UNIVERSITY OF CALIFORNIA

Los Angeles

Obesity and Contraception

A dissertation submitted in partial satisfaction of the requirements

for the degree Doctor of Philosophy in

Public Health

by

Lauren Norris Lessard

2014

ABSTRACT OF THE DISSERTATION

Obesity and Contraception

by

Lauren Norris Lessard

Doctor of Philosophy in Public Health

University of California, Los Angeles, 2014

Professor Anne R. Pebley, Chair

Preventing unplanned pregnancies for women who are obese is especially important given the likelihood of co-morbidities that endanger both the woman and fetus. Given that the most effective contraception methods are available only by prescription, necessitating interaction with providers, this study addresses the following questions: Does obesity impact contraception use and women's choice in contraception type? If so, is there a possibility that health care provider bias toward obese individuals contributes to this impact?

This sequential mixed methods study leveraged quantitative analysis to inform qualitative interviews with family medicine physicians. Regression analysis was conducted using the National Surveys of Family Growth (NSFG), Cycle 2006-2010. The analytic sample (n=5,600+) controlled for individual and socioeconomic factors including poverty, race, education and access to health care. Qualitative, structured interviews were conducted with family medicine residents employed by an accredited California family medicine residency program.

The findings demonstrate that sexually active women with a BMI over 35 (obese class II) are 49% less likely to use contraception than women with a BMI below 25 (p-value <.05.) Recent access to

reproductive health care did not significantly improve rates of contraception. Women in obese class II who had a recent pelvic exam and/or family planning counseling remain 44% less likely to use contraception (p-value= .000). The findings also demonstrate that obesity is not a significant predictor of using a method prescribed or administered by a physician. Obese women are just as sexually active, as likely to access reproductive health care and – when prescribed – often use the most efficacious method of reversible contraception than other women.

These findings imply that continuing to focus intervention efforts primarily on access to reproductive health care for this population may not deliver desired outcomes. The interviews explored the context in which obese patients receive care to highlight and examine important nuances specific to this population. Physicians cited patient concern about contraceptive side effects, provider bias and time and/or resources constraints as contributing to lower rates of use. When asked for suggestions, the majority of physicians recommended invoking a policy to ask all patients of reproductive age about family planning goals. Other common suggestions addressed time constraints, inadequate equipment and additional education for physicians regarding obesity specific reproductive health.

The dissertation of Lauren Norris Lessard is approved.

Jessica Gipson

Ondine S. Von Ehrenstein

Aurora Jackson

Anne R. Pebley, Committee Chair

University of California, Los Angeles

2014

DEDICATION

I humbly dedicate this dissertation to the village that supported me during the long journey of graduate study:

To my husband, Eli, who despite the demands of his medical career, claims that mine is more important and envisioned this achievement long before I would dare. It's through his support, confidence and humor that this, and all other hurdles, seem surmountable.

To our son, Zack, who reminds me daily to not miss the forest for the trees and for whom I pledge a career working towards a healthier, happier and more inclusive society.

To my dad, Bob Norris, without whom I can confidently say I may have slipped into the comfortable abyss of the "PhD student ABD" status for several years and the only other person, besides my committee, who enthusiastically read this entire body of work. I'm forever grateful for his insight, humor and support over the last thirty years and – if I'm half as thoughtful and dedicated to learning as he is – I will consider myself a great scholar and success.

To my mom, Pam Norris, who consistently picked up all the pieces of my life when I had to isolate myself to complete components of this degree. It is because of her that I can say that motherhood, a career and a doctorate are not mutually exclusive goals.

To my friends and family, who endured countless happy hours and dinner parties listening to my rants about the disparities of unintended pregnancies in underserved populations and upon whom I honed my arguments why all funding in maternal and child health should start with family planning. Each was gracious and encouraged me to translate research into salient, practical and useful knowledge for real women to use in the real world.

To Ana Tapia, who assisted me on this research and contributed so much to the field of Public Health in such a short time. Her tragic loss the week before this dissertation was approved has inspired me to channel her dedication and passion for improving the health of society's underserved people. May her legacy live on as we advance the science to which she dedicated her life.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

The following tables of quantitative results are located in chapter 4.

ACKNOWLEDGEMENTS

This dissertation represents far more than the culmination of years of study by the author. The rigor of this work reflects the generous contributions of many brilliant and inspiring people to whom I will be eternally grateful:

To my advisor Anne R. Pebley, PhD, a gracious leader in public health who demonstrates – through her own research and support of students – that rigorous scholarship is necessary to enact social change and, as such, scholars have a responsibility to use the privileges of academia to imagine and create a healthier environment for underserved populations.

To my committee members Jessica Gipson, PhD, Aurora Jackson, PhD and Ondine von Erhenstein, PhD for sharing their expertise, providing thoughtful and thorough critique of my work, and dedicating their time and attention during busy semesters.

To my professors within the UCLA Fielding School of Public Health, Department of Community Health Sciences for demonstrating by example and through challenging coursework how to think critically and analytically. To my professors and graduate student cohort at UC Berkeley in the Department of Public Health- Maternal and Child Health, for instilling in me the commitment to ensuring every woman chooses if and when she wants a child, regardless of her race/ethnicity, poverty status, body size and country of origin.

To my mentor, Diana Ramos, MD MPH- Director of Reproductive Health, Los Angeles County Department of Public Health- for planting the seed of this research topic and encouraging me to follow her lead and bridge the public health and medical fields.

Doctoral Funding

UCLA Graduate Research Mentorship Fellowship, June 2013-May 2014
UCLA Child and Family Health Training Fellowship, September 2011-June 2013
Health Resources and Service Administration (HRSA) Scholarship, September 2011-June 2012
UCLA School of Public Health, Department of Community Health Sciences Funding, September 2011-June 2013

VITA

Lauren Norris Lessard

Education

MPH, University of California, Berkeley, 2011
Maternal and Child Care, School of Public Health

BA, University of California, Santa Cruz, 2005
Political Science, Legal Studies

Professional Positions

Post Graduate Research Fellow, August 2013 – present
Central Valley Health Policy Institute, Fresno State University, Fresno, CA
Reproductive Health Consultant, January 2012- August 2014
Los Angeles County Department of Public Health and First 5 Los Angeles, Los Angeles, CA
Project Manager, AskCHIS Community Workshops, June 2011 – June 2013
UCLA Center for Health Policy Research Los Angeles, CA
Staff Research Associate, November 2008- November 2010
The Mind Your Heart Study, San Francisco, CA
University of California, San Francisco (UCSF)/San Francisco Veterans Medical Center (SFVAMC)
Graduate Student Intern, May 2010- August 2010
Department of Reproductive Health
Los Angeles County Department of Public Health (LAC-DPH), Los Angeles, CA
US Peace Corps Representative, May 2007-August 2008
Pan American Health Organization (PAHO) Paramaribo, Suriname
Development Coordinator, June 2006-April 2007
Planned Parenthood Mar Monte (PPMM) Santa Cruz, CA
Congressional Aide, January 2004-July 2004, January 2005-June 2006
Congressman Sam Farr, 17th Congressional District, CA

Awards

2011 Fellowship: UCB School of Public Health, Center for Health Leadership
2011 UCB Patricia H. Woods Scholarship
2011 UCB School of Public Health Diversity Scholarship
2010 UCB Max Factor Family Fund Scholarship for Public Health Leaders
2005 UCSC Dean's List Scholar

Lauren Norris Lessard
Publications/Presentations

Lessard LN, Karasek D, Ma S, Darney P, Deardorff J, Lahiff M, Grossman D, Foster DG. Contraceptive Features Preferred by Women at Risk for Unintended Pregnancy. Perspectives in Sexual and Reproductive Health. 2012 Sep; 44(3):194-200. 2012 Jul 19.

Lessard LN MPH, PhD Candidate. Obesity and Contraception. Oral presentation presented at the Annual American Public Health Association Conference, November 18, 2014. New Orleans, LA.

Lessard LN BA, Diana Ramos MD MPH, Giannina Donatoni PhD, Cynthia Harding MPH. Overcoming Barriers to Preconception Health: Lessons Learned from Public Health Professionals in Los Angeles County. Poster presented at the Annual American Congress of Obstetricians and Gynecologists (ACOG) Conference, October 14, 2010. Maui, HI.

CHAPTER 1: INTRODUCTION

Comprehensive reproductive healthcare and pregnancy prevention is a public health priority for the obese population. [1-6] Nearly 70% of women over the age of 20 are overweight or obese in the United States today (33% overweight; 36% obese.)[7] Preventing unplanned pregnancies for obese women is especially important given the likelihood of co-morbidities that endanger both the woman and fetus during an unintended pregnancy. Given that the most effective contraception methods are available primarily by prescription, necessitating interaction with providers, any obesity-specific impediments to reproductive health care services must be overcome. To that end, this study addressed the following question:

Does obesity impact contraception use and women's choice in contraception type and if so, how does health care possible provider bias toward obese individuals contribute to this impact?

The investigation combined quantitative examination of cross-sectional survey data from the National Survey for Family Growth (NSFG) and qualitative analysis of physician perspectives to examine the disparities between obese and non-obese women with respect to accessing reproductive health services and use of contraception. Rates of contraception use by body size were examined and the hypothesis that obese women are less likely to access reproductive health services was evaluated. Subsequently, the type of contraception used by obese and non-obese women was investigated. These results were then assessed within the context of prior research regarding possible health care provider bias toward obese patients. [8-15] This was followed by examining the hypothesis that health care provider bias is an impediment to well-informed contraceptive use by obese women.

Study Aims

Study Aim 1

Examine Relationship Between Obesity and Rates of Contraception

The study investigated if obese women are less likely to use contraception than other women after adjustment for individual and socioeconomic factors. Contraception use among women who sought care was investigated as well. The hypotheses for this aim were: (1) obese women are not as likely to use contraception as non-obese women after controlling for individual and socioeconomic factors and (2) obese women of reproductive age are not as likely to seek reproductive health services as frequently as non-obese women, even after controlling for other influences.

Study Aim 2

Examine the relationship between obesity and type of contraception used.

The type of contraception used was particularly important given the pregnancy-related risks faced by this population.

In addition to efficacy, contraception methods vary in their administration, availability and duration. The hypothesis that obese women are more averse than other women to methods that require a prescription or physical exam was evaluated as was a related hypothesis that they are more likely to discontinue a method due to dissatisfaction and, therefore, to increase their risk of unintended pregnancy.

Study Aim 3

Explore physicians' perceptions of presence/implications of provider bias and evaluate the effect of possible health care provider bias on obese women's contraceptive decision-making.

Solicit ideas on improving rates of contraception use among obese women.

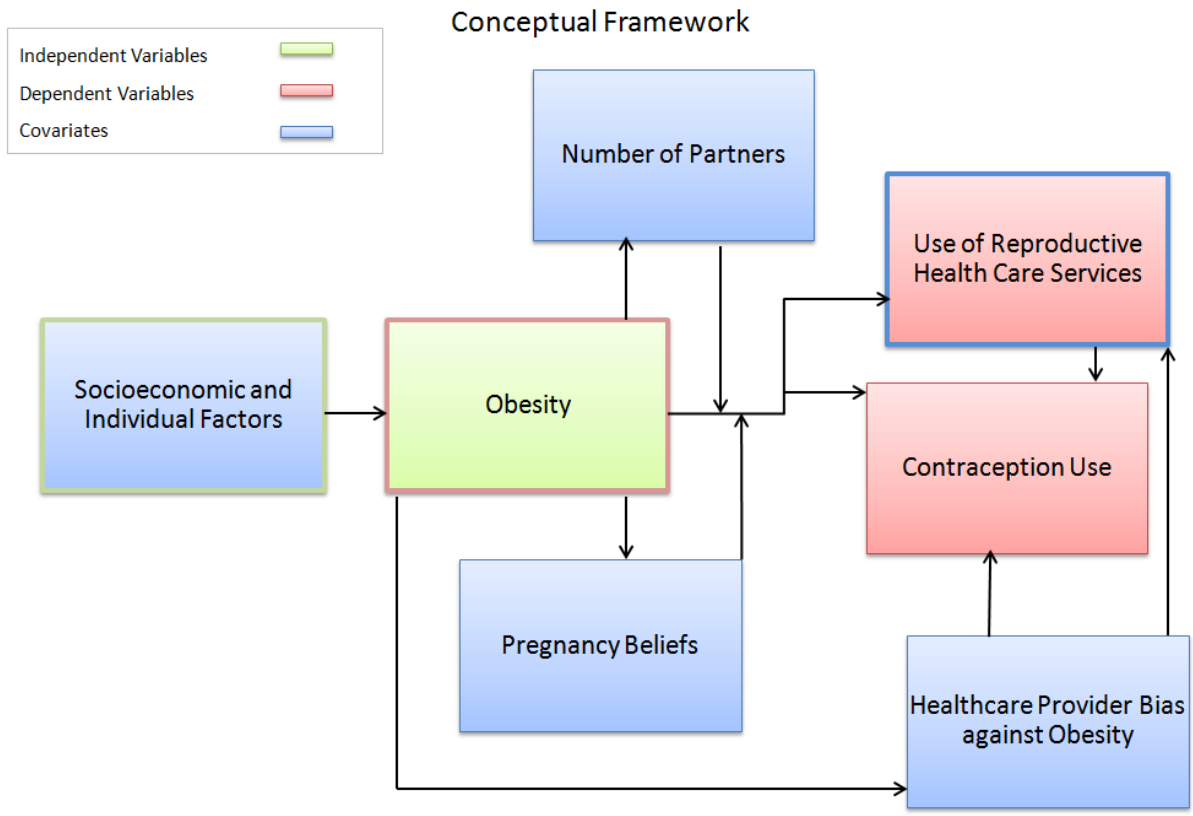
Qualitative interviews were conducted to obtain the perspectives of family medicine physicians, currently in residency. The quantitative findings informed the design of questions about why the use of contraception differs between obese and non-obese women and how practitioners can be better prepared and supported in serving the reproductive health needs of this population.

CHAPTER 2: BACKGROUND AND SIGNIFICANCE

Conceptual Framework

Based on a review of literature from several subject areas and disciplines, the conceptual framework depicted in figure 1 (below) outlines the pathways in which obesity may limit access to contraception and reproductive health services.

Figure 1



Note: Colored outlines indicate that variables are used as both colors in different analyses.

The pathways depicted in the framework include:

- Socioeconomic and individual factors contributing to obesity
- Obesity impacting a woman's personal pregnancy beliefs

- Obesity reducing a woman's willingness to seek reproductive health care
- Obesity triggering health care provider bias which may reduce the likelihood that family planning counseling is provided and/or the most efficacious method of contraception is recommended.

Review of Literature

The key components in the conceptual model hypothesized to influence the contraceptive decision-making of obese women are derived from the literature related to obesity, health care provider bias and reproductive health literature. As discussed below, the effects of each of these influences are hypothesized to impair obese women's ability to obtain an effective method of contraception, thus, increasing the chances that they will experience an unintended pregnancy.

