Postpartum Contraception in Publicly-Funded Programs and Interpregnancy Intervals

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OBJECTIVE: To assess the extent to which women received contraceptive services within 90 days after birth at their first or subsequent visits and whether contraceptive provision was associated with optimal interpregnancy intervals.

METHOD: We linked California's 2008 Birth Statistical Master File with Medicaid databases to build a cohort of women aged 15–44 years who had given birth in 2008 and received publicly-funded health care services in the 18 months after their previous live birth (N=117,644). We determined whether provision of contraception within 90 days after birth was associated with optimal interpregnancy intervals when controlling for covariates.

RESULT: Only 41% (n=48,775) of women had a contraceptive claim within 90 days after birth. To avoid short interpregnancy intervals, 6 women would need to receive contraception to avoid one additional short interval (number needed to treat=6.38). Receipt of a contraceptive method, receiving contraception at the first clinic visit, and being seen by Medi-Cal and its family planning expansion program were significantly associated with avoidance of short interpregnancy intervals. Receiving contraception at the first postpartum clinic visit had an additional independent effect on avoiding short interpregnancy intervals when controlling for the other variables. Although foreign-born women had 47% higher odds of avoiding short interpregnancy intervals than U.S.-born women, women of Asian and Pacific Islander ethnicity had 24% lower odds of avoiding short interpregnancy intervals than white women.

CONCLUSION: Findings of this study suggest that closer attention to provision of postpartum contraception in publicly-funded programs has the potential to improve optimal interpregnancy intervals among low-income women.

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LEVEL OF EVIDENCE: II

In the United States, more than one third of pregnancies (33.1%) are conceived within 18 months of a previous birth.[1] These short interpregnancy intervals place women at increased risk of preterm birth, neonates with low birth weight, and other adverse maternal and neonate health outcomes.[2–5] Minority and low-income women are more likely to have short birth intervals than are white or middle class women.[6,7] Women who do not breastfeed exclusively should start contraception no later than 3 weeks postpartum and exclusively breastfeeding women should use a complementary contraceptive method 3 months after birth.[8,9] However, little is known about the role publicly-funded health care services play in the postpartum period in providing contraception to ensure optimal interpregnancy intervals.

In California, nearly half of all births (47.6%) were paid for by Medi-Cal, California's Medicaid program.[10] The large majority of these mothers are eligible to receive health care services after delivery, including contraceptive services, from either

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Medi-Cal or its family planning expansion program: Family PACT (Planning, Access, Care, and Treatment). Family PACT evaluation findings suggest that the first visit with a family planning provider is a key opportunity to initiate contraception after a delivery.[11] In this study, we determined to what extent women received contraceptive services in the 90-day postpartum period at their first or subsequent visits and whether this is associated with the proportion of optimal interpregnancy intervals. We also determined to what extent interpregnancy intervals were associated with women's education, ethnicity or race, country of birth, age, and parity.

MATERIALS AND METHODS

The data analysis was approved by the University of California, San Francisco Committee of Human Subjects Approval and the California State Committee of Human Subjects Protection. We built a cohort of women aged 15–44 years who received publicly-funded health care services in the 18 months after birth. We identified records for second or higher order births among women from California's 2008 Birth Statistical Master File and their prior births from earlier Birth Statistical Master Files. Women whose previous births occurred before January 1, 2002, or outside California were excluded. Other exclusions were those with multiple births, missing birth date data, birth intervals of less than 30 days, and missing or improbable maternal age (younger than age 12 years at the time of the birth).

We then calculated the birth-to-conception interval between the date of the previous live birth and the conception date of the birth occurring in 2008. The conception date was defined as the date of last menses plus 9 days. The date of the last menses was reported on the birth file, but in cases of missing values, the last menses was either calculated by subtracting the length of gestation on the birth file from the neonate's date of birth or was estimated using regression data of birth weight, parity, and ethnicity.

