

THE ASSOCIATION BETWEEN NATIVITY STATUS AND CURRENT USE OF
CONTRACEPTION AND USE OF FAMILY PLANNING SERVICES ANALYSIS
USING THE NATIONAL SURVEY OF FAMILY GROWTH (NSFG) 2013-2015
DATA

by

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A thesis submitted to the faculty of
The University of North Carolina at Charlotte
in Partial Fulfillment of the requirements
for the degree of Master of
Public Health

Charlotte

2017

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ABSTRACT

FARIDA NELLY YADA. The association between nativity status and current use of contraception and use of family planning services analysis using the national survey of family growth (NSFG) 2013-2015 data. (Under the direction of DR. LARISSA R. BRUNNER HUBER)

In 2014, it was estimated that 49% or nearly half of all U.S. pregnancies were unintended. The reproductive experiences of women aged 15-44 vary greatly and are often affected by various demographic characteristics such as age, race, religion, and income. There are approximately 580,000 new immigrants in the U.S. yearly, and more than half of them are females. The purpose of this study was to assess the association between nativity status (i.e., U.S. born or not) and the current use of contraception, and the use of family planning services in the last 12 months among women ages 18-40 in the U.S. interviewed for the latest National Survey of Family Growth (NSFG).

This was a cross-sectional secondary data analysis of the 2013-2015 NSFG (n=3,635 for the current contraceptive use outcome and n=4,072 for the use of family planning services outcome). The NSFG is a periodic survey conducted by the Centers for Disease Control and Prevention (CDC) that collects data on family growth. Data were collected via in person interviews. Multivariate logistic regression was used to calculate odds ratios (ORs) and 95% confidence intervals (CIs) of the exposure-outcome associations while controlling for confounders.

Nearly 82% of the study participants reported currently using some form of contraception while 18% reported having used family planning services in the last 12 months. After adjusting for age, race/ethnicity, primary language, income, marital status, insurance status, and religion there was no association between nativity status and current use of contraception (OR= 1.01; 95% CI: 0.66-1.55). After adjusting for age, race/ethnicity, primary language, income, marital status, insurance status, and age at first intercourse, women born outside of the U.S. had nearly 30% decreased odds of using family planning services in the last 12 months; however, this finding was not statistically significant (OR= 0.68; 95% CI: 0.43-1.09). Based on the study findings, nativity status does not appear to affect a woman's ability to use contraception. However, nativity status is related to the use of family planning services. Although not statistically significant, there is a suggestion that foreign-born women are less likely to use these services. Further studies that examine the exposure in greater detail and provide a more comprehensive understanding of U.S. women's use of family planning services are needed.

ACKNOWLEDGEMENTS

First and foremost I would like to thank God Almighty for giving me the strength, unfailing love, countless blessings, and opportunity to undertake this degree and research study. I would like to express my sincere gratitude to my academic advisor and thesis chair, Dr. Larissa Huber, who despite busy schedule spent all those hours reviewing my work. Dr. Huber has had the greatest influence on me since I have started this program and she always encouraged me to be confident in my work. I am also grateful to Dr. Sharon Portwood and Dr. Pilar Zuber for being there for me throughout the past two years and for taking the time to serve on my thesis committee. Their useful suggestions greatly helped me improve my writing and presentation skills. I would also like to acknowledge, Dr. Michael Moore for his technical assistance with this project. Finally, I would like to thank the wonderful persons who supported me unconditionally throughout this process.

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CHAPTER 1: INTRODUCTION

It is estimated that 225 million women in developing countries wish to delay or to stop having children, but do not have any access to contraception or family planning services (World Health Organization, [WHO], 2015). Family planning services include contraceptive options, pregnancy testing, counseling, basic infertility aids, preconception health assistance, and sexually transmitted disease prevention (Chandra et al., 2004; Chandra et al., 2004; Gavin et al., 2014). Family planning and contraception reduce unintended/unwanted pregnancies, as well as the need for abortions, since families can attain their desired number of children with adequate spacing. Decreasing unintended pregnancies and increasing the length of time between pregnancies, can help reduce maternal and infant morbidity and mortality (Tsui, McDonald-Mosley, & Burke, 2010).

The use of contraceptives and family planning services has remained stagnant in various parts of the world such as Asia and Latin America, and it is even lower in Sub-Saharan Africa. At the global level, the use of contraceptives and family planning services has slightly increased from 54% in 1990 to 57% in 2014. Although there has not been much increase in the use of family planning services in Asia and Latin America and the Caribbean, the percentages are fairly high (61% in Asia and 67% in Latin America and the Caribbean). However, in Africa, the percentages remain low at 27.6% (WHO, 2015).

There are approximately half a million immigrants and 80,000 refugees from around the world, who come to the U.S. yearly for various reasons (Centers for Disease

Control & Prevention [CDC], 2014). There is a need to refer foreign-born (i.e., immigrants or individuals who were not born in the U.S.) women of reproductive age to culturally and linguistically competent health care providers in order to provide them with care and to meet their family planning needs.

The U.S. still faces challenges when it comes to providing improved reproductive health services to the general population. In 2014, it was estimated that nearly half of all pregnancies were unintended (Gavin, 2014). In the U.S., the reproductive experiences of women ages 15-44 vary greatly and are often affected by demographic characteristics, such as place of birth, education, origin/race, and religion. Social factors, such as attitudes and beliefs towards family planning, are also predictors of reproductive methods and experiences (Chandra et al., 2004). In 2002, the percentage of women ages 15-44 who received at least one family planning or medical service from a medical care provider in the last 12 months was 72.7% (CDC, 2015).

Although numerous studies report the use of family planning services by women in the U.S., there is a lack of extensive literature on the use and unmet family planning needs of immigrant women living in the U.S. Using data from the National Survey of Family Growth (NSFG), this study aimed to provide statistical evidence that there are associations between nativity status (i.e., place of birth defined as being born in the U.S. or not and referred to as nativity status from here on out) and the current use of contraception and family planning services.

CHAPTER 2: LITERATURE REVIEW

2.1 Immigration in the U.S.

In 2000, 28.4 million foreign-born persons were living in the U.S. and accounted for 10.4% percent of the total population (Carasquillo & Pati, 2004). Immigrants may experience different health problems than their U.S.-born counterparts (CDC, 2014). The number of immigrants in the U.S. rose to 42.4 million in 2014. The majority (59%) of these 42 million immigrants entered the U.S. before 2000, 29% entered between 2000 and 2009, and the remaining 12% entered in 2010 or later. In 2014, approximately 47% of immigrants (20 million) were naturalized U.S. citizens. The remaining 53% (22.4 million) included lawful permanent residents, unauthorized immigrants, and legal residents on temporary visas, including students and temporary workers (Migration Policy Institute [MPI], 2016).

