

PRAMS PERSPECTIVES

A Pregnancy Risk Assessment Monitoring System Report October 2006

Short Interpregnancy Spacing in Utah

Background

Research indicates that short interpregnancy intervals (IPIs) are associated with pregnancy outcomes that are less than optimal. A large study carried out by Fuentes-Afflick et al. found that after adjusting for confounding variables, women with short IPIs were more likely to have a premature infant.¹ In addition, the study found that there was a gradient of risk for premature outcomes, and women with the shortest intervals had the highest risk. In another study, Klerman et al. researched whether the length of the interval between pregnancies was

What is PRAMS?

Data in this newsletter were provided by the Utah Pregnancy Risk Assessment Monitoring System (PRAMS). PRAMS is an ongoing, population-based risk factor surveillance system designed to identify and monitor selected maternal experiences that occur before and during pregnancy and experiences of the child's early infancy. Each month, a sample of approximately 200 women, two to four months postpartum, is selected. The sample is stratified based upon race and infant birth weight so that inferences and comparisons about these groups can be determined. The results are weighted for sample design and non-response.

PRAMS is intended to help answer questions that birth certificate data alone cannot answer. Data will be used to provide important information that can guide policy and other efforts to improve care and outcomes for pregnant women and infants in Utah. Women were asked questions about prenatal care, breastfeeding, smoking and alcohol use, physical abuse, and early infant care.

The PRAMS data reported here represents all live births to Utah residents from 2000 to 2003. A total of 8908 mothers were selected to participate in the project and 6784 mothers responded for a response rate of 76.2%. Survey results were weighted for non-response so that analyses could be generalized to the entire population of Utah women delivering live births.

associated with either preterm birth or intrauterine growth retardation (IUGR) and found that in bivariate analysis, the percentage of preterm deliveries decreased as the interval lengthened but had no effect on the risk of IUGR.² In yet another study utilizing Utah data, Zhu et al. analyzed data to determine whether the association between a short interval between pregnancies and adverse perinatal outcomes was due to confounding by other risk factors. Three adverse perinatal outcomes were examined: low birth weight (LBW \leq 2500 gms.), preterm births (< 37 weeks gestation), and small for gestational age (SGA-BW < the 10th percentile for GA). Zhu found that after controlling for confounders, the risk of any of the three adverse perinatal outcomes was high if the interpregnancy interval was < 3 months and that the risks declined rapidly as the interpregnancy interval increased.³

Utah has experienced an 8% increase in our prematurity rate over the past decade (9.2% in 1995 to 10% in 2004). This increase has occurred despite the fact that Utah's population of reproductive aged women is generally healthier with fewer known risk factors for preterm births than many other states across the nation, and may be partially attributable to short IPIs. Utah has relatively limited "safety net" funding for family planning services; although the state receives Title X funding for contraceptive services for low income women, there is no state funding designated for family planning services as is the case in many other states across the nation.

In addition, Utah has more stringent income eligibility requirements (133% of the federal poverty level) for women to qualify for prenatal Medicaid services than the majority of other states in the nation and these benefits terminate at eight weeks postpartum leaving low income women who wish to space their pregnancies not able to access effective contraceptives to accomplish that goal.

In this study, we analyzed Utah PRAMS data to identify characteristics of Utah women who experienced short IPIs and highlighted their increased risk for poor pregnancy outcomes. This analysis will aid us in targeting populations at risk for short pregnancy intervals and help to identify strategies that may help improve their pregnancy outcomes.

Methodology

Interpregnancy interval was calculated from data contained on the birth certificate. Pregnancy interval was defined as the length of time between the last live birth and the delivery of the current live birth minus the length of gestation of the current pregnancy. PRAMS data from 2000 – 2003 were used in this analysis. Chi-square tests were used to determine if differences between groups were statistically significant. For all analyses, an IPI of 19 – 59 months was used as the comparison group. This group was chosen as the authors felt it aligned well with the Healthy People 2010 goal to reduce the proportion of births occurring < 24 months of a previous birth. In addition, previous studies published by Zhu and Fuentes-Afflick indicated that women with both short and long pregnancy intervals demonstrated less than optimal pregnancies outcomes. These authors hypothesized that women who have long pregnancy intervals may have confounding health issues that impair fertility and also have a negative impact on pregnancy outcomes.