Women who have their delivery paid by Medi-Cal typically qualify to receive services up to 90 days after their delivery and can then receive publicly-funded services through Medi-Cal Fee-for-Service or Managed Care or enroll in the Medi-Cal family planning expansion, Family PACT. Medi-Cal providers can enroll in the limited-benefit Family PACT program if they agree to adhere to Family PACT program standards; reimbursement is then on a fee-for-service basis.[12,13] We used the state's Management and Information System to analyze administrative Medi-Cal and Family PACT clinic and pharmacy claims and encounter data to identify the provision of contraceptive methods. Women were defined as receiving contraception if they had at least one Medi-Cal or Family PACT claim for receipt of long-acting contraception (implants, intrauterine device), user-dependent hormonal methods (oral contraception, injection, patch, ring), or barrier methods (eg, condoms, diaphragm, jelly, foam). Emergency contraception was excluded from the definition of method of contraception received. Women who had a documented sterilization at the time of the delivery were excluded from the analysis.

To match data from the Birth Statistical Master File data to Medi-Cal and Family PACT claims, we applied a probabilistic linking methodology that uses combinations of demographic details to link Medi-Cal and Family PACT data to California Birth Statistical Master File data. The linking algorithm is based on the Fellegi-Sunter model of record linkage[14,15] that mathematically decides whether a pair of records from two disparate data files belongs to the same entity (person).

To avoid having to compare each record in the two data sets, the process begins by blocking potential matched pairs of records based on a defined set of deterministic data matches. From there a vector of weighted scores (eg, uncommon names receive a higher weight than common names) is created indicating the levels of agreement and disagreement between like variables within each record pair. This vector is used to create a composite score for each pair. Pairs above a predefined decision threshold are determined to be links. Finally a set of defined selection criteria is used to redefine incorrect link categorizations, eg, records that are linked with a high score but have completely different dates of birth and Social Security numbers have their link broken.

The final cohort consisted of 117,644 women who had previous live births. Eighty-five percent of these women (99,752) received services funded by Medi-Cal or Family PACT within 90 days postpartum.

We defined a dichotomous outcome variable indicating whether or not a woman had an optimal interpregnancy interval of at least 18 months between birth and next conception. We used multiple regression models with three predictor variables. Two were dichotomous variables related to the timing of receipt of a contraceptive method: 1) whether women received a contraceptive method within 90 days of giving birth; and 2) whether women received a contraceptive method at their first visit after delivery. The third categorical variable indicated whether women completed a Medi-Cal-funded visit, a Family

PACT-funded visit, or received services from both programs during the 90-day postpartum period.

Client demographics were determined from birth certificates (age at earlier birth, education level, race and ethnicity, country of birth, and parity). Demographic variables were coded as educational level (less than high school, high school and some college education, or college graduate and higher); race and ethnicity (white, black, Latina, Asian and Pacific Islander, Native American, or other or unknown); country of birth (U.S.-born or foreign-born); and parity (two births or more than two births). Univariate analyses were performed on the demographic variables to examine the distribution of the cohort. Additionally bivariate analyses were used to determine the proportions of women receiving contraception by the demographic characteristics.

We conducted multivariate regression analyses using SAS 9.2 to determine the relationship among provision of contraception in the 90-day postpartum period, contraceptive provision at the first clinic visit, and state health program type (Medi-Cal or Family PACT) with interpregnancy intervals when controlling for client demographics (education level, race and ethnicity, country of birth, parity, and age). We constructed two logistic regression models looking at dependent variables indicating avoidance of short (less than 18 months between birth and conception) and extremely short (less than 6 months) interpregnancy intervals.

RESULTS

The cohort consisted of 117,644 women who were seen at least once by a Medi-Cal or Family PACT provider within 18 months of delivery. The largest racial or ethnic group was Latinas (72%) followed by non-Hispanic whites (14%), non-Hispanic black (7%), Asian and Pacific Islander (5%), Native Americans, and other women (1%, respectively). More than half of the cohort (51%) were foreign-born (Table 1). Asian and Pacific Islanders had the largest proportion of women who were foreign-born (70%) followed by Latinas (62%) (data not shown).

