high parity births).

**Titaley, C. R., Dibley, M. J., Roberts, C. L., & Agho, K. (2010). Combined iron/folic acid supplements and malaria prophylaxis reduce neonatal mortality in 19 sub-Saharan African countries. *American Journal of Clinical Nutrition*, 92(1), 235–243.**

**Background:** In non malaria regions, iron/folic acid supplementation during pregnancy protects newborns against preterm delivery and early neonatal death. Other studies from malaria-endemic areas have reported an adverse effect of iron supplements on malaria prevalence in pregnant women.

**Objective:** We examined the association between iron/folic acid supplements and prenatal antimalaria prophylaxis on neonatal mortality in malaria-endemic countries of sub-Saharan Africa.

**Design:** This analysis used the most recent data from Demographic and Health Surveys of 19 malaria-endemic countries in sub-Saharan Africa. Survival information of 101,636 singleton live-born infants from the most recent delivery of ever-married women < or =5 y before each survey was examined. The effect of each potential predictor on neonatal deaths was analyzed by using Cox proportional hazards regression models.

**Results:** Infants whose mothers received any iron/folic acid supplements and sulfadoxine-pyrimethamine intermittent preventive treatment (SP-IPT(p)) for malaria during pregnancy were significantly protected from neonatal death [hazard ratio (HR): 0.76; 95% CI: 0.58, 0.99]. The protective effect was not significant in mothers who received only iron/folic acid supplements (HR: 0.90; 95% CI: 0.73, 1.12) or only SP-IPT(p) (HR: 1.08; 95% CI: 0.74, 1.57). Among the sociodemographic and birth characteristics, factors that significantly increased the risk of neonatal death included first-born infants, a birth interval of <2 y, maternal age at delivery of > or =30 y, smaller than average-sized infants, and male infants.

**Conclusion:** The use of antenatal iron/folic acid supplements combined with appropriate intermittent preventive treatment of malaria during pregnancy is an important intervention to reduce neonatal mortality in malaria-endemic regions.

**Venkatesh, K. K., de Bruyn, G., Marinda, E., Ot wombe, K., van Niekerk, R., Urban, M., . . . Gray, G. E. (2011). Morbidity and mortality among infants born to HIV-infected women in South Africa: Implications for child health in resource-limited settings. *Journal of Tropical Pediatrics*, 57(2), 109–119.**

**Background:** We examined correlates of infant morbidity and mortality within the first 3 months of life among HIV-exposed infants receiving post-exposure antiretroviral prophylaxis in South Africa.

**Methods:** We conducted a prospective cohort study of 848 mother-child dyads. Multivariable Cox proportional hazards models were used.

**Results:** The main causes of infant morbidity were gastrointestinal and respiratory infections. Morbidity was higher with infant HIV infection (HR: 2.61; 95% CI: 1.40-4.85; p=0.002) and maternal plasma viral load (PVL) >100,000 copies ml<sup>-1</sup> (HR: 1.87; 95% CI: 1.01-3.48; p=0.048), and lower with maternal age <20 years (HR: 0.25; 95% CI: 0.07-0.88; p=0.031). Mortality was higher with infant HIV infection (HR: 4.10; 95% CI: 1.18-14.31; p=0.027) and maternal PVL >100,000 copies ml<sup>-1</sup> (HR: 6.93; 95% CI: 1.64-29.26; p=0.008). Infant feeding status did not influence the risk of morbidity nor mortality.

**Conclusions:** Future interventions that minimize pediatric HIV infection and reduce maternal viremia, which are the main predictors of child health soon after birth, will impact positively on infant health outcomes.

**Wuehler, S. E., & Ouedraogo, A. W. (2011). Situational analysis of infant and young child nutrition policies and programmatic activities in Burkina Faso. *Maternal and Child Nutrition*, 7(1), 35–62.**

Progress towards reducing mortality and malnutrition among children < 5 years of age has been less than needed to achieve related Millennium Development Goals. Therefore, several international agencies joined to 'Reposition children's right to adequate nutrition in the Sahel', starting with an analysis of current activities related to infant and young child nutrition (IYCN). The objectives of the present paper are to compare relevant national policies, training materials, programmes, and monitoring and evaluation activities with internationally accepted IYCN recommendations. These findings are available to assist countries in identifying inconsistencies and filling gaps in current programming. Between August and November 2008, key informants responsible for conducting IYCN-related activities in Burkina Faso were interviewed, and 153 documents were examined on the following themes: optimal breastfeeding and complementary feeding practices, prevention of micronutrient deficiencies, screening and treatment of acute malnutrition, prevention of mother-to-child transmission of HIV, food security and hygienic practices. National policy documents addressed nearly all of the key IYCN topics, specifically or generally. Formative research has identified some local barriers and beliefs related to general breastfeeding and complementary feeding practices, and other formative research addressed about half of the IYCN topics included in this review. However, there was little evidence that this formative research was being utilized in developing training materials and designing programme interventions. Nevertheless, the training materials that were reviewed do provide specific guidance for nearly all of the key IYCN topics. Although many of the IYCN programmes are intended for national coverage, we could only confirm with available reports that programme coverage extended to certain regions. Some programme monitoring and evaluation were conducted, but few of these provided information on whether the specific IYCN programme components were implemented as designed. Most surveys that were identified reported on general nutrition status indicators, but did not provide the detail necessary for programme impact evaluations. The policy framework is well established for optimal IYCN practices, but greater resources and capacity building are needed to: (i) conduct necessary research and adapt training materials and programme protocols to local needs; (ii) improve, carry out, and document monitoring and evaluation that highlight effective and ineffective programme components; and (iii) apply these findings in developing, expanding, and improving effective programmes.

**Yaghini, S. O., Khomeh, S., Danesh, F., Modaresi, M. R., & Saneian, H. (2011). Determinants of exclusive breast milk feeding of infants in Isfahan, Iran. *Journal of Isfahan Medical School*, 28(117), 890–903.**

**Background:** There are many studies shown the advantages of breastfeeding, not only for the infant, but also for the mother. There is no doubt that breastfeeding carries many advantages. Mother's milk is more benefit than formula. Breastfeeding reduce the risk of post natal bleeding infectious disease, breast and ovarian cancer, iron deficiency anemia and even death. There are several factors influence exclusive breastfeeding in the first six month after birth. It is necessary that hygienic systems and mothers baby clinics do suitable proceeding to increase the rate of breastfeeding.

**Methods:** This cross sectional study conducted in Isfahan urban health centers in 2008. The sample size was calculated by especial formula for prevalence study. In this study, we selected 656 children



living in Isfahan by easy method. The data were analyzed by SPSS software using Student-t and chisquare test.

**Finding:** 537 (81.9%) were fed by breastfeeding and 119 (18.1%) were fed by formula. In addition, 235 of boys (78.9%) and 301 of girls (84.3%) were feed by breastfeeding and the difference between two groups was not statistically significant. Many factors have positive role for breastfeeding such as mothers' awareness mothers job, rank of birth, birth weight and etc and this factors must be noticed by responsibility of public health.

**Conclusion:** This study showed the effect of some factors such as socioeconomic status of family, birth weight, type of delivery and etc in the breastfeeding.