2.2 Racial/ethnic Composition of the U.S. Immigrant Population

In 2014, 48% of the foreign-born population reported their race as white, 26% as Asian, 9% as black, and 15% as some other race; more than 2% reported having two or more races. Approximately 46% of immigrants (19.4 million people) reported having Hispanic or Latino origins (MPI, 2016).

2.3 Gender and Age Composition of the U.S. Immigrant Population

In 2014, approximately 51% of immigrants were female. This percentage has remained relatively unchanged since 1980, when women comprised 53% of the immigrant population. Overall, the immigrant population in 2014 was older than the U.S.-born population. The median age of immigrants was 43.5 years, compared to 35.9

years for the native born. Fewer than 1% of the foreign-born were under age 5, compared to 7% for the U.S. born. For the oldest age group (65 years and older), there was no meaningful difference between immigrants and U.S. born (14% vs. 15%) (MPI, 2016).

2.4 Family Planning in the U.S.

2.4.1 *Overview of Contraceptive Prevalence in the U.S.*

Family planning services include receiving any of the following from a doctor, nurse, or other health care provider: a birth control method or prescription for a method; a checkup or medical test related to using a particular birth control method; counseling about birth control methods; emergency contraception or a prescription or counseling for it; or sterilizing operations or counseling about getting sterilized. In the U.S., women usually receive their family planning services from a private doctor, a health maintenance organization, or a clinic (Chandra et al., 2004).

Prior to 2002, comparable population-based estimates for contraceptive use were not available for all 50 states in the U.S. Thus, in 2002, the Behavioral Risk Factor Surveillance System (BRFSS) collected data from all states to provide population-based estimates of current contraceptive use for the first time. These data were compared to the data that the NSFG produced that same year. In the U.S., the NSFG is the standard source of national-level information on contraceptive use. The results of this comparison revealed that compared to the NSFG sample, the BRFSS sample included women with higher levels of education (>12 years 28.5% vs. 25.6%) and lower levels of household income, (25.8% vs. 30.6% with an income of <\$25,00) (Santelli et al., 2008).

Santelli et al., (2008) found that the percentage of women who reported the use of any method of contraception was 61.8% in the BRFSS and 63.1% in the NSFG. While a number of methods of contraception had different percentages of women reporting use between the BRFSS and NSFG, most of these differences tended to be minimal (e.g. vasectomy: 7.7% vs. 6.3%; male condom: 9.4% vs. 11.8%; the oral contraceptive pill: 21.9% vs. 19.6%; periodic abstinence or rhythm: 1.5% vs. 1.0%; the diaphragm: 0.5% vs. 0.2%; and withdrawal: 0.3% vs. 2.7%). There were no statistically significant differences in the percentage of women reporting use of female sterilization, injectables, intrauterine devices (IUD), implants, and foam/jellies/creams/suppositories. Reasons for nonuse of contraception were also addressed in both surveys, with women reporting the following as reasons for nonuse: hysterectomy (6.1% vs. 4.6%), currently pregnant (5.1% vs. 4.6%), and seeking pregnancy (4.0% vs. 4.5%).

2.4.2 Overview of the Use of Family Planning Services in the U.S

More than 20 million women receive family planning services yearly from a medical provider, and 24% of them receive that care from publicly funded family planning clinics (Frost, 2004). In addition to contraceptive methods, most clinics provide STD testing, Pap tests, breast and pelvic exams, and preconception counseling (Frost, 2004). Funding for clinic providers varies widely depending on local government and financial crises; however, the two primary federal programs that support family planning services are Medicaid and Title X of the Public Health Service Act. Medicaid is a federal-state health insurance program for low-income citizens (The Centers for Medicare & Medicaid Services, 2016). Title X is the only federal grant program that is dedicated

solely to providing recipients with comprehensive family planning and related health services (U.S. Department of Health & Human Services [U.S. DHHS], 2016.)

In a study of trends in U.S. women's use of sexual and reproductive health care services, Frost (2008) applied NSFG data to U.S. Census Bureau data to estimate that approximately 45.4 out of 61 million U.S. women had received at least one sexual or reproductive health care service in the last 12 months. The percentage of women who reported receiving one or more contraceptive services from a medical provider rose significantly, from 35.7% in 1995, to 41.4% in 2002.

In 2002, 76% of respondents who reported receipt of any sexual or reproductive health service received their care primarily from a private doctor; 20.1% received care from publicly funded clinics; and 3.9% received care from hospitals or other providers. For contraceptive services, 71.8% visited private providers, 24.8% visited publicly funded clinics, and 3.4% visited hospitals or other providers. For routine care, such as Pap tests or pelvic exams, 80.9% visited private doctors and 16.8% sought services at publicly funded clinics (Frost, 2008). The lack of control for potential confounding variables, such as patient needs, was a major limitation of this study.

2.5 International Perspectives on Family Planning

A variety of social determinants of health affect the use of family planning services. For example, faith and religion have been found to play a role in reproductive health seeking behaviors among immigrant women living in Europe. A study of 10 Muslim women of Turkish origin living in the Netherlands revealed that antenatal screening was not considered necessary because termination was not an option, even if

the child was discovered to have abnormalities (Gitsels van-der-Wal et al., 2014). The researchers also found that the participants in their study were unaware that Islamic traditions do allow for termination if a fetus has serious abnormalities, leading the researchers to recommend that public health counselors and health care providers be aware of the role of religious beliefs in family planning service-seeking behaviors. A notable limitation of this study was the small and selective sample size, thus reducing the generalizability of the findings.

In an international study focusing on the unmet family planning needs of postpartum women, Cleland et al., (2015) found that 44% percent of childhood deaths were neonatal (within the first 4 weeks after birth) deaths, and that prematurity was the most common cause (WHO, 2006). An analysis of Demographic Health Survey data for 52 different countries demonstrated that inadequate spacing between births increased the risk of adverse health outcomes and death for both mothers and children. However unmet family planning needs for postpartum women are hard to assess and cannot be compared to the unmet needs of women in other categories since postpartum women are usually classified based on their previous reproductive preferences (Cleland et al., 2015).

