2009

The relationship between repeat unintended pregnancies and current family planning practice

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Virginia Commonwealth University

Title Page
Master of Public Health Research Project

The Relationship between Repeat Unintended Pregnancies and Current
Contraceptive Use

by

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Master of Public Health Program
MPH Research Project: EPID 691

Virginia Commonwealth University
Richmond, Virginia

11/09

Submission Statement
Master of Public Health Research Project

This MPH Research Project report is submitted in partial fulfillment of the requirements for a Master of Public Health degree from Virginia Commonwealth University's School of Medicine. I agree that this research project report be made available for circulation in accordance with the program's policies and regulations pertaining to documents of this type. I also understand that I must receive approval from my Faculty Advisor in order to copy from or publish this document, or submit to a funding agency. I understand that any copying from or publication of this document for potential financial gain is not allowed unless permission is granted by my Faculty Advisor or (in the absence of my Faculty Advisor) the Director of the MPH Program.

_____

Student Signature

_____11/18/09_____

Date

Master of Public Health
Research Project Agreement Form
Department of Epidemiology and Community Health

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Please complete the following outline. **Do not exceed 2 pages (A-H).**

A. PROJECT TITLE:
The relationship between repeated unintended pregnancies and current family planning practice.

B. PURPOSE:
The purpose of this analysis is to examine the relationship between repeated unintended pregnancies and current family planning practice

C. SPECIFIC OBJECTIVES (list major aims of the study):
1. To examine the relationship between numbers of unintended pregnancies and patterns/methods of family planning practice.
2. To assess racial and ethnic differences within this phenomenon (from objective 1)
3. To examine determinants of family planning use among women with repeated unintended pregnancies

D. DESCRIPTION OF METHODS
D.1. Identify source of data:
The data from the National Statistics of Family Growth (NSFG) will be used for the analysis.
D.2. State the types of study design:
The NSFG is a cross-sectional study.
D.3. Describe the study population and sample size:
The population of the sample is heterosexual men and women between ages of 15-44. The data are representative of the US population in this age group.
D.4. List variables to be included:
Exposure variables: Repeated unintended pregnancies
Outcome: current family planning practice
Analysis stratified by race and ethnicities, education, income, gender, and age group.
Potential confounders: numbers of sexual partners in the past, and history of sexual abuse
D.5. Describe methods to be used for data analysis:
Logistic regression will be used to analyze the relationship between repeated unintended pregnancies and current family planning practice. The data will be stratified and analyzed by race and ethnicity, age group, income, education and gender. The potential confounders will be also evaluated.

E. ANTICITIPATED RESULTS:
It is anticipated that an increased number of unintended pregnancies correlates with no/ineffective family planning practice. Also high risk population will be indentified by comparing the relationship by race and ethnicity, age group, gender, income and education. There is a high possibility of confounding effects by history of sexual abuse and number of sexual partner in the past. The following characteristics are anticipated to be in the higher risk group: minority, less education completed, less income, female and moderately younger populations (mid 20's).

F. SIGNIFICANCE OF PROJECT TO PUBLIC HEALTH:
Unintended pregnancies have shown to negatively affect the health of mothers and infants. The affect is even worse if it happens repeatedly. Therefore, it is important to examine the determinants of family planning practice among those with repeated unintended pregnancies. This study intends to acknowledge the relationship between repeated unintended pregnancies and family planning practice and examine the phenomenon further by indentifying the characteristics of the high risk population. The findings of this study may provide the evidence for public health practitioners to design targeted interventions. Unintended pregnancies are preventable through proper family planning practice. Therefore, public health personnel need to keep seeking ways to approach this issue effectively. As a result, we hope that every person recognizes the importance of becoming pregnant when they are better prepared to create healthy conditions for the infants to grow in the womb as well as when they are born.

G. IRB Status:
1) Do you plan to collect data through direct intervention or interaction with human subjects? _yes X no
2) Will you have access to any existing identifiable private information? __yes X no
If you answered "no" to both of the questions above, IRB review is not required.
If you answered "yes" to either one of these questions, your proposed study must be reviewed by the VCU Institutional Review Board (IRB). Please contact Dr. Vance or Dr. Sridhar for assistance with this procedure. Please indicate your IRB status:

___ to be submitted (targeted date_____)

___ submitted (date of submission_____; VCU IRB # _____)

___ IRB exempt review approved (date_____)

___ IRB expedited review approved (date_____)

___ IRB approval not required

H. PROPOSED SCHEDULE: Start Date: <u>May 18, 2009</u> Anticipated End Date: <u>August 10, 2009</u>

I. INDICATE WHICH OF THE FOLLOWING AREAS OF PUBLIC HEALTH KNOWLEDGE WILL BE DEMONSTRATED:
1. <u>Biostatistics</u> - collection, storage, retrieval, analysis and interpretation of health data; design and analysis of health-related surveys and experiments; and concepts and practice of statistical data analysis. X yes ___no (if yes, briefly describe): The NSFG will be analyzed to examine the relationship between repeated unintended pregnancies and current family planning practice. The analysis will be conducted using the SAS program.
2. <u>Epidemiology</u> - distributions and determinants of disease, disabilities and death in human populations; the characteristics and dynamics of human populations; and the natural history of disease and the biologic basis of health. _Xyes _no (if yes, briefly describe): By analyzing the data with logistic regression, the characteristics will be indentified of those likely to have repeated unintended pregnancies with less/ineffective use of family planning methods.
3. <u>Environmental Health Sciences</u> - environmental factors including biological, physical and chemical factors which affect the health of a community. ___yes Xno (if yes, briefly describe):
4. Health Services Administration – planning, organization, administration, management, evaluation and policy analysis of health programs. ___yes Xno (if yes, briefly describe):

5. Social/Behavioral Sciences – concepts and methods of social and behavioral sciences relevant to the identification and the solution of public health problems. ___yes X̲no (if yes, briefly describe):

SIGNATURE PAGE
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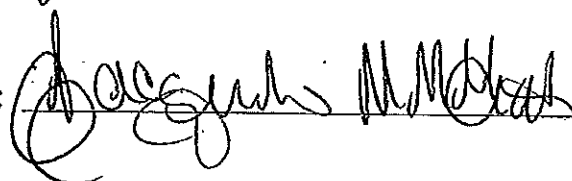
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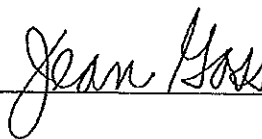
SIGNATURES:

Student: _____ Date: <u>6/5/09</u>

Preceptor: _____ Date: <u>6/5/09</u>

Faculty Advisor:_____ Date: <u>6/8/09</u>

MPH Program Director: _____ Date: <u>7/1/09</u>

MPH Program Coordinator: _____ Date: <u>7/1/09</u>

MPH Research Project Approval Form

The Relationship between Repeat Unintended Pregnancies and
Current Contraceptive Use
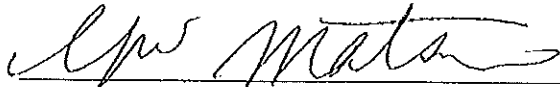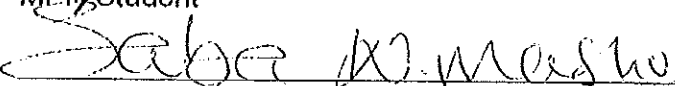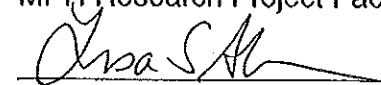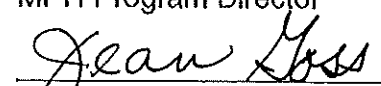
Submitted to the Graduate Faculty of the
Department of Epidemiology and Community Health
Virginia Commonwealth University

In partial fulfillment of the requirements for the degree of
Master of Public Health

by: Yui Matsuda

Comments:

Approval signatures:

MPH Student   Date

MPH Research Project Faculty Advisor   Date

MPH Program Director   Date

MPH Program Coordinator   Date

DEDICATION

To
my husband,

Saul Arnoldo Cornejo,

my best friend,
who has always supported me and stayed right beside me
with patience and encouragement.

But those who hope in the LORD
will renew their strength.
They will soar on wings like eagles;
they will run and not grow weary,
they will walk and not be faint. Isaiah 40:31, NIV

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Abstract

Nearly half of all pregnancies in the United States are unintended. In 2002, the direct medical costs of unintended pregnancies were estimated to be almost five billion dollars. Moreover, women with unintended pregnancies tend to delay seeking prenatal care and making the necessary life style changes for the fetus. Subsequently, unintended pregnancies have the potential to lead to low birth weight infants and potentially poorer long-term child development. Although there are negative consequences with unintended pregnancies, repeat unintended pregnancies impose even greater health risks for both mothers and infants. To prevent unintended and repeat unintended pregnancies, family planning methods must be utilized effectively. Despite the potential risk associated with negative health outcomes of mothers and infants, repeated unintended pregnancies have not been studied extensively. Therefore, the purpose of this study was to examine the relationship between the number of unintended pregnancies and effective use of family planning methods. A secondary analysis of The National Statistics of Family Growth, cycle 6 (2002) was done. The study showed a statistically significant association between the number of unintended pregnancies and effective contraceptive use after adjusting for confounders which include age, race, annual household income, marital status and types of insurance. The recommendations of this study include creating better strategies for family planning practices and improving contraceptive education and service delivery for those with higher risk.

