Unintended pregnancy and interpregnancy interval by maternal age, National Survey of Family Growth★,★★,,★,,★★

Katherine A. Ahrens[a,*], **Marie E. Thoma**[b], **Casey E. Copen**[c], **Brittni N. Frederiksen**[a], **Emily J. Decker**[a], and **Susan Moskosky**[a]

[a]Office of Population Affairs, Office of the Assistant Secretary for Health, Rockville, MD

[b]Department of Family Science, University of Maryland, College Park, MD

[c]Division of Vital Statistics, Reproductive Statistics Branch, National Center for Health Statistics, Centers for Disease Control and Prevention, Hyattsville, MD

Abstract

Background: The relationship between unintended pregnancy and interpregnancy interval (IPI) across maternal age is not clear.

Methods: Using data from the National Survey of Family Growth, we estimated the percentages of pregnancies that were unintended among IPI groups (<6, 6–11, 12–17,18–23, 24+ months) by maternal age at last live birth (15–19, 20–24,25–29, 30–44 years).

Results: Approximately 40% of pregnancies were unintended and 36% followed an IPI<18 months. Within each maternal age group, the percentage of pregnancies that were unintended decreased as IPI increased.

Conclusion: Unintended pregnancies are associated with shorter IPI across the reproductive age spectrum.

Keywords

Interpregnancy intervals; Birth spacing; Pregnancy intention; Postpartum contraception

1. Intoduction

Reducing unintended pregnancies and the percentage of pregnancies conceived within 18 months of a previous live birth are nationwide health improvement priorities for the United States (U.S.) [1]. Unintended pregnancies and closely spaced pregnancies have been associated with adverse outcomes for the mother and infant, and both may potentially be

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prevented through access to family planning services [2–5]. Although there may be considerable overlap in unintended pregnancy and closely spaced pregnancies, the relationship between them has not yet been described for U.S. women by maternal age.

Previous analyses among U.S. women have found younger maternal age is associated with increased risk of unintended pregnancy [6], while women at older maternal age are at higher risk for closely spaced pregnancies [7]. In addition, there is some evidence that maternal age might modify the association between pregnancy spacing and adverse pregnancy outcomes [8,9]. Therefore, examining the relationships between unintended pregnancy and pregnancy spacing by maternal age may help clarify how these two health improvement priorities overlap and inform public health interventions to improve postpartum access to contraception, which can both reduce unintended pregnancy and lengthen pregnancy spacing, potentially reducing adverse pregnancy outcomes.

2. Methods

2.1. Study participants

We analyzed data on pregnancies reported by women from the 2006–2010 and 2011–2015 National Survey of Family Growth (NSFG), an in-person survey designed to be nationally representative of the household U.S. population ages 15–44 years [10]. Female response rates for 2006–2010, 2011–2013, and 2013–2015 were 77.7%, 73.4% and 71.2%, respectively. Pregnancies following a live birth and occurring within 5 years of the date of interview were included in our analysis.

2.2. Pregnancy history and maternal age

The following details were self-reported and assessed for all pregnancies: pregnancy occurrence (i.e., month and year the pregnancy ended), duration (i.e., the number of months' or weeks' pregnant when the pregnancy ended), and outcome (i.e., miscarriage, stillbirth, abortion, ectopic or tubal pregnancy, or live birth). Month and year the pregnancy began was computed by the interview software by subtracting pregnancy duration from the month and year the pregnancy ended; this was then verified with the female respondent. Maternal age at time of last live birth was computed by subtracting her date of birth from the time of her last live birth, and then categorized into four groups: 15–19, 20–24, 25–29, and 30–44 years.

2.3. Unintended pregnancy

Pregnancy intention at the time of conception was assessed retrospectively based on a series of questions, primarily: "Right before you became pregnant, did you yourself want to have a(nother) baby at any time in the future?" and "Would you say you became pregnant too soon, at about the right time, or later than you wanted?" If the respondent answered "no" to the first question, the pregnancy was categorized as "unwanted"; if the respondent answered "yes" to the first question and "too soon" to the second, the pregnancy was categorized as "mistimed." Following conventional categorization for pregnancy intention [5,6,11–13], unwanted and mistimed pregnancies were considered unintended pregnancies, with the remaining pregnancies, including those with "didn't care/indifferent" and "don't know/not sure" responses (~1.2%), considered intended.