**Zubaran, C., & Foresti, K. (2011). The correlation between breastfeeding and maternal quality of life in southern Brazil. *Breastfeeding Medicine*, 6(1), 25–30.**

**Purpose:** This study examined the relationship between the breastfeeding efficacy and quality of life (QoL) in a sample of 89 mothers from southern Brazil. To the authors' knowledge, this is the first study to explore correlations between maternal QoL and breastfeeding efficacy in Brazil.

**Methods:** Research participants completed the Portuguese version of the World Health Organization Quality of Life-BREF and Multicultural Quality of Life Index questionnaires. Breastfeeding efficacy was evaluated through the Breastfeeding Self-Efficacy Scale-Short Form (BSES-SF). Correlations between the scores of the QoL instruments and the BSES-SF were examined using Pearson product-moment correlation coefficients.

**Results:** There were significant correlations among the scores of the two QoL questionnaires and the BSES-SF. Multiple regression analysis revealed that both QoL instruments significantly predicted BSES-SF scores. Neither socioeconomic status nor level of educational attainment was a significant predictor of breastfeeding efficacy.

**Conclusions:** The results from the present study indicate that breastfeeding efficacy is significantly related to QoL among mothers in southern Brazil. The association between QoL and breastfeeding efficacy appears to be independent from any effect of socioeconomic status or level of educational achievement.

## 10. PROGESTIN-ONLY CONTRACEPTION

**Brito, M. B., Ferriani, R. A., Quintana, S. M., Yazlle, M. E., Silva de Sa, M. F., & Vieira, C. S. (2009). Safety of the etonogestrel-releasing implant during the immediate postpartum period: A pilot study. *Contraception*, 80(6), 519–526.**

**Background:** The effects of etonogestrel (ETG)-releasing contraceptive implant during the immediate postpartum period on maternal safety are unknown.

**Study design:** Forty healthy women exclusively breastfeeding were randomized to receive either ETG-releasing implant 24-48 h after delivery (n=20) or depot medroxyprogesterone acetate (DMPA group; n=20) at the sixth week postpartum. We measured blood pressure, maternal and neonatal weight, body mass index (BMI; kg/m(2)), waist circumference (WC), complete blood count, C-reactive protein, interleukin-6, tumor necrosis factor (TNF-alpha), lipid profile, fasting serum glucose and maintenance of exclusive lactation up to the 12th week postpartum.

**Results:** Decreases in mean maternal weight, BMI (kg/m(2)) and WC were significantly greater in the ETG-releasing implant group than in the DMPA group during the first 6 weeks postpartum (-4.64+/-2.71 kg vs. -2.6+/-2.45 kg mean+/-SD, p=.017; -1.77+/-1.06 kg/m(2) vs. -0.97+/-0.95 kg/m(2), p=.026; -15.3+/-6.72 cm vs. -9.05+/-5.84 cm, p=.003, respectively). In addition, total cholesterol and HDL, were lower in DMPA users, and TNF-alpha and leukocytes were higher in DMPA users compared to in the implant group, between 6 and 12 weeks after delivery. The newborns of implant users showed a trend towards gaining more weight, as compared with the infants of the DMPA mothers during the first 6 weeks of life (implant group: +1460.50+/-621.34 g vs. DMPA group: +1035.0+/-562.43 g, p=.05). The remaining variables, including the duration of exclusive breastfeeding, were similar between the groups.

**Conclusion:** The insertion of ETG-releasing contraceptive implant during the immediate postpartum period was not associated with deleterious maternal clinical effects or with significant maternal metabolic alterations or decreased infant weight gain.

**Brito, M. B., Meijers, J. C., Garcia, A. A., Feniani, R. A., De Sá, M. F. S., Quintana, S. M., & Vieira, C. S. (2010). P191 The Etonogestrel-releasing contraceptive implant inserted immediately postpartum has no negative influence in the haemostatic system [Poster abstract]. *European Journal of Contraception and Reproductive Health Care*, 15(1), 167.**

**Objective:** Assess the safety in the haemostatic system of Etonogestrel (ENG)-releasing contraceptive implant inserted in the period of highest risk for thrombosis throughout reproductive years.

**Material and methods:** Forty healthy women aged 18 to 35 years-old were randomized to receive either ENG-releasing implant 24 - 48 h after delivery (n = 20) or depot medroxyprogesterone acetate (control group; n = 20) at the 6th week postpartum. Blood samples were collected to evaluate haemostatic variables [fibrinogen, coagulation factors (F) II, V, VII, VIII, IX, X, XI; protein C; free protein S, antithrombin, activated protein C resistance; tissue plasminogen activator;  $\alpha$ 2-antiplasmin; PAI-1; thrombin-antithrombin complex; prothrombin fragment 1 + 2; D dimers; TTPA; TP and TT] at 24 - 48 hours, at 6 and 12 weeks after delivery. ANOVA and unpaired t-Student tests were used as appropriated.

**Results:** At baseline, groups have similar clinical characteristics and laboratory exams. There were a higher reduction in FII (Control:  $-30.03 \pm 24.54\%$  vs. ENG:  $-13.53 \pm 24.7\%$ ,  $p = 0.041$ ), FV (Control:  $-24.17 \pm 20.23\%$  vs. ENG:  $-9.73 \pm 17.88\%$ ,  $p = 0.02$ ), FVII (Control:  $-58.6 \pm 32.3\%$  vs. ENG:  $-11.2 \pm 41.3\%$ ,  $p < 0.0001$ ), FX (Control:  $-23.58 \pm 19.02\%$  vs. ENG:  $+ 0.7 \pm 40.49\%$ ,  $p = 0.02$ ) and protein C (Control:  $-22.64 \pm 15.49\%$  vs. ENG:  $-6.92 \pm 17.99\%$ ,  $p = 0.005$ ) in the control group during the 12 weeks. During the first six weeks, occurred a greater declined in FIX (Control:  $-21.76 \pm 8.62\%$  vs. ENG:  $-14.53 \pm 10.59\%$ ,  $p = 0.023$ ) and fibrinogen (Control:  $-222.45 \pm 94.72$  mg/dL vs. ENG:  $-149.35 \pm 99.71$  mg/dL,  $p = 0.023$ ) in control group. The changes in remainder variables did not differ between the groups.

**Conclusions:** The ENG-releasing contraceptive implant, represents an option for contraception during the postpartum period, classically recommended after six weeks postpartum. However for patients at risk for short intergestational period, it could be started earlier. This study did not observe any deleterious effects in haemostatic system when this implant was inserted immediately after delivery, during the period of highest risk for thrombosis throughout reproductive years, the first twelve weeks postpartum. So this could be an interesting long-acting reversible contraceptive method for patients at risk for short intergestational interval.

**de Melo, N. R. (2010). Estrogen-free oral hormonal contraception: benefits of the progestin-only pill. *Women's Health (London, England)*, 6(5),721–735.**

Although combined oral contraceptives (COCs) are commonly used and highly effective in preventing pregnancy, they may not be suitable for some women. COC use is associated with increased rates of cardiovascular events and is not recommended in nonbreastfeeding women in the immediate postpartum period or in breastfeeding women during the initial 6 months of breastfeeding. Moreover, estrogen-related adverse effects, such as headache, are common. Estrogen-free progestin-only pills (POPs) are a valuable option in women who prefer to take an oral hormonal contraceptive, but are ineligible for, or choose not to use, COCs. Although some POPs have been associated with lower contraceptive effectiveness than COCs, the POP containing desogestrel has shown similar contraceptive effectiveness to COCs. The most commonly reported complaints in women using all POPs are bleeding problems. Counseling women interested in using POPs about the variable bleeding patterns associated with this method may improve compliance and acceptance.