Introduction

Nearly half of all pregnancies in the United States are unintended (Finer & Henshaw, 2006). The direct medical cost of unintended pregnancies was estimated to be nearly five billion dollars in 2002 (Trussell, 2007). Moreover, women with unintended pregnancies tend to delay seeking prenatal care as well as making the necessary life style changes appropriate for the fetus (Cheng, Schwartz, Douglas, & Horon, 2009). Subsequently, unintended pregnancies have the potential to lead to low-birth weight infants and potentially poorer long-term child development (Bhutta, Cleves, Casey, Cradock, & Anand, 2002). While there are already known negative consequences with unintended pregnancies, repeat unintended pregnancies impose an even greater health risk for mothers and their infants. The mothers' health risks include maternal death, poor mental health, intimate partner violence, and complications associated with unsafe abortions (Gipson, Koenig & Hindin, 2008). The health risks of infants include premature birth, low birth weight, neonatal death, morbidity and poor developmental outcome as they grow (Orr, Miller, James, & Babones, 2000; Besculides & Laraque, 2004; Gipson, Koenig & Hindin, 2008). Unfortunately, a history of unintended pregnancy has been found to be a predictor of subsequent unintended pregnancies (Kuroki, Allsworth, Redding, Blume, & Peipert, 2008).

There are limited studies that have examined repeat unintended pregnancies among adolescents or young women. The greatest predictor of repeat unintended pregnancies is low educational status followed by less effective contraceptive use (Bennett, Culhane, McCollum & Elo, 2006). Very young adolescents and women with unwanted early sexual experiences also have been found to have an increased risk of unintended "rapid repeat" pregnancy, which is defined as pregnancy within eighteen months of a previous pregnancy (Boardman, Allsworth, Phipps, & Lapane, 2006; Jocoby, Gorenflo, Black, Wunderlich, & Eyler, 1999).

A study by Matteson et al. (2006) showed that a history of unintended pregnancy was not associated with current usage of a contraceptive method, and those that reported unintended pregnancy tended to be minority, older, and have a lower education status. Another study found that unintended pregnancy occurred more frequently with women between the ages of 18 to 24, of low-income, cohabitating, and of minority status, particularly African American (Finer & Henshaw, 2006). As far as the characteristics of contraceptive users are concerned, women who use oral contraceptives (OC) were more likely to graduate at least from high school, to be white, and to have private insurance, compared to women with no contraceptive use (Krings, Matteson, Allsworth, Mathias, & Perpert, 2008). Other characteristics of women who are likely to use OC include having only one sexual partner or no new sexual partner within the last six months as compared to condom use or no contraceptive use (Krings et al., 2008). Having multiple partners was also associated with non-contraceptive users in another study (Raine, Minnis, & Padian, 2003). Moreover, those with multiple sex partners tend to use barrier methods more than hormonal methods if and when they used contraceptives (Raine et al., 2003).

It is also important to point out that 43% of unintended pregnancies result from inconsistent or incorrect use of contraceptives (Finer & Henshaw, 2006). Many reasons exist for why women use methods inconsistently or discontinue their use. The major obstacles include unrealistic perception of their pregnancy risk and an inability to negotiate contraceptive use with their partner (Kinsella, Crane, Ogden, & Stevens-Simon, 2007; Frost, Darroch & Remez, 2008), side effects, (Davidson et al., 1997; Ramstrom, Baron, Crane, & Shlay, 2002; Huber et al., 2006), and dissatisfaction with the current method (Frost, Singh & Finer, 2007; Frost & Darroch, 2008;Ramstrom, Baron, Crane, & Shlay, 2002). Therefore, it is important to consider the current

use of family planning methods as well as the consistency of their use as factors that determine the women's risk for repeat unintended pregnancy.

Even though studies exist in the literature about the predicting characteristics for family planning methods and the risk of repeat unintended pregnancy, there has been no study that has investigated the relationship between the number of unintended pregnancies and current contraceptive use. Therefore, the purpose of this study is to examine the relationship between the number of unintended pregnancies and current ineffective contraceptive use. It is important to acknowledge the relationship between repeat unintended pregnancies and family planning practices as well as identifying the characteristics of this high-risk population. Therefore, this study may guide health care practitioners and provide evidence to design targeted interventions, and thus approach this issue more effectively.

Method

The National Survey of Family Growth (NSFG) 2002, cycle 6 was used for this analysis. The NSFG is a cross-sectional study representing the household population of men and women between 15-44 years of age in the United States. The study surveyed a total population of 12,571; 4,928 men and 7,643 women respondents. Women who reported never having been sexually active (n=858) and those who had never been pregnant (n=1752) were excluded from the analysis. Overall, there were 2,993 women respondents analyzed in this study, which examined repeat unintended pregnancies and current contraceptive use among those women respondents.

