Postpartum Insusceptibility to Pregnancy and Modern Contraceptive Use in Nepal and Tanzania

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Abstract

Background: Postpartum contraception enables women to space their births, decreasing infant and maternal morbidity and mortality. However, use of modern methods is low in the early postpartum period when women become exposed to pregnancy risk.

Methods: Using DHS data from Nepal and Tanzania, this study assesses trends in postpartum insusceptibility to pregnancy and modern contraceptive use. Multinomial logistic regression models assess the association between timing of contraceptive adoption and women’s interaction with the health system.

Results: Postpartum return to fertility is occurring more quickly in both Nepal and Tanzania. Postpartum contraceptive use has increased over time, but most of the increase has been in short-acting method use in the late postpartum period (6-11 months postpartum). Facility-based delivery is associated with a 2.1 times higher risk of early adoption of modern contraception relative to no adoption in the first year postpartum in Nepal (95% CI: 1.2 – 3.9) and a 1.9 times higher risk in Tanzania (95% CI: 1.3 – 2.7).

Though uncommon, use of long-acting and permanent methods (LAPM) is associated with adoption in the early postpartum period. In Nepal, LAPM users relative to pill or injectable users had 2.2 times higher risk of early adoption (95% CI: 1.2 – 4.0), and in Tanzania, LAPM users had 2.6 times higher risk of adoption in the early postpartum period (95% CI: 1.3 – 4.6).

Discussion: The decreasing duration of postpartum insusceptibility to pregnancy suggests a need for earlier adoption of modern contraception. Integration of family planning with maternal health services, especially delivery care, provides an opportunity to improve postpartum contraceptive use in the early postpartum period.
Background

Postpartum contraception is promoted to space births and reduce maternal and child morbidity and mortality. Birth intervals of less than 24 months confer higher risk of fetal, neonatal and child deaths between one and four years of age (Conde-Agudelo, Rosas-Bermudez and Kafury-Goeta, 2006; Rutstein, 2008). In addition, short inter-pregnancy intervals pose a threat to maternal health (Conde-Agudelo, Rosas-Bermudez and Kafury-Goeta, 2007). Despite the advantages of delaying subsequent pregnancies, many women are do not see a need to use modern contraceptive methods in the postpartum period, especially while they are amenorrheic (Salway and Nurani, 1998a; Salway and Nurani, 1998b). Women’s exposure to risk or susceptibility to subsequent pregnancy guides women’s postpartum contraceptive behavior, and postpartum insusceptibility varies significantly across countries depending on duration of breastfeeding and postpartum abstinence (Cleland, Shah and Benova, 2015). As a result, it is necessary for interventions to tailor their strategies to prevailing practices to improve postpartum contraceptive use (Cleland, Shah and Benova, 2015). One strategy that seems to be appropriate in most settings is integration of postpartum contraceptive services with maternal health services. A recent DHS comparative report found that across countries, contact with the health system for maternal health services was associated with postpartum contraceptive use (Winfrey and Rakesh, 2014).

To inform design of an intervention to improve early postpartum contraceptive adoption in Nepal and Tanzania, this study seeks to understand the current state of postpartum insusceptibility and modern contraceptive use over the postpartum period. It also seeks to understand how women’s contact with the health care system in these settings is associated with timing of postpartum contraceptive use.

Methods

Data

All available Demographic and Health Survey (DHS) data from Nepal and Tanzania were used to conduct trend analyses. The analytic sample included women who were 0-11 months postpartum. In Nepal this included postpartum women from four surveys conducted in 1996 (n=1448), 2001 (n=1322), 2006 (n=1044), and 2011 (n=1040). In Tanzania, this included postpartum women from five surveys conducted in 1991 (n=1619), 1996 (n=1421), 1999 (n=665), 2004 (n=1760), and 2010 (n=1637). Analyses of the timing of adoption of contraception in the first year postpartum (0-11 months) were conducted among women 12-24 months postpartum in the most recent survey year for each country, Nepal 2011 (n=904) and Tanzania 2010 (n=1413).
Measures