Societal Obesity Stigma

Brownell argues that negative attitudes towards obesity remain an acceptable form of discrimination.[16] The stigma surrounding obesity is often justified by individuals because of the significant social and financial price society pays for the condition.[17] Obese individuals are often blamed for these costs. Adjectives that have been used to describe obese people by those who interact with them in employment, health care and education settings include: out-of-control, asexual, lazy, ugly and weak-willed. [12,16,18,19]

These negative attitudes have created a pervasive stigma, which can be defined as "an attribute that conveys a devalued social identity within a particular context."[20] Research has shown that through discrimination, obesity stigma negatively influences nearly every context within which a person functions. From an early age, obese children are discounted in education settings by their teachers and even family members.[21-24] Evidence of discrimination and maltreatment has been shown in employment settings and hiring practices, reducing individuals' ability to provide for themselves and advance in

society.[25,26] Discrimination in health care settings has been measured in several ways. The evidence indicates that provision of health care and ultimately health status suffers as a result of discrimination against the obese.[8-15] Living with this stigma has been shown to impair mental and physical health, both directly through physiological pathways (resulting from internalizing stress) and indirectly through lifestyle changes such as avoiding health care and social settings.[27,28]

Health Care Providers and Obesity Stigma

Despite the association between stigma and poor health and the already pressing health concerns of obesity, there is significant documentation of obesity stigma in health care settings. Previous research concludes that health care providers response to patients differs by body size.[12] Studies have examined obese patient interactions with nurses, physicians, medical students, administrative staff and even obesity specialists and each type of interaction has been characterized by components of stigmatization.[12-16,29] Studies investigating stigma and obese obstetric patients found that physicians viewed their patients as less self-disciplined, less healthy and less likely to take care of themselves and exhibited negative and annoyed feelings when caring for those patients.[30] This is particularly concerning given the complicated and dangerous implications obesity can have during pregnancy. Studies have also shown that physicians spend less time with obese patients and are less willing to discuss health promotion and prevention.[31]

Low expectations from health care providers can self-perpetuate and negatively impact relationships with obese patients while degrading their patients' health care. Essentially, the condition of obesity is perceived as evidence of non-compliance and laziness which, in turn, leads to less time spent with obese patients to discuss weight reduction and other important health matters. Obese patients encountering a lack of effective support are susceptible to becoming discouraged, leading to a lack of enthusiasm evidenced by minimal effort and failure to advocate for themselves.[16] Subsequently, providers perceive the lack of progress and interest as justifying their initial assessment. This self-

perpetuating cycle can foster a sense of hopelessness.[16] This further erodes the relationship between health care providers and the patient, a key component of most successful treatment regimens.[16,32]

Though research is nascent in investigating the extent and impact of health care provider bias on contraception use, studies have shown that provider discrimination has affected reproductive health. Health care providers have been shown to be less likely to reinforce the importance of pelvic exams with obese patients than non-obese patients and some have even gone so far to indicate that they are less willing to touch obese patients.[13,31] This is especially problematic for family planning since the most effective methods often require a pelvic exam as well as vaginal insertion.[33] Physicians have specifically reported that obesity impairs their ability to correctly insert intra-uterine devices (IUD), widely known to be one of the most effective contraceptive methods available.[33,34] They are also less likely to discuss the importance of other screenings, like mammograms, if their patients are obese.[14] These limitations are likely to impact a physician's ability to discuss contraception, let alone inquire about aspects of their patient's life to ensure they prescribe an appropriate and effective method.

Obese Women of Reproductive Age

From an early age, obese children begin to feel ashamed, embarrassed and worthless as a result of society's persuasive dialogue surrounding obesity.[35,36] These feelings are carried into adulthood, often resulting in adults who have low self-esteem, low self-efficacy and intense internalization of obesity stereotypes.[16,31] As described previously, these feelings translate to reluctance to seek out health care and failure to advocate for one's rights and health options, which contributes to their poor health status. This has been especially problematic for women of reproductive age who are more likely to experience difficult pregnancies and poorer health outcomes for their children as a result of their physical and mental health.[37]

It is also possible that low self-esteem and self-efficacy impact sexual practices and further place obese women's health at risk. The preliminary findings of new research indicate that obese women may

engage in sexual activities that place them at higher risk than their non-obese counterparts, though admittedly nascent in its development.[38] focusing on obese young adults and adolescents have shown that this population is more likely than their non-obese counterparts to have a higher number of casual partners, fail to use contraception and/or be intoxicated at time of intercourse.[39-43] Though there may be many factors associated with higher risk sexual behavior and obesity, one theory is that low self-esteem leaves women feeling powerless and lonely and may prevent women from negotiating for safer sexual scenarios such as contraception use.[16,31,38]

Contraception

Though physicians have also reported difficulty in using some methods with obese women, slight modifications of procedure can ensure the process is safe and effective.[34] Health care provider bias may disincline them from adapting their approach to better support obese women. Though much attention has been focused on obesity and contraception, often questioning efficacy of methods in populations with elevated BMI, recent data have shown that the most effective methods showed extremely low failure rates and did not differ based on BMI.[44,45]

When addressing family planning with a patient, evidence has demonstrated the importance of a positive, close relationship with one's provider in appropriately matching a contraceptive method with a woman's needs.[46] This is because of the sensitive nature of the topic and the many lifestyle considerations that need to be discussed before determining which method will best meet a woman's family planning needs. In a study evaluating obese women's experience in family planning clinics, obese women cited concerns over poor facility preparedness to accommodate their needs and embarrassment during initial intake procedures.[47] Obese patients anticipating prejudice may be less likely to advocate for family planning services and may avoid health care settings in general, limiting their access to the most effective methods of contraception.

Unintended Pregnancy

Without unfettered access to family planning counseling and effective contraceptive methods in a supportive, positive and appropriately equipped health care environment, women are at increased risk of unintended pregnancy.[1] Unintended pregnancies that are continued to term are associated with increased risk of detrimental prenatal behavior and negative health and social outcomes for both the mother and child.[48,49] Unfortunately, obese women have been shown to be at an even higher risk for unintended pregnancy than their non-obese counterparts because of less consistent use of effective contraception.[38]

In addition to experiencing unintended pregnancies at a higher rate, obese women may detect their pregnancies less quickly, increasing the likelihood for negative health outcomes.[48,49] For example, if pregnancy recognition is delayed, obese women may initiate prenatal care later and delay any behavioral changes that may accompany pregnancy recognition, e.g. vitamin supplementation, smoking cessation. Obesity is associated with decreased fertility and women may believe they are less likely to conceive and therefore, less likely to suspect pregnancy.[5,6,50] Also, obesity is associated with menstrual irregularities, including infrequent or missed menstrual cycles known as amenorrhea.[6] Amenorrhea has been linked with delayed pregnancy detection as women may not have realized they were ovulating and at risk of pregnancy due to their unpredictable cycles.[51] As discussed previously, obese women are also more hesitant to seek medical care and may avoid visiting a physician to investigate any pregnancy-related symptoms, further delaying recognition. This delay may also reduce women's options for pregnancy resolutions as many states have laws mandating gestational age limits for women seeking abortions.[52] Previous research has shown that obesity is a predictor of delay in receiving abortions.[53]

Maternal and Child Health Outcomes

Obesity is associated with a variety of dangerous health conditions for women and children both during and following pregnancies carried to term. While pregnant, obese women are at increased risk

for many serious medical conditions, including gestational diabetes, pulmonary embolism and hypertensive disorders including hypertension, pre-eclampsia/eclampsia.[2-5,31] Often, the risk increases linearly with BMI.[6] During delivery, obesity is a risk factor for labor augmentation, caesarean delivery and anesthesia complications.[2,3]

There are also components of the interaction between obesity and pregnancy that further perpetuate the cycle of weight gain. Following delivery, obesity has been associated with postpartum depression.[54] Pregnancy also increases the likelihood of postnatal maternal obesity and research has shown that obese women are less likely to lose pregnancy weight.[5,6] Furthermore, obesity can impair and/or shorten breastfeeding, a source of post-pregnancy weight loss and a proven health benefit for infants.[55]

For infants, maternal obesity has been associated with significant fetal and infant morbidity and mortality. A recent meta-analysis showed significant increase in risk for neural tube defects, including spinal bifida, cardiovascular anomaly, cleft lip and palate, hydrocephaly and a limb reduction anomaly.[56] Increase in maternal BMI is associated with failure to detect fetal abnormalities in an ultrasound due to the location of adipose tissue, and can prevent detection of neural tube and cardiac defects.[57] Recent studies utilizing the life course perspective have demonstrated that maternal obesity can affect fetal programming and predispose the child to obesity throughout life.[37,58]

Ultimately, research indicates that comprehensive reproductive healthcare is a high priority for this population.

Review of Theories

The following theories frame the proposed impact of obesity and healthcare provider bias on a women's contraceptive decision-making.

Stereotype Content Model

For stigma to exist, social groups need to adopt and apply a stereotype to a group of people based on perceived characteristics. The nature and content of that stereotype plays a large role in determining the actions of those who stigmatize and how that stigma affects individuals to which it's applied. The conceptual model utilizes the Stereotype Content Model, developed by Fiske, et al., to help clarify how stereotypes of obese people can detrimentally affect their health.[59]

The Stereotype Content Model is based on the premise that the content of all stereotypes vary along two traits: warmth and competence. Stereotypes can be classified as being high or low for each trait and, as a result, evoke feelings from those who perpetuate the stereotypes based on those classifications. Furthermore, the content of the stereotypes dictate social structure in society, i.e. positive stereotypes lead to higher social status.[59] For example, elderly people are perceived as low in competence but high in warmth, resulting in feelings of pity from higher social status groups. The stereotype for Asian Americans has been shown to be the inverse, high in competence but low in warmth, evoking feelings of envy by other society members. Though not reviewed in the study, there is substantial evidence indicating that obesity is perceived as both low in competence and low in warmth, and similar to other populations with the same designation, often resulting in members of higher social groups feeling contempt towards obese people.[16]

Early research into the stereotypes and resulting stigma of obesity indicate that higher status social groups rely on visibility and controllability to justify their response.[20] Recent studies utilizing the life course perspective have demonstrated that maternal obesity can affect fetal programming and predispose the child to obesity with the condition.[60] Furthermore, research has found that people use

descriptions such as lazy, undisciplined, gluttonous and asexual to describe obese people, indicating that the low warmth and low competence designation in the Stereotype Content Model is accurate.[16,18,19,61] This designation is indicated by the Stereotype Content Model to be associated with the most negative stigmas, resulting in reactions of disgust and contempt by higher status individuals. The ramifications of this stigma are substantial and can contribute to a lifetime of poor physical and mental health conditions for those labeled obese.[12,16]

The relationship depicted in the conceptual model between obesity and health care provider bias was developed on this theory, predicting that health care providers incorporate these negative stereotypes into their decision-making and assume obese women are asexual and unattractive. The model predicts that physicians are then less likely to provide family planning services and/or lower quality, cursory counseling, thus negatively impacting contraception use.

Stress and Coping Model

Rooting stigma in a model addressing stress and coping is an important step towards understanding the many impacts that it may have on an individual and any actions that individuals might take. The core feature of a stigma is "an attribute that conveys a devalued social identity within a particular context."[20] This devaluation exposes the individual to a variety of stressors, and even more so if the stigma is a condition that is readily apparent, such as obesity.[62] Stigmas that are based on physical appearance can increase the potential and impact of stress because unfair treatment or judgments can be triggered instantaneously.[63] Stressors are defined as "an event in which environmental or internal demands tax or exceed the adaptive resources of the individual."[64] Stigma may be particularly debilitating as it often affects many aspects of a person's life including self-perception, relationships, the workplace, and physical and mental health.

An adapted version of the stress and coping model considers the many ways stigma can affect the stigmatized person, including psychologically, socially, and biologically.[62,65,66] It also identifies and

describes reactions to stigma within the context of coping with stress. It's important to note that responses to stress are dynamic and interdependent.[65] Perpetual stigmatization often results in many responses, altering future actions. Still, the model is a reasonable starting point for understanding the actions obese women may take in response to societal level stigma and helps organize the diverse responses into a framework that has been empirically tested.[62]

When exposed to stress, the model indicates that individuals may experience voluntary coping responses and/or involuntary responses to manage the deluge of stress they experience. Coping is defined as, "conscious volitional efforts to regulate emotion, thought, behavior, physiology, and the environment in response to stressful events or circumstances."[65] Involuntary responses are largely perceived to be outside a person's control and therefore, not necessarily coping in nature. Within each distinction of voluntary or involuntary is the further clarification of engagement or disengagement. This subsequent classification is based on the fight (engagement) or flight (disengagement) response to personal threat.[65]

Voluntary disengagement coping responses include those that can be classified as avoidance, denial or wishful thinking. In the obesity model, these patterns are recognized when an obese woman avoids visiting her health care provider altogether for fear of being stigmatized or chooses not to discuss contraception in an effort to avoid any indication that her practitioner believes her to be asexual or unattractive. Also, evidence shows that obese people are more likely to blame themselves for discrimination, which may be an attempt to minimize evidence of prejudice in others, an element of wishful thinking.[61]

Voluntary engagement coping responses are targeted at either changing the stressful situation (primary control) or adapting to the stressful event (secondary control.) Changing the stressful event would be actively engaging in problem solving and emotion regulation to change the status quo. Though not depicted in the obesity model presented, actively advocating for one's health care needs

and/or taking steps to personally improve one's health and subsequently that of their future children could be classified as problem solving and emotion regulation. Also included in this category is adaptation, which ranges from devaluing other's opinions of oneself to accepting, and internalizing those opinions. Internalizing those opinions can further perpetuate the status quo and contribute to poor physical and mental health long term.

Involuntary engagement responses to stigma are evident throughout the obesity model, ranging from physical and mental health deficits to impulsivity.[62] Low birth weight, heart disease, hypertension and depression are correlated with membership in stigmatized groups and considered to be the result of the body's involuntary response to increased stress.[37,67,68] The stress and coping model also posits that impulsive action can be considered an involuntary engagement response. Engaging in unprotected intercourse and other risky sexual behavior could be an individual's subconscious response to rejecting the status quo that they are sexually undesirable due to their physical condition.

Disengaging involuntary responses to stress would consist of subconsciously avoiding thoughts of prejudice and disadvantage stemming from obesity. Though difficult to measure, evidence shows that individuals who unconsciously suppress feelings of stigmatization are much more likely to experience positive health benefits from avoidance than those that deliberately try to suppress prejudicial thoughts.[69]

The stress response(s) among stigmatized individuals is dictated by many factors, ranging from social support to physical health to cognitive function. There are also positive and negative implications of each, which need to be considered when designing research and interventions investigating the patterns and effects on individuals.

This theory is incorporated in the model through the relationships between obesity and women's pregnancy beliefs, interactions with sexual partners, utilization of reproductive health services, and ultimately contraception use. Avoidance of health care providers for fear of reprisal about weight

or embarrassing interactions resulting from necessary accommodations for an individual's body size is a voluntary disengagement coping response. The internalization of being perceived as lazy, gluttonous and asexual results in obese women having low self-worth, self-esteem and self-efficacy and limits their ability to negotiate contraception use, seek care or advocate for a contraceptive method that better fits their needs.

Theory of System Justification

For the pathways indicated in this model to lead to lack of /ineffective contraception and subsequently poor maternal and child health, an implicit agreement between physicians and obese women is required. The theory of system justification suggests that this agreement implies that both parties will support and perpetuate the stigma presented in the discussion of the Stereotype Content Model as the status quo for obese women. Whether it's intentional or subconscious, the theory posits that physicians and women reject the notion that obese women are in need of contraception based on the perception that they are asexual, lazy and unattractive. Though detrimental, it is not surprising when a high-status group casts judgment on a low status group. However, to better understand the self-damaging behavior on the part of obese women, it is useful to consider the theory of system justification.[70]

Initially, people may be predisposed to preserve their individual interests and self-esteem. However, as society shifts to perceiving a disadvantaged group negatively, the stigmatized adopt that perception, subsequently viewing themselves as inferior. Jost and his colleagues argue for four principles that explain "out group favoritism" of disadvantaged individuals: (1) there is a general ideological motive to justify the existing social order; (2) this motive is at least partially responsible for the internalization of inferiority among members of disadvantaged groups; (3) it is observed most readily at an implicit, subconscious level of awareness; and (4) paradoxically, it is sometimes strongest among those who are most harmed by the status quo.[71] Though likely self-damaging in the long run,

some researchers have found that these behavioral patterns can be initially stress reducing for some low status groups, which may explain the behavior's prevalence.[72,73] For example, for people with low socioeconomic status, research has shown that individuals initially feel less anxiety when they believe they are at fault for their current conditions, rather than perceiving themselves as systematically discriminated against.[2] Researchers have concluded that it may be easier to blame oneself than believe that other individuals or even the system itself is at fault, a reality that would leave little room for growth and opportunity. Unfortunately, this *"attributional ambiguity"* hinders efforts to address and correct the stigma.[62,73]

In the case of obesity, it is unclear if it is actually less stressful for obese people to believe they are at fault or that they have internalized the status quo.[72,73] Regardless, research has shown that when faced with prejudice and discrimination, obese individuals are more likely than other stigmatized groups to blame themselves.[73] This tendency could also result from the belief that their stigmatized identity is temporary and therefore, individuals are less inclined to challenge stereotypes on behalf of the entire group because they believe they can escape their status by losing weight.[74,75] Either way, it seems difficult for both the high and low status groups in this model to comprehend the systematic reasons that people are obese, subsequently placing blame solely on the low status group. In many ways, a broader understanding of the problem would implicate the favored class as also being at fault, which neither group is likely to do given the universally positive perceptions of the higher status group.