Cleland et al., (2015) also found that women in certain parts of Africa and Asia listed breastfeeding, amenorrhea, and the wait for return of periods as reasons not to use family planning methods. For example, the researchers interviewed 33 women in Ouagadougou, Burkina Faso and discovered that even though amenorrhea was not thought to be valid protection against pregnancy, one-third of respondents considered lack of menses as an important factor for not initiating a family planning method. The

researchers also observed a correlation between fears of side effects on contraception and religious reservations in women in Nigeria, Kenya, Guyana, and Zimbabwe (Cleland et al., 2015). A limitation of this study was that the researchers did not assess whether demand existed for early postpartum family planning services.

Another group with unmet contraceptive needs is Haitian immigrants and Haitian-American women. In a cross-sectional study of acculturation and reproductive health among Haitian and Haitian-American women in South Florida, Cyrus et al., (2015) used secondary data from 57 women ages 18-51 years who had been interviewed for another study. The acculturation measures used were residency, language, and country of birth. The results indicated that 82% of the respondents were born in Haiti; 58% resided in the U.S. for 10 years or less; and 75.4% primarily spoke Créole at home.

Approximately 51% of the women had health insurance, and the most commonly used contraceptive methods were male condoms (78.9%) and oral contraceptives (OCs) (19.3%). Women who did not speak primarily Créole at home were more likely to use OCs (42.9 % vs. 11.9%; $p=.01$). Additionally, women who had resided in the U.S. for more than 10 years were more likely to use OCs, (22.2% vs. 16.7%; $p=.64$). Health insurance coverage was higher among those who had resided in the U.S. for 10 or more years (66.7 % vs. 33.7%; $p=.02$) or who were not born in Haiti (80.0% vs. 44.7%; $p=.05$). Although this study provided important information, the small sample size and the narrow geographic scope limits the generalizability of the findings. Also, it is important to note that the main focus of the original study was not to investigate acculturation.

2.6 Immigrants and General Health Care in the U.S.

Approximately half of all recently arrived immigrants lack health insurance, and they are twice as likely as the U.S.-born population to lack a usual source of care. Among the general population, health insurance and having a usual source of care have been shown to be two of the strongest predictors of receiving preventative healthcare, such as cancer-screening services. In their study of a nationally representative sample, Carasquillo & Pati (2004) examined the role that having health insurance and a usual source of care play on immigrant women's utilization of Pap smear and mammography services. They conducted telephone interviews between April and November 2001, using The Commonwealth Fund's Health Care Quality Survey. Their sample was 6,722 adults aged 18 or older living in the U.S. who spoke English, Spanish, Mandarin, Cantonese, Vietnamese or Korean. Respondents born outside of the U.S. were considered immigrants.

Compared to U.S. born women, recent immigrant respondents had a lower prevalence of having a Pap smear (73% vs. 89%) or mammogram (78% vs. 89%) in the previous two years. Compared to U.S.-born women, recent immigrants (living in the U.S. for < 10years) were also younger; less educated, had lower incomes, and were more likely to be married. Recent immigrants were more likely to report that their health was less than excellent or very good but less likely to report having any disease or chronic condition. Among long-tenure immigrants (i.e., living in the U.S. for >10 years), 83% had a Pap smear versus 89% of U.S.-born women. For mammography, 89% of both long-tenure immigrants and U.S.-born women reported having a mammogram. Although this

study used a representative sample of immigrant women in the U.S. to examine the relationship between insurance status, having a usual source of care, and preventative healthcare services, it did not specifically examine contraception and family planning services. More in-depth research is needed to evaluate immigrant women's use of family planning services, as well as factors affecting their access to such services.

In a cross-sectional study of 200 people in Missouri, Gonzalez et al., (2010) investigated the relationship between patriarchal attitudes and the use of contraception and family planning services among recent Hispanic immigrants. This sample was comprised of 100 women and 100 men who were living in the U.S. for five years or less; 83% were from Mexico. The majority of men (85%) and women (89%) were less than 35 years old. Only 9% had more than 12 years of education. Fifty-three percent of the women reported having a job and sixty-one percent reported having used some form of birth control in the last six months. Marital status had an influence on reproductive choices; 53% of respondents were married or cohabiting with at least two to three children, while 11% were married without children. Most married and cohabiting participants (62%, 54 men and 71 women) thought that it was important to go with their partner to receive family planning services. A major limitation to this study was that generalizability is limited due to the fact that the sample size was small, selective, and obtained only from Missouri.

2.7 Concluding Remarks

There is limited literature on U.S. immigrants' use of and access to reproductive health and family planning services. The existing literature does suggest that issues in this

group vary with respect to demographic factors such as tenure in the U.S., language, marital status, health insurance status, preconceived notions, race/ethnicity, religion, age, education, income, and type of provider (private or public) (Carasquillo & Pati, 2004; Cyrus et al., 2015; Frost, 2004; Gitsels van-der-Wal et al., 2014).

However, a shortcoming of the existing literature was that many studies lacked generalizability due to small sample sizes and limited geographic locations (Carasquillo & Pati, 2004; Cyrus et al., 2015 Gitsels van-der-Wal et al., 2014; Gonzalez et al., 2010). Also, these studies rarely controlled for potential confounders (Frost, 2008). Accordingly, further research is needed to investigate the use of family planning services in U.S. women while focusing on immigrant women. In response to that need, this study aimed to determine if the use of these services differs by nativity status.

CHAPTER 3: HYPOTHESES

The purpose of this study was to assess the association between nativity status and the current use of contraception and family planning services among women in the U.S. interviewed for the National Survey of Family Growth (NSFG) with a focus on foreign-born women. The specific hypotheses addressed were:

- 1) Foreign-born women living in the U.S. have decreased odds of currently using contraception compared to their U.S.-born counterparts.
- 2) Foreign-born women living in the U.S. have decreased odds of having used family planning services in the past 12 months compared to their U.S.-born counterparts.

CHAPTER 4: METHODS

4.1 Study Design and Population

This study was a secondary data analysis of National Survey of Family Growth (NSFG) data. The NSFG is jointly planned and funded by the CDC's National Center for Health Statistics (NCHS) (Chandra et al., 2004), and conducted by the U.S. Department of Health and Human Services. The first NSFG surveys were conducted in periodic cycles starting in 1973. In 2006, the NSFG shifted from a periodic survey to continuous interviewing with interviews conducted during 48 weeks of every 4 years. The NSFG collects data on factors affecting the formation, growth and dissolution of families, including marriage, divorce and cohabitation, contraception, sterilization, infertility, pregnancy outcomes, and births (U.S. DHHS, 2016).