Postpartum insusceptibility is defined as women who report that they are currently postpartum amenorrheic or abstinent. This study considers only modern contraceptive methods, and categorizes users of traditional or folkloric methods as non-users. Modern methods of contraception are categorized into short-acting methods, including lactational amenorrhea (LAM), oral contraceptive pills, injectables and male and female condoms, and long-acting or permanent methods, including IUD, implant, and male or female sterilization. Timing of adoption of postpartum contraception was categorized as no adoption by 12 months postpartum, early adoption (0-5 months postpartum), or late adoption (6-11 months postpartum). This measure was calculated among non-pregnant women who are 12-24 months postpartum to ensure complete data on modern contraceptive use in the first year postpartum.

Analyses

We present trends in postpartum insusceptibility and postpartum modern contraceptive use among women who are 0-11 months postpartum in each available DHS. To assess changes in the postpartum contraceptive method mix over time, we present the proportion of women 0-11 months postpartum who use no modern contraception, short-acting contraceptive methods, or long-acting or permanent methods by DHS survey year. We also present postpartum method mix by month postpartum to assess the timing of use in the most recent DHS surveys. DHS survey weights were applied to estimate population-level descriptive statistics.

Finally, multivariable models were used to assess the association between timing of adoption of postpartum contraception in the first year postpartum and characteristics of women’s contact with the health system. Unweighted multinomial logistic regression models were used to compare early adopters and late adopters to women who did not adopt a modern method by 12 months postpartum, adjusting for parity, woman’s education, age and rural or urban residence. Multivariable analyses were run on the most recent DHS for each country among women 12-24 months postpartum. All analyses were run using Stata 14.0.
Results

Trends in Insusceptibility to Pregnancy over the Postpartum Period

Return to fertility is occurring more quickly over time. Over 95% of women remain insusceptible to pregnancy 0-2 months postpartum across DHS surveys, but by 3-5 months postpartum, differences emerge. In Nepal, 87% of women were insusceptible to pregnancy between 3-5 months postpartum in 1996, compared to only 77% in 2011 (Figure 1a). The differences between 1996 and 2011 grow larger at 6-8 months and 9-11 months postpartum where there is a 16 percentage point and 18 percentage point difference, respectively. Figure 1b demonstrates that the change in postpartum insusceptibility between 1996 and 2011 is due to a sharp decline in postpartum amenorrhea starting at 3-5 months postpartum. Patterns in postpartum abstinence are essentially unchanged between the two surveys.

Figure 1a. Nepal Postpartum Insusceptibility by DHS Year

Figure 1b. Nepal Decomposition of Postpartum Insusceptibility in 1996 and 2011
In Tanzania, the differences between 1991 and 2010 are not as large during the first 8 months postpartum, but at 9-11 months postpartum 73% of women were insusceptible to pregnancy in 1991, compared to only 54% in 2010 (Figure 2a). Unlike Nepal, postpartum amenorrhea has changed very little between 1991 and 2010 in Tanzania (Figure 2b). Most of the difference in postpartum insusceptibility observed at 9-11 months postpartum can be attributed to a decrease in postpartum abstinence in 2010, compared to 1991.

Figure 2a. Tanzania Postpartum Insusceptibility by DHS Year

![Figure 2a. Tanzania Postpartum Insusceptibility by DHS Year](image1)

Figure 2b. Tanzania Decomposition of Postpartum Insusceptibility in 1991 and 2010

![Figure 2b. Tanzania Decomposition of Postpartum Insusceptibility in 1991 and 2010](image2)
Trends in Modern Contraceptive Use and Reasons for Non-use over the Postpartum Period