**Duvan, C. I., Gözdemir, E., Kaygusuz, I., Kamalak, Z., & Turhan, N. O. (2010). Etonogestrel contraceptive implant (Implanon): Analysis of patient compliance and adverse effects in the breastfeeding period. *Journal of the Turkish German Gynecology Association*, 11(3), 141–144.**

**Objective:** To analyse the compliance of patients and side effects of Implanon® during breast feeding.

**Material and methods:** Prospective study of 61 postpartum women who chose Implanon® for long term contraception between April 2007 and December 2009. Compliance, side effects and removals were recorded.

**Results:** Amenorrhoea, prolonged bleeding, frequent bleeding and infrequent bleeding were reported in 20 (32%), 13 (21%), 4 (6.5%) and 2 (3.2%) patients, respectively. Non-menstrual side effects experienced by participants included; weight gain reported by 10 patients (16%), anxiety by 6

(9.8%), breast tenderness by 4 (6.5%), headache by 4 (6.5%), pain at the insertion site by two (3.2%), hirsutism by two (3.2%), acne by 1 (1.6%), loss of libido by 1 (1.6%), weight gain and headache by two (3.2%), weight gain and anxiety by two (1.6%). The mean breastfeeding period was  $16 \pm 7.4$  /months. During the follow up, Implanon® was removed from 24 patients (39%).

**Conclusion:** If patients are well informed about its expected side effects before placement, Implanon® is well tolerated and is an acceptable choice for women who have recently experienced labor and are looking for long term reversible contraception.

**Grimes, D. A., Lopez, L. M., O'Brien, P., & Raymond, E. G. (2009). Progestin-only pills for contraception. *Cochrane Database of Systematic Reviews*, (1), CD007541. doi:10.1002/14651858.CD007541**

Progestin-only pills, as their name implies, contain just one hormone; in contrast, the more common combined birth control pills contain two hormones. How these one-hormone pills compare to each other or to two-hormone pills is not clear. Hence, we did this review to compare progestin-only pills to other similar pills or to combined (two-hormone) pills. We did a computer search and literature search to find randomized trials of progestin-only pills. We found six trials, some of which were several decades old and thus have limited relevance to pills available today. A newer pill containing the progestin desogestrel may be better at preventing pregnancy than an older pill with levonorgestrel, but the newer pill caused more bleeding problems. Pills with levonorgestrel may be more effective than pills with other progestins no longer used. These studies are not adequate to tell how progestin-only pills compare to each other or to combined (two-hormone) pills. Bigger studies with currently used pills will be needed to answer these questions.

**Kapp, N., Curtis, K., & Nanda, K. (2010). Progestogen-only contraceptive use among breastfeeding women: A systematic review. *Contraception*, 82(1), 17–37. doi:10.1016/j.contraception.2010.02.002**

**Background:** The use of progestogen-only contraceptives by breastfeeding women raises theoretical concerns regarding possible adverse effects on breastfeeding success, and infant health or growth. This review was conducted to determine from the literature whether use of progestogen-only contraceptives by breastfeeding women leads to adverse effects on lactation, or infant growth or health when compared to nonuse.

**Study design:** We searched the Medline, Popline, Cochrane and LILACS databases for all articles published from database inception through May 2009. Studies were included if they investigated the use of progestogen-only methods in breastfeeding women and reported on clinical outcomes in either women or their infants. Standard data abstraction templates were used to systematically assess and summarize. Summary odds ratios were not calculated, given the heterogeneity of interventions, results and non-quantifiable outcomes reported.

**Results:** We identified 43 articles for this review. Overall, five randomized trials and 38 observational studies demonstrated no adverse effects of various progestogen-only methods of contraception on multiple measures of breastfeeding performance through 12 months in women using these methods in the postpartum period. Many of these studies also demonstrated no adverse effects of progestogen-only methods on infant growth, health or development from 6 months to 6 years of age. Additional studies demonstrated no effects on infant immunoglobulins or sex hormones

of exposed male infants. A single study of a desogestrel pill reported two cases of gynecomastia in exposed infants.

**Conclusions:** Evidence suggests that progestogen-only methods of contraception do not adversely affect breastfeeding performance when used during lactation. Evidence that progestogen-only contraception does not adversely affect infant growth, health, or development when used by breastfeeding women is consistent but methodologically limited.

**Madelenat, P., & Koskas, M. (2008). Update on the progestin-only contraception. *Journal de Gynecologie Obstetrique et Biologie de la Reproduction*, 37(7), 637–660.**

Despite the lack of complete data concerning their effects, the use of progestin-only contraception is increasing in France (particularly the intra-uterine device, the subdermal implantation, and microprogestins). These prescriptions include a broad range of molecules and administration of doses. In some cases, prescriptions of progestogens are made out of the marketing authorisation indications (especially for macroprogestins). For all of these reasons, an Expert Advisory Board has been set up in order to answer the 35 questions addressed by an Expert Organization Board. The choice of these questions was based on controversial or nonconsensual points usually encountered in everyday clinical practice. When possible, answers given were strongly supported by data issued from medical literature. In situations where clinical studies were lacking, the Expert Advisory Board answered in the most consensual way. All answers given by the Expert Advisory Board were subsequently submitted to the Expert Assessment Board before the latest validation of this document. The progestogen only contraception has different levels of action (local and/or central) which may vary from one drug to another. Its prescription is granted satisfactory efficacy (the macroprogestins' efficacy has never been evaluated) but requires a strict pill-taking routine (especially for the microprogestin contraception). It has never been demonstrated that the use of progestogen is associated with an increased risk of breast cancer. Nevertheless, analysis of breast cancer and progestogen studies should be carried out carefully. Even though the effects, often misunderstood, of the different progestogens on mineral bone density are likely to vary according to the molecules, in particular due to the plasma estradiol level, there is no direct argument for considering the progestin only contraception as a fracture risk factor. As for the venous thromboembolism risk, progestogens are not considered to be risk factors. The progestogen only contraception is advised in the following cases: bad tolerance of exogenous oestrogens; in order to counteract an endogenous hyperoestrogenosis; metabolic or cardiovascular contraindications to estroprogestin; hormonal fluctuations generating premenstrual dysphoria or catamenial headaches. Lastly, the progestin-only contraception should be used as a prime contraception in some particular situations (breast feeding, adenomyosis...).

**Rodriguez, M. I., & Kaunitz, A. M. (2009). An evidence-based approach to postpartum use of depot medroxyprogesterone acetate in breastfeeding women. *Contraception*, 80(1), 4–6.**

This article addresses the controversy surrounding and current guidelines for the use of depot medroxyprogesterone (DMPA) in postpartum, breastfeeding women. The authors acknowledge that “the use of DMPA immediately postpartum in breastfeeding women has remained controversial due to theoretical concerns over the potential impact of DMPA on milk supply and quality, the possibility

of transference to the neonate with adverse outcomes, and maternal safety risks. These concerns have been potentiated by the World Health Organization's (WHO) classification of DMPA use postpartum in breastfeeding women as Class 3, a condition where the theoretical or proven risks usually outweigh the advantages of using the method" (Rodriguez & Kaunitz, 2009, p. 4). A review of the evidence leads to the following conclusion: "Existing data are not sufficient to limit DMPA use postpartum in women at high risk for unintended pregnancy. To minimize the maternal and neonatal risks of unintended pregnancy, DMPA should be administered prior to hospital discharge and no later than the third postpartum week in well-counseled women choosing to use DMPA as their contraceptive, regardless of lactation status" (Rodriguez & Kaunitz, 2009, p. 6).