Nearly two thirds of the women (64%) were aged 20–29 years at the time of the prior documented birth in the 2008 Birth Statistical Master File. Twenty-two percent of the women were younger than 20 years, and 14% were 30 years of age or older. Forty-six

Table 1. Demographic Characteristics of Women and Percentage Dispensed Contraception 90 Days After Delivery (N=117,644)

	n	% Total	% Receiving Contraception
Ethnicity			
White	16,164	14	34
Latina	84,936	72	45
Black	8,537	7	30
Asian and Pacific Islander	5,917	5	29
Native American	690	1	31
Other or unknown	1,400	1	34
Education			
Less than 12th grade	50,461	43	45
High school graduate or some college	60,740	52	39
Bachelor's degree or more	3,657	3	33
Missing	2,786	2	38
Country of birth			
U.S.-born	58,182	49	36
Foreign-born	59,462	51	47
Age at previous birth (y)			
Younger than 20	26,401	22	43
20–29	74,721	64	42
30 or older	16,522	14	38
Parity			
2 live births	54,511	46	42
More than 2 live births	63,120	54	41
Missing	13	0	38
Publicly-funded program			
Medi-Cal only	70,413	60	41
Family PACT only	21,757	18	40
Both	25,474	22	44

PACT, Planning, Access, Care, and Treatment.

percent had only one previous birth before 2008. A large proportion of women had less than a high school degree (43%), and 52% had a high school degree or some college. Only 3% were college graduates.

The majority of the cohort (75%) was served only by Medi-Cal during the postpartum period. Eleven percent were served only by the Family PACT program and 13% were served by both Medi-Cal and Family PACT during the 90 days after birth.

There was wide variation in contraception dispensing within the 90-day postpartum period among different racial and ethnic groups, from a low of 9% among Asian and Pacific Islander women to a high of 45% among Latinas. A higher percentage of foreign-born women (47%) than U.S.-born women (36%) were dispensed contraception within 90 days. The percentage of women with dispensed contraception decreased with increasing age, higher education, and higher parity. Women who were served by both Medi-Cal and Family PACT had a higher percentage of contraception dispensing within 90 days after birth (44%) than those women who were served only by Medi-Cal (41%) or Family PACT (40%) (Table 1).

Our cohort consisted of 117,644 women who were seen at least once at a Medi-Cal- or Family PACT-funded visit within 18 months of delivery. We used claims data to determine contraceptive dispensing. Only 41% of these women (n=48,775) had contraceptive claims within 90 days after birth. We identified three missed opportunities to provide contraception in the postpartum period: 17,892 (15%) were not seen within 90 days postpartum, although they received at least one service in months 4–18 after birth. Another 11,843 women (10%) did not receive any contraception at their first postpartum visit and were not seen again during the 90-day postpartum period. Finally, 33% of the cohort (39,134 women) had more than one visit within the 90-day postpartum period but did not receive any contraception at any of these visits (Fig. 1). Of our cohort, women who received contraception in the postpartum period were 0.67 less likely to have short intervals than women who did not (relative risk 0.67). To avoid short interpregnancy intervals, six women would need to receive contraception to avoid one additional short interval (number needed to treat=6.38).