The outcome variable, contraceptive methods used at the last intercourse, was categorized into 'effective use' or 'ineffective use'. The effective use of family planning methods

made up those that prevent unintended pregnancies over the duration of their appropriate application. They include oral contraceptives, injections, implants, Intrauterine Devices (IUDs), patches, and male or female sterilization. Methods of family planning such as male and female condom, withdrawal, natural family planning, diaphragm, spermicidal foam, jelly or cream, cervical cap, or other methods were categorized as ineffective contraceptives. Emergency contraceptives are also included in this category, because the nature of these types of contraceptives are not preventative, thus do not fit in the definition of the effective contraceptive methods, which prevents unintended pregnancies over more than one intercourse. The respondents who indicated no current contraceptive use, in addition to those with ineffective or non-preventative contraceptive use, were combined and composed a variable referred to as 'ineffective or non-preventative contraceptive use'. The exposure variable examined was 'repeat unintended pregnancies'. The intendedness of each pregnancy was asked from the respondents' first to the 19th pregnancies. The number of unintended pregnancies were summed and categorized into zero, one, two, three, four, and five or more unintended pregnancies.

Potential confounders examined included the numbers of age, race, ethnicity, annual household income, education completed, sexual partners in the past, marital status, and insurance status. These covariates were categorized in accordance to the literature. Each of the variables were coded with the following categories; age (16-19, 20-24, 25-29, 30-34, 35-39, or 40-44 years old), race (Caucasian, African American or other), ethnicity (Hispanic or non-Hispanic), annual household income (less than $9999, $10000-14999, $15000-24999, $25000-34999, 35000-44999, $50000-74999, and $75000 or up), education completed (less than 9th grade, completed high school, some college, or college or more), sexual partners in the past (1, 2-4, 5-9, 10-19, or 20 or more partners), marital status (cohabitating, married, or widowed, divorced, separated or

never been married) and types of insurance (private or public). Logistic regression analysis was conducted to estimate the odds of current effective contraceptive use. Potential confounders were retained in the model if there was a greater than ten percent change in the estimate. The final logistic regression model was built and ran to quantify the association between repeat unintended pregnancies and current contraceptive use while adjusted by the confounders. The data was analyzed with SAS 9.1 statistical software.

Results

The descriptions of the study population are shown in table 1. Among the respondents with ineffective contraceptive use, 67% were Caucasian. The respondents came from various income brackets, and each bracket contained 11-15% of the respondents. Age was fairly equally distributed (17-19%) among four year incremented categories, except for women ages 15-19 (10%) and 40-44 (14%). Forty-six percent were married women, 11% cohabitating and 42% divorced, separated, widowed or had never been married. Women with private insurance made up 74% of the ineffective contraceptive users, and the rest held public insurance. The distribution of the number of unintended pregnancies among ineffective contraceptive users were following; 32% had no unintended pregnancy; 35% had 1 unintended pregnancy, 17% had 2 unintended pregnancies, 9% had 3 unintended pregnancies, 3% each had four and five or more unintended pregnancies.

Table 2 shows the crude odds ratios (ORs) of the covariates by the outcome variable. Overall, women with more than one unintended pregnancy were less likely to use effective contraceptives. However, not all of the associations were statistically significant. Compared to women ages 25-29, women ages 15-19 were 57% more likely to use ineffective contraceptive

methods (OR 1.57, 95%CI 1.27-1.95). Similarly, compared to women ages 25-29, women ages

40-44 were 25% less likely to use ineffective contraceptive methods (OR 0.75, 95%CI 0.63-

0.89). Compared to those with an annual household income of $75,000 or more, those with less

than $9,999 were 70% more likely to use ineffective contraceptive methods (OR 1.7, 95%CI

1.39-2.09). Compared to the respondents with an annual household income of $75,000 or more,

those with $10,000-14,999 were 47% less likely to use effective contraceptives (OR 1.47, 1.2-

1.81). Compared to those with an annual household income of $75,000 or more, those with

$15,000-24,999 and $25,000-34,999 were each 29% less likely to use effective contraceptive

methods (OR 1.29, 95%CI 1.07-1.55). Finally, compared to those with an annual household

income of $75,000 or more, those with annual household income of $35,000-44,999 were 30%

less likely to use effective contraceptives (OR 1.3, 95%CI 1.08-1.56).

In regards to race, compared to Caucasians, African Americans were 62% more likely to

use ineffective contraceptive methods (OR 1.62, 1.43-1.84). In addition, compared to

Caucasians, other minorities were 53% were less likely to use effective contraceptive methods

(OR 1.84, 1.49-2.27). Compared to married respondents, divorced, widowed, or never been

married were 55% less likely to have effective contraceptive use (OR 0.45, 95%CI 0.4-0.5).

Finally, compared to women with private insurance, women with public insurance were 22% less

likely to use effective contraception (OR 1.35, 95%CI 1.19-1.48).