Approximately 20% of repeat births in the dataset were missing either the month or year of the last live birth, thus the interpregnancy interval could not be calculated for these women and they were excluded from the analysis. Women who delivered twins or triplets were also excluded. Lastly, of the ~190,000 births represented in this study, 36% were born to primiparous women and therefore not included in the analysis.

Results

Almost 5% of Utah women in our analysis experienced a very short IPI (0-6 months) during the study period with almost 40% of live births reporting an interpregnancy interval of ≤ 18 months. The study by Fuentes-Afflick et al. which was carried out on white Hispanic and non-Hispanic women who resided in California reported a similar percentage (~37%) of women with IPIs ≤ 18 months. Figure 1 illustrates the distribution of interpregnancy intervals among Utah women included in the analysis.

Publishing Information

This publication was supported by Grant Number 1UR6DP000494-01 from the Centers for Disease Control and Prevention (CDC). Its contents are solely the responsibility of the authors and do not necessarily represent the official views of CDC.

**Figure 1. Interpregnancy Interval
Utah PRAMS Data 2000 - 2003**

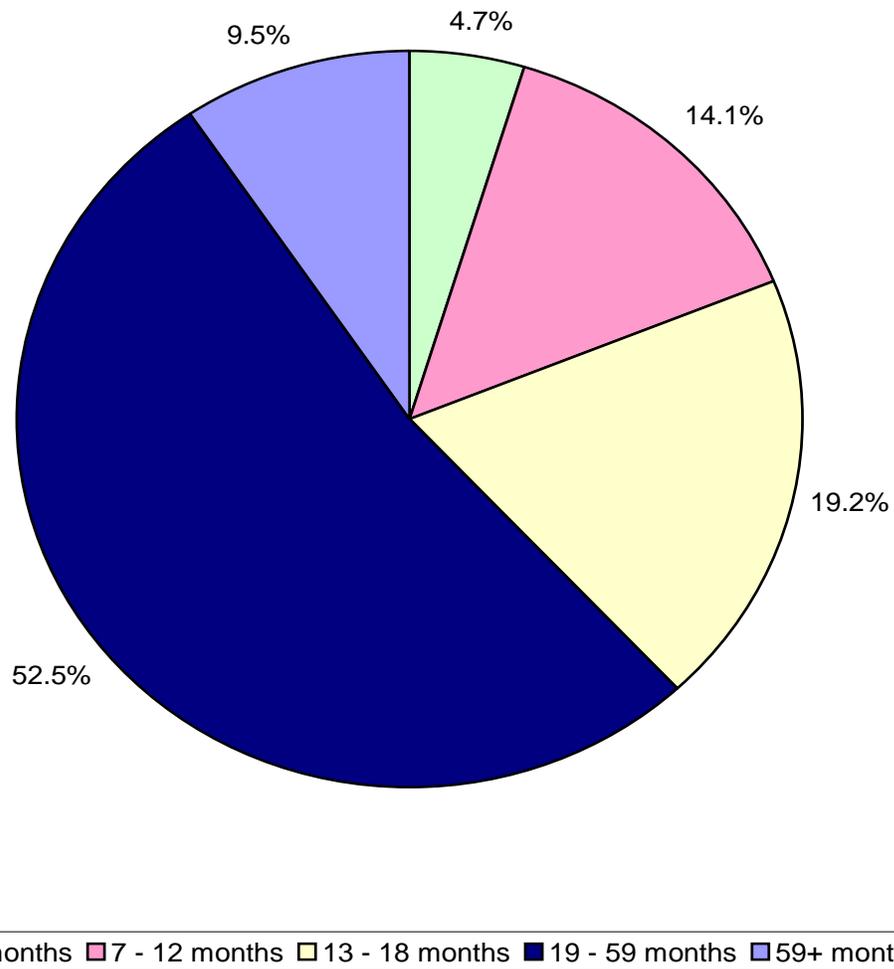


Table 1 shows the proportion of women with short IPIs by maternal characteristics. Women with the shortest IPI (0-6 months) were significantly more likely to:

- be of a younger age
- be from a non-white racial group
- be unmarried
- report no insurance prior to pregnancy or report Medicaid prior to pregnancy
- report incomes less than 100% of the federal poverty level
- report being enrolled in WIC during pregnancy

Table 1: The Proportion of Women With Short Interpregnancy Spacing by Maternal Characteristics, 2000-2003 Utah PRAMS Data

Characteristics	Percentage With IPI 0 - 6 months	95% Confidence Interval	P-Value ¹	Percentage With IPI 7-12 months	95% Confidence Interval	P-Value ¹	Percentage With IPI 13-18 months	95% Confidence Interval	P-Value ¹	Percentage With IPI 19-59 months	95% Confidence Interval
Total Birth Population	4.7%	± 0.9%	<0.0001	14.1%	± 1.5%	<0.0001	19.2%	± 1.7%	<0.01	52.5%	± 2.2%
Maternal Age											
Less than 18	6.5%	± 9.5%		13.6%	± 19.3%		23.2%	± 38.4%		56.8%	± 43.8%
18 - 19	15.8%	± 11.0%		17.7%	± 11.7%		33.2%	± 14.7%		33.4%	± 15.4%
20 - 24	7.5%	± 2.2%		19.5%	± 3.6%		22.7%	± 3.8%		46.7%	± 4.5%
25 - 29	4.5%	± 1.4%		15.2%	± 2.5%		19.1%	± 2.7%		53.5%	± 3.5%
30 - 34	2.9%	± 1.4%		9.6%	± 2.5%		16.4%	± 3.3%		59.3%	± 4.3%
35 - 39	1.8%	± 1.7%		7.6%	± 3.5%		17.0%	± 5.3%		53.2%	± 6.8%
40 +	0.0%	N/A		8.9%	± 8.2%		8.5%	± 8.1%		38.9%	± 13.6%
Education Level											
Less Than High School	8.8%	± 3.6%	NS	14.7%	± 4.8%	NS	19.7%	± 5.3%	NS	44.3%	± 6.5%
Completed High School	4.0%	± 1.4%		13.2%	± 2.5%		15.9%	± 2.8%		55.1%	± 3.9%
Some College	4.2%	± 1.5%		13.6%	± 2.7%		21.5%	± 3.2%		52.5%	± 3.8%
College Graduate	4.4%	± 1.7%		14.9%	± 3.0%		20.7%	± 3.4%		53.0%	± 4.2%
Race											
White	4.3%	± 0.9%	<0.001	13.9%	± 1.6%	<0.05	19.2%	± 1.8%	NS	53.0%	± 2.3%
Other Than White	13.1%	± 4.7%		18.1%	± 4.4%		15.5%	± 3.3%		44.0%	± 5.2%
Marital Status											
Married	4.3%	± 0.9%	<0.05	14.2%	± 1.6%	NS	19.5%	± 1.8%	NS	53.4%	± 2.3%
Unmarried	7.3%	± 3.2%		13.2%	± 4.7%		16.8%	± 5.1%		45.9%	± 3.4%
Ethnicity											
Hispanic	6.7%	± 3.3%	NS	16.3%	± 5.2%	NS	19.6%	± 5.4%	NS	41.8%	± 6.7%
Non-Hispanic	4.5%	± 0.9%		13.8%	± 1.6%		19.0%	± 1.8%		54.0%	± 2.3%
Insurance Before Pregnancy											
Yes	3.5%	± 0.9%	<0.0001	13.9%	± 1.7%	NS	19.1%	± 2.0%	NS	54.8%	± 2.5%
No	7.9%	± 2.2%		14.5%	± 3.0%		19.2%	± 3.4%		46.4%	± 4.2%
Medicaid Before Pregnancy											
Yes	9.7%	± 5.3%	<0.05	12.2%	± 6.0%	NS	26.5%	± 8.6%	<0.05	36.6%	± 9.0%
No	4.4%	± 0.9%		14.2%	± 1.5%		18.7%	± 1.7%		53.4%	± 2.2%
FPL											
≤100%	8.9%	± 2.5%	<0.0001	16.7%	± 3.4%	<0.01	21.0%	± 3.8%	<0.05	41.8%	± 4.5%
101 - 133%	5.8%	± 2.9%		13.0%	± 4.5%		21.1%	± 5.4%		55.9%	± 6.7%
134 - 199%	4.6%	± 2.0%		15.3%	± 3.5%		16.5%	± 3.5%		55.2%	± 4.8%
200%+	2.2%	± 0.9%		12.1%	± 2.1%		18.1%	± 2.5%		57.5%	± 3.2%
Enrolled in WIC During Pregnancy											
Yes	8.3%	± 2.2%	<0.0001	18.4%	± 3.3%	<0.0001	23.5%	± 3.6%	<0.0001	41.0%	± 4.1%
No	3.3%	± 0.9%		12.4%	± 1.7%		17.6%	± 1.9%		57.0%	± 2.5%