System justification theory is particularly poignant in healthcare settings. Not only are physicians often viewed as a high-status group because of their profession, interacting with physicians often requires physical examinations with measurements that define an individual's weight status. Feeling shame about one's physical condition leads to anxiety about interacting with healthcare professionals and reluctance to seek care from those that may subconsciously be judging and stigmatizing their obese patients.[12,31] This relationship has been observed in a variety of high need, "low

status" populations including those with mental health conditions and others with stigmatized health issues.[76] Research suggests that both perceived and actual self-stigma can result in loss of self-esteem and self-efficacy and limit prospects for motivation and recovery.[77]

The stigma surrounding obesity has also increased due to recent analysis regarding the significant social and financial price society pays for the condition.[17] Obese individuals are often blamed for these costs. The perception of the status quo is a dichotomy that obese people are out-of-control, asexual, lazy and at-fault and that thin people are successful, motivated and deservedly of higher status.[12,16,18,19] These perceptions lead to depression and self-deprecation for the low status group, both of which are linked with obesity.[16] Obese individuals both internalize the stigma and engage in behavior patterns that reinforce the existing social structure.[78] Unfortunately, anxiety about stigma may interfere with behavior and performance in a way that makes it impossible to disconfirm stereotypes.[62] In this context, such behavior contributes to poor health.

This theory provides further evidence and support for the conceptual model and many of the factors depicted. The predicted avoidance and reluctance to advocate for oneself is represented by the relationship between obesity and use of services and contraception use. The health care provider perspective is also informed by this theory and will be explored in the qualitative interviews with family medicine physicians.

Contribution to the Field

This study is one of the first analyses to examine differences in contraceptive and reproductive health services by obesity, particularly in the United States. A previous study pursued similar analysis with a French population, and though informative, the health and social context of France is different from the United States.[38] Additionally, little research has been conducted specifically examining the presence and effects of health care provider obesity bias on contraceptive use in obese populations. This study examines contraceptive use among obese women and possible biases that may lower rates of contraceptive use from the perspective of the physician. While the cited studies contribute to the background and conceptual model for this research study, each of those studies address unique components of health care provider involvement and patient healthcare that differ from the primary aim of this study.

In particular, there are four papers that report on similar topics. One study, by Adams, Smith, Wilbur and Grady, administered a survey to 1300 physicians and 300 women to assess physician's reluctance in conducting pelvic exams.[13] Though the study did not address contraception use, it can be ascertained that reluctance to perform pelvic exams may extend to reluctance to insert an IUD, an efficacious form of contraception. The findings of Adams, et al. provide substantial insight into the decision-making of physicians when faced with an obese patient. However, since the study was published in 1993, there is a need for updated research given current contraceptive technology and the increased prevalence of obesity.

A more recent study evaluated the experiences of obese women during prior visits to family planning clinics. Women interviewed had presented for abortion and were asked to reflect on facility preparedness, ranges of services provided and feelings experienced during the visit. Of obese women participating in the survey, 10% reported that facilities were underprepared to provide care for heavier women and 25% reported that at least one item in the clinic was inadequate for their size. Women also

cited feelings of embarrassment when being weighed in public areas and were more likely to receive unsolicited advice about their weight. This study validates several study hypotheses and provides valuable patient perspective. Though, sample size and sampling procedures limit generalizability of findings to a broad, national population, this appears to be the first study to address obesity and bias in family planning settings.[47]

In the field of obstetrics and gynecology, researchers have published literature reviews and editorials suggesting that physicians need to increase their awareness and prevention of unintended pregnancy among obese women. Grimes et al. conducted a review of medical literature that indicated that some contraceptive methods may be difficult to administer, have increased side effects and/or lower efficacy in obese populations.[34] This editorial implores physicians to carefully address family planning with obese patients to prevent unintended pregnancies and match lifestyle needs with the appropriate contraception. Though helpful in spurring conversation about this important topic, the publication does not provide original analysis to reinforce the opinions of the authors. Furthermore, more recent data show that efficacy is not an issue with some of the methods that were questioned, including birth control pills and implants.[44,45] A similar article was recently published that summarized information regarding obesity and contraception for providers and updating the perceptions portrayed in Grimes, et al. The authors conducted a literature review to evaluate efficacy, concern with side effects and concerns surrounding contraception use in post bariatric patients.[79] While the information presented was useful, the authors concluded that more research needs to be conducted to better understand contraception use in this high risk population.

Deficits in the field are also notable in terms of study design. The mixed method approach combined quantitative analysis from a nationwide survey with qualitative analysis of personal interviews with health care providers treating obese patients. By combining methods, this study tested all hypotheses in the conceptual model. Furthermore, by including perspectives from health care

providers, the study concludes with suggestions for specific targets for educational and process-oriented interventions.

CHAPTER 3: RESEARCH AND DESIGN METHODS

Overview

The mixed method nature of this study combines quantitative analysis of the National Survey of Family Growth (NSFG) data with qualitative insights collected from interviews with health care providers actively treating obese patients. By combining methods, significant estimates and predictors of behaviors can be assessed within the possible context of provider bias. Furthermore, by including perspectives from health care providers, opportunities to enact educational and process-oriented interventions have been identified.

Questions and Hypotheses

Targeted research questions were framed to accomplish the study's three aims and ultimately generate answers to the overarching research question:

Does obesity impact contraception use and women's choice of contraception type? If so, does health care provider bias toward obese individuals contribute to this impact?

Each of the eight targeted research questions is presented below in context with the appropriate study aim, the specific goal, underlying hypotheses and a brief summary of the approach. Later in this chapter, the analytic plans for the quantitative and qualitative research phases describe the specific research approach for each of the questions in detail. Research results for the quantitative and qualitative analyses phases are presented in chapters 4 and 5 respectively.

Study Aim 1

Examine the relationship between obesity and rates of contraception.

Three sequential research questions framed the regression analysis used to accomplish the first aim of the study by first examining individual and socioeconomic factors, then contraceptive use and subsequently access to reproductive health services.

Analyze Disparity Factors (aim 1 question 1.1):

How do obese women differ from other women in terms

of individual and socioeconomic factors?

The goal for this question was to test the effect of socioeconomic and individual level factors on the probability of being obese. Understanding the initial individual characteristics in these populations was necessary to control for differences. Focal relationships then highlight significant differences in reproductive health behavior beyond these characteristics.

Research question 1.1 tested three hypotheses. First, that individual and socioeconomic factors substantially increase a woman's probability of being obese. This is likely because poverty and low educational attainment impair an individual's ability to improve diet, obtain preventive health resources and/or live in a safe area that accommodates opportunities to exercise.[80] Secondly, that these factors are also likely to limit a woman's ability to obtain contraception and, finally, that prior pregnancies may increase the probability of obesity but may also increase the chance that a woman seeks reproductive care and contraception.

The approach - detailed in the analytic plan - was to examine the full sample to identify factors differentiating obese women from other women. The analysis accounts for age, race, poverty level, education, number of partners, perceived trouble conceiving, ambivalence about unintended pregnancies and parity.

Examine Use of Contraception (aim 1 question 1.2):

Are obese women less likely to use contraception than non-obese women?

The goal of this question was to analyze contraceptive use among obese and non-obese women. Since contraception is available outside of a clinical setting, it was important to consider all methods as obese women may be more likely to obtain a contraceptive method that does not require a prescription.

Research question 1.2 tested the hypothesis that obese women of reproductive age are not as likely to seek reproductive health services as frequently as non-obese women, even after controlling for other factors. As indicated in the conceptual model, obesity reduces self-efficacy and self-worth restricting obese women's imperative to seek contraception.

The approach - detailed in the analytic plan - was to examine the data to explore differences between obese women and other women in rates of contraceptive use. With these findings - along with the factors identified via researching possible disparities (question 1.1) - The full sample was systematically restricted to establish the analytic sample.

Examine Use of Reproductive Health Services (aim 1 question 1.3)

Do obese women use reproductive health services less often than non-obese women?

This goal of this question was to test if obesity affects the probability of accessing reproductive health services, after controlling for the presence of the socioeconomic and individual level factors.

Research question 1.3 tested several hypotheses. Firstly, that sexually active obese women are not as likely to seek reproductive health services as frequently as non-obese women. The theoretical background for this research insinuates that societal perceptions of obese people are both low in warmth and competence, perpetuating dangerously negative stereotypes that obese people are unattractive, asexual, lazy and responsible for their condition. Individuals often internalize these stereotypes, resulting in feelings of low self-efficacy and self-worth, represented in the model as "self-perception." Due to these feelings as well as fears of judgment and reprisal, obese women may avoid interacting with pharmacists and health care providers.

This question also tested the hypothesis that women who are obese may also seek validation in sexual relationships given their poor self-image, possibly in higher risk settings. As a result, they engage in sexual activities with multiple partners. Also tested was the hypothesis that women who are obese may underestimate their risk of pregnancy, presuming they are not at risk of getting pregnant due to reproductive complications associated with obesity and/or denial about their risk. Another factor considered was that ambivalence about pregnancy, even if a woman indicates that she does not currently desire a child, can impact contraception use. The final hypothesis for research question 1.3 was that obese women may be less likely to be upset by an unintended pregnancy as the event could be initially perceived as an opportunity to improve their self-worth and self-efficacy, despite the intention to not conceive.

The approach - detailed in the analytic plan - examined the restricted sample to evaluate differences between obese women and other women in their use of reproductive health services. The

NSFG data recorded respondents' report of the following reproductive health services within the previous 12 months: family planning counseling from a provider, pelvic exam and/or attending a visit specifically related to birth control.

Study Aim 2

Examine the relationship between obesity and type of contraception.

This study aim required an examination of the data related to the type of contraception used and rates of discontinuation. Two specific research questions framed the regression analysis.

Investigate the Type of Contraception Used (aim 2 question 2.1)

Do obese women differ from non-obese women in the type of contraception they use?

The goal of this question was to analyze contraceptive use patterns among women using contraception to determine if obesity affects the probability of utilizing specific contraceptive methods after controlling for socioeconomic and individual-level factors outlined in the conceptual model. Among women choosing to use contraception, method type and source impact their risk of unintended pregnancy. Issues of access, application, and maintenance were considered.

This question tested several facets of the hypothesis that women who are obese may be less likely to use certain methods than non-obese women. Obese women may be less likely to obtain methods from a "usual source of care," relying on other sources of access as well as over-the-counter methods. They may also be less likely to use highly effective methods as often as non-obese women. This is due in large part to their hesitance to undergo physical exams with health care providers. When they do see a physician, obese women are less often referred highly effective methods and the perception that providers are of a higher status, both physically and socially, may prevent obese patients from questioning and inquiring about methods not readily recommended by their health care provider. This is exacerbated when health care providers do not inquire about sexual activity and family planning.

The approach - detailed in the analytic plan - evaluated the analytic sample for differences between obese women and other women in the types of contraception method used.

Examine Discontinuation of Contraception (aim 2 question 2.2)

Are obese women more likely to report method dissatisfaction and discontinue use?

The goal of this question was to analyze dissatisfaction and discontinuation rates by obesity to test if obesity impacts the probability that women will report having discontinued use.

Research question 2.2 tested the hypothesis that obese women are more likely to report dissatisfaction with methods and discontinue use. This is likely because they are not receiving adequate family planning counseling and may not be using methods that are most appropriate for them. When methods do not meet women's needs, women are more likely to discontinue methods or use them incorrectly, placing themselves at risk for unintended pregnancy.

The approach - detailed in the analytic plan - evaluated the analytic sample for differences between obese women and other women in rates of discontinuing the method of contraception due to dissatisfaction.

Study Aim 3

Examine Perspectives and Options for Support

Subsequent to concluding the quantitative analysis phase, those findings were used to inform the qualitative research phase of the study.

Examine Physician Perspectives (aim 3 question set 3.1)

Primary Question: *What are physician's perspectives as to why obese women are less likely to use contraception?*

Follow-up Questions: *Have physicians witnessed examples of women being treated differently based on obesity status from colleagues? How does obesity affect physician's family planning counseling with female patients?*

The goal of the primary question was to seek physicians' perspective on quantitative findings and then have them reflect on which aspects of care may impact obese women's likelihood to utilize contraception. Health care provider point of view is critical in understanding the relationship between obesity and contraception use as many of the most effective methods of contraception require a prescription. However, the health care provider perspective has been largely absent from the dialogue about this issue.

The follow up questions presented interviewees with study hypotheses to spur reflection on these issues within the context of the primary question. The purpose of this area of questioning was to explore the possibility of obesity bias impacting patient care in general and ultimately, access to reproductive health. Having physicians relate instances of health care provider bias and possible implications for patients provided insight into how they personally regarded the issue.

Research question set 3.1 explored the possibility that physicians prioritize obesity as the primary health concern and do not consistently address contraception despite the heightened risks to

this population resulting from unintended pregnancy. The questions explored facets related to this hypothesis including the perception that obese women are less likely to be sexually active due to the negative stereotypes that surround obesity, particularly that obese individuals are asexual, unattractive and socially undesirable partners.

Though physicians may be initially surprised by the discrepancy in contraception use between obese and non-obese women, they will be able to cite specific aspects of patient care that are likely to impact an obese woman's medical experience as it relates to contraception. Physicians are also likely to have noticed - and be open to discussing - examples of health care provider bias when referring to interactions they personally witnessed. They are likely to acknowledge that it adversely affects patient care. As rates of obesity increase, health care provider bias will likely increase as well due to the added socioeconomic burden and increasing resentment and frustration towards obese people. Obesity bias will likely re-direct focus away from reproductive health for women to weight management and associated comorbidities.

The approach - detailed in the analytic plan –entailed presenting residents with findings from the quantitative analysis and seeking reflection on why obese women were less likely to use contraception. At this point in the interview, residents were not presented study hypotheses, but-rather were simply asked to cite reasons for the disparity. Residents were then asked directly if they felt social views of obesity impact patient/provider interactions Interviews were coded and analyzed per processes outlined in the methods section.

Improve Provider Support (aim 3 question 3.2)

How can providers help improve rates of contraception use among obese women?

The goal of this question was to elicit suggestions from physicians as to how they can help improve the likelihood that sexually active obese women desiring to prevent pregnancy receive a contraceptive method that meets their needs.

Research question 3.2 tested the hypothesis that physicians are likely to offer perceptive and useful insights into how medical practices can better serve obese women. Physicians will acknowledge that unintended pregnancy in this population is a poor health outcome given the extensive comorbidities and should be re-prioritized to be addressed in each appointment. Providers need to directly inquire about family planning in the population, regardless of the pressing health concerns that also need to be addressed.

The approach – detailed in the analytic plan – was to ask residents how to improve rates of contraception use in this population, specifically from a health care perspective rather than patient-initiated change. Interviews were coded and analyzed per processes outlined in the methods section.

Improve Support to Providers (aim 3 question set 3.3)

Primary Question: *In what ways can physicians be better supported to increase contraception use in this population?*

Follow-up Questions: *How does obesity affect physicians'' recommendations for specific type of contraception? How does obesity impact physicians' recommendations of methods that require vaginal insertion (such as the IUD)?*

The goal was to explore physicians' personal perspectives of limitations and concerns regarding contraception and side effects for obese women. Physicians were asked to brainstorm ways in which outside influences can support physicians in ensuring obese women improve their rates of contraception serve this population. Additionally, physicians were asked to reflect on how obesity impacts their decision-making when recommending contraception.

Research question set 3.3 tested the hypothesis that physicians would identify system-based constraints in the current medical approach to providing obese women with reproductive health care that and be willing and able to suggest practical solutions. In order for physicians to provide more support to obese women, systematic changes in time allotted for patients, support from lower-level care staff and additional provider education needs to be provided. As new concerns in health and health care emerge, physicians are bombarded with questions that need to be addressed and procedures that need to be implemented. Developing a practical, system-supported approach for broaching contraception with patients and systematically prioritizing family planning in health care will spur physicians to address this issue for all patients.

The follow-up questions will help gauge physicians' knowledge and practice surrounding contraception use for obese women. Physicians will likely cite prevalent misconceptions about side effects highlighting the need for continuing education and clarification. Additionally, physicians will

identify systematic barriers that impede discussing and prescribing the most efficacious methods of contraception with obese women.

The approach - detailed in the analytic plan – presented residents with the opportunity to identify obstacles to improving rates of contraception use in this population and suggest ways to mitigate those problems. They were also asked to reflect on how obesity impacts their recommendation of contraception methods. Interviews were coded and analyzed per processes outlined in the methods section.

Research Design

This study is based on a sequential mixed method design, with quantitative findings contributing to the development of questions for qualitative interviews. Quantitative and qualitative data collection and analysis were used to examine the pathways framed by the conceptual model. Results are presented in terms of quantitative statistical analysis and qualitative inferences.