Table 3 demonstrates the crude and adjusted ORs of unintended pregnancies in

ineffective contraceptive use. The result of logistic regression analysis adjusted for the

confounders showed that there were some trends in an increase of ORs from one to five or more

unintended pregnancies. Compared to the women with no unintended pregnancy, women with

one and two unintended pregnancies were found to be significantly more likely to use ineffective

contraceptive methods, thus less likely to use effective contraceptives (OR 1.25, 95%CI 1.06-1.47; OR1.37, 95%CI 1.14-1.67). Compared to no unintended pregnancy, women with four unintended pregnancies were 75% less likely to use effective contraceptive methods (OR 1.75, 95%CI 1.22-2.5). Although four unintended pregnancies had significant OR for using effective contraceptives, five unintended pregnancies or more did not (OR 1.37, 95%CI 0.9-2.08).

Discussion

This study showed that there was an association between the increased number of unintended pregnancies and effective contraceptive use. However, significant relationships were only seen among one, two and four unintended pregnancies and not among three and five or more unintended pregnancies. Overall, previous studies have similar findings, except for one by Matteson et al. Previous studies examined unintended pregnancy as a yes or no variable. Matteson et al. found that a past unplanned pregnancy was not associated with the use of any contraceptive methods (2006). Their study, however, counted any methods of contraceptives as a positive exposure variable, even though some of the existing contraceptive methods were not necessarily very effective. Matteson et al. had a smaller sample size when compared to the other similar studies referenced in this paper; therefore, it may have been difficult to detect significant statistical differences (N=242 for no history of unplanned pregnancy, N=182 for history of unplanned pregnancy). Bennett et al. also stated that less effective contraceptive use had a significant relationship with repeat unintended pregnancies within eleven months of the last delivery as compared to highly effective contraceptive use (2006). Kuroki et al. (2008) showed that the history of an unintended pregnancy was significantly associated with unplanned pregnancy. Therefore, the current literature has demonstrated an increased risk of one unintended pregnancy leading to another unintended pregnancy.

Some confounders identified in this study were consistent with the previous studies, such as low income, minority status and younger age (Finer & Henshaw, 2006; Matteson et al., 2006). However, education completed was not identified as a determinant, which was inconsistent with the literature (Bennett et al., 2006). The reason could be that this was a cross-sectional study and each participant was asked about the wantedness of every pregnancy. Thus, depending on the age of the respondent and her pregnancy history, the respondent may have had to recall her pregnancies of several decades ago. Even though the survey asked about the history of the respondents' pregnancies, it only asked the respondent's current education completed. Therefore, a woman may have advanced her education after she became pregnant for the first time, for example, and her current educational status may not have reflected the educational status of each pregnancy that she was asked about. Due to the nature of the cross-sectional study, the existence of this highly predictable confounder is underestimated. The confounders found in this study could be used to further indentify the high risk population for health care providers and public health practitioners in allocating family planning resources such as education and counseling.

A strength of this study is the generalizability of the findings. The secondary analysis study uses the National Survey of Family Growth(NSFG), which is based on an independent, national probability sample of women ages 16-44 (Leplowski et al., 2006). Therefore, the finding of this study can be generalized to reproductive aged women in the United States. Additionally, the data provides a large sample size of 2993 for the analysis.

Despite the strengths of this study, there were some weaknesses that need to be mentioned. First, due to the cross-sectional nature of the study, causal relationships may not be established. In order to determine cause and effect relationships, longitudinal studies need to be examined. Recall bias may also be a problem in this study. Women may be answering questions

about previous pregnancies that occurred many years ago, and they may have forgotten the intendedness of the pregnancy (questions did not indicate the timing of those previous pregnancies.) In addition, respondents' characteristics were set by the survey administrators. Therefore, any characteristics that may be important, but were not included as survey questions, could not be analyzed in this study. For example, regarding insurance status, the survey only asked if the respondents had public and private insurance and disregarded the population without any insurance.

This study examined current effective family planning use and demonstrated a relationship with repeat unintended pregnancies. Future studies are needed to look into identifying factors influencing repeat unintended pregnancies derived from the non-dose response nature of the result that we found. One suggestion would be to compare women of all unintended pregnancies and all intended pregnancies with the same number of gravida to investigate the differences in their characteristics. In addition, it may be interesting to examine male characteristics in regards to contraceptive use and repeat unintended pregnancies, as it is well known that increasing understanding and involving men in the reproductive health arena increases contraceptive use and awareness of its use (Kraft et al., 2007). However, the nature of unintended pregnancies' disclosure to men being limited, the issue of how to ask the same question to women and men in order for the questions to be comparable between genders remains difficult.