## II. PROGRAM APPROACH AND OTHER POSTPARTUM CONTRACEPTION

**Ahmed, S., Norton, M., Williams, E., Ahmed, S., Shah, R., Begum, N., . . . A. H. Baqui. (2013). Operations research to add postpartum family planning to maternal and neonatal health to improve birth spacing in Sylhet District, Bangladesh. *Global Health: Science and Practice, 1*(2), 262–276. doi:10.9745/GHSP-D-13-00002**

**Background:** Short birth intervals are associated with increased risk of adverse maternal and neonatal health (MNH) outcomes. Improving postpartum contraceptive use is an important programmatic strategy to improve the health and well-being of women, newborns, and children. This article documents the intervention package and evaluation design of a study conducted in a rural district of Bangladesh to evaluate the effects of an integrated, community-based MNH and postpartum family planning program on contraceptive use and birth-interval lengths.

**Intervention:** The study integrated family planning counseling within 5 community health worker (CHW)-household visits to pregnant and postpartum women, while a community mobilizer (CM) led community meetings on the importance of postpartum family planning and pregnancy spacing for maternal and child health. The CM and the CHWs emphasized 3 messages: (1) Use of the Lactational Amenorrhea Method (LAM) during the first 6 months postpartum and transition to another modern contraceptive method; (2) Exclusive, rather than fully or nearly fully, breastfeeding to support LAM effectiveness and good infant breastfeeding practices; (3) Use of a modern contraceptive method after a live birth for at least 24 months before attempting another pregnancy (a birth-to-birth interval of about 3 years) to support improved infant health and nutrition. CHWs provided only family planning counseling in the original study design, but we later added community-based distribution of methods, and referrals for clinical methods, to meet women's demand.

**Methods:** Using a quasi-experimental design, and relying primarily on pre/post-household surveys, we selected pregnant women from 4 unions to receive the intervention (n=52,280) and pregnant women from 4 other unions (n=52,290) to serve as the comparison group. Enrollment occurred between 2007 and 2009, and data collection ended in January 2013.

**Preliminary results:** Formative research showed that women and their family members generally did not perceive birth spacing as a priority, and most recently delivered women were not using contraception. At baseline, women in the intervention and comparison groups were similar in terms of age, husband's education, religion, and parity. CHWs visited over 90% of women in both intervention and comparison groups during pregnancy and the first 3 months postpartum.

**Discussion:** This article provides helpful intervention-design details for program managers intending to add postpartum family planning services to community-based MNH programs. Outcomes of the intervention will be reported in a future paper. Preliminary findings indicate that the package of 5 CHW visits was feasible and did not compromise worker performance. Adding doorstep delivery of contraceptives to the intervention package may enhance impact.

**Glazier, A. F., Logan, J., & McGlew, T. J. (1996). Who gives advice about postpartum contraception? *Contraception, 53*(4), 217–220.**

Women were interviewed to determine what advice they received about postpartum contraception and what they thought of it. Only 4% of women discussed postpartum contraception antenatally.

Up to 84% discussed the issue with a midwife on the postnatal ward but discussion was often felt to be brief, limited and frequently held as the mother was leaving the hospital. Obstetricians appeared to have little interest in the subject and only 50% of mothers left the hospital with supplies of a contraceptive. Almost all women discussed contraception with their general practitioner at the postnatal check but a significant number felt that the choice of method was limited to condoms or pills. The postnatal check is traditionally held at six weeks—two to three weeks after the recommended time for starting contraceptive precautions. Women with short inter-pregnancy intervals were younger, less likely to be married and more likely to default from postnatal follow-up. Pregnant women should be offered the opportunity during the antenatal period to discuss postpartum contraception with someone who has a special interest in the subject. The postnatal ward is not an appropriate setting for discussion about future contraception.

**Hundt, G. L., Beckerleg, S., Kassem, F., Abu Jafar, A. M., Belmaker, I., Abu Saad, K., & Shoham-Vardi, I. (2000). Women's health custom made: Building on the 40 days postpartum for Arab women. *Health Care for Women International, 21(6), 529–542.***

The 40-day postpartum period is characterized in the Middle East and elsewhere by an observance of seclusion, congratulatory visiting, the reciprocal exchange of gifts and money, and a special diet. Based on primary data from in-depth interviews among the Negev Bedouin in Israel, health enhancing practices are reviewed. The data are a subset from a larger study carried out in this setting. Often postnatal checkups, family planning counseling, and immunization services may not be routinely available or used. It is argued that these health services could be provided at the end of the 40-day period for mother and child, as in a pilot study in Tunisia some years ago. Health service provision would thus build on the health enhancing practices of the 40-day period.

**Lopez, L. M., Hiller, J. E., Grimes, D. A., & Chen, M. (2012). Education for contraceptive use by women after childbirth. *Cochrane Database of Systematic Reviews, 8, CD001863.* doi:10.1002/14651858.CD001863.pub3**

#### **Plain language summary**

Counseling about family planning is standard care for most women who have just given birth. Many women feel this service is provided as part of a checklist. Few providers and researchers have looked at how well the counseling works. Some people have questioned the basis for such programs. We do not know if postpartum women want to use family planning or whether they will return to a health center for family planning advice. Women may wish to discuss family planning before they have the baby and after they leave the hospital. Women may also prefer to talk about birth control along with other health issues. In this review, we looked at the effects of educational programs about family planning for women who have just had a baby.

In May 2012, we did computer searches to find trials of education about family planning after having a baby. We also wrote to researchers to find other trials. The trials had to study how much the program affected family planning use. The program must have occurred within a month after the birth. We had no language limits for the searches. We entered the data into RevMan and used the odds ratio to examine effect. We also looked at the quality of the research methods.



We found 10 trials. Of four trials with one [or—Ed.] two contacts, two gave the women education while in the hospital. One showed more women in the counseling group used birth control than those without counseling at 8 to 12 weeks. In the other, more women with counseling both right after birth and later used birth control at six months than those with only the later session. Of the other two trials, one did not have enough data and the other was a very small study. Three of six trials with longer and more complex programs made a difference. Two showed fewer pregnancies or births among teenagers in the group with extra services. Also, a special home-visiting program showed more birth control use.

The overall results were of moderate quality. However, the five studies that showed some effect were low to moderate quality. These programs would have to be adapted for other settings and then retested. Researchers and health care providers can decide which ones might fit their setting and budget.