2.4. Interpregnancy interval

Interpregnancy interval (IPI) was defined as the number of months between the woman's last live birth delivery month and the conception month of her next pregnancy, regardless of its outcome or whether it was a single or multi-fetal gestation. IPI was categorized as: <6, 6–11, 12–17,18–23, and 24+ months. Short IPI was defined as<18 months. Analyses could include multiple IPI measurements for the same woman if she had more than one live birth followed by another pregnancy occurring within 5 years of the interview; for example, if she had a live birth 4 years ago, followed by a pregnancy leading to a live birth 2 years ago, followed by a pregnancy resulting in miscarriage, that would have yielded two IPI measurements (the IPI between the livebirth pregnancies and the IPI between the second live birth pregnancy and the miscarriage).

2.5. Statistical analysis

The percentages of pregnancies following a live birth that were unintended and were conceived within a short IPI were estimated, separately, from predicted probabilities using unadjusted logistic regression models for women overall and by maternal age group. After stratifying the analysis by maternal age group, the percentage of unintended pregnancies was estimated overall and by type of unintended pregnancy (unwanted or mistimed) for each IPI category. In addition, pregnancy prevalence ratios (PR) for unintended pregnancy were estimated using predicted probabilities from unadjusted logistic regression models; IPI of 18–23 months served as the reference group. All linear trend p-values were estimated by modeling categorical variables as continuous variables.

Analyses used SAS-callable SUDAAN and accounted for the complex survey design. There were 6382 pregnancies among 5079 women included in the analysis.

3. Results

Overall, 40% of pregnancies following a live birth were unintended (Fig. 1). This decreased across maternal age category, from 54% in women ages 15–19 to 33% in women ages 30–44 (p-value<0.01). The percentage of pregnancies conceived within a short IPI was 36% overall, which increased across maternal age category, from 32% in women ages 15–19 to 42% in women ages 30–44 (p-value<0.01).

The percentage of pregnancies that were unintended decreased by length of IPI for each maternal age group (all linear trend p-values<0.01) (Fig. 2), with the highest percentage of unintended pregnancies observed for IPIs 0–5 months among women ages 15–19 (86%) and 20–24 (80%). Prevalence ratios for unintended pregnancy were generally elevated for IPIs 0–5 months and 6–11 months compared with 18–23 months; however, for ages 25–29, other IPI prevalence ratios were also significantly elevated.

4. Discussion

Among U.S. women with pregnancies following a live birth and occurring within 5 years of the interview, approximately 40% of pregnancies were unintended and 36% followed an

IPI<18 months. Within each maternal age group, the percentage of pregnancies that were unintended decreased as IPI increased.

Our findings regarding the overlap between unintended pregnancy and closely spaced pregnancies are in line with previous analyses of U.S. women, which found shorter IPIs were more likely to be unintended pregnancies [5,14]. However, our study further examined this overlap, showing unintended pregnancy decreased as IPI increased for each maternal age group.

Regarding overall prevalence of unintended pregnancy (40%), our findings are fairly consistent with recent estimates of unintended pregnancy (45%) among U.S. women [6]. However, Finer et al. examinedall recent pregnancies, not just those following a live birth, and augmented data from NSFG with information from abortion surveys to account for potential abortion underreporting in the NSFG [6,15]. Both studies found unintended pregnancy decreased with increasing maternal age.

The percentage of short IPI in our study (36%) was slightly higher than in a recent analysis of IPI between live births in the U.S. by Thoma et al. using vital records data (29%), a discrepancy which can be explained by our inclusion of pregnancies that did not result in live birth [7]. Thoma et al. also found short IPI increased with increasing maternal age at last live birth.

There were several limitations of our analysis. First, due to the relatively small number of pregnancies following an IPI<6 months reported among women aged 30 and older (n=83), we collapsed older maternal age into a single group spanning 15 years instead of the 5-year age groups we used for younger women, which could have obscured differences among older age groups. However, in a supplemental analysis, we examined women ages 30–34 separately, and findings were similar to those among women ages 30–44 overall (data not shown). Second, because our study is based on pregnancies following live births that occurred prior to 2015, the findings may not be generalizable to postpartum women in the U.S. today, especially in light of recent increases in health insurance coverage since passage of the Affordable Care Act (ACA) [16]. However, in a post-hoc analysis we examined the relationship between unintended pregnancy and IPI length by type of payment for last live birth, and found that for both Medicaid- and private-insurance covered births, unintended pregnancy decreased with increasing length of IPI (albeit pregnancies following a Medicaid-covered birth were more likely to be unintended overall compared to those covered by private insurance [61% vs. 35%, Chi-square p<.01]) (Supplemental Fig. 1). Therefore, further investigation of how pregnancy intention overlaps with IPI by maternal age in the U.S. among pregnancies conceived after births post-ACA health insurance expansion are warranted. And third, all pregnancy history information from the NSFG is retrospective and self-reported, which may affect accuracy [15].