¹ IPI of 19 - 59 months as Comparison Group

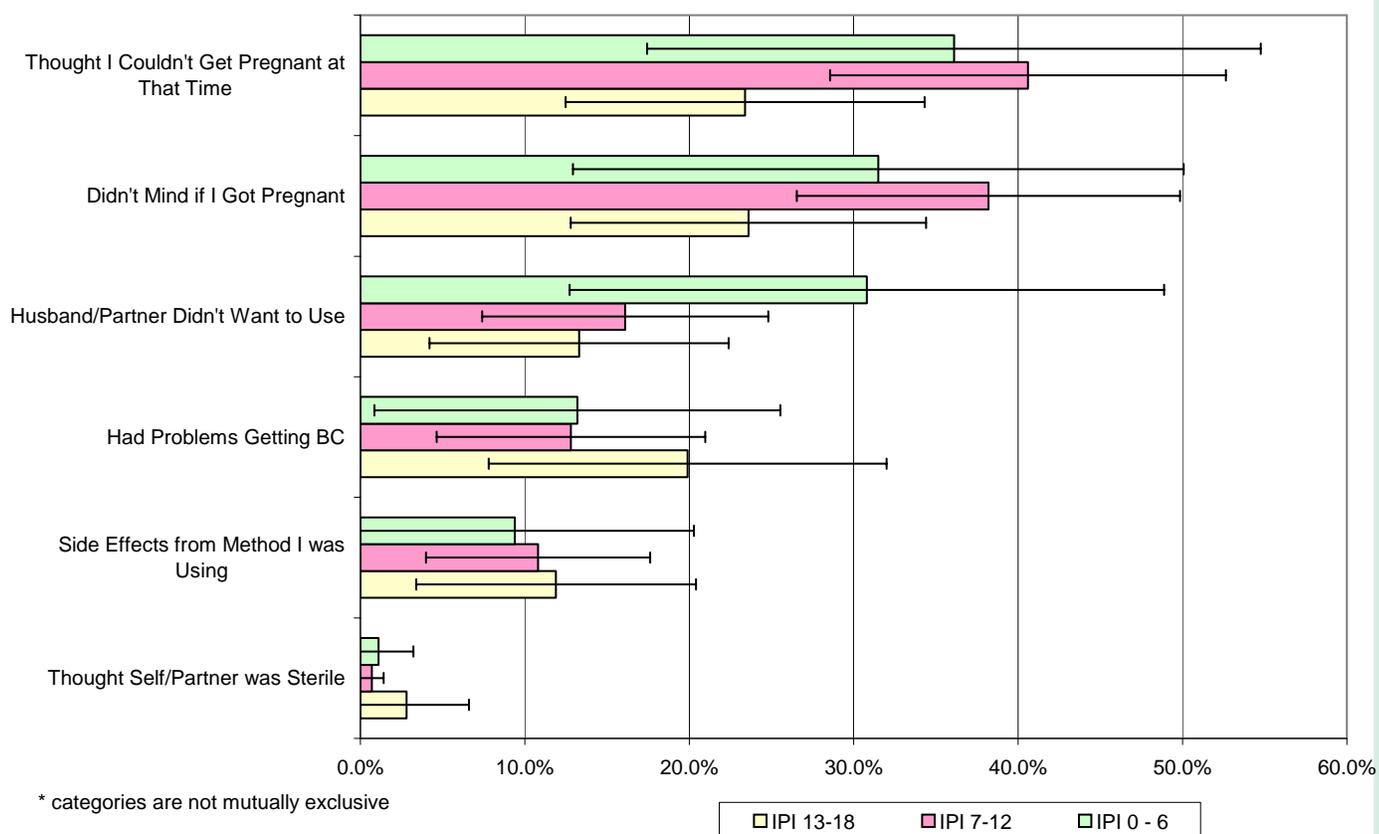
NS = Not Significant

Among women with the shortest IPIs, almost 63% reported that their pregnancy was unintended; of which, over 60% reported using some form of birth control at conception. It must be noted however, that this survey question includes all forms of birth control, including some of the less effective methods such as the rhythm or withdrawal methods. Figure 2 denotes the reasons given for not using birth control among women who reported an unintended pregnancy by IPI. The leading reason cited among women with the shortest IPIs was “thought I couldn’t get pregnant at that time.”

Poor pregnancy outcomes among women with short IPIs did not vary significantly from the comparison group in that there were not statistically significant differences in the rate of preterm births or small for gestational age (SGA) infants. Regression analysis was also performed for these outcomes, controlling for age, education, marital status, race, ethnicity, and poverty status, and showed no significant findings for IPI. We hypothesize that this may be attributed to the comparison group used in this analysis. Most published studies have used a shorter interval for comparison than 19 to 59 months. However, considering that findings from previous studies indicate poor pregnancies outcomes in women with shorter and longer intervals, the authors felt this comparison group was most appropriate.

One difference noted in stratifying the study group by previous preterm birth, women who had not delivered a previous preterm infant experienced a significantly increased risk of delivering a preterm infant following a very short pregnancy interval. In addition, women who experienced a very short IPI reported higher rates of bedrest and hospital stays during their pregnancies than women in the comparison group.

Figure 2. Reasons for Not Using Birth Control at Time of Conception Among Women Who Reported Their Most Recent Pregnancy Was Unintended, 2000 - 2003 Utah PRAMS Data



Domestic violence and a variety of psychosocial stressors were reported at significantly higher rates among women who experienced very short IPIs (0-6 months). This group of women reported higher rates of financial stress, partner associated stress, and traumatic stress as well as physical abuse before and during pregnancy. In addition, women who experienced very short IPIs reported over twice the rate of severe postpartum depression than those in the general population. It's difficult to discern however, whether these high rates of depression contributed to the risk of very short IPIs or resulted from the stress of having closely spaced infants, as depression was reported only for the most recent delivery. Table 2 presents reported rates of these indicators by each IPI category.