The NSFG was first designed to survey a nationally representative sample of women ages 15-44; in 2002, it was extended to include men as well. The latest NSFG data (2013-2015) consist of a national probability sample of women and men ages 15-44 living in households in the U.S. All individuals between the ages of 15-44 who spoke either English or Spanish were eligible to participate in the survey. Institutionalized individuals, including people living in prisons, juvenile facilities, homes for the intellectually disabled, and long-term psychiatric hospitals, and on military bases, were excluded from the survey (CDC, 2014; Groves et al., 2009).

Fieldwork for the 2013-2015 NSFG was conducted from September, 2013, through September, 2015, based on a survey protocol and informed consent procedures

approved by the NCHS Research Ethics Review Board. The sample for this study was obtained through a series of five stages, starting with the selection of primary sampling units (PSUs). PSUs are metropolitan statistical areas, such as counties or groups of counties. The second stage consisted of the selection of secondary sampling units (SSUs) selected within PSUs. The third stage was the selection of housing units from geographically sorted lists of housing units, beginning from a random starting point. Interviewers then contacted the housing units to determine if any members were eligible to participate in the NSFG. The fourth stage of selection involved selecting one eligible individual from households with eligible persons. As with the 2011-2013 NSFG, the 2013-2015 NSFG used a follow-up sampling approach in the fifth stage. Each quarter, a subsample of active cases was selected for continued follow-up. This procedure was designed to reduce non-response (American Association for Public Opinion Research [AAPOR], 2015).

After the NSFG staff selected sample respondents based on screening interviews in selected households, female interviewers trained specifically for the NSFG survey conducted in-person interviews. The interviewers asked the questions using laptops and then entered the responses directly on their laptop (a procedure called computer-assisted personal interviewing [CAPI]). The respondents used self-administered Audio Computer-Assisted Self-Interview (ACASI) to answer the more sensitive questions privately by directly entering their responses into the computer without the assistance of the interviewer. Parental permission and minor assent were obtained for all minor respondents ages 15-17. The interviews for female respondents averaged 74 minutes in length, and the interviews for male respondents were an average of 51 minutes long. An

incentive of \$40 was offered for participation (AAPOR, 2015).

A total of 10,205 interviews were conducted and the participants included 5,699 women and 4,506 men. The overall response rate was 69.3%. Women had a response rate of 71.2% and men had a response rate of 67.1% (AAPOR, 2015). The reproductive age ranges for women are 15-44 years and 20-59 years for adult women (WHO, 2017). The present analysis included only those women ages 18-40 participating in the 2013-2015 NSFG survey who were not pregnant, who reported being heterosexually active, and for whom complete data on their place of birth and use of contraception and family planning services in the last 12 months were available.

4.2 Exposure Assessment

The main exposure in this study was nativity status. The exposure was assessed through the question: “Were you born outside of the U.S.?” Responses for the question were either “yes” or “no.” Women who responded “yes” were considered exposed and women who responded “no” were considered unexposed.

4.3 Outcome Assessment

The first outcome variable of this study was contraceptive use. During the interview, women were asked about their current use of contraception. Women who indicated that they currently used a method of contraception were considered to have the outcome. The second outcome variable was the use of family planning services. The NSFG staff created a variable based on women’s responses to other questions that represented women’s use of family planning services such as, pregnancy, abortion, Pap smears, pelvic exams, postpartum visits, and prenatal or STD services in the past 12 months. Women who indicated they utilized family planning services in the last 12

months were considered to have the outcome.

4.4 Covariate Assessment

Based on past literature, variables that may be related to both the exposure and the outcomes, and that were not on the causal pathway, were considered potential confounders. These confounders included demographic factors such as primary language, race/ethnicity, religion, age, marital status, education, income, health insurance status, age at first heterosexual intercourse, number of pregnancies, and formal sex education before the age of 18 (Carasquillo & Pati, 2004; Frost, 2004; Frost, 2008). These variables were self-reported during the interview, and all referent groups were based on categories used in prior studies (Cyrus et al., 2015; Gonzalez et al., 2009).

4.5 Data Analysis

4.5.1 Univariate Analysis

Summary statistics were obtained to describe the demographics of the study population. Specifically, frequencies and percentages were calculated.

4.5.2 Bivariate Analysis

Logistic regression was used to calculate unadjusted odds ratios and 95% confidence intervals to obtain the crude association between nativity status and the current use of contraception and family planning services. In addition, other factors associated with use of contraception and family planning services were identified.

4.5.3 Multivariate Analysis

Multivariate logistic regression was used to obtain adjusted odds ratios and 95% confidence intervals for the association between nativity and the current use of contraception and family planning services while controlling for potential confounders

(Table 3). A variable was considered to be confounder of the exposure-outcome association if it changed the odds ratio estimate by at least 10% (Maldonado & Greenland, 1993). All analyses were conducted using SAS-Callable SUDAAN to account for the NSFG's complex sampling design (Lepowski et al., 2010).

4.6 Sample Size and Power

Setting the ratio of unexposed (i.e., U.S. born women) to exposed (i.e., women who were born outside of the U.S.) at approximately 4.7:1, the frequency of current contraception use among the unexposed at 89%, the smallest detectable odds ratio for the nativity-current contraception use association was approximately 1.42. Assuming the same settings and with the frequency of family planning services use among the unexposed at 85%, the smallest detectable odds ratio for the nativity-family planning services use association was 1.35.

4.7 Human Subjects Protection

This was a secondary data analysis. Individuals voluntarily agreed to participate in the NSFG and no contact was made with the original survey participants. The Office of Research Compliance at the University of North Carolina Charlotte determined that the present study did not constitute human subjects research therefore did not require IRB approval.

4.8 Permission to Access Data

NSFG data are available to the public. Researchers obtained the questionnaires, datasets, and codebooks for download from the Centers for Disease Control and Prevention website: (https://www.cdc.gov/nchs/nsfg/nsfg_2013_2015_puf.htm).

CHAPTER 5: RESULTS

5.1 Univariate Results

5.1.1 Current Contraception Use

A total of 5,699 women participated in the 2013-2015 NSFG. Women were excluded from the nativity-current contraceptive use analysis if they were not between the ages of 18 and 40 years old ($n=1,256$), if they never had intercourse ($n=335$), if they were pregnant or trying to become pregnant ($n=437$), and if they refused to answer or did not know whether or not they were born in the U.S. ($n=1$), their religion ($n=12$), their insurance status ($n=20$), or whether or not they had received formal sex education before the age of 18 ($n=3$). Thus, there were 3,635 women available for analysis.