Quantitative Research

The quantitative research phase of the study addressed study aims 1 and 2 relating to examining rates of contraception and types of contraception used by obese women. First, the full sample of data were examined to gain insights into how obese women differ from other women. Subsequently, the data were examined to pinpoint which women are more likely to be obese. With these insights, the process defined below was used to control the study's focus and accuracy by restricting the full sample to establish the analytic sample.

The analytic sample was then examined to explore the differences in contraception use between obese women and other women. Next the analytic sample was used to investigate the differences in access to reproductive health care between obese and other women. Access to reproductive health services was then incorporated along with the other factors to investigate the relationship between obesity and contraception use.

The study's findings at this point quantified rates of contraception by sexually active, obese women desiring not to become pregnant and highlighted a significant disparity in contraceptive use between obese women and other women that cannot be explained by differences in access to reproductive health care. This disparity was then investigated for contributing factors by examining the analytic sample for types of contraception used. These findings were then examined in the context of patient access to prescription and/or physician administered contraception.

Research Dataset: National Survey of Family Growth (NSFG)

The quantitative portion of the study was conducted using the National Survey of Family Growth (NSFG). Conducted by the U.S. Centers for Disease Control and Prevention's National Center for Health Statistics (CDC NCHS), the purpose of the NSFG is to provide nationally representative data on topics related to reproductive health.[81] The study has been conducted seven times since 1973 and surveys a nationally representative sample of non-institutionalized women and men (ages 15–44 years) in the United States. Since 1982, NSFG samples include women ages 15–44 regardless of marital status.[82] The interviews were administered in person by trained female interviewers, most frequently in the homes of participants. The data have been de-identified to protect the identity of the respondents. Methods of data collection were reviewed and approved by the Institutional Review Board at the National Center for Health Statistics.

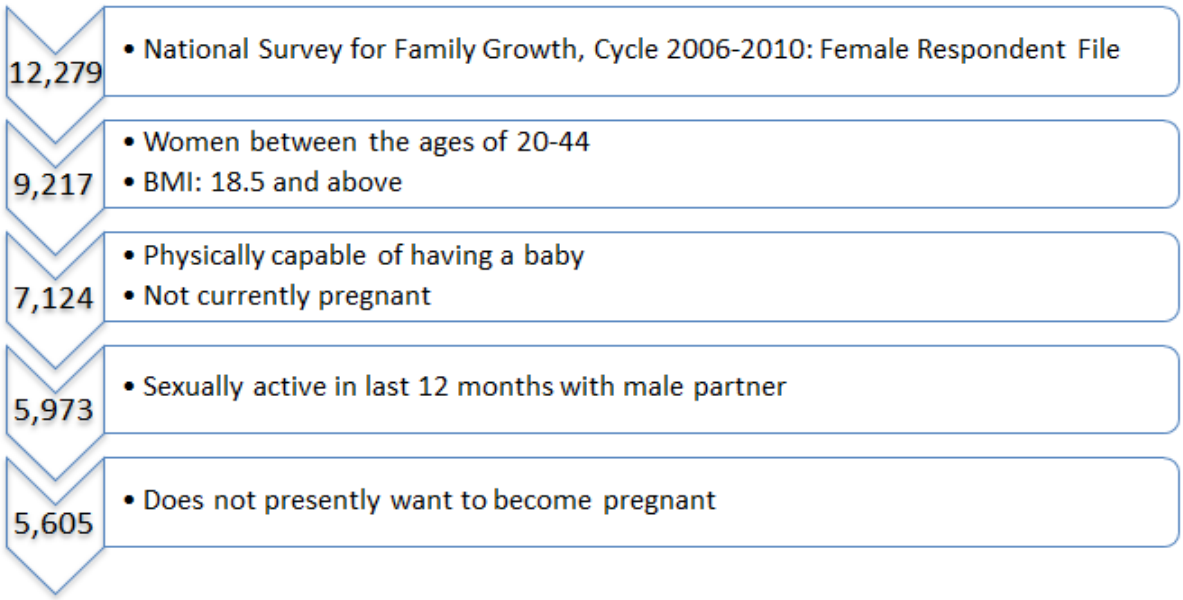
Researchers at the University of Michigan's Institute for Social Research were contracted by the CDC NCHS to conduct the survey from June 2006 to June 2010. The survey is based on a multi-stage, stratified, clustered probability sample. The sample is drawn from 110 geographic areas or ''primary sampling units'' (PSUs) across the country. To protect the respondent's privacy, only one person was interviewed in each selected household. During the period from 2006–2010, those aged 15–19 and black and Hispanic adults were sampled at higher rates than others. More details on NSFG data collection and procedures are available on the agency's website.[81]

The NSFG includes survey weights for statistical analyses to account for oversampling and the multi-stage study design. Results from weighted datasets were used for comparison to those from un-weighted datasets in the final models, as shown in Appendix A. Since this study uses data from all four years, the weight designed to address those issues for the total 2006-2010 dataset was used.

Sample/Inclusion Criteria

The 2006–2010 NSFG has an initial sample size of 12,279 women and a response rate of 78%.[81] The analytic sample was selected from this overall sample as shown in Figure 2.

Figure 2



Respondents who were under the age of 20, had BMI levels below 18.5 or did not have reported values for those measures were eliminated from the sample. BMI levels were not available for women under age 20 as adolescence is a period of growth and BMI is not a recommended measure during this time period. Women with BMI values below 18.5 may have unique fertility issues due to being underweight and therefore, are not comparable to other women in this analysis. Respondents who are not physically capable of having children or were currently pregnant were eliminated because they are not utilizing contraception. Only respondents who were sexually active in the last 12 months, and thus likely in need of contraception, were included. The final reduction was to exclude women trying to become pregnant since they are not likely to use contraception. These restrictions created a sample of sexually active women who need contraception to prevent unintended pregnancies.

Variables

Variables were often recoded to create categories for analyses. Most recodes were based on typical use of similar variables in characteristic descriptions throughout public health research, unless otherwise stated. Descriptions of each variable and the manner in which it was recoded and used follow below.

Focal Independent Variable

Body Mass Index (BMI)

The main independent variable is obesity, used in study aims 1 and 2. Body Mass Index (BMI) is used throughout the study as a measure for obesity. Though self-reported BMI measures are not the most accurate measure of obesity, obtaining anthropometric measures in a nationwide survey is expensive and rarely done. For population level estimates of obesity, self-reported BMI is a widely used and accepted measure.[83] Still, it is important to consider the error that may be introduced as a result of this measure. Research shows that self-reported BMI differs by gender, age and can be especially problematic if used to predict morbidity or mortality.[84,85] Men are more likely to be misclassified as obese due to muscle mass weighing more than adipose tissue.[84] Given that the sample is all women, male-female differences in misclassification did not affect the analysis. BMI measures tend to have higher error in older populations. The study sample age range is 18-44, reducing the likelihood of age-related reporting error in self-reported BMI measures.

BMI was calculated by NSFG staff using the self-reported height and weight measurements for each respondent over the age of 19 with the following formula: BMI= weight (kg)/ [height (m)] ^{2}. NSFG does not recommend using BMI measurements for respondents younger than 20 as these women are considered adolescents and may have varying proportions of height and weight depending on their individual growth stage.

The initial BMI range was 15-60. A categorical version of the variable was created based on Centers for Disease Control (CDC) recommendations. Women who had a BMI below 18.5 were not included in the analysis given that many of the factors that could contribute to being underweight are not associated with obesity. As indicated in each individual analysis and table, categories of the BMI variable were often combined to create a four-category BMI variable. The categories are as follows:

- **Underweight**: BMI lower than 18.5
- **Normal**: BMI between 18.5- 24.9
- **Overweight**: BMI between 25-29.9
- **Obese Class I**: BMI between 30-34.9
- **Obese Class II:** BMI between 35-39.9
- **Obese Class III**: BMI 40 and above

Focal Dependent Variables

The following variables were used throughout the analyses as the dependent variables:

Contraception Use

Contraception use was the dependent variable for analyzing contraception use by obesity level (question 1.2). The variable representing contraception use in the study was based on respondents citing use of any contraception method in the last 12 months. This question was only asked of respondents who also reported having had sexual intercourse with a male in the last 12 months. The variable is coded dichotomous, yes/no.

Use of Reproductive Health Services

Use of reproductive health services is based on NSFG survey data reporting use of three specific types of reproductive health services (research question 1.3). A separate set of models were generated and examined for each of them:

- Received family planning counseling: This variable is dichotomous yes/no, based on respondents' answers to the following question: "In the past 12 months, have you received a counseling or information about birth control?"

- Pelvic exam in last 12 months: This variable is dichotomous yes/no, based on respondents' answers to the following question: "In the past 12 months, have you received a pelvic exam?"

- Attended a medical visit related to birth control: This variable is dichotomous yes/no, based on respondents' answers to the following question: "In the past 12 months, have you received a check up or medical test related to using a birth control method?"

Contraception type

Contraception type is based on survey questions related to the use of specific types of contraception (research question 2.1). Respondents were asked if they had used a specific method of contraception in the 12 months prior to the interview. Their answers were then used to create dichotomous yes/no variables for each of the following methods: pill; diaphragm; IUD; implant; Depo-Provera; cervical cap; Lunelle; patch; ring; emergency contraception and no method. If someone used more than one of these methods, the most effective method - based on literature related to efficacy - was recorded.[33] These methods were then grouped. The following variables are dichotomous yes/no:[86]

- Contraception requires a physician to administer

- Contraception requires a prescription

Discontinuation of method due to dissatisfaction

The measure, discontinuation of method due to dissatisfaction, is based on questions related to respondent's cessation of a type of contraception (research question 2.2). It is dichotomous yes/no, based on respondents' answers to the following question: *"Some people try a method and then don't use it again, or stop using it, because they are not satisfied with the method. Did you ever stop using a method because you were not satisfied with it in some way?"*

Covariates

Several variables were chosen for use in the study based on previous literature citing association between obesity and individual level and socioeconomic factors. These variables were used as independent variables in examining disparities among women based on their BMI (research question 1.1) but were used as covariates in all remaining analyses:

Age

The variable for age was self-reported and continuous in the original dataset. Only women between the ages of 20 and 44 were assigned BMI and, therefore, included in the study, the following categories were created: 20-24; 25-29; 30-34; 35-39; and 40-44.

Race/Ethnicity

The race measurement was recoded using two variables from the original dataset. In year 1, all respondents selected the race they most identify with from white, Hispanic, black or other. In year 2, respondents were first asked if they were Hispanic, and if they were not, they then answered the question from year 1 regarding the race they most identified with, white, black or other. The recoded variable accounted for this methodological change.

Poverty

The variable indicating a respondent's poverty level was calculated by NSFG staff using self-reported annual income and number of people living in a household. The resulting value was then determined to be above or below the Federal Poverty Level (FPL), as classified by percent. If a respondent's income is 100% of the FPL, their income and family size meets the guidelines to be considered in poverty, as determined by the US Department of Health and Human Services (DHHS). If a respondent is 200% of the FPL, their income is twice the value reported by DHHS for their family size. If a respondent is 50% of the FPL, their income is half the value reported by DHHS for their family size.

Education

Each respondent was asked about their highest completed year of school or highest degree received. The variable was then recoded into the following, larger categories:

- Some High School or less, No Diploma
- HS Diploma or GED
- Some College
- Bachelor's Degree
- Graduate School

Relationship status

All respondents were asked about their marriage status. The variable in the analysis was used directly from the NSFG and has the following categories:

- Married

- Widowed
- Divorced
- Separated
- Never Married

Parity

All respondents were asked to indicate if they have given birth to any children. The variable is coded dichotomous, yes/no.

Pathways

The conceptual model incorporates the following three factors in the model serving as pathways for obesity to impair access to reproductive health services and contraception use:

Pregnancy Beliefs

There has been significant discussion surrounding the effects of obesity on an individuals' pregnancy beliefs, hypothesizing that their self- worth and self-esteem may be lower as a result.[12,16,18,19] The variables are as follows:

Difficulty conceiving

Women who are obese may underestimate their risk of pregnancy, assuming that they are at lower or no risk of getting pregnant due to reproductive complications associated with obesity, or because of denial about their risk. To measure women's assessment of their own risk of becoming pregnant, this variable is based on the following NSFG question: *"Some women are physically able to have a(nother) baby, but have difficulty getting pregnant or carrying the baby to term. As far as you*

know, would you, yourself, have any difficulty getting pregnant (again) or carrying a(nother) baby?" The variable is coded as follows: yes, no or don't know.

Feelings regarding unintended pregnancy

Obese women may be less likely to be upset by an unintended pregnancy because, as some observers suggest, pregnancy may improve a woman's self-worth and self-efficacy, despite their intentions to not conceive. To capture this possibility, the analysis includes a variable based on a question about how respondents would feel if they got pregnant at the time of the interview. Only respondents interviewed in years 3 and 4 answered this question. The variable was recoded into the following categories:

- Upset
- Pleased/Ambivalent
- Prefer not to Answer

Number of Sexual Partners

Number of sexual partners is included as an additional pathway through which obesity may affect contraceptive use. Women who are obese may seek validation in sexual relationships and have more partners than non-obese women, given their poor self-image. The variable included in the analysis to reflect this mechanism is the number of current sexual partners. Respondents were asked to list the number of current sexual partners they had, including their husband if they were married. The variable was then recoded into the following categories:

- 0
- 1

- 2+

Health Care Coverage

Incorporating health care coverage allowed for further consideration of the relationship between individual and socioeconomic status and obesity. Respondents were asked if they had coverage in the previous 12 months and if so, were asked to select which type of coverage from a list of 10 possible options. This analysis combined the options as follows:

- Private/Employer Based Coverage
- Public (State/Federal Program)
- No Coverage
- Refused/Not Reported

Analytic Plan for Quantitative Analysis

The quantitative analytic approach remained consistent throughout the study. Both descriptive and regression analyses were conducted for each question with the independent variables, dependent variables, covariates and factors defined as appropriate. Each relationship is modeled and reported separately.

The descriptive analyses define differences in the specified dependent variables across the categories of the independent variable. The p-value reported for each dependent variable represents the chi-square test estimated for the relationship in question.

Regression models were developed for each question in three stages: null model with independent and dependent variable of interest; model with individual and socioeconomic characteristics; and model with individual and socioeconomic characteristics and additional covariates. For analyses in which the independent variable is significant, the variables included in the additional covariate model (as compared to the base model) will be tested for confounding. All analysis was conducted using STATA, version 11.

Study Aim #1

Examine the relationship between obesity and rates of contraception.

Three specific research questions were investigated to accomplish study aim 1. Listed below, each question is followed by a description of the analytic plan and a table depicting the summary of approach.

Aim 1 Research Question 1.1

Are obese women different than non-obese women in terms of individual and socioeconomic factors?

Initial analysis for Question 1.1 was descriptive, reporting counts, percentages and chi-square tests for the individual and socioeconomic status variables (age, race, poverty, education and relationship status), using the entire sample of women between the ages of 20-44 with a BMI of 18.5 and above.[1]

The model incorporated the socioeconomic and individual level variables as independent variables, creating an ordered logit regression equation. The dependent variable in this analysis had 3 levels of obesity status, stratified by BMI as follows Normal: 18-24.9; Overweight: 25-29.9; Obese: 30+. Dummy variables were created for independent variables that had multiple categories. The findings indicated which individual and socioeconomic status factors increase the probability that a woman will be obese and informed future model development. It is important to incorporate individual and socioeconomic factors as control variables because access to reproductive health services, contraception use and obesity can each be impacted by these factors, as indicated in the conceptual model. For comparison, the final model was run with and without the NSFG survey weight.

Summary of Approach

The following summary presents the analytic framework including sample, independent variables, dependent variable and methods of analysis.

[1] Women with a BMI below 18.5 are not included in the sample because they are considered underweight. This could be a measurement error or a result of physical factors that are not applicable to obese women and therefore not a reasonable comparison group.

Summary of Approach for Question 1.1 (Tables 1 thru 4) *Are obese women different than non-obese women in terms of individual and socioeconomic factors?*		
Sample	All women between the ages of 20-44	
Independent Variables	1) Age 2) Race 3) Poverty 4) Education 5) Relationship status 6) Parity	
Dependent Variable	BMI	a) Normal: 18-24.9 b) Overweight: 25-29.9 c) Obese: 30+
Analysis	1) Descriptive analysis (Counts, % and Chi-square) 2) Ordered Logit regression with/without survey weight (1.1)	

Aim 1 Research Question 1.2

Are obese women less likely to use contraception than non-obese women?