Our study shows that unintended pregnancies are more likely with shorter interpregnancy intervals across the reproductive age spectrum among women in the U.S. These findings may be used to inform future research on barriers to and facilitators of access to family

planning services, and to develop interventions aimed at increasing access to contraception among postpartum women in the U.S.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

Acknowledgments

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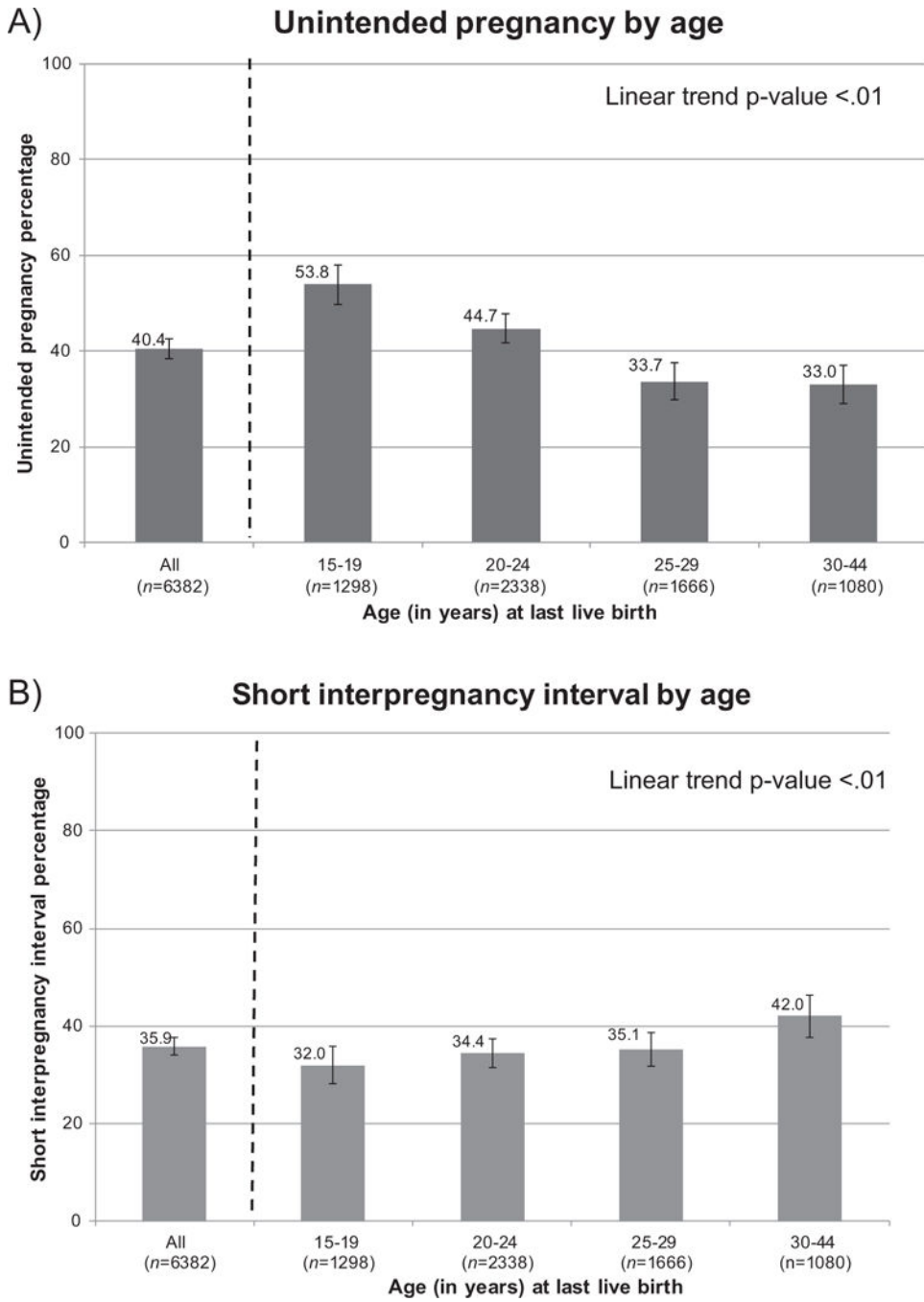
Fig. 1.
A) The percentage of pregnancies unintended (unwanted or mistimed) and B) the percentage of pregnancies conceived within a short (<18 month) interpregnancy interval by maternal age (in years) at last