**Mattson, S. (1998). Maternal-child health in Zimbabwe. *Health Care for Women International*, 19(3), 231–242.**

In this paper I describe maternal and child health needs in Zimbabwe, as well as existing health care delivery services designed to meet these needs. The information presented is based on a project sponsored by Earthwatch (a worldwide volunteer organization) that addressed the needs of women and infants, as well as the author's contribution to this effort. Because of a long-standing drought, many women and children in Zimbabwe are malnourished. Poor nutrition affects the woman herself, pregnancy outcomes, and the developing child, and has far-reaching repercussions. The major problems that contribute to maternal child morbidity and mortality include nutritional deficiencies, lack of safe water, and family planning needs. Earlier surveys conducted on maternal nutrition consistently showed iron deficiency, goiters, underweight, and inadequate nutrient intake to be quite prevalent. On the basis of previous assessments, this project focused on educating community health workers on ways to assist families with nutritional deficiencies, family planning, and hygiene needs.

**Morrison, J., Tamang, S., Mesko, N., Osrin, D., Shrestha, B., Manandhar, M., . . . Costello, A. (2005). Women's health groups to improve perinatal care in rural Nepal. *BMC Pregnancy and Childbirth*, 5(1), 6.**

**Background:** Neonatal mortality rates are high in rural Nepal where more than 90% of deliveries are in the home. Evidence suggests that death rates can be reduced by interventions at community level. We describe an intervention, which aimed to harness the power of community planning and decision making to improve maternal and newborn care in rural Nepal.

**Methods:** The development of 111 women's groups in a population of 86 704 in Makwanpur district, Nepal is described. The groups, facilitated by local women, were the intervention component of a randomized controlled trial to reduce perinatal and neonatal mortality rates. Through participant observation and analysis of reports, we describe the implementation of this intervention: the community entry process, the facilitation of monthly meetings through a

participatory action cycle of problem identification, community planning, and implementation and evaluation of strategies to tackle the identified problems.

**Results:** In response to the needs of the group, participatory health education was added to the intervention and the women's groups developed varied strategies to tackle problems of maternal and newborn care: establishing mother and child health funds, producing clean home delivery kits and operating stretcher schemes. Close linkages with community leaders and community health workers improved strategy implementation. There were also indications of positive effects on group members and health services, and most groups remained active after 30 months.

**Conclusion:** A large scale and potentially sustainable participatory intervention with women's groups, which focused on pregnancy, childbirth and the newborn period, resulted in innovative strategies identified by local communities to tackle perinatal care problems.

**Mullany, B.C. (2006). Barriers to and attitudes towards promoting husbands' involvement in maternal health in Katmandu, Nepal. *Social Science and Medicine*, 62(11), 2798–2809.**

Couple-friendly reproductive health services and male partner involvement in women's reproductive health have recently garnered considerable attention. Given the sensitive nature of gender roles and relations in many cultures, understanding the context of a particular setting, potential barriers, and attitudes towards a new intervention are necessary first steps in designing services that include men. In preparation for a male involvement in antenatal care intervention, this qualitative study specifically aims to: (a) understand the barriers to male involvement in maternal health and (b) explore men's, women's, and providers' attitudes towards the promotion of male involvement in antenatal care and maternal health. In-depth interviews were conducted with fourteen couples and eight maternal health care providers at a public maternity hospital in Katmandu, Nepal. Additionally, seventeen couples participated in focus group discussions. The most prominent barriers to male involvement in maternal health included low levels of knowledge, social stigma, shyness/embarrassment and job responsibilities. Though providers also foresaw some obstacles, primarily in the forms of hospital policy, manpower and space problems, providers unanimously felt the option of couples-friendly maternal health services would enhance the quality of care and understanding of health information given to pregnant women, echoing attitudes expressed by most pregnant women and their husbands. Accordingly, a major shift in hospital policy was seen as an important first step in introducing couple-friendly antenatal or delivery services. The predominantly favorable attitudes of pregnant women, husbands, and providers towards encouraging greater male involvement in maternal health in this study imply that the introduction of an option for such services would be both feasible and well accepted.

**Mullany, B. C., Becker, S., & Hindin, M. J. (2007). The impact of including husbands in antenatal health education services on maternal health practices in urban Nepal: Results from a randomized controlled trial. *Health Education Research*, 22(2), 166–176.**

Observational studies suggest that including men in reproductive health interventions can enhance positive health outcomes. A randomized controlled trial was designed to test the impact of involving male partners in antenatal health education on maternal health care utilization and birth

preparedness in urban Nepal. In total, 442 women seeking antenatal services during second trimester of pregnancy were randomized into three groups: women who received education with their husbands, women who received education alone and women who received no education. The education intervention consisted of two 35-min health education sessions. Women were followed until after delivery. Women who received education with husbands were more likely to attend a post-partum visit than women who received education alone [RR = 1.25, 95% CI = (1.01, 1.54)] or no education [RR = 1.29, 95% CI = (1.04, 1.60)]. Women who received education with their husbands were also nearly twice as likely as control group women to report making >3 birth preparations [RR = 1.99, 95% CI = (1.10, 3.59)]. Study groups were similar with respect to attending the recommended number of antenatal care checkups, delivering in a health institution or having a skilled provider at birth. These data provide evidence that educating pregnant women and their male partners yields a greater net impact on maternal health behaviors compared with educating women alone.

**Mullany, B. C., Lakhey, B., Shrestha, D., Hindin, M. J., & Becker, S. (2009). Impact of husbands' participation in antenatal health education services on maternal health knowledge. *JNMA; Journal of the Nepal Medical Association, 48(173), 28–34.***

**Introduction:** A randomized controlled trial was designed to test the impact of involving husbands in antenatal health education on women's maternal health knowledge.

**Methods:** Total 442 women receiving antenatal services at a hospital in Kathmandu, Nepal were randomized into three groups: women who attended education sessions with their husbands, women who attended education sessions alone, and women who attended no education sessions (controls). At baseline and after delivery, women's maternal health knowledge and change in knowledge levels were compared between the groups.

**Results:** Compared to control group women, women educated with husbands increased their knowledge scores by an average of 0.61 points (95% CI=0.32-0.89, P<0.001), while women educated alone increased their scores by only 0.34 points (95% CI=0.04-0.65, P<0.05). Women educated with partners could identify more pregnancy complications and family planning methods than women in both other groups.

**Conclusions:** These findings suggest that women learn and retain the most information when they are educated with their partners.

**Nte, A. R., Odu, N., & Enyindah, C. E. (2009). Male involvement in family planning: Women's perception. *Nigerian Journal of Clinical Practice, 12(3), 306–310.***

**Objectives:** To assess the knowledge of mothers of under-five children brought to immunisation centres of contraceptive methods applicable by males and their perceptions of the roles of males in family planning.

**Subjects and methods:** This cross-sectional descriptive study involved a questionnaire interview of mothers who came to immunise their children at five public immunisation centres in Port Harcourt. Data entry and analysis employed EPI-Info version 6.

**Results:** Amongst the 558 mothers interviewed, the contraceptive prevalence rate was 5.6% and 85.6% of them knew at least a family planning method for males. About 15.8% would depend on their spouses for choice of contraceptive methods and 52.7% would discontinue family planning if

their spouses objected. About 33.5% of the spouses had used some form of contraception while only 22.1% of the females recognised that male involvement could impact on the acceptance rate of family planning services. Despite their knowledge of safe child spacing, about 53% of the respondents delivered within shorter intervals and had significantly more pregnancies/children that they would have had if they were in 'control' of their reproductive health decisions. The spouses, despite being significantly older, more educated, with higher level jobs, and in-charge of the reproductive health decision in the home, did not contribute to the knowledge of the women and their practices of family planning.