The models designed for this question explored the relationship between obesity and contraception use. As discussed previously, contraception is available outside of a clinical setting so it was important to consider "any contraception use" as reproductive health services are not the only avenue through which women obtain contraception. The independent variable in this analysis had 4 levels of obesity status, stratified by BMI as follows Normal: 18-24.9; Overweight: 25-29.9; Obese: 30-34.9; Obese II: 35+. The dependent variable for this model was "contraception use in last 12 months."

The regression analysis began with a null model measuring if obesity is associated with the probability of using contraception. Next, the socioeconomic and individual level variables were included. Then the intervening variables that represent the factors that - based on the conceptual model - may be associated with the relationship between obesity and contraception use. These included the measures representing health care coverage, number of current sexual partners and pregnancy beliefs. The final model was run with and without the NSFG survey weight.

Summary of Approach

The following summary presents the analytic framework including sample, independent variable, dependent variable, covariates and methods of analysis.

Summary of Approach for Question 1.2 (Tables 5 thru 7) *Are obese women less likely to use contraception than non-obese women?*		
Sample	Women between the ages of 20-44, sexually active, not intending to get pregnant.	
Independent Variable	BMI	a) Normal: 18-24.9 b) Overweight: 25-29.9 c) Obese: 30-34.9 d) Obese II: 35+
Dependent Variable	Contraception Use (in last 12 months)	
Covariates	1) Age 2) Race 3) Poverty 4) Education 5) Relationship status 6) Parity 7) Healthcare Coverage 8) Number of Partners 9) Pregnancy Beliefs a. Perceived difficulty getting pregnant b. Feelings about possible unintended pregnancy	
Analysis	1) Descriptive analysis (Counts, % and Chi-square) 2) Logistic regression for each Dependent variable (1.2a) 3) Multivariate Logistic regression for each Dependent variable with individual and socioeconomic variables (1.2b) 4) Multivariate Logistic regression for each Dependent variable with individual and socioeconomic variables and possible factors with/without survey weight (1.2c)	

Aim 1 Research Question 1.3

Do obese women utilize reproductive health services less often than non-obese women?

The models created to address this question supported examination of how obesity affects utilization of reproductive health services. The independent variable for this model was obesity, represented by the 4-level BMI variable described in previous analysis analyzing contraception use by obesity status (question 1.2). The dependent variable for this model was "use of reproductive health services," as measured by the following variables: pelvic exam in the last 12 months; attended a medical visit related to birth control in last 12 months; and received family planning counseling in the last 12 months. A separate set of models were estimated for each of these outcomes.

The regression analysis began with a null model measuring the association of obesity with the probability of each outcome. Next, the socioeconomic and individual level variables were added. Then, the intervening variables representing factors that - based on the conceptual model - may cause obesity to affect the use of these services were incorporated. These include the measures representing healthcare status, number of partners and pregnancy. The final model was run with and without the NSFG survey weight.

Summary of Approach

The following summary presents the analytic framework including sample, independent variable, dependent variables, covariates and methods of analysis.

Summary of Approach for Question 1.3 (Tables 8.1 thru 8.3) *Do obese women utilize reproductive health services less often than non-obese women?*		
Sample	Women aged 20-44, sexually active, not intending to get pregnant.	
Independent Variable	BMI	a) Normal: 18-24.9 b) Overweight: 25-29.9 c) Obese: 30-34.9 d) Obese II: 35+
Dependent Variables	1) Recent Pelvic Exam 2) Attended Medical Visit related to Birth Control 3) Received Family Planning Counseling	
Covariates	1) Age 2) Race 3) Poverty 4) Education 5) Relationship status 6) Parity 7) Healthcare Coverage 8) Number of Partners 9) Pregnancy Beliefs a. Perceived difficulty getting pregnant b. Feelings about possible unintended pregnancy	
Analysis	1) Descriptive analysis (Counts, % and Chi-square) 2) Logistic regression for each Dependent variable (1.3a) 3) Multivariate Logistic regression for each Dependent variable with individual and socioeconomic variables (1.3b) 4) Multivariate Logistic regression for each Dependent variable with individual and socioeconomic variables and possible factors with/without survey weight (1.3c)	

Study Aim #2

Examine the relationship between obesity and women's choice in type of contraception.

Two specific research questions were investigated to accomplish study aim 2. Listed below, each question is followed by a description of the analytic plan and a table depicting the summary of approach.

Aim 2 Research Question 2.1

Do obese women differ from non-obese women in the type of contraception they use?

The models created to address this question discern the association of obesity with choice in contraception method. The independent variable for this model was obesity, represented by the 4-level BMI variable described in previous analysis analyzing contraception use by obesity status (question 1.2). The dependent variable for this model was contraception type: Condoms, Pill, Diaphragm, IUD, Implant, Depo-provera, Lunelle, Patch, Ring, Emergency Contraception, and No Method. For most cases, women listed one method and in the case that more than one method was listed, the most effective method was incorporated into the analysis. The methods were then grouped by characteristics, creating two categories (not exclusive of each other): contraception requires a physician to administer and contraception requires a prescription.

The regression analysis began with a null model to examine the association of obesity with the probability of choosing a type of contraception. Given the number of contraceptive categories, only two additional variables were incorporated in the model to preserve stability. These include the measures representing health care coverage and number of partners. A separate set of models, following the same process, were then examined for two categories of contraceptive methods. These analyses followed previous model design and included socioeconomic and individual factors as well as the additional covariates. Final models were run with and without the NSFG survey weight.

Summary of Approach

The following summary presents the analytic framework including sample, independent variable, dependent variables, covariates and methods of analysis.

<table>
<tr><th colspan="4">Summary of Approach for Question 2.1 (Tables 9 thru 10.3)
Do obese women differ from other women in the type of contraception they use?</th></tr>
<tr><td>Sample</td><td colspan="3">Women between the ages of 20-44, sexually active, not intending to get pregnant</td></tr>
<tr><td>Independent Variable</td><td>BMI</td><td colspan="2">a) Normal: 18-24.9
b) Overweight: 25-29.9
c) Obese: 30-34.9
d) Obese II: 35+</td></tr>
<tr><td>Dependent Variables</td><td colspan="2">Method Types
1) Condoms
2) Pill
3) Diaphragm
4) IUD
5) Implant
6) Depo-provera
7) Lunelle
8) Patch
9) Ring
10) Emergency Contraception
11) No Method</td><td>Method Groups

a) Requires a physician to administer
b) Requires a prescription

Note: A method can belong to more than one group</td></tr>
<tr><td>Covariates</td><td colspan="3">1) Age
2) Race
3) Poverty
4) Education
5) Relationship status
6) Parity
7) Healthcare Coverage
8) Number of Partners
9) Pregnancy Beliefs
a. Perceived difficulty getting pregnant
b. Feelings about possible unintended pregnancy</td></tr>
<tr><td>Analysis</td><td colspan="3">1) Descriptive analysis (Counts, % and Chi-square)
2) Multinomial Logistic Regression for each type and each method group (2.1a)
3) Multinomial Logistic Regression for type of contraceptive and each method group with social and individual and socioeconomic variables (2.1b)
4) Multinomial Logistic Regression for each type and each method group with social and socioeconomic variables and possible factors with/without survey weight(2.1c)</td></tr>
</table>

Aim 2 Research Question 2.2

Are obese women more likely to report method discontinuation due to dissatisfaction?

The models designed for this question examine the association of obesity with contraception dissatisfaction and discontinuation. The independent variable for this model was obesity, represented by the 4-level BMI variable described in previous analysis analyzing contraception use by obesity status (question 1.2). The dependent variable for this model was method discontinuation due to dissatisfaction, utilized as a yes/no dummy variable.

The regression analysis began with a null model measuring the association of obesity with the probability of method discontinuation. The socioeconomic and individual level variables were then added. Next, the intervening variables that represent the factors that - based on the conceptual model - may cause obesity to impact discontinuation of a contraceptive method were incorporated. These factors include the measures representing healthcare status, number of partners and pregnancy beliefs. Final models were both run with and without the NSFG survey weight.

Summary of Approach

The following summary presents the analytic framework including sample, independent variable, dependent variable, covariates and methods of analysis.

<table>
<tr><th colspan="3">Summary of Approach for Question 2.2 (Table 11)
Are obese women more likely to report method discontinuation due to dissatisfaction?</th></tr>
<tr><td>Sample</td><td colspan="2">Women between the ages of 20-44, sexually active, not intending to get pregnant, who utilized contraception in last 12 months</td></tr>
<tr><td>Independent Variable</td><td>BMI</td><td>e) Normal: 18-24.9
f) Overweight: 25-29.9
g) Obese: 30-34.9
h) Obese II: 35+</td></tr>
<tr><td>Dependent Variable</td><td colspan="2">Discontinued method due to dissatisfaction (yes/no)</td></tr>
<tr><td>Covariates</td><td colspan="2">10) Age
11) Race
12) Poverty
13) Education
14) Relationship status
15) Parity
16) Healthcare Coverage
17) Number of Partners
18) Pregnancy Beliefs
a. Perceived difficulty getting pregnant
b. Feelings about possible unintended pregnancy</td></tr>
<tr><td>Analysis</td><td colspan="2">1) Descriptive analysis (Counts, % and Chi-square)
2) Logistic regression yes/no discontinuation of method as dependent variable, multinomial logistic regression for method type as dependent variable (2.2a)
3) Multivariate logistic regression yes/no discontinuation of method as dependent variable (2.2b)
4) Multivariate logistic regression yes/no discontinuation of method as dependent variable and possible factors with/without survey weight (2.2c)</td></tr>
</table>

Qualitative Research

In this study, qualitative information-rich data were collected from a sample of respondents chosen because of their careers and ability to speak to the issue of possible health care provider bias towards obesity. Since the NSFG was not designed to collect data on physician perspectives on obese patients' contraceptive needs, qualitative research was needed to gather and assess their insights. The sequential mixed methods approach enabled the study to leverage the findings from the quantitative analysis to surface discussion points and inform interview questions.[87]

Qualitative Study Sample

Interviews were conducted with eighteen family medicine residents, with experience ranging from 1-3 years in the field. Approximately 60% of residents were women and over half were non-white and fluent in Spanish. Residents graduated from an accredited medical university with a Doctorate in Medicine (MD) or a Doctorate in Osteopathy (DO). The level of clinical independence progresses over the course of their training with oversight by senior physicians in family medicine. Residents are responsible for all patient contact, diagnoses and treatment plans with insight provided by senior physicians as necessary. Though, the institution for which they work is not identified to preserve anonymity, residents work in a western state in several types of settings, ranging from small rural clinics to a large, urban hospital, with patients of varied levels of socioeconomic status. The patient population served by residents has slightly higher rates of obesity and lower socioeconomic status than national estimates. Additionally, family planning is an important, established aspect of residency training and each resident will be expected to be comfortable with family planning counseling, reproductive health exams and prescription of methods by the completion of residency. However, the level of experience for these tasks varies for each resident by how long they have been in the program and will likely impact their responses. Participants were typical cases, chosen based on their specialty as family medicine residents.

Family medicine physicians were chosen for this study because of the significant role they play in providing contraception to women. Though family planning is an integral component of family medicine training and all physicians are expected to provide contraception services, family medicine physicians serve more disadvantaged populations and provide a greater degree of continuity of care than other specialties.[88,89] Family medicine physicians are responsible for approximately 20-30% of the provision of reproductive healthcare in the United States; a number that is expected to rise as new healthcare changes take effect.[90] However, evidence suggests that women who seek contraception advice from their family medicine providers - independent of obesity status - may not be benefiting from the broad spectrum of contraceptive options available nor receiving effective counseling.[89,91]

With respect to sexually active, obese women, understanding possible biases in this population of physicians may reveal educational opportunities regarding provision of care. Additionally, residents are in a unique position to observe patient-provider interactions with colleagues and superiors. Additionally, although residents have had less experience with patient interactions, they are at a point in their careers where their practices may be more mutable than senior physicians working in private practice.

Recruitment

Residents were informed about the study by the Research Director of the Family Medicine Residency Program and participation was voluntary. Participants were offered $10 in return for 20 minutes of their time. Though this is a short, in-depth interview, early consultation with the residency director confirmed that residents would be unable to participate in longer interviews due to their 85-95 hour weekly commitment to their training program. Given the sensitive topic of inquiry, individual interviews with oral consent maximized privacy and anonymity. Participants were assigned a number and no other identifying information was collected. Interviews were audio-recorded for transcription

and recordings were deleted after transcription was completed. Participants were given the following background about the study:

The purpose of this research study is to explore how obesity impacts contraception use. This study aims to provide knowledge for use in policy and health care settings regarding why obese women are less likely to use contraception and are subsequently at an increased risk for unintended pregnancy.

Though study hypotheses proposed the possibility of physician bias, this concept was not introduced before the interview so as not to initially bias residents' responses. After residents reflected on why they felt obese women were less likely to use contraception, follow up questions proposed the possibility of physician bias if the topic had not already been discussed by the resident. It's worth noting that the consent form alluded to the possibility of implicating colleagues regarding bias, so it was possible that one or more interviewees interpreted that to mean bias was a potential research topic before beginning the interview. However, there was no evidence that this occurred.

Data collection was conducted using structured, open-ended interviews with respondents. The wording and sequence of questions were determined ahead of time so that respondents were asked the same questions in the same order. Using the same questions for each interview maximized comparability of responses, ensured data were complete for each respondent and facilitated organization and analysis of data.[92] Admittedly, this approach limited flexibility in relating the interview to particular individuals. However, given the interview duration and nature of the questions, this study design appropriately maximized data collection.

Methods

Interviews were transcribed within 48 hours of each interview by a research assistant. The primary researcher read and compared the transcribed interviews with corresponding audio recordings for accuracy. After the transcribed interviews were reviewed, the audio recordings were deleted to

preserve anonymity. The primary researcher made notes after each interview to explore themes, perspective and consistency in interview format. Dedoose Software was used to organize the emerging codes.

The primary researcher read each interview twice, before beginning coding of that interview. Coding was continuous, and conducted concurrent to ongoing data collection and processing. [92] Initially, codes emerged from the data, known as inductive codes. Given the structure of the interview, the questions largely guided the development and organization of the coding. To avoid early biases from developing themes, codes remained predominately unaffiliated with one another though there was limited use of "parent-child" coding to help organization by question. Close to fifty codes were initially developed after the first 5 interviews had been transcribed and read. Thereafter, additional codes were added any time the researcher felt variations in responses needed nuanced codes.

One complete round of coding for the 18 interviews resulted in 103 codes. Notes were made on how these codes could be organized and or re-coded to better reflect the data. These notes were used to reorganize the coding scheme in Dedoose. The organization was predominately based on the interview question. However, since the respondents often spontaneously returned to earlier topics or addressed a topic that the interview was going to address further on, the coding scheme was not strictly question-based. In general, residents did not stray from the topics addressed in the interviews, probably due to concern for time.

The primary researcher conducted a second round of coding, based on the slightly consolidated, highly organized list of codes created after reviewing the initial codes. In last round of coding, the primary researcher coded for perspective (either talking about themselves or other physicians), overlapping themes between questions and hierarchical coding relationships to ensure that codes were analyzed in the appropriate context. For example, some answers were initially coded by "how physicians can help," and further refined by the resident's suggestion, including "improve relationship

with patient" or "have more patience." Additionally, the primary researcher created a list of themes that emerged from the codes. This list of themes was used to organize the analysis.

Upon completion of coding, data reduction of codes was used to determine how the codes and themes related to each other, and most importantly, the initial research questions. After all codes and themes were identified and organized, the data were interpreted to identify the core messages within the context of the conceptual framework. Data reduction was primarily accomplished by constructing a diagram to help facilitate understanding why obese women may be less likely to use contraception than non-obese women.

Study Aim 3

Explore physicians' perceptions of presence/implications of provider bias through qualitative interviews to evaluate effect of provider bias on obese women's contraceptive decision-making.

Aim 3 Research Questions 3.1 (examine physician perspectives)

Primary Research Question: What are physician's perspectives as to why obese women are less likely to use contraception?

Follow-up Research Questions: Have physicians witnessed examples of health care provider bias from colleagues in regard to obesity? How does obesity affect physician's intentions to discuss sexual activity and family planning with female patients?

The goal and hypotheses informing these questions is provided earlier in this chapter.

Aim 3 Research Question 3.2 (improve provider support to patents)

How can providers help improve rates of contraception use among obese women?

The goal and hypotheses informing this question is provided earlier in this chapter.

Aim 3 Research Questions 3.3 (improve support to providers)

Primary Research Question: In what ways can physicians be better supported to increase contraception use in this population?