live birth: NSFG 2006–2010, 2011–2015 (6382 pregnancies among 5079 women). Linear trends were assessed using logistic models with age category at last live birth (15–19, 20–24, 25–29, 30–44 years) as a continuous variable.
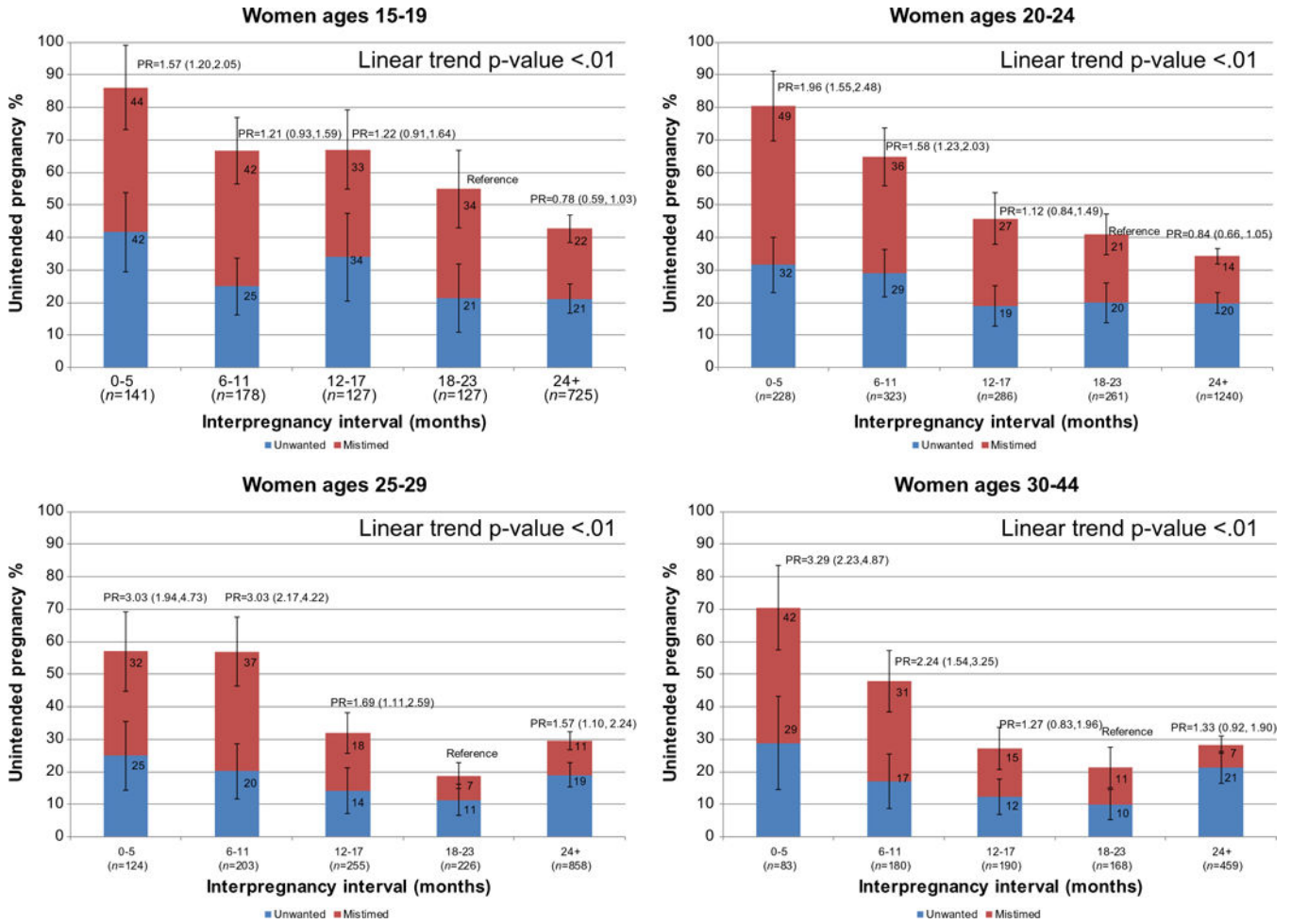
Fig. 2.
The percentage of pregnancies unintended (unwanted or mistimed) by interpregnancy interval since last live birth, by maternal age at time of last live birth: NSFG 2006–2010, 2011–2015. Prevalence ratio (PR) and 95% confidence interval for unintended pregnancy are in comparison to reference group 18–23 months (6382 pregnancies among 5079 women). Linear trends were assessed using logistic models with interpregnancy interval (0–5, 6–11, 12–17, 18–23, 24+ months) as a continuous variable.