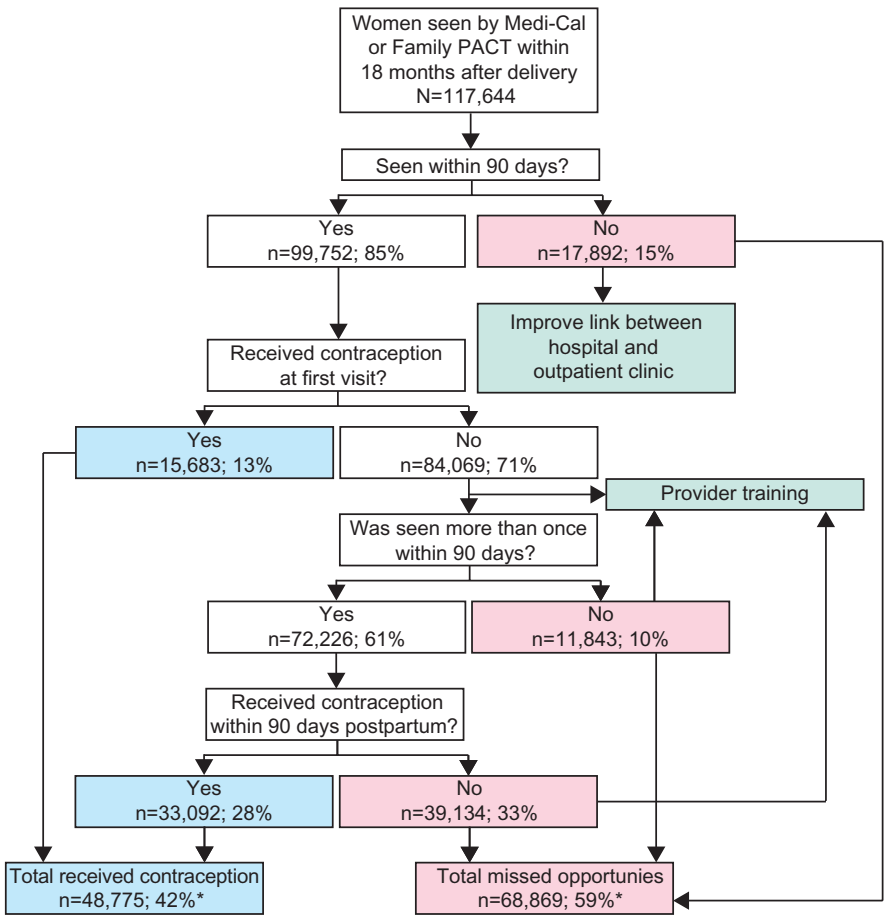

Fig. 1. Missed opportunities to dispense contraception the in 90-day postpartum period. Pink boxes represent missed opportunities; blue boxes represent receipt of contraception; green boxes represent possible improvements to avoid missing opportunities. Family PACT, Family Planning, Access, Care, and Treatment. *Percentages may not add up because of rounding.

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Approximately four in 10 women (36%) in the cohort became pregnant within 18 months after the previous birth. Of those, 14% had very short intervals (conception 7–12 months after birth) and 10% extremely short intervals (conception within 6 months after birth) (Fig. 2).

In general, the same predictor variables were significantly associated with interpregnancy interval in both models, but the association of the predictor variables was stronger in the model of extremely short interpregnancy intervals. The dispensing of a contraceptive method in the 90-day postpartum period was significantly associated with avoidance of short interpregnancy intervals. The odds of avoiding short interpregnancy intervals was 1.6 times greater for women who received contraceptive methods postpartum compared with women who did not when controlling for other predictor variables (method received at first visit and program seen) and other covariates (education level, race and ethnicity, country of birth, parity, and age): odds ratio (OR) 1.60, 95% confidence interval (CI) 1.55–1.65, and two times greater for avoiding extremely short interpregnancy intervals (OR 1.98, CI 1.88–2.08). Contraception dispensing at the first clinic visit had an additional independent effect on avoiding short interpregnancy intervals when controlling for the other variables. When a woman received a contraceptive method at her first visit, she had 1.6 times the odds of avoiding short interpregnancy intervals (OR 1.57, CI 1.50–1.65) than women who did not receive contraception at their first visit.

Having been served only by the Family PACT program within 90 days was not significantly associated with avoiding short interpregnancy intervals. However, women who were served by both the Medi-Cal and Family PACT program within 90 days after delivery had greater odds of avoiding both short interpregnancy intervals (OR 1.06, CI 1.02–1.10) and extremely short interpregnancy intervals (OR 1.17, CI 1.08–1.26) than women who were served by only Medi-Cal.

Women with a higher level of education were significantly more likely to have optimal interpregnancy intervals. Compared with women who had not graduated from high school, high school graduates had approximately 1.2 times the odds and college graduates had 1.5 times the odds of having optimal interpregnancy intervals (OR 1.17, CI 1.14–1.21 and OR 1.47, CI 1.36–1.60, respectively).