Conclusion

This study proved the important relationship between repeat unintended pregnancies and effective family planning practices. This evidence alerts health care providers and public health

practitioners of the need to improve family planning service delivery and contraceptive information and resources. Unintended pregnancies are preventable through proper family planning practices. Therefore, sexually active partners, health care providers and public health practitioners should work together to identify ways to decrease unintended pregnancies.

Table 1 Characteristics of study population

Confounders	Ineffective contraceptive use		Effective contraceptive use	
	Number	%	Number	%
Age				
15-19	325	10.17	177	6.15
20-24	624	19.53	514	17.86
25-29	624	19.53	588	20.43
30-34	621	19.44	540	18.76
35-39	543	17	525	18.24
40-44	458	14.33	534	18.55
Race				
Caucasian	2126	66.65	2213	51
African American	801	25.11	514	17.87
Other	263	8.24	149	5.18
Income				
under $9999/year	368	12.29	248	9.09
$10000-14999/year	338	11.29	263	9.64
$15000-24999/year	446	14.89	397	14.55
$25000-34999/year	459	15.33	408	14.96
$35000-44999/year	440	14.69	389	14.26
$50000-74999/year	492	16.43	505	18.51
$75000 or more/year	452	15.09	518	18.99
Marital Status				
married	1477	46.23	1496	51.98
cohabitating	361	11.3	345	11.99
divorced, separated, widowed, or never been married	1357	42.47	1037	36.03
Insurance Status				
private insurance	2041	74.49	2089	82.28
public insurance	699	25.51	450	17.72

Table 2: Crude Odds ratio of the confound

Confounders	Crude OR	95%CI	
Age			
15-19	1.57	1.27	1.95
20-24	1.04	0.88	1.22
25-29	1		
30-34	0.9	0.77	1.06
35-39	0.86	0.73	1.02
40-44	0.75	0.63	0.89
Race			
Caucasian	1		
African American	1.62	1.43	1.84
Other	1.84	1.49	2.27
Income			
under $9999/year	1.7	1.39	2.09
$10000-14999/year	1.47	1.2	1.81
$15000-24999/year	1.29	1.07	1.55
$25000-34999/year	1.29	1.07	1.55
$35000-44999/year	1.3	1.08	1.56
$50000-74999/year	1.12	0.94	1.33
$75000 or more/year	1		
Marital Status			
married	1		
cohabitating	1.06	0.9	1.25
divorced, separated, widowed, or never been married	1.35	1.19	1.48
Insurance Status			
private insurance	1		
public insurance	1.59	1.39	1.82

Table 3: Crude and adjusted Odds ratio of the number of unintended pregnancies and ineffective contraceptive use

Number of unintended pregnancies	Ineffective contraceptive use		Effective contraceptive use		Crude OR 95% CI			Adjusted OR 95% CI		
	Number	%	Number	%						
0	775	32	656	30.4	1			1		
1	844	34.85	738	34.2	1.03	0.89	1.19	1.25	1.06	1.47
2	433	17.88	419	19.42	1.14	0.96	1.35	1.37	1.14	1.67
3	207	8.55	182	8.43	1.04	0.83	1.3	1.23	0.96	1.61
4	83	3.43	90	4.17	1.28	0.93	1.75	1.75	1.22	2.5
5 or more	80	3.3	73	3.38	1.08	0.77	1.52	1.37	0.9	2.08

The Relationship Between Repeat Unintended Pregnancies and Current Contraceptive Use

Yui Matsuda, RN, BSN, Saba Masho, MD, MPH, DrPH, and Jacqueline M. McGrath PhD, RN, FNAP, FAAN

Department of Epidemiology and Community Health, School of Nursing, Virginia Commonwealth University, Richmond, Virginia

Introduction

- Nearly half of all pregnancies in the United States are unintended.
- The direct medical cost of unintended pregnancies has been estimated to be nearly five billion dollars in 2002.
- Unintended pregnancy has various negative consequences. When REPEATED, its negative effects are even worse;
  - Mothers' health risks
    - maternal death, poor mental health, intimate partner violence, and so on
  - Infant's health risks
    - premature birth, low birth weight, neonatal death, morbidity and poor developmental outcome
- There are limited studies that have examined repeat unintended pregnancies among young women or adolescents

Study Purpose

To examine the relationship between the number of unintended pregnancies and current contraceptive use.

- N=2,993

Methods

- The 2002 National Survey of Family Growth (NSFG) was analyzed.