**Conclusion:** Despite the advantaged position of males in family matters, their roles in family planning remains largely unutilised. If the acceptance of family planning must improve, males should also be targeted by family planning programmes.

**Rattanavong, P., Thammavong, T., Louanvilayvong, D., Southammavong, L., Viounalath, V., Laohasiriwong, W., . . . Schelp, F. P. (2000). Reproductive health in selected villages in Lao PDR. *Southeast Asian Journal of Tropical Medicine and Public Health*, 31(Suppl. 2), 51–62.**

The aim of the project was to improve the knowledge and attitude towards birth spacing by training the villagers in the selected villages of Vientiane Province in Lao PDR in family planning, providing them with the various family planning methods, and improving antenatal (ANC) and postnatal (PNC) care in the villages. Throughout the province, traditional birth attendants (TBA) were trained on several occasions during the project period. There were clear indications that reproductive health improved between 1995 and 1997. Considerable improvements were observed in the percentage of women making use of ANC and practicing birth spacing by using some form of contraception or other. The most common methods used were contraceptive pills and injectables. In the case of child mortality a slight decrease was found in the percentage of women having their first pregnancy below the age of 18 years. A still unsolved problem is the high number of abortions.

**Robin, G., Massart, P., Graizeau, F., & Guerin du Masgenet, B. (2008). La contraception du post-partum: Etat des connaissances [Postpartum birth control: State-of-the-art]. *Gynecologie, Obstetrique & Fertilité*, 36(6), 603–615.**

It takes approximately six weeks for menstrual flow to come back after delivery, but ovulation may occur from the twenty-fifth day. That is why postpartum birth control must be integrated into care on maternity wards. Obstetricians and midwives should deliver updated information about different contraceptive means. They should consider risk factors and prescribe an effective contraceptive option for every woman who wishes it before she leaves the maternity ward. Recent studies call for a change in current medical behavior regarding postpartum contraception, even if there is no consensus at present. In a normal context without additional risk factors, it is possible to prescribe a birth control pill containing low dosage of combined oral contraceptives. Doing so, the patient will not be exposed to an increased risk of deep venous thrombosis nor to significant breastfeeding disruption. Low-dose progestin-only pills are also a good choice because there are no risks during lactation. When the patient is unable to take combined oral contraceptives, it is still possible to prescribe progestin-only oral contraceptives. Intra-uterine devices may also be inserted from the fourth or sixth week following delivery. In certain conditions, intra-uterine devices may be inserted

in the 48 hours following a delivery, some obstetricians may even perform an insertion during caesarean sections. The main purpose of this article is to simplify the contraceptive outline in order to ease its prescription and to avoid unwanted pregnancies.

**Ross, J., Stover, J., & Adelaja, D. (2007). Family planning programs in 2004: New assessments in a changing environment. *International Family Planning Perspectives*, 33(1), 22–30.**

**Context:** Periodic assessments between 1972 and 1999 found consistent increases in the intensity and types of effort exerted by national family planning programs in developing countries. An updated evaluation was needed to examine whether these trends have been affected by recent changes in the family planning environment, such as decentralization, the HIV/AIDS epidemic and funding reductions.

**Methods:** In 2004, informants in 82 developing countries completed a questionnaire that assessed 30 dimensions of program effort and included several new scales to explore current issues. Selected results were compared with findings from prior rounds of the study.

**Results:** Family planning effort increased between 1999 and 2004, both globally and within regions. When the data were weighted by country population size, effort declined slightly overall but increased in four of six regions. Countries with low initial scores improved more than those with high initial scores. Contraceptive access varied by region and was lowest in Sub-Saharan Africa. The strongest justifications for programs were improving maternal and child health and preventing unwanted births. Changes in funding were often judged to have had negative effects on programs. Unmarried youth and women receiving postabortion care received the least emphasis among special populations of interest.

**Conclusions:** Although average program effort scores have risen again, increases in effort, funding and access to contraceptive methods are still needed in many countries, especially in rural areas, and among the poor. More emphasis should be placed on providing postpartum and postabortion family planning services.

**Saeed, G. A., Fakhar, S., Rahim, F., & Tabassum, S. (2008). Change in trend of contraceptive uptake—effect of educational leaflets and counseling. *Contraception* 77(5), 377–381.**

**Background:** The study was conducted to determine the impact of counseling and educational leaflets on contraceptive practices of couples.

**Study design:** Randomization of 600 women was done in two groups matched for age, parity and socioeconomic status at the Department of Obstetrics and Gynaecology, Shifa Foundation Community Health Centre, Shifa International Hospital, Islamabad, Pakistan. In Group A, the intervention group was exposed to contraceptive counseling and educational leaflets in the postnatal ward after delivery, whereas in Group B, the nonintervention group was not given any formal contraceptive advice. Later on, both groups were assessed regarding their contraceptive practices.

**Results:** At their follow-up visit (8–12 weeks) postpartum, 19 (6.3%) women in the nonintervention group had started contraceptive use, whereas 153 (50.8%) had decided to start contraception in the next 6 months, and 129 (42.8%) women were still undecided. The main contraceptive user was the male partner (n=117, 38.8%), and the most common method used was

coitus interruptus (n=62, 36.3%). In the intervention group, 170 women (56.9%) had started using contraceptives, whereas 129 (43.1%) had decided to start contraceptive use in the next 6 months. The predominant contraceptive user was the females (n=212–70.9%), and the most popular method chosen was oral contraceptive pills (n=111, 37.1%).

**Conclusion:** There is a definite increase in contraceptive uptake in women provided with educational leaflets and counseling session with a shift toward use of more reliable contraceptive methods.

**Sahip, Y., & Turan, J. M. (2007). Education for expectant fathers in workplaces in Turkey. *Journal of Biosocial Science*, 39(6), 843–860.**

Worldwide, there is increasing recognition that if family and reproductive health programmes are to be successful, the involvement of men is essential. As part of the problem, men also have to be seen as part of the solution. The reality is that in many countries, including Turkey, men generally do not accompany their partners to health facilities for family planning, antenatal and postnatal services and are not expected to attend the labour or birth of their child. Workplace programmes are a potential strategy for meeting the reproductive health education needs of men in industrial cities such as Istanbul. This intervention study was developed to test the feasibility and effects of expanding a special programme for expectant fathers to large workplaces in Istanbul, with the aim of improving the health of Turkish families during the pregnancy, birth and newborn periods. The findings indicate that it is possible to train workplace physicians in Istanbul to conduct regular educational programmes for expectant fathers on reproductive health, and that such programmes may have beneficial effects, especially in the areas of pregnancy nutrition, exclusive breast-feeding, and support behaviours. Considering the difficulty of getting men to attend hospital or clinic-based educational programmes in large urban areas, bringing such training programmes to men at their places of work has the potential to be an important strategy. Given that large workplaces in Turkey already have full-time physicians charged with the duty of health education for employees, this is also a feasible strategy.