Among racial and ethnic groups, Asian and Pacific Islander women were the least likely to have optimal interpregnancy intervals. They had 24% lower odds of avoiding short intervals (OR 0.76, CI 0.71–0.81) and 43% lower odds of avoiding extremely short interpregnancy intervals (OR 0.57, CI 0.51–0.63) than white women. Latina women did not have a significant association with having optimal interpregnancy intervals, but being Latina was associated with extremely short intervals (OR 0.86, CI 0.81–0.91). Black women had 6% higher odds of having optimal interpregnancy intervals (OR 1.06, CI 1.003–1.13) than white women. However, when looking at extremely short intervals, this trend is reversed with black women having lower odds of avoiding extremely short interpregnancy intervals (OR 0.91, CI 0.84–0.995) than white women.

Being foreign-born had a strong association with avoidance of both short and extremely short interpregnancy intervals. Foreign-born women had 47% higher odds of avoiding short interpregnancy intervals (OR 1.47, CI 1.42–1.52) and 81% higher odds of avoiding extremely short interpregnancy intervals (OR 1.81, CI 1.72–1.91) than U.S.-born women.

Among the covariates, there was only a weak association between higher parity (more than two live births) with short and extremely short intervals and older age with short intervals in the multivariate model (Table 2).

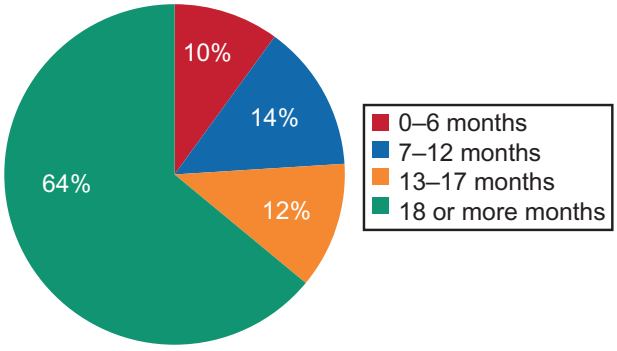

Fig. 2. Interpregnancy interval (months; N=117,644).
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DISCUSSION

This study highlights the importance of postpartum follow-up, linkages between hospital and outpatient health care providers, and use of any health care provider–patient contact during the postpartum period to counsel and dispense contraception. Contraceptive counseling should routinely include explanations of the medical risks of short pregnancy intervals. Identifying and using all opportunities to prescribe contraception or place an implant or intrauterine device during postpartum visits is a key strategy to

Table 2. Adjusted Odds Ratio of Avoiding Extremely Short (6 Months) and Suboptimal (18 Months) Interpregnancy Intervals When Controlling for Covariates (N=117,644)

Covariate	6-mo OR (95% CI)	18-mo OR (95% CI)
Contraception received	1.98 (1.88–2.08)	1.60 (1.55–1.65)
Contraception at first visit	1.63 (1.49–1.80)	1.57 (1.50–1.65)
Program (reference: Medi-Cal)	1.00	1.00
Family PACT only	0.97 (0.89–1.06)	0.99 (0.94–1.04)
Both	1.17 (1.08–1.26)	1.06 (1.02–1.10)
Education (reference: less than 12th grade)	1.00	1.00
High school or some college	1.20 (1.15–1.25)	1.17 (1.14–1.21)
College graduate	1.99 (1.72–2.30)	1.47 (1.36–1.60)
Race or ethnicity (reference: white)	1.00	1.00
Latina	0.86 (0.81–0.91)	0.97 (0.93–1.01)
Black	0.91 (0.84–0.995)	1.06 (1.003–1.13)
Asian and Pacific Islander	0.57 (0.51–0.63)	0.76 (0.71–0.81)
Native American	0.87 (0.70–1.10)	0.93 (0.79–1.10)
Other or unknown	0.93 (0.68–1.27)	0.89 (0.74–1.07)
Foreign-born	1.81 (1.72–1.91)	1.47 (1.42–1.52)
Parity (more than 2 births)	0.99 (0.99–0.997)	0.98 (0.98–0.99)
Age	0.98 (0.94–1.03)	1.04 (1.01–1.07)

OR, odds ratio; CI, confidence interval; PACT, Planning, Access, Care, and Treatment.