Study Inclusion Criteria:
- Women 16-44 years old and living in households in the U.S.
- N=2,993

Definitions:
- Outcome -ineffective contraceptive use including: current less effective /non-preventative /no contraceptive use
  - less effective methods (male and female condom, withdrawal, natural family planning, diaphragm, spermicidal foam, jelly or cream, cervical cap or other method);
  - non-preventative method, (emergency contraception) or no contraception
  - effective contraceptive use (oral contraceptives, injections, implants, IUD, patch, and male or female sterilization.)
- Exposure -unintended pregnancy
  - zero/one/two/three/four/five or more

Covariates:
- Age
- Race
- Marital status
- Insurance
- Ethnicity
- Income
- Education
- Number of past sexual partners

Analysis

- Logistic regression analysis was conducted to determine the association between unintended pregnancies and current contraceptive use.
- Potential confounders were retained in the model if there was a greater than 10% change in the estimate. Analysis was performed using SAS 9.1 statistical software.

Results

Table 1: Count and row percents and crude odds ratio

Confounders	Ineffective contraceptive use Number	%	Effective contraceptive use Number	%	Crude OR	95%CI	
Age							
15-19	325	10.17	177	6.15	1.57	1.27	1.95
20-24	624	19.53	514	17.86	1.04	0.88	1.22
25-29	624	19.53	588	20.43	1		
30-34	621	19.44	540	18.76	0.9	0.77	1.06
35-39	543	17	525	18.24	0.86	0.73	1.02
40-44	458	14.33	534	18.55	0.75	0.63	0.89
Race							
Caucasian	2126	66.65	2213	51	1		
African American	801	25.11	514	17.87	1.62	1.43	1.84
Other	263	8.24	149	5.18	1.84	1.49	2.27
Income							
under $9999/year	368	12.29	248	9.09	1.7	1.39	2.09
$10000-14999/year	338	11.29	263	9.64	1.47	1.2	1.81
$15000-24999/year	446	14.89	397	14.55	1.29	1.07	1.55
$25000-34999/year	459	15.33	408	14.96	1.29	1.07	1.55
$35000-44999/year	440	14.69	389	14.26	1.3	1.08	1.56
$50000-74999/year	492	16.43	505	18.51	1.12	0.94	1.33
$75000 or more/year	452	15.09	518	18.99	1		
Marital Status							
married	1477	46.23	1496	51.98	1		
cohabitating	361	11.3	345	11.99	1.06	0.9	1.25
divorced, separated, widowed, or never been married	1357	42.47	1037	36.03	1.35	1.19	1.48
Insurance Status							
private insurance	2041	74.49	2089	82.28	1		
public insurance	699	25.51	450	17.72	1.59	1.39	1.82

Table 2: Crude and adjusted OR of the number of unintended pregnancies and Ineffective contraceptive use

Number of unintended pregnancies	Ineffective contraceptive use Number	%	Effective contraceptive use Number	%	Crude OR	95% CI		Adjusted OR	95% CI	
0	775	32	656	30.4	1			1		
1	844	34.85	738	34.2	1.03	0.89	1.19	1.25	1.06	1.47
2	433	17.88	419	19.42	1.14	0.96	1.35	1.37	1.14	1.67
3	207	8.55	182	8.43	1.04	0.83	1.3	1.23	0.96	1.61
4	83	3.43	90	4.17	1.28	0.93	1.75	1.75	1.22	2.5
5 or more	80	3.3	73	3.38	1.08	0.77	1.52	1.37	0.9	2.08

Results (text)

- Compared to women with intended pregnancies, women with unintended pregnancies were less likely to use effective contraceptive methods.
- The association between ineffective contraceptive use and unintended pregnancies are significant among women with one, two, and four unintended pregnancies.
- Those with younger age, minority race, lower income, divorced, separated, widowed and never been married, or public insurance had significantly higher odds of using less effective/non-preventative/no contraceptive methods.

Discussion

- Previous literature have inconsistent findings: a smaller study showed no significant relationship between history of repeat unintended pregnancies and contraceptive use of any method. However, two other studies reported significant relationships between unintended pregnancies and contraceptive use. History of unintended pregnancies in all three studies are yes/no variable.
- Unintended pregnancies are preventable through proper family planning practices. Therefore, sexually active partners, health care providers and public health practitioners should work together to identify ways to decrease unintended pregnancies.

Strength
- The study sample size is large and representative of women in their reproductive age in the United States. Thus, the finding is generalizable to a broad population of women in the United States.
- The study builds the science by showing that there is a relationship between repeat unintended pregnancies and ineffective contraceptive use.

Limitations
- This is a cross-sectional study, therefore cause and effect relationship cannot be proved.
- Recall bias may be present regarding the unintendedness of previous pregnancies and thus, underestimate the true effect.

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References

Besculides, M. & Laraque, F. (2004). Unintended pregnancy among the urban poor. *Journal of Urban Health, 81,* 340-348.

Bennett, I.M., Culhane, J.F., McCollum, K.F. & Elo, I.T. (2006). Unintended rapid repeat pregnancy and low education status: Any role for depression and contraceptive use? *American Journal of Obstetrics & Gynecology, 194,* 749-54.