Table 2: Selected Outcomes Among Interpregnancy Interval, 2000-2003 Utah PRAMS Data

Indicator	IPI 0 - 6 Months	IPI 7 - 12 Months	IPI 13 - 18 Months	IPI 19 - 59 Months
Severe Postpartum Depression	16.0%	10.2%	6.5%	6.3%
Unintended Pregnancy	62.8%	56.4%	32.6%	25.9%
Unintended Pregnancy - Not Using Contraception	39.6%	44.6%	47.8%	45.5%
Financial Stress~	64.3%	55.2%	51.5%	49.7%
Partner Associated Stress*	39.1%	29.1%	28.5%	24.5%
Traumatic Stress^	24.4%	10.8%	13.8%	13.5%
Physical Abuse Before Pregnancy	12.3%	3.7%	2.7%	3.2%
Physical Abuse During Pregnancy	8.2%	3.9%	2.0%	2.7%
Hospital Stay of 1 to 7 Days	18.3%	13.1%	11.8%	9.3%
Bed Rest	46.4%	29.7%	27.5%	31.2%
Prenatal care in first trimester	62.2%	77.1%	80.5%	82.6%
*** IPI of 19 - 59 months as Comparison Group for P values				
Green shading denotes statistical significance				
~ Includes loss of job for woman or partner, unpaid bills, moving to a new address				
* Includes separation or divorce, arguing with partner, or partner not wanting pregnancy				
^ Includes jail, physical fight, being homeless, or a close person experiencing drug or alcohol use				

Authors

Lois Bloebaum, MPA, BSN, Manager, Reproductive Health Program
 Laurie Baksh, MPH, PRAMS Data Manager
 Joanne McGarry, BS, PRAMS Operations Manager
 Debby Carapezza, MSN, RN, Nurse Consultant
 Shaheen Hossain, PhD, Manager, Data Resources Program
 Nan Streeter, MS, RN, Director, Bureau of Maternal and Child Health

Discussion/Recommendations

Our analysis indicated that the majority of women with very short IPIs reported their pregnancy as unintended and 60% of these women were using some form of birth control at the time of conception. Education to improve contraceptive misuse/failure in these women is an area of intervention that may help to avert and/or delay pregnancies and improve pregnancy outcomes.

Approximately 40% of women who reported an unintended pregnancy and experienced short IPIs reported not using contraception. The largest reported reason for not using contraception was, “thought I couldn’t get pregnant.” Qualitative data volunteered by respondents indicate that many women felt that breastfeeding was an effective birth control method. This finding indicates that more thorough education of women regarding fertility postpartum may help to alleviate short IPIs. It may be helpful to discuss birth control options multiple times with pregnant and postpartum women. To this end, an educational tool on resumption of fertility after delivery has been included with this report to be copied and disseminated by providers and educators. Additionally, human sexuality curriculum should be enhanced to assure that women are well educated about fertility and the importance of planning for and adequately spacing their pregnancies.

This study indicates that the women at highest risk for the shortest IPIs were at low socio-economic level and were either uninsured or on Medicaid prior to pregnancy. Extension of family planning benefits for women who qualify for prenatal Medicaid coupled with interpregnancy case management for women in the highest risk categories may not only lengthen interpregnancy intervals resulting in healthier moms and babies, but may also prove to be cost effective. It is also critical that providers be alert and screen for a variety of social-emotional issues such as depression and domestic violence, for which women with short IPIs may be at higher risk.

References

- 1) Fuentes-Afflick, E. and N. A. Hessol (2000). “Interpregnancy Intervals and the Risk of Premature Infants.” Obstetrics and Gynecology 95(3): 383-390.
- 2) Klerman, L. V., S. P. Cliver, et al. (1998). “The Impact of Short Interpregnancy Intervals on Pregnancy Outcomes in a Low-Income Population.” American Journal of Public Health 88(8): 1182-1185.
- 3) Zhu, B.-P., R. T. Rolfs, et al. (1999). “Effect of the Interval Between Pregnancies on Perinatal Outcomes.” New England Journal of Medicine 340(8): 589-594.