Approximately 32.25% ($n=1,169$) of the women were between the ages of 18-25, 22.32% ($n= 864$) were between the ages of 26-30, 18.35% ($n=683$) were between the ages of 31-34 and 27.12% ($n=919$) were between the ages 35-40 (Table 1). More than half of the women were non-Hispanic White ($n= 1,659$, 55%), followed by Hispanic women ($n= 875$, 20.73%), non-Hispanic Black women ($n= 743$, 13.79%) and women of other/mixed races/ethnicities ($n= 358$, 10.48%). Most women were highly educated ($n= 1,150$, 37.92% with a college degree or above, $n= 988$, 25.91% some college, $n= 884$, 22.46% high school graduate, and $n= 613$, 13.71% less than a high school education). English was the primary language spoken at home by approximately 89% ($n= 3,181$) of the women. Nearly 8% ($n=351$) of the women spoke Spanish at home and 3.30% ($n= 103$) primarily spoke another language at home.

Most women were married (n= 1,134, 39.19%), while 35.11% (n= 1,507) had never been married, 17.97% (n= 621) were cohabiting with a partner of the opposite sex, and 7.73% (n= 373) were divorced, separated, or widowed. Most of the women had no live births (n= 1,581, 45.63%). The majority of women were born in the U.S. (n= 2,972, 82.44%) while 17.56% (n= 663) were foreign-born. In regards to current contraceptive use, 81.78% (n= 2,860) of women were users and 18.22% (n= 775) of women were non-users.

5.1.2 Family Planning Use in the Last 12 Months

Women were excluded if they were not between the ages of 18 and 40 years old (n=1,256), if they never had intercourse (n=335), and if they refused to answer or did not know whether or not they were born in the U.S. (n=1), their religion (n=12), their insurance status (n=20), or whether or not they had received formal sex education before the age of 18 (n=3). Therefore, 4,072 women were included in the nativity-family planning services use analysis.

Nearly 32% (n= 1,302) of the women were between the ages of 18-25, 22.90% (n= 982) were between the ages of 26-30, 19.05% (n= 790) were between the ages of 31-34 and 26.51% (n= 997) were between the ages 35-40 (Table 4). The majority of women were non-Hispanic White (n= 1,849, 55.29%). About 20% (n= 982) of women indicated they were Hispanic, 13.72% (n= 836) were non-Hispanic Black and 10.56% (n= 405) women were of other/mixed races/ethnicities. Most women were highly educated (n= 1,286, 38.74% with a college degree or above, and n= 1,095, 25.52% with some college). Approximately 89% (n= 3,562) of the women spoke primarily English at home. Nearly

4% (n=123) of the women primarily spoke another language at home and 7.47% (n= 387) spoke Spanish.

Most women were married (n= 1,353, 41.78%), followed by the 35.49% (n= 1,598) who were never married, 18.60% (n= 732) who were cohabiting with a partner of the opposite sex, and 7.12% (n= 389) who were divorced, separated, or widowed. Close to half of the women had no live births (n= 1,763, 45.35%). Most women were born in the U.S. (n= 3,328, 82.60%) whereas 17.40% (n= 744) were foreign-born. Approximately 18% (n= 895) of women reported family planning use in the last 12 months while 81.62% (n= 3,177) did not.

5.2 Bivariate Results

5.2.1 Current Contraception Use

Women between the ages of 31-34 had 1.58 times the odds of currently using contraception as compared to women aged 18-25 years old (Table 2), and this result was statistically significant (95% CI: 1.17-2.15). While women in the other age groups also had increased odds of current contraception use, none of these findings were statistically significant (26-30 years: OR= 1.21; 95% CI: 0.88-1.66 and 35-40 years: OR= 1.16; 95% CI: 0.88-1.55). Non-Hispanic Black women had 57% decreased odds of currently using contraception as compared to non-Hispanic White women and this result was statistically significant (OR= 0.43; 95% CI: 0.34-0.55). Hispanic women and women of other/mixed races both had nearly 25% decreased odds of currently using contraception as compared to non-Hispanic White women, however, these results were not statistically significant (OR=0.76, 95% CI: 0.57-1.01 and OR=0.75, 95% CI: 0.51-1.10, respectively).

Women whose primary language spoken at home was Spanish also had 34% decreased odds of being current contraceptive users as compared to women whose primary language at home was English and this finding was also statistically significant (OR= 0.66; 95% CI: 0.49-0.90). Women who primarily spoke a language other than English or Spanish at home had 0.75 times the odds of currently using contraception as compared to women who spoke English (95% CI: 0.40-1.38).

Women with lower levels of education had decreased odds of currently using contraception as compared to women with a college degree or above (less than high school: OR=0.80; 95% CI: 0.56-1.15, high school diploma: OR= 0.85; 95% CI: 0.62-1.16, and some college: OR= 0.71; 95% CI: 0.52-0.98). A dose-response relationship was observed between income and current use of contraception. Compared to women who had annual incomes of \$45,000, as household income decreased so did the odds of currently using contraception (<\$19,999: OR= 0.53; 95% CI: 0.40-0.90 and \$20,000-44,999: OR= 0.72; 95% CI: 0.54-0.96).

Women who were divorced, separated, or widowed and women who were never married had statistically significant decreased odds of currently using contraception as compared to married women (divorced, separated, widowed: OR= 0.32; 95% CI: 0.19-0.52 and never married: OR=0.24; 95% CI: 0.18-0.31). However, there was no association between cohabiting and current contraceptive use (OR= 1.03; 95% CI: 0.65-1.62). In comparison to women who had no live births, the odds of currently using contraception increased as parity increased (one birth: OR=1.35; 95% CI: 1.02-1.79, two births: OR= 2.07; 95% CI: 1.61-2.65, and three or more births: OR= 2.20; 95% CI: 1.56-3.12). Women who had health insurance had 35% decreased odds (OR= 0.65; 95% CI:

0.47-0.89) of currently using contraception as compared to women who were uninsured and this finding was statistically significant. With regards to the main exposure, women who were born outside of the U.S. had 13% decreased odds of currently using contraception as compared to their U.S.-born counterparts, however, this result was not statistically significant (OR= 0.87; 95% CI: 0.66-1.15).