Use of modern contraception in the first year postpartum has increased over time in both Nepal and Tanzania, but there has been very little increase in postpartum contraceptive use 0-2 months postpartum. In Nepal, there have been modest increases of approximately 5 percentage points between 1996 and 2011 up to 8 months postpartum (Figure 3a). The largest increase is seen at 9-11 months postpartum. Only 12% of women were using modern contraception between 9-11 months postpartum in 1996, compared to 28% in 2011. Among women who are susceptible to pregnancy, are not abstinent and are not currently amenorrheic, and who want to delay or limit subsequent births, breastfeeding is the primary reason for non-use (21.4% of non-users), followed by husband or partner opposition to family planning use (6.2%) (data not shown). In Tanzania, large increases in modern contraceptive use are observed as early as 3-5 months postpartum (Figure 3b). Only 4% of women were using modern contraception between 3-5 months postpartum in 1991, compared to 17% in 2010. Unlike Nepal, husband or partner opposition to family planning use was the primary reason for non-use among postpartum women who are susceptible to pregnancy (27.4%), followed by breastfeeding (10.3%) and her opposition to family planning use (8.7%) (data not shown).

Figure 3a. Nepal Modern Contraceptive Use by DHS Survey
Postpartum Contraceptive Method Mix

Though postpartum modern contraceptive use has increased over time, this is primarily due to increases in short-acting method use. In Nepal, most of the increase is due to a nearly doubling of short-acting method use from 7% in 1996 to 13% in 2011 (Figure 4a). Long-acting and permanent methods have consistently accounted for approximately 3% of postpartum method use. In Tanzania, there is a similar increase in short-acting method use over time, from 4% in 1991 to 16% in 2010 (Figure 4b). Long-acting and permanent methods have continued to account for only 1% of postpartum method use in Tanzania.
Timing of postpartum contraceptive use varies by method type. In the most recent DHS surveys in each country, short-acting methods are uncommon at 0-2 months postpartum, but steadily increase over the first year postpartum (Figure 5a and 5b). In both countries long-acting and permanent method use remains stable and low over the first year postpartum, perhaps with the exception of 9-11 months postpartum in Nepal where we see a small increase in LAPM (Figure 5a).
Timing of Adoption of Modern Methods of Postpartum Contraception

Timing of adoption of modern contraception in the first year postpartum was assessed among women 12-24 months postpartum by women’s contact with the health system during pregnancy or around delivery. In Nepal, 73.9% of women 12-24 months postpartum did not adopt a modern contraceptive method in the year following childbirth, while 13.5% adopted in the early postpartum period (0-5
months postpartum) and 12.6% adopted in the late postpartum period (6-11 months postpartum) (data not shown). In Tanzania, we observe a similar pattern: 76.9% of women did not adopt a modern contraceptive method in the year following childbirth, while 12.7% adopted in the early postpartum period, and 10.4% adopted in the late postpartum period. Contact with the health system varied somewhat by country (Table 1). Among women 12-24 months postpartum, the proportion of women receiving ANC and PNC were similar between Tanzania and Nepal, but Tanzania had a considerably higher proportion of facility-based deliveries (53.0%) compared to Nepal (21.1%). The contraceptive method mix also varied between countries. LAPMs were more common in Nepal, with 27.8% of current modern contraceptive users 12-24 months postpartum using these methods compared to 12.5% of current users in Tanzania.

Table 1 presents the results of the multivariable analyses, adjusting for parity, woman’s urban or rural residence and woman’s age and education. In both countries facility-based delivery was associated with use of a modern method of postpartum contraception relative to no adoption in the first year postpartum. In Nepal, facility-based delivery was associated with a two times higher risk of early adoption relative to no adoption in the first year postpartum (95 % CI: 1.2 – 3.9). In Tanzania, facility-based deliveries were associated with a 1.9 times higher risk of early adoption (95% CI: 1.3 – 2.7) and 2.3 times higher risk of late adoption (95% CI: 1.5 – 3.5) relative to no adoption in the first year postpartum. Antenatal and postnatal care were not associated with timing of adoption of modern contraception among women 12-24 months postpartum.