**Speroff, L., & Mishell, D. R., Jr. (2008). The postpartum visit: It's time for a change in order to optimally initiate contraception. *Contraception*, 78(2), 90–98.**

This commentary calls for a change in the traditional six-week postpartum visit for new mothers. Establishing a three-week postpartum visit would allow for the effective and timely initiation of contraception. The recommendation draws on evidence from multiple studies that many women resume sexual activity before six weeks postpartum and that ovulation may occur by four weeks postpartum in non-breastfeeding women. The three-week visit would also be beneficial for breastfeeding mothers to evaluate if breastfeeding meets the criteria of the lactational amenorrhea method and whether an additional contraceptive method is necessary.

The commentary reviews evidence for the use of different contraceptive methods in postpartum and lactating women, including sections on estrogen-progestin contraception, depot-medroxyprogesterone acetate (DMPA), contraceptive implants, fertility-awareness-based methods (periodic abstinence), barrier methods, and the postpartum IUD. Of note, the authors recommend the use of the progestin-only pill in lactating women due to the effect of combined contraceptives on lactation, and assert that “the combination of lactation and the progestin-only minipill is associated

with near total contraceptive efficacy” (Speroff & Mishell, 2008, p. 94). The commentary concludes with a discussion of the risk of venous thromboembolism (VTE) in the postpartum period and the increased risk of VTE with exogenous estrogens in combined contraceptives.

**Varkey, L.C., Mishra, A., Das, A., Ottolenghi, E., Huntington, D., Adamchak, S., . . . Homan, F. (2004.) *Involving men in maternity care in India*. New Delhi, India: USAID & Population Council FRONTIERS program. Retrieved from [http://www.popcouncil.org/uploads/pdfs/frontiers/FR\\_FinalReports/India\\_MIM.pdf](http://www.popcouncil.org/uploads/pdfs/frontiers/FR_FinalReports/India_MIM.pdf)**

The FRONTIERS Men in Maternity (MiM) program in India “encouraged husbands’ participation in their wives’ antenatal and postpartum care” as a response to the findings that men as primary household decision-makers have an impact upon women’s health (Varkey et al., 2004, p. ii). Populations of couples served by three dispensaries served as controls for three comparable populations who used different dispensaries. The interventions targeted healthy maternal and newborn care, as well as appropriate prevention strategies for STIs, with emphasis on involvement of fathers. Outcomes included parameters of “family planning knowledge and use,” “STI preventive behaviors,” “pregnancy danger signs,” “syphilis testing,” “gender roles and decision-making,” “infant health indicators,” “client-provider interaction and satisfaction,” and “cost of intervention” (Varkey et al., 2004, pp. iii–iv). Findings included that couples who experienced the interventions were not more likely to remember the components of LAM, but they were more likely to use family planning “between six to nine months postpartum” (Varkey et al., 2004, p. iii). STI knowledge did not increase, but “knowledge of danger signs” of pregnancy did for women (but not men) in the intervention group (Varkey et al., 2004, p. iii). Finally, these interventions were found to be cost-effective, and men were more involved in the intervention group than in the control dispensary populations (Varkey et al., 2004, p. iv).

**Vernon, R. (2009). Meeting the family planning needs of postpartum women. *Studies in Family Planning*, 40(3), 235–245.**

Drawing on the evidence for women’s unmet need for contraception in the first year after childbirth, this commentary is a review of “social and operations research that tests the delivery of postpartum [contraceptive] services in less developed countries... in order to present programmatic lessons regarding the organization of these programs” (Vernon, 2009, p. 235). The importance of counseling and information given during antenatal care is highlighted, as well as the potential for the involvement of male partners to improve health knowledge and outcomes. Concerning postpartum care in hospitals, the greatest barrier to the provision of postpartum contraception is the need to adequately train providers. Three lessons learned are to focus on a few key behaviors during training with appropriate follow-up, to offer women a full range of contraceptives immediately following childbirth, and to establish and monitor outcome indicators. The postpartum IUD and lactational amenorrhea method are also discussed, and the importance of integrating informed consent into programs offering sterilization and IUD is stressed. In postpartum care provided in outpatient clinics, the greatest barrier to service is low attendance at scheduled postpartum visits. Strategies for improving the rate of return of postpartum women are explored, mainly eliminating independent service-delivery schedules for mothers and infants and establishing a minimum number of joint follow-up visits. Approaches for community-based postpartum care are also reviewed, and the

importance of providing postpartum contraception to HIV-infected women is emphasized as a top priority.

**Winikoff, B., & Mensch, B. (1991). Rethinking postpartum family planning. *Studies in Family Planning*, 22(5), 294–307.**

This article examines the rationales for commonly advocated postpartum family planning services and challenges the behavioral and biological assumptions on which they are based. An alternative approach to service delivery is suggested. Services should be designed to incorporate breastfeeding and to increase their acceptability to postpartum women.

**Yue, K., O'Donnell, C., & Sparks, P. L. (2010). The effect of spousal communication on contraceptive use in Central Terai, Nepal. *Patient Education and Counseling*, 81(3), 402–408.**

**Objective:** Family planning has several social and health benefits; it can reduce maternal mortality and the number of unplanned pregnancies, as well as increase educational and economic opportunities. Utilizing quantitative data from an endline household survey (July 2009) and data from focus group discussions, the Centre for Development and Population Activities (CEDPA) seeks to determine whether spousal communication increases contraceptive use among married women of child-bearing age in Nepal's Central Terai region.

**Methods:** Quantitative household survey and qualitative focus group discussions.

**Results:** Women who discuss family planning with their husbands (OR=7.254), perceive husband approval on family planning (OR=5.558) and have born a son (OR=2.239) are more likely to use a modern contraceptive method. Qualitative data show that several other considerations can be motivating factors for contraceptive uptake.

**Conclusion:** While results do not explain the direction of causality, it is clear that spousal discussion and partner approval are significant in a woman's decision to use modern contraceptives in the Central Terai region of Nepal.

**Practice implications:** More research needs to be conducted on the effect of spousal communication and contraceptive use, in particular, the role of frequency, quality, and content of spousal communication, as well as individual motivations.



## 12. RETURN TO FERTILITY

**Bouchard, T., Fehring, R. J., & Schneider, M. (2013). Efficacy of a new postpartum transition protocol for avoiding pregnancy. *Journal of the American Board of Family Medicine, 26*(1), 35–44. doi:10.3122/jabfm.2013.01.120126**

**Introduction:** The postpartum period is a challenging time for family planning, especially for women who breastfeed. Breastfeeding delays the return of menses (lactational amenorrhea), but ovulation often occurs before first menses. For this reason, a protocol was developed to assist women in identifying their return of fertility postpartum to avoid pregnancy.

**Methods:** In this prospective, 12-month, longitudinal cohort study, 198 postpartum women aged 20 to 45 years (mean age, 30.2 years) were taught a protocol for avoiding pregnancy with either online or in-person instruction. A hand-held fertility monitor was used to identify the fertile period by testing for urinary changes in estrogen and luteinizing hormone, and the results were tracked on a web site. During lactational amenorrhea, urine testing was done in 20-day intervals. When menses returned, the monitor was reset at the onset of each new menstrual cycle. Participants were instructed to avoid intercourse during the identified fertile period. Kaplan-Meier survival analysis was used to calculate unintentional pregnancy rates through the first 12 months postpartum.

**Results:** There were 8 unintended pregnancies per 100 women at 12 months postpartum. With correct use, there were 2 unintended pregnancies per 100 women at 12 months.

**Conclusions:** The online postpartum protocol may effectively assist a select group of women in avoiding pregnancy during the transition to regular menstrual cycles.