Follow-up Research Questions: How does obesity affect physicians'' recommendations for specific type of contraception? How does obesity impact physicians' recommendations of methods that require vaginal insertion (such as the IUD)?

The goal and hypotheses informing these questions is provided earlier in this chapter.

Institutional Review Board

This study was approved by the following institutional review boards (IRBs): University of California, Los Angeles-South Campus IRB (#14-000777) and Community Medical Centers IRB (# 2014047). Given the sensitivity of the topic, both IRBs approved oral consent procedures for the qualitative study participants in order to preserve anonymity. The IRBs also approved use of the NSFG secondary dataset.

CHAPTER 4: QUANTITATIVE RESULTS

Overview

Study Aims 1 and 2 were achieved via the quantitative analytic process detailed in Chapter 3. Quantitative findings are presented below via eleven data tables, each of which is followed by a narrative summary of findings. Note that Study Aim 3 was achieved via qualitative analysis with results presented in Chapter 5. Chapter 6 consolidates and presents the major findings of the sequential mixed-method approach.

- Tables 3 thru 5 represent the process used to control the study's focus and establish the analytic sample.

- Table 6 uses the analytic sample to explore the disparity between access to reproductive health services between obese women and those of normal weight.

- Table 7 uses the analytic sample for a regression analysis examining the relationship between contraception use in the last 12 months and obesity, exploring models with and without the covariates representing number of partners and pregnancy beliefs.

- Tables 8.1, 8.2 and 8.3 are complimentary, each having two components. The first investigates obesity as a factor in accessing a specific reproductive health service within the past 12 months and the second evaluates the use of contraception by those women who did access the service.

- Table 9 analyzed types of contraception used by the analytic sample with emphasis on availability and effectiveness.

- Table 10.1 displays the results from the analytic sample from the regression analysis of contraceptive type by obesity level controlling for health care and number of partners. Tables

10.2 and 10.3 examine types of contraception used by the analytic sample in the context of physician involvement.

- Table 11 investigates results from the analytic sample from regression analysis of discontinuation of contraception use.

Study Aim 1: Examine Relationship Between Obesity and Rates of Contraception

Aim 1 Research Question 1.1 (analyze disparity factors)

How do obese women differ from other women in terms

of individual and socioeconomic factors?

Tables 1 through 5 present the findings related to researching disparities among women based on obesity level (question 1.1).

Table 1: Individual and Socioeconomic Characteristics by Obesity

Table 1 (below) uses the full sample to provide insight into the manner in which obese women differ from women of normal weight.

Table 1: Individual and Socioeconomic Characteristics by Obesity, NSFG 2006-2010
All Female Respondents (Full Sample, N= 9,217, % values weighted)

	Normal Weight (BMI 18.5-24.9)		*Overweight (BMI 25-29.9)*		*Obese Class I (BMI 30-34.9)*		*Obese Class II/III (BMI over 35)*		*Test Statistic***
Demographic Characteristics	%	n	%	n	%	n	%	n	P-Value
Respondents Age 20-44 (% by row)	38.7%	3459	26.2%	2491	16.9%	1544	16.3%	1632	
Age									<.000
20-24	26.3%	914	19.1%	483	15.2%	250	13.6%	307	
25-29	21.8%	825	20.2%	571	19.8%	360	20.7%	517	
30-34	16.2%	639	20.0%	526	19.5%	324	21.7%	555	
35-39	21.1%	558	22.5%	470	22.4%	299	24.7%	179	
40-44	14.6%	406	18.2%	351	23.0%	246	19.3%	74	
Race									<.000
White	68.8%	2045	60.4%	1222	58.9%	724	56.8%	754	
Hispanic	13.4%	623	16.5%	561	17.8%	337	15.0%	297	
Black	8.2%	448	16.5%	559	17.0%	403	21.7%	499	
Other	9.6%	329	6.6%	143	6.4%	74	6.5%	75	
Poverty Level									<.000
Below 100% FPL	16.6%	719	19.5%	650	22.5%	434	25.6%	492	
100-199% FPL	19.0%	736	24.0%	590	23.8%	415	27.4%	441	
200-299% FPL	17.8%	623	20.8%	461	18.8%	273	17.5%	280	
300% and Above FPL	46.6%	1381	35.7%	790	34.8%	422	29.4%	419	
Education									<.000
Some High School, No Diploma	10.7%	484	16.2%	455	15.8%	298	17.2%	307	
HS Diploma or GED	20.3%	712	24.2%	657	27.8%	435	32.7%	517	
Some College	30.5%	1069	31.0%	780	30.8%	493	34.8%	555	
Bachelor's Degree	28.1%	866	21.1%	441	19.1%	233	11.1%	179	
Graduate School	10.4%	328	7.5%	158	6.4%	85	4.2%	74	
Health Care									<.000
Private/Employer Based Coverage	73.7%	2331	65.6%	1501	67.9%	905	60.2%	916	
Public (State/Federal Program)	10.6%	533	18.3%	564	17.2%	392	25.8%	473	
No Coverage	15.6%	594	16.0%	425	14.8%	246	13.9%	240	
Marital Status									<.000
Married	49.3%	1348	50.1%	1001	53.7%	643	44.1%	561	
Widowed	.8%	19	.6%	13	.4%	9	.9%	15	
Divorced	8.0%	311	10.7%	266	11.2%	177	11.1%	192	
Separated	3.5%	135	4.3%	138	4.3%	89	5.0%	94	
Never Married	38.4%	1646	34.2%	1073	30.3%	626	38.8%	770	
Parity									<.000
No children	41.1%	1490	30.7%	788	26.6%	407	29.6%	512	
1+ Children	58.9%	1969	69.3%	1703	73.4%	1137	70.4%	1120	
Sexual Activity with Male Partner									<.000
Never Been Sexually Active	5.9%	196	3.0%	95	3.4%	55	5.1%	77	
Not sexually active in 12 months	6.5%	283	8.1%	251	9.5%	170	12.1%	254	
Sexually active in last 12 months	87.7%	38	88.8%	2145	87.1%	1319	82.8%	1301	

Note: Percent values total to 100% by column unless otherwise noted.

** Pearson chi-squared calculated for categorical dependent variables. Kruskal-Wallis test calculated for ordinal/dependent variables.

Results for Table 1

Table 1 includes descriptive characteristics for the full NSFG sample of women between the ages of 20-44 along with reported BMI values. The findings are consistent with previous literature exploring the social and individual characteristics of women based on BMI.

Women with BMI between 18.5 and 24.9 (normal weight) accounted for 39% of the sample, with the remaining sample reporting BMI 25 and above. Reported marital status was similar across BMI levels, with slightly lower rates of married women for obese class II/III than the normal weight category (44.1% as compared to 49.3%). The proportion of women reporting sexual activity in the last 12 months was similar across BMI levels. BMI categories over 25 had a higher percentage of women who had given birth (70.4% and above as compared to 58.9% of women with normal weight.) The percentage of women with private/employer coverage was higher for women of normal weight.

Notable characteristics shared by women in the obese class I and obese class II/III categories that differentiated them from women with normal weight included:

- Age: fewer women between the ages of 20-24 (15.2% and 13.6%, respectively) as compared to normal and overweight categories (26.3% and 19.1%, respectively).

- Race: over twice the rate of black women than the normal weight category (17.0% and 21.7% as compared to 8.2%).

- Poverty: a higher percentage 100% below the FPL (22.5% and 25.6% as compared to 16.6%)

- College Education: had a high school diploma or less (43.7% and 49.9% as compared to 30.9%).

Discussion for Table 1

Table 1 uses the full sample to provide insight into the manner in which obese women differ from women of normal weight. Characteristically, obese classes I and II/III have higher proportions of black women, are less educated, have lower incomes and rely more upon public insurance.

Of particular interest is the proportion of women who have been sexually active in the preceding 12 months. Research shows that women between the ages of 18-44 who do not use contraception experience an 85% chance of becoming pregnant over the course of a year.[93] Surprisingly, over 83% of all women – *regardless of BMI* - are sexually active. This is substantially higher than current national estimates citing 70% of women, ages 15-44, as sexually active.[1] Recognizing that obese women are no less likely to be sexually active than women of normal weight underscores the importance of providing this population with effective reproductive health, family planning and contraceptive services.

Table 2: Likelihood of Obesity

Using the full sample, Table 2 (below) depicts a regression analysis related to which women are more likely to be obese.

Table 2: Individual/Social Characteristics and Obesity *
Ordered Logistic Regression (Full Sample, N=9,217)

	Unweighted Sample			
Demographic Characteristics	Odds Ratio	P-Value	CI Lower (Exp.)	CI Upper (Exp.)
Female Respondents Age Range 20-45	1.009	.004	1.003	1.020
Race				
Black	1.393	.000	1.251	1.550
Hispanic	1.257	.000	1.126	1.400
Other	0.759	.002	0.639	0.900
White (ref)	/	/	/	/
Poverty Level				
Below 100% FPL	1.113	.121	0.972	1.270
100-199% FPL	1.128	.051	0.999	1.275
200-299% FPL	1.112	.087	0.985	1.257
300% and Above FPL (ref)	/	/	/	/
Health Care				
Public (State/Federal Program)	1.067	.303	0.943	1.210
No Coverage	0.921	.196	0.813	1.040
Private/Employer Based Coverage (ref)	/	/	/	/
Education				
High School Degree or below	1.187	.005	1.046	1.340
Some College	1.171	.006	1.053	1.312
Bachelor's Degree/Graduate School (ref)	/	/	/	/
Married (dummy)	1.150	.003	1.047	1.260
Parity (Dummy)	1.260	.000	1.141	1.400

*Obesity entered as 3-category BMI measure

/ Reference Categories, omitted from regression

Omnibus Tests of Model		
Model	**Chi-square**	**Sig.**
Unweighted	208.598	.000
Weighted	311.540	.000

Results for Table 2

Table 2 is an ordered logistic regression with BMI as the dependent variable and age, race/ethnicity, poverty, health care, education, marital status, and parity as independent variables. The BMI variable used in the model was a three level variable: normal weight, overweight and a combined obesity class I and obesity class II/III category. The relationship between obesity and the independent variables does not appear to be linear and therefore, obesity was analyzed as a categorical variable. Age was entered in the model as continuous and both marital status (married/not married) and parity (no children/1 or more children) were coded as yes/no dummy variables. Regrettably, information regarding cohabitation was not available. Dummy variables were created for the remaining categorical variables and the omitted reference groups are indicated. The analysis was conducted both with and without the NSFG survey weight. Highlighted variables in the analysis are significant at the p-value<= .05 level. The exponentiated values are reported for the coefficient. Also presented is the 95% confidence interval (upper and lower bounds). Since the effects are similar between the unweighted and weighted analyses, values presented are unweighted (weighted analyses are included in the appendix).

Holding all other values constant, the likelihood of an individual being obese increases 1% every additional year above age 20. Additionally:

- Black women are 39% more likely to be obese than white women.
- Hispanic women also have approximately 26% increased odds of obesity as compared to white women.
- Though not statistically significant at the .05 level, increasing rates of poverty demonstrate trends of increasing odds of obesity.

- The odds of obesity increases as education level decreases (some college: 17%; high school degree or below: 19%).

- Married women have approximately 15% higher odds to be obese and women who have had children have a substantial increase as well (26%).

- Women with previous children are 26% more likely to be obese as compared to women without children, after controlling for age, race, poverty, education and marital status.

Discussion for Table 2

This regression provide cues as to which women are more likely to be obese. Obesity odds increases as women age but decreases with higher educational attainment. Black and Hispanic women are more likely to be obese as compared to white/non-Hispanic women, even after controlling for poverty, education, health care status, marital status and parity. This is an important finding, indicating factors associated with race/ethnicity increase a woman's risk of being obese. Additionally, parity increases a women's likelihood of being obese because women typically gain excess weight with each pregnancy and often retain that weight post-delivery. [94]

These findings are consistent with the literature, indicating that underserved populations, including those that have higher rates of poverty, lower educational attainment and are racially/ethnically diverse, are at an increased risk of obesity.[95] Unfortunately, this population has fewer resources to manage comorbidity conditions associated with obesity. Further, this population may be less likely to use contraception and would have fewer resources to manage an unintended pregnancy much less the complications from obesity-related risks.

Tables 3 thru 5: Generating the Analytic Sample

Tables 3 thru 5 represent the process used to control the study's focus and accuracy and establish the analytic sample. The process of inclusion used to produce the analytic sample is depicted in Figure 2.

Table 3: Comparison of Obesity Characteristics Full Sample to Analytic Sample

Table 3 (below) compares obesity characteristics of the full sample to the analytic sample.

Table 3: Comparison of Individual and Socioeconomic Characteristics by Obesity Unweighted, Full (N=9,217) and Analytic Sample (N=5,605)								
	Normal Weight (BMI 18.5-24.9)		*Overweight (BMI 25-29.9)*		*Obese Class I (BMI 30-34.9)*		*Obese Class II/III (BMI over 35)*	
Demographic Characteristics	**Full**	**Analytic**	**Full**	**Analytic**	**Full**	**Analytic**	**Full**	**Analytic**
Respondents Age 20-44 (% by row)	37.1%	42.3%	26.7%	27.3%	16.6%	16.2%	17.5%	14.2%
Age								
20-24	27.3%	29.3%	20.1%	24.1%	16.9%	21.0%	13.3%	17.6%
25-29	24.7%	25.6%	23.8%	26.3%	24.3%	27.7%	22.9%	28.3%
30-34	19.1%	18.3%	21.9%	21.6%	21.9%	20.5%	23.3%	22.5%
35-39	16.7%	15.3%	19.6%	15.6%	20.2%	15.8%	23.0%	19.6%
40-44	12.1%	11.5%	14.6%	12.4%	16.6%	15.0%	17.4%	12.1%
Race								
White	59.4%	60.9%	49.2%	50.7%	47.1%	46.4%	46.4%	47.5%
Hispanic	18.1%	17.9%	22.6%	22.7%	21.9%	21.9%	18.3%	18.0%
Black	13.0%	11.6%	22.5%	21.8%	26.2%	26.5%	30.7%	29.1%
Other	9.6%	9.7%	5.8%	4.8%	4.8%	5.3%	4.6%	5.4%
Poverty Level								
Below 100% FPL	20.8%	17.3%	26.1%	24.1%	28.1%	25.5%	30.1%	26.6%
100-199% FPL	21.3%	20.2%	23.7%	22.8%	26.9%	26.3%	27.0%	26.0%
200-299% FPL	18.0%	18.3%	18.5%	19.1%	17.7%	19.5%	17.2%	18.6%
300% and Above FPL	39.9%	44.2%	31.7%	34.1%	27.3%	28.7%	25.7%	28.8%
Education								
Some High School, No Diploma	14.0%	10.8%	18.3%	15.8%	19.3%	17.4%	18.8%	15.8%
HS Diploma or GED	20.6%	19.2%	26.4%	24.7%	28.2%	27.9%	31.7%	30.4%
Some College	30.9%	31.3%	31.3%	32.1%	31.9%	33.4%	34.0%	35.7%
Bachelor's Degree	25.0%	27.6%	17.7%	19.8%	15.1%	15.8%	11.0%	13.7%
Graduate School	9.5%	11.1%	6.3%	7.6%	5.5%	5.4%	4.5%	4.4%
Health Care								
Private/Employer Based Coverage	67.4%	71.2%	60.3%	62.4%	58.6%	59.9%	56.1%	59.7%
Public (State/Federal Program)	15.4%	14.0%	22.6%	21.4%	25.4%	25.7%	29.0%	26.0%
No Coverage	17.2%	14.8%	17.1%	16.2%	15.9%	14.2%	14.7%	14.2%
Marital Status								
Married	39.0%	41.6%	40.2%	42.8%	41.6%	44.2%	34.4%	37.7%
Widowed	.5%	.3%	.5%	.4%	.6%	.2%	.9%	.5%
Divorced	9.0%	7.0%	10.7%	7.4%	11.5%	8.5%	11.8%	8.5%
Separated	3.9%	2.8%	5.5%	4.1%	5.8%	4.2%	5.8%	4.5%
Never Married	47.6%	48.3%	43.1%	45.4%	40.5%	42.9%	47.2%	48.7%
Parity								
No children	43.1%	44.0%	31.6%	33.1%	26.4%	28.1%	31.4%	31.8%
1+ Children	56.9%	56.0%	68.4%	66.9%	73.6%	71.9%	68.6%	68.2%

Note: Percent values total to 100% by column unless otherwise noted.