5.2.2 Family Planning Use in the Last 12 Months

Women who were older had statistically significant decreased odds of having used family planning services in the past 12 months compared to women in the youngest age category of 18-25 years (35-40 years: OR= 0.44; 95% CI: 0.32-0.60, 31-34 years: OR= 0.59; 95% CI: 0.44-0.80, and 26-30 years: OR= 0.73; 95% CI: 0.53-0.99) (Table 5). Women who were Hispanic, non-Hispanic Black, or of other/mixed race/ethnicity all had statistically significant increased odds of having used family planning services in the last 12 months as compared to non-Hispanic White women (Hispanic: OR= 3.36; 95% CI: 2.43-4.66, non-Hispanic Black: OR= 2.62; 95% CI: 1.88-3.6 and other/mixed race: OR= 2.30; 95% CI: 1.54-3.45).

Women whose primary language spoken at home was Spanish had a three-fold increased odds of having used family planning services in the last 12 months as compared to women whose primary language at home was English and this finding was statistically significant (OR=3.09, 95% CI: 2.29-4.17). Women who primarily spoke a language other than English or Spanish at home had 1.12 times the odds of currently using contraception as compared to women who spoke English (95% CI: 0.54-2.30).

Women with lower levels of education had increased odds of having used family planning services in the last 12 months as compared to women with a college degree or

above, and all of these findings were statistically significant (less than high school: OR=3.61; 95% CI: 2.29-5.69, high school diploma: OR= 2.65; 95% CI: 1.76-3.99, and some college: OR= 1.52; 95% CI: 1.10-2.12). Lower income levels were also associated with increased odds of having used family planning services in the last 12 months (\leq \$19,999: OR= 4.90; 95% CI: 3.60-6.66 and \$20,000-44,999: OR= 3.41; 95% CI: 2.55-4.56). Women who were cohabiting, divorced, separated, or widowed, and women who were never married had statistically significant increased odds of having used family planning services in the last 12 months compared to married women (cohabiting: OR= 2.70; 95% CI: 2.06-3.54; divorced, separated, widowed: OR= 1.67; 95% CI 1.11-2.50; and never married: OR=2.43; 95% CI: 1.82-3.24).

Women who had health insurance had increased odds of having used family planning services in the last 12 months as compared to women who were uninsured and this finding was statistically significant (OR=2.17; 95% CI: 1.66-2.84). Women who had initiated sexual intercourse at or after the age of 18 had 29% decreased odds of having used family planning services in the last 12 months as compared to women who had initiated sexual intercourse before the age of 18 and this finding was also statistically significant (OR= 0.71; 95% CI: 0.55-0.90). Concerning the main exposure, women who were born outside of the U.S. had nearly twice the odds of having used family planning services in the last 12 months as compared to their U.S.-born counterparts and this finding was statistically significant (OR=1.97, 95% CI: 1.36-2.85).

5.3 Multivariate Results

After adjusting for age, race/ethnicity, primary language, income, marital status, insurance status, and religion, there was no association between nativity status and

current use of contraception (OR= 1.01; 95% CI: 0.66-1.55) (Table 3). With regards to the family planning services use outcome, after adjusting for age, race/ethnicity, primary language, income, marital status, insurance status, and age at first intercourse, the association between nativity status and family planning services use in the last 12 months reversed direction and did not remain statistically significant. Specifically, women who were born outside of the U.S. had 32% decreased odds of having used family planning services in the last 12 months as compared to their U.S. born counterparts (OR= 0.68; 95% CI: 0.43-1.09) (Table 6).

CHAPTER 6: DISCUSSION

6.1 Summary of Main Findings

In this population-based study of women residing in the U.S., there was no association between nativity status and current use of contraception after adjustment for confounders. After adjustment for confounders, foreign-born women had approximately 30% decreased odds of using family planning services in the last 12 months; however, this finding was not statistically significant.

In this nationally representative sample of adult women living in the U.S., the prevalence of currently using some form of contraception was nearly 82%, a rate 19% higher than found in previous literature using NSFG data (Santelli et al., 2008). The higher rate observed in the present study might be due to the use of the most recent NSFG data while the previous study used 2002 NSFG data. Another plausible explanation for the increase in contraception use from 2002 to the present could be the introduction of the Affordable Care Act (A.C.A) in 2010. The A.C.A. increased women's insurance coverage as well as access to family planning and contraceptive services (August et al., 2016).

The prevalence of having used family planning services in the last 12 months in the study population was approximately 18%. In comparison, Frost's (2008) study that used 1995-2002 NSFG data found that 35.7% of women had received one or more family planning services in 1995, and that rate rose to 41.4% in 2002. The difference in the prevalence of family planning use between the current study and the study by Frost could

be due to the changed timeframe and wider age inclusions (i.e., 18-44). Studies examining the association between nativity status and the use of contraception and family planning services are sparse. Thus to put the current findings in context, studies that investigated issues like acculturation and reproductive health were used. In a cross-sectional study of acculturation and reproductive health among Haitian and Haitian-American women, Cyrus et al., (2015) found that women of Haitian origin who had resided in the U.S. for more than ten years were more likely to use oral contraceptives compared to women who had resided in the U.S. for less than 5 years. In contrast, the present study found no association between nativity status and contraception use. This discrepancy may be due to the fact that the previous study only examined 57 women of Haitian origin while the current study had a much larger and racially/ ethnically diverse population.

In a similar study, Carasquillo & Pati (2004) found that compared to women who were born in the U.S., foreign-born women who had been living in the U.S. for ten years had higher prevalences of having Pap smears and mammograms than women who had resided in the U.S. for five years or less. The current study did not find a positive association between nativity status and the use of family planning services; however, the current study considered the use of family planning services in general (e.g. contraceptive options, pregnancy testing, counseling, basic infertility aids, preconception health assistance, and sexually transmitted disease testing and prevention). This difference in the definition of family planning could partially explain the inconsistent findings.

6.2 Strengths and Limitations

6.2.1 Nondifferential Misclassification

This secondary data analysis was limited by the questions asked in the NSFG interview. Nondifferential misclassification of the outcome is possible since some women may have found it difficult to recall if they used family planning services over the last 12 months. Likewise, women may have reported current contraceptive use or receiving care to appear socially acceptable. Nondifferential misclassification of the exposure is also possible. Women might not have wanted to truthfully disclose whether they were a U.S. native or were foreign born. Furthermore, nativity status may have not been sufficient to completely capture accurate exposure information in this study; while data on nativity status were available, information on the participants' countries of origin was not collected. Foreign-born participants from developing countries, where access to family planning is limited, are likely to be different from foreign-born women from developed countries. Another notable limiting factor was that data on the length of U.S. residence in years for the foreign-born women in this study was also unavailable. After residing in the U.S. for at least ten years, a person is considered a long-tenure immigrant and the role of acculturation on family planning behaviors is more observable (Cyrus et al., 2015). If nondifferential misclassification of the exposure or outcomes occurred, the study results would likely be biased towards the null.