The modern contraceptive method used, among current users, was associated with timing of adoption. In both Nepal and Tanzania method use varied only by adoption in the early postpartum period. In Nepal, condom users relative to pill or injectable users had 3.1 times higher risk of adoption in the early postpartum period (95% CI: 1.3 – 7.5) relative to no adoption in the first year postpartum. LAPM users were significantly more likely to adopt their method in the early postpartum period, compared to pill or injectable users in both countries. In Nepal, LAPM users relative to pill or injectable users had 2.2 times higher risk of early adoption (95% CI: 1.2 – 4.0), and in Tanzania, LAPM users had 2.6 times higher risk of adoption in the early postpartum period (95% CI: 1.3 – 4.6).
Table 1. Timing of adoption of modern contraception in the first year postpartum by interaction with the health system, based on current contraceptive use among women 12-24 months postpartum

<table>
<thead>
<tr>
<th>Interaction with the health system</th>
<th>Nepal 2011 DHS</th>
<th>Tanzania 2010 DHS</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total (n=904)</td>
<td>Early postpartum a (n=134)</td>
</tr>
<tr>
<td></td>
<td>(%)</td>
<td>RRR c,d (95% CI)</td>
</tr>
<tr>
<td>Antenatal care (ANC)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 4 ANC visits (ref)</td>
<td>(47.6)</td>
<td>1.0</td>
</tr>
<tr>
<td>4 or more ANC visits</td>
<td>(52.4)</td>
<td>0.9 (0.6-1.5)</td>
</tr>
<tr>
<td>Facility delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home delivery (ref)</td>
<td>(78.0)</td>
<td>1.0</td>
</tr>
<tr>
<td>Facility-based delivery</td>
<td>(21.1)</td>
<td>2.1* (1.2-3.9)</td>
</tr>
<tr>
<td>Health check for woman after delivery</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No (ref)</td>
<td>(86.2)</td>
<td>1.0</td>
</tr>
<tr>
<td>Yes</td>
<td>(13.8)</td>
<td>1.2 (0.6-2.6)</td>
</tr>
<tr>
<td>Current modern contraceptive (among users) e</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pills or injectables (ref)</td>
<td>(54.6)</td>
<td>1.0</td>
</tr>
<tr>
<td>Male or female condoms</td>
<td>(17.5)</td>
<td>3.0* (1.5-6.1)</td>
</tr>
<tr>
<td>Long-acting or permanent methods f</td>
<td>(27.8)</td>
<td>2.2* (1.2-4.0)</td>
</tr>
</tbody>
</table>

a Early postpartum: 0-5 months postpartum
b Late postpartum: 6-11 months postpartum
c Reference group for multinomial logit is no modern method adoption by 12 months postpartum
d Models adjust for parity, age, education, and rural/urban residence
e LAM users excluded from this analysis because all but one started using in the early postpartum period
f Long-acting or permanent methods include IUD, implant, and male or female sterilization

* Indicates statistical significance at p<0.05
Discussion

Early adoption of postpartum contraception is becoming more crucial due to the decline in insusceptibility to pregnancy by 3-5 months postpartum. This change is particularly striking in Nepal where postpartum amenorrhea has decreased by 14 percentage points at 3-5 months postpartum, from 82% of women in 1996 to 68% of women in 2011. The analysis of reasons for non-use among women who were susceptible to pregnancy (neither postpartum amenorrheic nor abstinent) and wanted to delay or limit subsequent births demonstrated that breastfeeding was the primary reason for non-use in Nepal (21.4%). Though return of menses has been shown to trigger contraceptive use in several countries (FHI 360, 2012; Salway and Nurani, 1998a; Salway and Nurani, 1998b), one-fifth of postpartum women susceptible to pregnancy reported that breastfeeding was a reason for non-use. Though some modern methods are not recommended while breastfeeding (WHO, 2015), women should be counseled on risk of pregnancy in the postpartum period and modern contraceptive methods that are approved for use while breastfeeding. In Tanzania, husband or partner opposition was the primary reason for non-use among women susceptible to pregnancy who wanted to delay or limit subsequent births (27.4%), suggesting lack of support for contraceptive use in the postpartum period. Women should have the option to include their husbands in antenatal and postnatal counseling to increase their awareness about risk of pregnancy and safety of modern contraceptive use in the postpartum period.