** Pearson chi-squared calculated for categorical dependent variables. Kruskal-Wallis test calculated for ordinal/dependent variables.

Results for Table 3

Table 3 compares obesity characteristics of the full sample to the analytic sample. Excluded respondents included:

- Respondents who were under the age of 20, had BMI levels below 18.5 or did not have reported values for those measures were eliminated first
- Respondents who are not physically capable of having children or were currently pregnant were eliminated next
- Next, only respondents who were sexually active in the last 12 months were included
- The final reduction was to include only those that were not desiring pregnancy

The difference in proportion between the two samples is never larger than 5%. The analytic sample has a slightly larger proportion of normal weight women and a slightly smaller proportion of obese class II women (normal: 37.1%f[2], 42.3%r[3]; obese II: 17.5%f, 14.2%r). The analytic sample has a slightly smaller proportion of women 100% or below FPL, approximately 1.5-3.5% difference depending on BMI. This is the approximate level of difference evident between the two samples for age, education and healthcare as well. Race, marital status and parity tend to differ by less than 2%.

Discussion for Table 3

As demonstrated by the proportion for each characteristic stratified by obesity, the samples are very similar.

[2] f indicates full sample.
[3] r indicates analytic sample.

Table 4: Comparison of Analytic Sample by survey weight

Table 4 (below) compares the analytic sample with and without survey weight.

Table 4: Unweighted and Weighted Comparison of Individual and Socioeconomic Characteristics by Obesity for Analytic Sample								
	Normal Weight (BMI 18.5-24.9)		*Overweight (BMI 25-29.9)*		*Obese Class I (BMI 30-34.9)*		*Obese Class II/III (BMI over 35)*	
Demographic Characteristics	**Unweighted**	**Weighted**	**Unweighted**	**Weighted**	**Unweighted**	**Weighted**	**Unweighted**	**Weighted**
Respondents Age 20-44 (% by row)	42.3%	44.4%	27.3%	25.9%	16.2%	16.2%	14.2%	13.4%
Age								
20-24	29.3%	26.9%	24.1%	23.9%	21.0%	17.7%	17.6%	17.0%
25-29	25.6%	22.4%	26.3%	21.5%	27.7%	23.9%	28.3%	26.4%
30-34	18.3%	15.7%	21.6%	19.7%	20.5%	18.8%	22.5%	21.1%
35-39	15.3%	19.3%	15.6%	18.0%	15.8%	18.4%	19.6%	23.5%
40-44	11.5%	15.7%	12.4%	16.9%	15.0%	21.1%	12.1%	12.0%
Race								
White	60.9%	70.7%	50.7%	64.0%	46.4%	59.5%	47.5%	60.0%
Hispanic	17.9%	13.2%	22.7%	15.3%	21.9%	16.8%	18.0%	14.9%
Black	11.6%	6.8%	21.8%	16.2%	26.5%	16.3%	29.1%	19.4%
Other	9.7%	9.3%	4.8%	4.5%	5.3%	7.4%	5.4%	5.7%
Poverty Level								
Below 100% FPL	17.3%	13.1%	24.1%	15.9%	25.5%	21.2%	26.6%	20.3%
100-199% FPL	20.2%	18.1%	22.8%	21.5%	26.3%	23.3%	26.0%	28.2%
200-299% FPL	18.3%	17.4%	19.1%	21.8%	19.5%	19.8%	18.6%	18.2%
300% and Above FPL	44.2%	51.5%	34.1%	40.8%	28.7%	35.7%	28.8%	33.3%
Education								
Some High School, No Diploma	10.8%	7.6%	15.8%	12.4%	17.4%	14.2%	15.8%	14.5%
HS Diploma or GED	19.2%	18.6%	24.7%	22.4%	27.9%	26.8%	30.4%	30.7%
Some College	31.3%	31.5%	32.1%	31.8%	33.4%	32.5%	35.7%	37.2%
Bachelor's Degree	27.6%	29.9%	19.8%	24.1%	15.8%	20.1%	13.7%	14.1%
Graduate School	11.1%	12.5%	7.6%	9.4%	5.4%	6.4%	4.4%	3.6%
Health Care								
Private/Employer Based Coverage	71.2%	77.1%	62.4%	69.9%	59.9%	68.4%	59.7%	64.9%
Public (State/Federal Program)	14.0%	9.2%	21.4%	15.4%	25.7%	18.6%	26.0%	22.8%
No Coverage	14.8%	13.7%	16.2%	14.7%	14.2%	12.8%	14.2%	12.2%
Marital Status								
Married	41.6%	52.2%	42.8%	51.7%	44.2%	56.1%	37.7%	48.3%
Widowed	.3%	.3%	.4%	.4%	.2%	.1%	.5%	.8%
Divorced	7.0%	6.0%	7.4%	7.1%	8.5%	7.6%	8.5%	8.0%
Separated	2.8%	2.6%	4.1%	3.3%	4.2%	3.2%	4.5%	3.6%
Never Married	48.3%	38.8%	45.4%	37.5%	42.9%	33.0%	48.7%	39.4%
Parity								
No children	44.0%	41.8%	33.1%	34.6%	28.1%	28.9%	31.8%	32.4%
1+ Children	56.0%	58.2%	66.9%	65.4%	71.9%	71.1%	68.2%	67.6%

Note: Percent values total to 100% by column unless otherwise noted.

Results for Table 4

Since the NSFG conducted an oversample of black and Hispanic women, Table 4 compares the analytic study sample (n=5,605) with and without the survey weight (please see Table 4 in appendix for n values). This ethnic oversample led the unweighted sample to be more likely to be poor and less likely to be married and have health insurance coverage.

Discussion for Table 4

To correct for the sample design, weighted data were used for all frequency distributions and descriptive statistics. All regression analyses are also conducted using weighted and unweighted data. Multivariate models based on weighted data are available in the appendix.

Table 5: Descriptive Values for Analytic Sample

Table 5 (below) presents descriptive data for the analytic sample.

Table 5: Individual and Socioeconomic Characteristics by Obesity NSFG 2006-2010: Analytic Sample (N= 5,605, % Values weighted)										
	Normal Weight (BMI 18.5-24.9)		*Overweight (BMI 25-29.9)*		*Obese Class I (BMI 30-34.9)*		*Obese Class II/III (BMI over 35)*		*Test Statistic***	*Total*
Demographic Characteristics	%	N	%	N	%	N	%	N	P-Value	N
Respondents Age 20-44 (% by row)	42.3	2373	27.3	1530	16.2	906	14.2	796		5605
Age									<.000	
20-24	26.9%	695	23.9%	368	17.7%	190	17.0%	140		1393
25-29	22.4%	608	21.5%	403	23.9%	251	26.4%	225		1487
30-34	15.7%	435	19.7%	330	18.8%	186	21.1%	179		1130
35-39	19.3%	363	18.0%	239	18.4%	143	23.5%	156		901
40-44	15.7%	272	16.9%	190	21.1%	136	12.0%	96		694
Race									<.000	
White	70.7%	1444	64.0%	775	59.5%	420	60.0%	378		3017
Hispanic	13.2%	424	15.3%	347	16.8%	198	14.9%	143		1112
Black	6.8%	275	16.2%	334	16.3%	240	19.4%	232		1081
Other	9.3%	230	4.5%	74	7.4%	48	5.7%	43		395
Poverty Level									<.000	
Below 100% FPL	13.1%	410	15.9%	368	21.2%	231	20.3%	212		1221
100-199% FPL	18.1%	479	21.5%	349	23.3%	238	28.2%	207		1273
200-299% FPL	17.4%	435	21.8%	292	19.8%	177	18.2%	148		1052
300% and Above FPL	51.5%	1049	40.8%	521	35.7%	260	33.3%	229		2059
Health Care									<.000	
Private/Employer Based Coverage	71.2%	1689	62.4%	955	59.9%	543	59.7%	475		3662
Public (State/Federal Program)	14.0%	332	21.4%	327	25.7%	233	26.0%	207		1099
No Coverage	14.8%	352	16.2%	248	14.2%	130	14.2%	114		844
Education									<.000	
Some High School, No Diploma	7.6%	257	12.4%	242	14.2%	158	14.5%	126		783
HS Diploma or GED	18.6%	456	22.4%	378	26.8%	253	30.7%	242		1329
Some College	31.5%	742	31.8%	491	32.5%	303	37.2%	284		1820
Bachelor's Degree	29.9%	655	24.1%	303	20.1%	143	14.1%	109		1210
Graduate School	12.5%	263	9.4%	116	6.4%	49	3.6%	35		463
Parity									<.000	
No children	41.8%	1045	34.6%	506	28.9%	255	32.4%	253		2059
1+ Children	58.2%	1328	65.4%	1024	71.1%	651	67.6%	543		3546
Marital Status									<.000	
Married	52.2%	986	51.7%	655	56.1%	400	48.3%	300		2341
Widowed	.3%	7	.4%	6	.1%	2	.8%	4		19
Divorced	6.0%	166	7.1%	113	7.6%	77	8.0%	68		424
Separated	2.6%	67	3.3%	62	3.2%	38	3.6%	36		203
Never Married	38.8%	1147	37.5%	694	33.0%	389	39.4%	388		2618

Note: Percent values total to 100% by column, unless otherwise noted. Percent values are weighted.

** Pearson chi-squared calculated for categorical dependent variables. Kruskal-Wallis test calculated for ordinal/dependent variables.

Results for Table 5

Table 5 shows descriptive values for the analytic sample, restricted to women with the following criteria:

- Between the ages of 20-44;
- BMI level above 18.5;
- Physically capable of having a baby and not currently pregnant;
- Sexually active in the last 12 months with a male partner; and
- Not presently trying to become pregnant.

The sample size for the analytic group is 5,605, approximately 60% of the full sample. The distribution of individual characteristics for each BMI category in the analytic sample are very similar to those of the full sample. Women who are obese (class I and class II/III) have a higher proportion of women who are black (16.3% and 19.4%, respectively); 200% below FPL (44.5% and 48.5%); publicly insured (26.0% and 25.7%); and a high school degree or less (41% and 45.2%) than women with lower BMI levels. Women who are obese (class I and class II/III) also have a higher proportion of women who have given birth (71.1% and 67.6%, respectively) than women with a BMI below 25 (56.0%) but have similar proportions of women who are married (52.2% - normal, 51.7% - overweight, 56.1% - obese class I, 48.3% - obese class II/III.)

Discussion for Table 5

The results in Table 5 are similar to those in the descriptive analysis in Table 1. As with the full sample, the obese population in the analytic sample is underserved and - consistent with previous literature - obese women are more likely to be racial/ethnic minorities, poor and less educated.[95]

Further, a higher proportion of obese women have had children, consistent with research that pregnancy contributes to weight gain.[94]

Aim 1 Research Question 1.2 (examine use of contraception)

Are obese women less likely to use contraception

than non-obese women?

Tables 6 and 7: Use of Contraception

Tables 6 and 7 present the findings related to examining use of contraception by obesity level (aim 1 question 1.2).

Table 6: Comparison of Access to Reproductive Health Services

Table 6 (below) uses the analytic sample to explore the disparity between access to reproductive health services between obese women and those of normal weight.

Table 6: Dependent Variables and Additional Covariates by Obesity NSFG 2006-2010 Analytic Sample (N= 5,605, % Values weighted)										
	Normal Weight (BMI 18.5-24.9)		*Overweight (BMI 25-29.9)*		*Obese Class I (BMI 30-34.9)*		*Obese Class II/III (BMI over 35)*		*Test Statistic***	*Total*
	%	N	%	N	%	N	%	N	P-Value	N
Dependent Variables										
Used Contraception in last 12 months									<.000	
Yes	90.2%	2140	88.2%	1320	86.3%	761	79.3%	623		4844
No	9.8%	233	11.8%	210	13.7%	145	20.7%	173		761
Attended birth control related medical visit									0.035	
Yes	32.9%	820	32.8%	506	33.0%	299	27.5%	239		1864
No	67.1%	1553	67.2%	1024	67.0%	607	72.5%	557		3741
Pelvic Exam in last 12 months									0.124	
Yes	67.7%	1557	69.7%	1022	66.3%	588	65.2%	503		3670
No	32.3%	816	30.3%	508	33.7%	318	34.8%	293		1935
Received family planning counseling									0.193	
Yes	24.1%	608	23.1%	409	22.2%	222	20.5%	198		1437
No	75.9%	1765	76.9%	1121	77.8%	684	79.5%	598		4168
Additional Covariates										
Number of Partners									0.005	
0	8.5%	272	9.1%	180	6.5%	96	11.7%	124		672
1	90.5%	2073	89.8%	1322	92.8%	796	86.7%	650		4841
1+	1.0%	28	1.2%	28	0.7%	14	1.6%	22		92
Pregnancy Beliefs										
Perceived difficulty getting pregnant									<.001	
Yes (ref)	8.7%	192	11.1%	160	13.7%	113	18.6%	139		604
No/Don't know	91.2%	2181	89.0%	1370	87.1%	793	81.4%	657		5001
Feelings about possible unintended pregnancy									<.001	
Upset	24.7%	690	23.8%	400	20.9%	221	22.7%	212		1523
Pleased/Ambivalent	18.3%	451	21.2%	352	23.6%	206	24.6%	191		1200
Prefer not to answer	57.1%	1232	55.0%	778	55.5%	479	52.7%	393		2882

Note: Percent values total to 100% by column, unless otherwise noted. Percent values are weighted.

** Pearson chi-squared calculated for categorical dependent variables. Kruskal-Wallis calculated for ordinal/dependent variables.

Results for Table 6

The variables in Table 6 were incorporated in regression analyses to address research questions pertaining to utilization of reproductive health services. The analysis was based on the analytic sample of 5,605 women who have been sexually active in the last year and do not desire to become pregnant. The table shows descriptive values and p-values for chi-squared tests for categorical dependent variables. Covariates serving as proxy variables for the factors depicted in the conceptual model, Figure 1, are also included. It is not clear from initial analysis that the relationship between obesity and the independent variables in the model is linear and therefore, obesity will be analyzed as a categorical variable in regression analyses.

Initial analysis indicates that obesity status does not lead to substantial differences in whether a woman attended a medical visit related to birth control, received family planning counseling or received a pelvic exam. Rates of attending a family planning visit are between 27-33% while rates of receiving family planning counseling are between 21-24% for all women.

Notably, women who are classified as obese II appear to be much less likely to use contraception (79.3% of obese II women used contraception in the last year as compared to 90.2% of women with normal weight, p-value <.000.)

Discussion for Table 6

Findings in Table 6 do not support the study's hypotheses that obese women are less likely to receive family planning services than non-obese women. Specifically, overweight and obese women are no less likely than women of normal weight to have had a pelvic exam and/or a family planning counseling session in the past year.

However, when compared to women who are not obese, there is a significant disparity in the use of birth control by women with BMI at or above 35. This finding raises an implication related to the quality of services and counseling:

When compared to women of normal weight, obese women are just as sexually active and interface with providers just as frequently, but are less likely to use contraception.

Further regression analysis in Tables 7 & 8 explored this association. The American College of Obstetricians and Gynecologists (ACOG) recommends that all sexually active women over the age of 21 receive well woman exams annually, including family planning counseling, with pelvic exams suggested every three years.[96] Only 65-67% of the sample has received a pelvic exam in the last year and less than 24% received family planning counseling. Given that the respondents in the analytic sample are sexually active and desire to prevent pregnancy, this finding indicates an unmet need for comprehensive reproductive health care.

Table 7: Comparison of Contraception Use in Last 12 Months

Table 7 uses the analytic sample for a regression analysis examining the relationship between contraception use in the last 12 months and obesity, exploring models with and without the covariates representing number of partners and pregnancy beliefs.

The table below presents unweighted NSFG data. Appendix A contains the weighted NSFG data associated with Table 7.