**Jackson, E., & Glasier, A. (2011). Return of ovulation and menses in postpartum nonlactating women: A systematic review. *Obstetrics and Gynecology, 117*(3), 657–662.**

**Objectives:** To estimate, from the literature, when nonlactating postpartum women regain fertility.

**Data sources:** We searched PubMed and Cochrane Library databases for all articles (in all languages) published in peer-reviewed journals from database inception through May 2010 for evidence related to the return of ovulation and menses in nonlactating postpartum women. Search terms included "Fertility" (Mesh) OR "Ovulation" (Mesh) OR "Ovulation Detection" (Mesh) OR "Ovulation Prediction" (Mesh) OR fertility OR ovulat\* AND "Postpartum Period" (Mesh) OR postpartum OR puerperium AND Human AND Female.

**Methods of study selection:** We included articles assessing nonlactating women's first ovulation postpartum. Studies in which women breastfed for any period of time or in whom lactation was suppressed with medications were excluded.

**Tabulation, integration and results:** We identified 1,623 articles; six articles reported four studies met our inclusion criteria. In three studies utilizing urinary pregnanediol levels to measure ovulation, mean day of first ovulation ranged from 45 to 94 days postpartum; 20%-71% of first menses were preceded by ovulation and 0%-60% of these ovulations were potentially fertile. In one study that used basal body temperature to measure ovulation, mean first ovulation occurred on day 74 postpartum; 33% of first menses were preceded by ovulation and 70% of these were potentially fertile.

**Conclusion:** Most nonlactating women will not ovulate until 6 weeks postpartum. A small number of women will ovulate earlier, potentially putting them at risk for pregnancy sooner, although the

fertility of these early ovulations is not well-established. The potential risk of pregnancy soon after delivery underscores the importance of initiating postpartum contraception in a timely fashion.

**Li, W., & Qiu, Y. (2007). Relation of supplementary feeding to resumptions of menstruation and ovulation in lactating postpartum women. *Chinese Medical Journal*, 120(10), 868–870.**

**Background:** Resumption of menstrual cycles is one of the indicators for restoration of reproductive capability in postpartum women. However, menstruation does not necessarily mean that ovulation has taken place. The aim of this study was to investigate the relation of supplementary feeding to return of menstruation and ovulation after delivery.

**Methods:** A questionnaire was used to obtain data from 101 breastfeeding mothers. The following elements were analyzed: age, education level, breastfeeding practice, time of return of menstruation, contraceptive practice, and starting time of supplementary feeding during the lactation at intervals of 6 weeks to 18 months after delivery. The ovulation was continuously monitored by ultrasonography and basal body temperature (BBT) measurement.

**Results:** By ultrasonography, 53 of the 101 women (52.5%) had the first ovulation (follicle > 1.8 cm in diameter) within 154 days after delivery on average, among whom 11 (10.9%, 11/101) had restoration of ovulation within 4 months and 42 (41.6%, 42/101) had it after 4 months. In women with follicles > 1.8 cm in diameter (n = 53), the menstruation resumed (138 +/- 84) days after delivery, and the supplementary feeding was started at (4.0 +/- 1.1) months, which were significantly earlier than those in the women with follicular diameter < 1.7 cm (n = 48; (293 +/- 88) days, (5.1 +/- 1.3) months;  $t = 9.003$ ,  $P < 0.01$  and  $t = 4.566$ ,  $P < 0.01$ ). In the women with follicles < 1.8 cm in diameter, 30 had return of menstruation before the end of ultrasonographic monitoring, while only 8 in the women with follicular diameter < 1.7 cm had menstrual resumption at the same time ( $\chi^2 = 16.91$ ,  $P < 0.01$ ). The starting time of supplementary feeding was positively correlated with the time of the restoration of menstruation (n = 100,  $r = 0.4764$ ,  $P < 0.01$ ) and first ovulation after delivery (n = 53,  $r = 0.5554$ ,  $P < 0.01$ ). In this series, no woman had pregnancy within 18 months postpartum.

**Conclusion:** Supplementary feeding can affect the restoration of menstrual cycles and ovulation in lactating postpartum women.

**Valeggia, C., & Ellison, P. (2009). Interactions between metabolic and reproductive functions in the resumption of postpartum fecundity. *American Journal of Human Biology*, 21(4), 559–566.**

Lactation has long been recognized as a major determinant of interbirth intervals. The temporal pattern of nursing has been proposed as the mechanism behind lactational amenorrhea. We present a new model of the dynamic regulation of lactational amenorrhea that identifies maternal energy availability as the main determinant of ovarian resumption. Variation in the intensity of lactation remains a component of the model as a determinant of the absolute energetic cost of milk production. However, maternal energy supply determines net energy availability; a larger energy supply leaves a greater net energy surplus than a smaller energy supply (lactation costs being equal). We characterize the hormonal postpartum profile of 70 lactating Toba women of Argentina. We use C-peptide, which reflects maternal insulin production, as a measure of energy availability. Initially

low, insulin production rises as the postpartum period progresses, reflecting the declining metabolic load of lactation. A short period of supernormal insulin production precedes menstrual resumption. The high levels of insulin may play a role in stimulating the resumption of ovarian activity, which in turn may help to resolve the transient period of insulin resistance. The dynamics of insulin sensitivity during lactation would aid in synchronizing the resumption of ovarian function with a reduction in the energy demands of milk production. This hypothesis is supported by the sustained weight gain experienced by lactating women during the months preceding the first postpartum menses. The link between fecundity and energy balance could serve as a mechanism for adjusting the duration of lactational amenorrhea to the relative metabolic load of lactation.

**Woranitat, W., & Taneepanichskul, S. (2007). Sexual function during the postpartum period. *Journal of the Medical Association of Thailand*, 90(9), 1744–1748.**

**Objective:** To study the characteristics of sexual function during the postpartum period.

**Study design:** Cross-sectional descriptive study.

**Material and method:** From May 2006 to July 2006. Eighty women, who attended the family planning clinic at King Chulalongkorn Memorial Hospital, were enrolled in the present study. All subjects were interviewed by the investigators with a questionnaire about general characteristic and Female Sexual Function Index questionnaire (FSFI) to determine their sexual function.

**Results:** Twenty-eight (35%) women had sexual intercourse within the six weeks postpartum period before they attended the family planning clinic. In this group, 18 women (35%) had vaginal deliveries and 10 women (34.5%) had cesarean deliveries. No statistically significant difference was demonstrated in terms of route of delivery ( $\chi^2 = 0.005$ ,  $p$ -value = 0.57). Women without episiotomy resumed sexual intercourse more than women with episiotomy (66.7% and 25.6%,  $\chi^2 = 6.76$ ,  $p$ -value = 0.015). There was no association between route of delivery and sexual function including sexual desire, sexual arousal, sexual lubrication, sexual orgasm, satisfaction, pain, and FSFI score.

**Conclusion:** Resumption of sexual intercourse in the postpartum period was quite high. However, route of delivery was not associated with resumption of sexual intercourse and female sexual function in postpartum period. More women without episiotomy had resumption of sexual intercourse than the others. Sexual demand of the partner is the influencing factor to resumption of sexual intercourse during the postpartum period. Counseling about sexuality and contraception after birth should be a regular practice in the hospital.