achieve optimal interpregnancy intervals and, ultimately, to achieve the Healthy People 2020 objective to reduce the proportion of pregnancies conceived within 18 months of a previous birth from 33.1% to 29.8%.[16]

Although clinical guidelines recommend that women initiate contraception in the first 3 months after delivery,[8] only 41% of women in this cohort had a contraceptive claim during the study period. Some women may want to space their children closer or may underestimate their fertility after birth[17] and therefore choose not to use contraception. Nevertheless, our finding is substantially lower than self-reported data in which 88% of respondents reported the use of contraception 2–7 months after delivery.[18] Our analysis identified three opportunities to provide contraception in the postpartum period. Studies suggest that initiation of contraception during the postpartum visit may be facilitated through closer hospital–outpatient linkages[19,20] and clinic protocols that repeatedly inform women about contraceptive options in their postpartum period.[21–23] Clinic protocols also should facilitate the use of any medical visit during the postpartum period to counsel and dispense contraception, even if the primary reason for the clinic visit was not family planning and including visits to the pediatrician for the infant. Family planning settings should be encouraged to schedule combined appointments for mother and infant so that the contraceptive discussion is a part of the infant-visit checklist each time in the first 3 months. Electronic health records should have reminders to review need for contraception in the postpartum period. Ensuring that women initiate contraception within 90 days after birth is important because 10% of women in our cohort had interpregnancy intervals of less than 6 months.

The multivariate analysis showed that when other factors were accounted for, receiving contraception was strongly associated with optimal interpregnancy intervals. Additionally, the receipt of contraception at the first visit had an independent effect on the odds of reaching an optimal interpregnancy interval. Being served by both Medi-Cal and Family PACT was also significant in the regression analysis of optimal interpregnancy intervals. These women most likely had a postpartum visit with a Medi-Cal provider and later a dedicated family planning visit with a Family PACT provider.

Consistent with other research,[6,7,12] women with higher education were more likely to have optimal interpregnancy intervals. Women with more years of education may have different motivations during their childbearing years that influence birth-spacing decisions. Age was not significantly associated with interpregnancy intervals in this analysis.

Overall, foreign-born women are more likely to have optimal interpregnancy intervals than U.S.-born women. Most foreign-born women in our sample were Latinas who tend to have high breastfeeding rates,[24] which may contribute to the longer interpregnancy intervals. The exception to this trend is Asian and Pacific Islander women, 70% of whom are foreign-born women but who had the highest odds of having very short interpregnancy intervals in the multivariate

analysis. A northern California study found that Asian and Pacific Islander women were observed to start formula or mixed feeding of their infants sooner after birth than white women.[25] Interventions to promote optimal interpregnancy intervals need to integrate breastfeeding promotion with contraceptive dispensing and counseling, in particular with the Asian and Pacific Islander population. As exclusive breastfeeding becomes more prevalent, the potential effect of delayed initiation of effective contraception has to be monitored. Since 2008, the rates of exclusive breastfeeding at 3 months and 6 months postpartum in the United States have had steady improvements. Exclusive breastfeeding in the first 6 months after birth delays the onset of ovulation, thereby reducing the risk of short interpregnancy intervals for many women. However, in 2012, nearly four in five women in California (78%) initiated mixed or formula feeding before the infant was 6 months old and therefore required contraception.[26]

This methodology did not assess contraception prescriptions that did not generate a pharmacy claim, were provided as part of a global fee at the hospital, or where partners received a vasectomy since the pregnancy. Contraceptive use may therefore be underestimated. However, clinicians have the incentive to provide long-acting reversible contraception with high upfront costs during outpatient postpartum visits rather than offering it as part of a global fee, and hormonal methods and condoms would need refills.

Women who received contraception may not have had ongoing contraceptive coverage if they did not get refills or discontinued the method for other reasons. Analyses are underway to determine the effect of using specific contraceptive methods and of contraceptive coverage over the 18-month period and their association with interpregnancy intervals.

Findings of this study suggest that closer attention to provision of postpartum contraception in publicly-funded programs has the potential to improve optimal interpregnancy intervals among low-income women.

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