Bhutta, A.T., Cleves, M.A., Casey, P.H., Cradock, M.M., Anand, K.J. (2002). Cognitive and behavioral outcomes of school-aged children who were born preterm: a meta-analysis. *JAMA,14*;288(6):728-37.

Boardman, L.A., Allsworth, J., Phipps, M.G., Lapane, K.L. (2006). Risk factors for unintended versus intended rapid repeat pregnancies among adolescents. *Journal of Adolescent Health, 39,* 597.e1-597.e8

Cheng, D. Schwarz E.B., Douglas, E., & Horon, I. (2009). Unintended pregnancy and associated maternal preconception, prenatal and postpartum behaviors. *Contraception,79*(3):194-8.

Davidson, A.R., Kalmuss, D., Cushman, L.F., Romero, D., Heartwell, S., & Rulin, M. (1997). Injectable contraceptive discontinuation and subsequent unintended pregnancy among low-income women. *American Journal of Public Health, 87*(9), 1532-4.

Finer, L.B. & Henshaw, S.K. (2006). Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. *Perspective in Sex and Reproductive Health, 38*(2), 90-96.

Frost, J.J., & Darroch, J.E. (2008). Factors associated with contraceptive choice and inconsistent method use, United States, 2004. *Perspective in Sex and Reproductive Health, 40*(2), 94-104.

Frost, J.J., Darroch, J.E., & Remez, L. (2008). Improving contraceptive use in the United States. *Issues Brief (Alan Guttmacher Institute), (1),* 1-8.

Frost, J.J., Singh, S., & Finer, L.B. (2007). Factors associated with contraceptive use and nonuse, United States, 2004. *Perspective in Sex and Reproductive Health, 39*(2), 90-9.

Gipson, J.D., Koenig, M.A., & Hindin, M.J. (2008). The effects of unintended pregnancy on infant, child and parental health: A review of the literature. *Studies in Family Planning, 39*(1), 18-38.

Huber, L.R., Hogue, C.J., Stein, A.D., Drews, C., Zieman, M., King, J., & Schayes, S. (2006). Contraceptive use and discontinuation: findings from the contraceptive history, initiation, and choice study. *American Journal of Obstetrics & Gynecology,194*(5), 1290-5.

Jocoby, M., Gorenflo, D., Black, E., Wunderlich, C., Eyler, E. (1999). Rapid repeat pregnancy and experiences of interpersonal violence among low-income adolescents. *American Journal of Preventive Medicine, 16*(4), 318-321.

Kinsella, E.O., Crane, L.A., Ogden, L.G. & Stevens-Simon, C. (2007). Characteristics of adolescent women who stop using contraception after use at first sexual intercourse. *Journal of Adolescent Gynecology, 20*(2), 73-81.

Kraft, J.M., Harvey, S.M., Thorburn, S., Henderson, J.T., Posner, S.F., Galavotti, C. (2007). *Women's Health Issues, 17,* 52-60.

Krings, K.M., Matteson, K.A., Allsworth, J.E., Mathias, E., & Perpert, J.F. (2008). Contraceptive choice:how do oral contraceptive users differ from condom users and women who use no contraception? *American Journal of Obstetrics & Gynecology,198*(5),e46-e47.

Kuroki, L.M., Allsworth, J.E., Redding, C.A., Blume, J.D., & Peipert, J.F. (2008). Is a previous unplanned pregnancy a risk factor for a subsequent unplanned pregnancy? *American Journal of Obstetrics & Gynecology, 199*:517.e.1-517.e.7.

Lepkowski, J.M., Mosher, W.D., Davis, K.E., Groves, R.M., Hoewyk, J.V., & Willem, J. (2006). National Survey of Family Growth, Cycle 6: sample design, weighting, imputation, and variance estimation." *Vital and health statistics. Series 2, Data evaluation and methods research, 142,* 1-82.

Matteson, K.A., Peipert, J.F., Allsworth, J.E., Phipps, M.G., & Redding, C.A. (2006). Unplannded pregnancy: Does past experience influence the use of a contraceptive method? *Obstetrics &Gynecology, 107*(1), 121-127.

Orr, S.T., Miller, C.A., James, S.A., & Babones, S. (2000). Unintended pregnancy and preterm birth. *Paediatric and Perinatal Epidemiology, 14,* 309-313.

Raine, T., Minnis, A.M., & Padian, N.S. (2003). Determinants of contraceptive method among young women at risk for unintended pregnancy and sexually transmitted infections. *Contraception, 68*(1), 19-25.

Ramstrom, K.C., Baron, A.E., Crane, L.A., & Shlay, J.C. (2002). Predictors of contraceptive discontinuation in a sexually transmitted disease clnic population. *Perspective of Sex and Reproductive Health, 34*(3), 146-52.

Trussell, J. (2007). The cost of unintended pregnancy in the United States. *Contraception, 75*(3), 168-170.