Though postpartum contraceptive use has increased over time, most of the increase has been in short-acting methods. Adoption of short-acting methods with high discontinuation rates during the early postpartum period is unlikely to achieve the goal of adequate pregnancy spacing as many women are likely to discontinue prior to their return to fertility (Cleland, Shah, and Benova, 2015). In addition, short-acting methods such as combined oral contraceptive pills and injectables, are not recommended during the early postpartum period due to increased risk of venous thromboembolism and interference with breastfeeding (WHO, 2015). Long-acting methods such as IUDs and implants are approved for use in the early postpartum period (WHO, 2015) and have considerably lower discontinuation rates (Cleland et al., 2006), making them a good option for breastfeeding women who wish to space their births but become susceptible to pregnancy within 6 months postpartum. This study finds that adoption of condoms in Nepal and long-acting and permanent methods in both countries is more common than adoption of oral contraceptive pills or injectables in the early postpartum period, which aligns with WHO recommendations.
Adoption of modern methods in the early postpartum period was associated with facility-based delivery and use of long-acting and permanent methods, after adjusting for socio-demographic characteristics typically associated with access to care. Facility-based delivery has been shown to be associated with postpartum contraceptive use in a variety of contexts (Gebreselassie et al., 2008; Winfrey and Rakesh, 2014), suggesting that delivery care is an acceptable time to integrate postpartum contraceptive services. Though long-acting and permanent methods were used by very few women in this study, these methods were more commonly adopted in the early postpartum period relative to pills or injectables. Long-acting and permanent methods require provision by a trained health provider, and with appropriate counseling, provision of these methods during delivery care can provide women with a convenient option at a time when they have contact with the health system. Previous studies have demonstrated an association between antenatal care and postpartum contraceptive use (Zerai and Tsui, 2001; Winfrey and Rakesh, 2014; Do and Hotchkiss, 2013), but this study found no association after adjusting for socio-demographic characteristics. That antenatal and postnatal care were not associated with modern contraceptive use 0-11 months postpartum suggests that postpartum family planning counseling is not common during ANC or PNC in these two countries. However, evidence is mixed on whether antenatal family planning counseling leads to increases in postpartum contraceptive uptake and decreased pregnancy rates (Smith et al., 2002; Soliman, 1999). More research is needed to understand whether postpartum family planning counseling during ANC and PNC can lead to increased uptake of postpartum contraception.

Limitations

The findings in this study should be viewed in light of its limitations. The sample of women 12-24 months postpartum who adopt methods in the early and late postpartum periods is relatively small, and our power is limited in the adjusted analyses. In addition, we do not have data on family planning counseling received during ANC, delivery care, or PNC. Data on family planning counseling during these interactions with the health system would have provided more sensitive measures of the association between these services and postpartum contraceptive use outcomes. Finally, multivariable analyses focus on current contraceptive use among women who are 12-24 months postpartum. Women who initiated method use in the postpartum period (0-11 months after delivery) but are not currently using modern contraception are not included in this analysis.
Conclusions

The duration of postpartum insusceptibility has decreased over time, and more women are becoming susceptible to pregnancy in the early postpartum period (0-5 months postpartum). Despite this trend, postpartum contraceptive use has remained low, and most of the increase over time has been in short-acting method use in the late postpartum period. Facility-based delivery is associated with early adoption of modern methods of postpartum contraception, and delivery care is an ideal time to offer long-acting methods, which require insertion by a trained health provider. These methods have low discontinuation rates and can be safely used while breastfeeding to meet the contraceptive needs of women in the early postpartum period. Integration of postpartum family planning with maternal health services and involving men if women desire are promising approaches to improve postpartum contraceptive use in the early postpartum period. Taken together, findings suggest that adoption of modern contraception in the early postpartum period is becoming more critical, and integration of family planning in maternal health services, especially delivery care, provides an opportunity to enable women and couples to safely and confidently achieve their intentions for birth spacing.
References