6.2.2 Bias

There was a potential for recall bias in this study if women who were born outside of the U.S. overreported current utilization of contraception and family planning services. Though this scenario was unlikely given that participants were told that the NSFG is

about marriage, divorce, family life, having children and health care, overreporting of current contraceptive use and of family planning services use could result in an overestimation of the association between nativity status and the current use of contraception and family planning services.

Selection bias could occur if participation in this survey was related to both the exposure and outcome. Women who chose to participate in the NSFG are likely to be different than those who did not. For example, NSFG researchers have noted that response rates for women are highest for Non-Hispanic Black and Hispanic women (AAPOR, 2015). Non-Hispanic White women and women of all other races actually have the lowest response rates. Furthermore, it is possible that NSFG participants are likely to have higher education levels, which could lead to higher knowledge of contraception and other family planning services than the general population. If participation was somehow related to both the exposure and the outcomes, the results may have been biased away from the null. Interviewer bias is unlikely to have occurred since the interviewers went through extensive training and followed a prepared script to ask questions and specific instructions on how to enter answers into their computers.

6.2.3 Confounding

Confounders related to both the exposure and the current use of contraception outcome in this study are age, race/ethnicity, primary language, income, marital status, insurance status, and religion. For the nativity status and use of family planning services association, age, race/ethnicity, primary language, income, marital status, insurance status, and age at first sexual intercourse were considered to be confounders. There is a possibility that there are other known or unknown potential confounding factors not

collected during the NSFG interview. One such variable is primary care practices (Frost, 2008). Foreign women may have different primary care practices than do U.S.-born women, and these practices may, in turn, influence their use of contraception and family planning services. Failure to control for known or unknown confounders could result in an over-or underestimation of the true association.

6.2.4 Strengths

Very few studies have examined how nativity status is related to contraception and family planning use. Of the studies conducted, most have lacked generalizability due to small sample sizes and limited geographic locations, and have had insufficient control for confounders (Carasquillo & Pati, 2004; Cyrus et al., 2015; Gitsels van-der-Wal et al., 2014; Gonzalez et al., 2010). This analysis used NSFG data, which is the standard source of information on contraceptive use and use of family planning services (Santelli et al., 2008). The NSFG interviewers collect information on numerous reproductive health topics. As a result, it was possible to control for a number of potentially important confounding factors including age at first sexual intercourse and receipt of formal sexual education before the age of 18 in this study. The complex sampling design adopted by the NSFG is designed to produce national data, not estimates for individual states (U.S. DHHS, 2016). Additionally, the overall female response rate of 71.2% for the 2013-2015 NSFG, minimizes concern for selection bias. Therefore, the findings can be generalized to sexually active women in the U.S. ages 18-40.

6.3 Implications and Future Research

Findings on the association between nativity status and the current use of contraception, and the use of family planning services may help public health officials

and health care providers to better plan interventions to address contraception and family planning needs of women in the U. S. While the present study's findings suggest that women are able to obtain contraception, regardless of nativity status, foreign-born women did have decreased odds of using family planning services compared to U.S. born women. Therefore, public health and medical professionals may need to design interventions that focus on advertising to families the various family planning services available and their benefits. These kinds of interventions may help to educate families on the subject of family planning, which could eventually lead to an overall decrease of unintended pregnancies in the U.S.

Further research in larger populations is needed to confirm the present findings. In particular, the exposure should consider participants' length of residence in the U.S., and country of origin in order to have a more comprehensive understanding of the association between nativity status and the use of family planning services. When considering contraceptive use and family planning, future studies should further investigate the types of contraceptive methods used by women, the kind of providers from whom they obtain family planning advice and prescriptions, and how these factors affect their use of contraception and other family planning services. Another potentially important factor to investigate is employment status and its correlation to contraception and family planning use. In a study of prevalence and determinants of contraception use among 16,616 married women in Bangladesh, employed women (67%) had higher prevalence of using contraceptives compared to unemployed women (Islam et al., 2016).

A comparative study would be helpful, especially to assess dissimilarities in use of family planning services including contraception between U.S. immigrants from

different countries (United Nations, 2015). Comparing trends in the use of family planning services in different countries could lead to more refined studies assessing more specific exposures based on observations from various cultural practices. A better understanding of the association between nativity status and the use of contraception and family planning services may help to improve the reproductive health of all women as well as reduce the number of unintended pregnancies in the U.S.

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APPENDIX: TABLES

Table 1. Characteristics of sample of women in study of nativity status and current use of contraception, 2013-2015 NSFG

Variables	Number N	Weighted Percent (%)
Age (years)		
18-25	1,169	32.25
26-30	864	22.32
31-34	683	18.35
35-40	919	27.12
Race/ethnicity		
Hispanic	875	20.73
Non-Hispanic White	1,659	55.00
Non-Hispanic Black	743	13.79
Other/mixed	358	10.48
Primary Language		
English	3,181	88.99
Spanish	351	7.72
Other	103	3.30
Education		
Less than High School graduate	613	13.71
High School graduate	884	22.46
Some college	988	25.91
College graduate or above	1,150	37.92
Income		
<\$19,999	1,218	26.27
\$20,000-49,999	1,170	30.78
\$≥45,000	1,247	42.95
Marital status		
Married	1,134	39.19
Cohabiting	621	17.97
Divorced/Separated/Widowed	373	7.73
Never Married	1,507	35.11
Parity		
0	1,581	45.63
1	845	22.68
2	751	19.82
≥3	458	11.87
Insurance Status		
Insured	1,042	25.54
Uninsured	2,593	74.46
Place of Birth		
Born in the U.S	2,972	82.44
Born outside of the U.S	663	17.56

Table 1. Continued

Religion		
Catholic	1,103	30.26
Protestant	1,799	48.21
Other	286	9.01
No religion	447	12.51
Current Contraceptive Use		
Yes	2,860	81.78
No	775	18.22
Family Planning Use in the Last 12 Months		
Yes	786	18.13
No	2,849	81.87
Age at First Intercourse		
<18	2,319	62.61
≥18	1,316	37.41
Formal Sex Education before Age 18		
Yes	772	22.15
No	2,863	77.85

Table 2. Unadjusted odds ratios and 95% confidence intervals for the association between demographics and nativity status and the current use of contraception, 2013-2015 NSFG

	OR	95% CI
Variables		
Age (years)		
18-25	1.00	Referent
26-30	1.21	[0.88-1.66]
31-34	1.58	[1.17-2.15]
35-40	1.15	[0.87-1.53]
Race/ethnicity		
Non-Hispanic White	1.00	Referent
Non-Hispanic Black	0.43	[0.34-0.55]
Hispanic	0.76	[0.57-1.01]
Other/mixed	0.75	[0.51-1.10]
Primary Language		
English	1.00	Referent
Spanish	0.66	[0.49-0.90]
Other	0.75	[0.40 -1.38]
Education		
Less than High School graduate	0.80	[0.56-1.15]
High School graduate	0.85	[0.62-1.16]
Some college	0.71	[0.52-0.98]
College graduate or above	1.00	Referent
Income		
<\$19,999	0.53	[0.40-0.69]
\$20,000-44,999	0.72	[0.54-0.96]
≥\$45,000	1.00	Referent
Marital status		
Married	1.00	Referent
Cohabiting	1.03	[0.65-1.62]
Divorced/Separated/Widowed	0.32	[0.19-0.52]
Never Married	0.24	[0.18-0.31]
Parity		
0	1.00	Referent
1	1.35	[1.02-1.79]
2	2.07	[1.61-2.65]
≥3	2.20	[1.56-3.12]
Insurance Status		
Insured	0.65	[0.47-0.89]
Uninsured	1.00	Referent

Table 2. Continued

Place of Birth

Born in the U.S.	1.00	Referent
Born outside of the U.S.	0.87	[0.66-1.15]

Religion

Catholic	1.16	[0.88-1.52]
Protestant	1.00	Referent
Other	0.65	[0.42-1.01]
No religion	0.99	[0.70-1.39]

Age at First Intercourse

<18	1.00	Referent
≥18	0.71	[0.53-0.94]

Formal Sex Education before Age 18

Yes	0.97	[0.75-1.27]
No	0.67	[0.43-1.04]

Table 3. Adjusted odds ratios and 95% confidence intervals for the association between nativity status and the current use of contraception, 2013-2015 NSFG

Variables	*OR	95% CI
Place of Birth		
U.S.	1.00	Referent
Outside of the U.S	1.01	[0.66-1.55]

Model adjusted for age, race/ethnicity, primary language, income, marital status, insurance status and religion

Table 4. Characteristics of sample of women in study of nativity status and use of family planning services, 2013-2015 NSFG

Variables	Number N	Weighted Percent (%)
Age (years)		
18-25	1,303	31.54
26-30	982	22.90
31-34	790	19.05
35-40	997	26.51
Race/ethnicity		
Hispanic	982	20.43
Non-Hispanic White	1,849	55.29
Non-Hispanic Black	836	13.72
Other/mixed	405	10.56
Primary Language		
English	3,562	88.99
Spanish	387	7.47
Other	123	3.53
Education		
Less than High School graduate	692	13.28
High School graduate	999	22.46
Some college	1,095	25.52
College graduate or above	1,286	38.74
Income		
<\$19,999	1,357	25.54
\$20,000-49,999	1,302	30.57
≥\$45,000	1,413	43.89
Marital status		
Married	1,353	41.78
Cohabiting	732	18.60
Divorced/Separated/Widowed	389	7.12
Never Married	1,598	35.49
Parity		
0	1,763	45.35
1	1,009	24.51
2	811	18.94
≥3	489	11.20
Insurance Status		
Insured	1,172	25.71
Uninsured	2,900	74.29
Place of Birth		
Born in the U.S	3,328	82.60
Born outside of the U.S	744	17.40

Table 4. Continued

Religion		
Catholic	1,240	30.56
Protestant	2,017	48.09
Other	325	8.98
No religion	490	12.36
Family Planning Use in the Last 12 Months		
Yes	895	18.38
No	3,177	81.62
Age at First Intercourse		
<18	2,589	62.29
≥18	1,483	37.71
Formal Sex Education before Age 18		
Yes	846	21.23
No	3,226	78.77

Table 5. Unadjusted odds ratios and 95% confidence intervals for the association between demographic and lifestyle characteristics and use of family planning services, 2013-2015 NSFG

	OR	95% CI
Variables		
Age (years)		
18-25	1.00	Referent
26-30	0.73	[0.53-0.99]
31-34	0.59	[0.44-0.80]
35-40	0.44	[0.32-0.60]
Race/ethnicity		
Non-Hispanic White	1.00	Referent
Non-Hispanic Black	2.62	[1.88-3.66]
Hispanic	3.36	[2.43-4.66]
Other/mixed	2.30	[1.54-3.45]
Primary Language		
English	1.00	Referent
Spanish	3.09	[2.29-4.17]
Other	1.12	[0.54-2.30]
Education		
Less than High School graduate	3.61	[2.29-5.69]
High School graduate	2.65	[1.76-3.99]
Some college	1.52	[1.10-2.12]
College graduate or above	1.00	Referent
Income		
<\$19,999	4.90	[3.60-6.66]
\$20,000-44,999	3.41	[2.55-4.56]
≥\$45,000	1.00	Referent
Marital status		
Married	1.00	Referent
Cohabiting	2.70	[2.06-3.54]
Divorced/Separated/Widowed	1.67	[1.11-2.50]
Never Married	2.43	[1.82-3.24]
Parity		
0	1.00	Referent
1	1.20	[0.91-1.59]
2	0.84	[0.61-1.17]
≥3	0.99	[0.65-1.50]
Insurance Status		
Insured	2.17	[1.66-2.84]
Uninsured	1.00	Referent

Table 5. Continued

Place of Birth		
Born in the U.S.	1.00	Referent
Born outside of the U.S.	1.97	[1.36-2.85]
Religion		
Catholic	1.32	[0.95-1.84]
Protestant	1.00	Referent
Other	0.86	[0.53-1.39]
No religion	1.36	[0.98-1.88]
Age at First Intercourse		
<18	1.00	Referent
≥18	0.71	[0.55-0.90]
Formal Sex Education before Age 18		
Yes	1.38	[1.04-1.83]
No	2.22	[1.56-3.17]

Table 6. Adjusted odds ratios and 95% confidence intervals for the association between nativity status and use of family planning services, 2013-2015 NSFG

Variables	*OR	95% CI
Place of Birth		
U.S.	1.00	Referent
Outside of the U.S	0.68	[0.43-1.09]

Model adjusted for age, race/ethnicity, primary language, income, marital status, insurance status and age at first intercourse