Table 7: Contraception Use in last 12 months (Multivariate Logistic Regression without weight; Analytic Sample, N=5605)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.000				.000
Normal (ref)	/	/		/	/	/		/
Overweight	.841	.684	1.033	.099	.870	.706	1.072	.190
Obese	.773	.612	.977	.031	.809	.639	1.027	.082
Obese II	.513	.408	.645	.000	.567	.449	.715	.000
Age				.053				.097
40-44	.678	.500	.920	.013	.744	.547	1.013	.061
35-39	.849	.638	1.131	.264	.977	.731	1.306	.874
30-34	.925	.711	1.202	.557	.999	.766	1.302	.993
25-29	1.025	.808	1.299	.840	1.105	.869	1.405	.416
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	1.861	1.461	2.369	.000	1.851	1.447	2.369	.000
Hispanic	1.213	.875	1.682	.247	1.187	.851	1.654	.312
Other	2.012	1.629	2.486	.000	2.061	1.663	2.555	.000
White (ref)	/	/	/	/	/	/		/
Poverty Level				.126				.153
Below 100% FPL	.724	.553	.949	.019	.731	.556	.963	.026
100-199% FPL	.868	.676	1.114	.266	.874	.678	1.126	.296
200-299% FPL	.875	.681	1.124	.296	.860	.667	1.109	.246
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.011				.010
Private/Employer Based Coverage (ref)	/	/		/	/	/		/
No Coverage	.696	.549	.882	.003	.691	.543	.880	.003
Public (State/Federal Program)	.813	.636	1.040	.100	.801	.624	1.028	.081
Education				.000				.000
Some High School, No Diploma	.419	.274	.642	.000	.433	.282	.666	.000
HS Diploma or GED	.563	.379	.838	.005	.575	.385	.859	.007
Some College	.809	.549	1.193	.285	.804	.543	1.190	.276
Bachelor's Degree	.870	.585	1.294	.493	.864	.579	1.289	.474
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/		/	/	/		/
1+ Children	.869	.702	1.075	.195	.780	.628	.969	.025
Marital Status				.000				.000
Never Married	.554	.381	.804	.002	.596	.406	.874	.008
Separated	.858	.615	1.197	.366	.883	.631	1.238	.471
Divorced	.835	.230	3.028	.784	1.135	.296	4.350	.854
Widowed	.627	.507	.774	.000	.575	.459	.720	.000
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.001
0 (ref)					/	/	/	/
1					1.556	1.207	2.005	.001
1+					.962	.542	1.705	.893
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't Know					2.651	2.152	3.266	.000
Feelings about possible unintended pregnancy								.000
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.604	.477	.765	.000
Prefer not to answer					.799	.651	.982	.033

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

CI= Exponentiated 95% Confidence level for lower (l) and upper (u) limits

Table 7 Omnibus Test of Model	Chi-square	Sig.
Unweighted without additional covariates	299.801	.000
Unweighted with additional covariatess	411.310	.000
Weighted without additional covariates	283.572	.000
Weighted with additional covariates	409.953	.000

Results for Table 7

Table 7 shows results from the regression analysis examining the relationship between contraception use in the last 12 months and obesity, exploring models with and without the covariates representing number of partners and pregnancy beliefs.

After controlling for the factors indicated in Table 6, obesity is a significant factor negatively associated with contraception use. For women with BMI 30-34.9 (obese class I), the unweighted model shows that they are 23% (p-value <.05) less likely to use contraception than women with a BMI 25 or below. When the other independent variables are introduced, though the significance decreases (p-value=.08), the coefficient is similar in size, indicating a 19% decrease in likeliness to use contraception. Across all models, women with a BMI over 35 (obese class II) are less likely to use contraception than women with a BMI below 25. For the models without independent variables, these women were 49% less likely to use contraception. In models that included the additional independent variables, these women were 43% less likely to use contraception. The overall variable for obesity is significant in the model (p-value <.000).

The analysis in Table 7 includes the same covariates explored previously, including the cited individual covariates. The relationships listed for each variable pertain to women with a BMI over 25 and were compared to the obesity reference group, BMI below 25. Women who are black or of "other" race/ethnicity are more likely to use contraception in the last 12 months than women who are white (black: 84%; other: 106%). Women who indicated that they do not have difficulty getting pregnant or are unsure, are much more likely to use contraception (no difficulty: 163%; don't know: 387%) than those that indicated that they may have trouble.

Women who are below 100% of the federal poverty line (FPL) are less likely to use contraception (27%). Similarly, women with no insurance coverage are much less likely to use contraception than women who have private coverage (31%). In regard to relationship status, women who have never been married are less likely to use contraception than women who are currently married (41%). Ambivalence about an unintended pregnancy was also an important factor as women who indicate that they would be pleased if a pregnancy occurred, are much less likely to use contraception (40%) than those that indicate that they would be upset.

Overall, the variables representing race, healthcare, education, marital status, number of partners, perceived difficulty getting pregnant and feelings about an unintended pregnancy are significant in the model. When tested for confounding, number of partners, perceived difficulty getting pregnant and feelings about an unintended pregnancy did not independently change the main effect of obesity more than 10% and therefore are not interpreted as confounders.

Discussion for Table 7

Controlling for the factors listed in Table 7, women with a BMI over 35 are much less likely to use contraception than women with a BMI below 25. This analysis was conducted with women whom are presently sexually active but do not want to conceive. This finding confirms the primary study hypothesis. Women who are obese are less likely to use contraception than women with a BMI below 25. This relationship is significant after controlling for several factors that may also impact use and access to contraception such as parity, insurance, poverty level, education level and relationship status. The data show that:

Obese women - already at particularly high risk for health complications from

an unintended pregnancy due to obesity are less likely than other women to use contraception.

As discussed in the results section, other factors in the model are associated with the likelihood of using contraception in the last 12 months and a BMI over 25, including factors that are consistent with the literature such as education, poverty level and insurance coverage. Additionally, the results also provide interesting insight into women's impetus to prevent pregnancy. Despite having previously indicated that they do not want to become pregnant, women who say that they would be pleased if an unintended pregnancy occurred are substantially less likely to use contraception. This finding suggests that should an individual indicate that she would be pleased with an unintended pregnancy; providers should encourage the patient to improve health behaviors in anticipation of pregnancy.

Based on previous analyses, obese women are more likely to see health providers about general health concerns compared to other women and just as likely to receive reproductive health services. Therefore, it appears that:

Access to health care is not the primary issue

preventing obese women from using contraception.

Tables 8.1 thru 8.3 employed regression analysis to further investigate this premise.

Aim 1 Question 1.3 (examine use of health services)

Do obese women access reproductive health services

less often than non-obese women?

Tables 8.1-8.3 Use of Reproductive Health Services

The analysis resulting in tables 8.1 through 8.3 investigated the premise that obese women are just as likely to access reproductive health services as other women and – of those obese women who do – compare their use of contraception with other recipients.

Tables 8.1, 8.2 and 8.3 are complimentary, each having two components. The first (labeled a) investigated obesity as a factor in accessing a specific reproductive health service within the past 12 months. The second set of analyses (labeled b) assesses if the use of contraception differs by obesity among those women who accessed the service. Each table component is followed by a narrative results section.

Tables 8.1 Contraception Use Subsequent to Family Planning Counseling in Past 12 Months

Tables 8.1a and 8.1b examine the characteristics and contraception use of women who received recent family planning counseling.

Table 8.1a Family Planning Counseling in Past 12 Months

Table 8.1a (below) presents the characteristics of women in the analytic sample who had recent family planning counseling. Table 8.1a(w) – located in Appendix A - presents the weighted NSFG data related to this analysis.

Table 8.1a: Family Planning Counseling in past 12 months (Multivariate Logistic Regression without weight; Analytic Sample, N=5605)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.560				.684
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.990	.859	1.142	.895	1.000	.867	1.153	.999
Obese	1.026	.865	1.218	.768	1.038	.874	1.233	.669
Obese II	.890	.741	1.069	.211	.914	.760	1.099	.338
Age				.000				.000
40-44	.327	.255	.419	.000	.336	.262	.431	.000
35-39	.440	.355	.547	.000	.452	.363	.562	.000
30-34	.688	.571	.828	.000	.702	.582	.846	.000
25-29	.890	.758	1.043	.150	.900	.767	1.057	.200
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.002				.002
Black	1.104	.912	1.335	.310	1.086	.896	1.316	.399
Hispanic	.740	.565	.970	.029	.739	.563	.971	.030
Other	1.165	.989	1.373	.068	1.160	.984	1.368	.078
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.328				.370
Below 100% FPL	.872	.718	1.060	.169	.879	.723	1.068	.194
100-199% FPL	.912	.768	1.082	.290	.914	.770	1.086	.307
200-299% FPL	.865	.731	1.023	.091	.870	.735	1.030	.105
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	1.165	.970	1.398	.102	1.160	.966	1.393	.113
No Coverage	.609	.502	.739	.000	.607	.500	.738	.000
Education				.008				.009
Some High School, No Diploma	.765	.570	1.026	.073	.765	.570	1.028	.076
HS Diploma or GED	.774	.598	1.003	.053	.781	.602	1.012	.062
Some College	.949	.748	1.205	.668	.951	.748	1.208	.679
Bachelor's Degree	1.070	.844	1.356	.578	1.078	.850	1.368	.535
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.119	.965	1.299	.137	1.099	.946	1.277	.217
Marital Status				.000				.000
Never Married	.664	.472	.934	.019	.699	.495	.986	.041
Separated	1.296	1.026	1.637	.030	1.301	1.029	1.645	.028
Divorced	1.194	.440	3.244	.728	1.349	.494	3.682	.559
Widowed	.773	.665	.899	.001	.748	.640	.874	.000
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.001
0 (ref)					/	/	/	/
1					1.345	1.116	1.621	.002
1+					.790	.470	1.329	.375
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't Know					1.072	.887	1.297	.471
Feelings about possible unintended pregnancy								.019
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.863	.729	1.020	.084
Prefer not to answer					.823	.718	.944	.005

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	275.571	.000
Unweighted with additional covariates	297.346	.000
Weighted without additional covariates	362.104	.000
Weighted with additional covariates	409.953	.000

Results for Table 8.1a

Table 8.1a features the analytic sample and indicates that obesity is not a significant predictor of a woman receiving family planning counseling in the last 12 months, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs. The p-values listed with the variable name represent joint tests of coefficients. If this value is <.05 than the variable as a whole (all categories) is significant in the model.

The relationships listed for the covariates in the model pertain to women with a BMI over 25 and are compared to the obesity reference group, BMI below 25. The number of family practice visits are lower with respect to increasing age, which is consistent with literature (as compared to women ages 20-24: women who are 25-29 are 17% less likely; women who are 30-35 are 30% less likely; women who are 35-39 are 55% less likely; and women who are 40-44 are 67% less likely.) Hispanic women are significantly less likely to attend a family planning visit than white women (26%). Additionally, women with no healthcare coverage are less likely to have attended a family planning visit in the last 12 months (9%). Women who are separated are much more likely to have attended a family planning visit (130%) than married women while women who have never married are 30% less likely to have attended a visit. Results significant at p-value< .05, unless otherwise indicated.

Overall, the variables representing age, race, healthcare, education, marital status, number of partners, and feelings about an unintended pregnancy are significant in the model and associated with family planning visits, as indicated by the p-values from the joint tests of coefficients. In the unweighted analysis, obesity is not significant in the model. When evaluating weighted and unweighted analyses, women in obese class II in the weighted analysis are borderline significantly less likely to have a family planning visit than women who are normal weight. Table 8.b examines contraception use among women who recently attended a family planning visit.

The discussion section for tables 8.1, 8.2 and 8.3 follows the presentation of results for table 8.3b.

Table 8.1b Contraception Use Subsequent to Family Planning Counseling in Past 12 Months

Table 8.1b (below) investigates the contraception use of women who received family planning counseling in the past 12 months. Table 8.1b(w) – located in Appendix A - presents the weighted NSFG data related to this analysis.

Table 8.1b: Contraception Use for Women with Family Planning Counseling in past 12 months (Multivariate Logistic Regression without weight; Analytic Sample, N=1864)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.068				.156
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.648	.384	1.092	.103	.635	.374	1.080	.094
Obese	.765	.415	1.411	.391	.756	.409	1.400	.374
Obese II	.455	.251	.824	.009	.515	.281	.945	.032
Age				.092				.041
40-44	3.310	.920	11.909	.067	3.526	.974	12.765	.055
35-39	2.208	.913	5.341	.079	2.884	1.159	7.175	.023
30-34	1.482	.775	2.836	.235	1.708	.878	3.325	.115
25-29	.943	.567	1.566	.819	1.025	.610	1.722	.926
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	1.891	1.074	3.330	.027	1.876	1.048	3.358	.034
Hispanic	.887	.417	1.885	.755	.985	.452	2.147	.970
Other	2.949	1.703	5.107	.000	3.205	1.835	5.596	.000
White (ref)	/		/	/	/	/	/	/
Poverty Level				.010				.014
Below 100% FPL	.554	.280	1.096	.090	.557	.278	1.115	.098
100-199% FPL	1.482	.726	3.024	.280	1.471	.715	3.027	.294
200-299% FPL	1.009	.507	2.005	.980	.998	.496	2.007	.995
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.844				.825
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	1.180	.651	2.139	.586	1.216	.660	2.238	.530
No Coverage	1.181	.573	2.433	.652	1.150	.552	2.394	.709
Education				.021				.010
Some High School, No Diploma	.191	.040	.911	.038	.182	.038	.881	.034
HS Diploma or GED	.311	.068	1.428	.133	.325	.070	1.510	.152
Some College	.546	.122	2.443	.429	.582	.129	2.632	.482
Bachelor's Degree	.415	.093	1.854	.250	.400	.089	1.808	.234
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.675	.366	1.243	.207	.599	.322	1.114	.106
Marital Status				.362				.223
Never Married	.538	.191	1.510	.239	.528	.181	1.541	.242
Separated	.687	.300	1.572	.374	.794	.335	1.882	.600
Divorced	~	~	~	.999	~	~	~	.999
Widowed	.598	.355	1.009	.054	.520	.296	.914	.023
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.192
0 (ref)	/	/	/	/	/	/	/	/
1					1.738	.940	3.213	.078
1+					1.097	.214	5.619	.912
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)	/	/	/	/	/	/	/	/
No/Don't Know					4.346	2.616	7.219	.000
Feelings about possible unintended pregnancy								.746
Upset (ref)	/	/	/	/	/	/	/	/
Pleased/Ambivalent					.544	.831	.458	1.510
Wouldn't Care					.468	.832	.506	1.368

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05
~ Unstable estimate due to sample size

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	104.392	.000
Unweighted with additional covariates	138.477	.000
Weighted without additional covariates	97.767	.000
Weighted with additional covariates	121.874	.000

Results for Table 8.1b

Table 8.1b investigates the contraception use of women who had a family planning visit in the past 12 months.

Women in obese class II are 48% less likely to use contraception (p-value= .034), after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs as compared to women with a normal weight.

Additionally, among women who had a family planning visit, women with less than a high school education and had a BMI over 25 were 82% less likely to use contraception (p-value=.034) when compared to those with a graduate school education and normal weight.

When tested for confounding, number of partners, and feelings about an unintended pregnancy did not independently change the main effect of obesity more than 10% and therefore are not perceived to be confounders. However, perceived difficulty getting pregnant did alter the main effect of Obesity II/III more than 10% and is considered a confounding variable.

Tables 8.2 Contraception Use Subsequent to a Pelvic Exam in Past 12 Months

Tables 8.2a and 8.2b examine the characteristics and contraception use of women who had a recent pelvic exam.

Table 8.2a Pelvic Exam in Past 12 Months

Table 8.2a (below) presents the characteristics of women in the analytic sample who had a recent pelvic exam and includes data related to both the base model and the additional covariates of number of partners and pregnancy beliefs. Table 8.2a(w) - located in Appendix A - presents the weighted NSFG data related to this analysis.

Table 8.2a: Pelvic exam in 12 months (Multivariate Logistic Regression without weight; Analytic Sample, N=5605)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.278				.271
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	1.120	.970	1.294	.123	1.122	.971	1.297	.119
Obese	1.034	.871	1.227	.705	1.029	.867	1.222	.743
Obese II	.946	.791	1.132	.545	.947	.791	1.133	.550
Age				.014				.012
40-44	1.112	.884	1.400	.365	1.118	.888	1.409	.343
35-39	1.068	.866	1.316	.541	1.067	.865	1.317	.544
30-34	1.196	.990	1.444	.063	1.208	.999	1.459	.051
25-29	1.315	1.114	1.552	.001	1.320	1.117	1.559	.001
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	.738	.614	.888	.001	.741	.615	.893	.002
Hispanic	.486	.379	.623	.000	.487	.379	.624	.000
Other	1.169	.991	1.378	.064	1.165	.988	1.375	.070
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.001				.002
Below 100% FPL	.696	.573	.844	.000	.705	.581	.855	.000
100-199% FPL	.742	.625	.881	.001	.748	.629	.888	.001
200-299% FPL	.848	.715	1.006	.059	.850	.716	1.008	.062
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	1.037	.864	1.245	.697	1.034	.860	1.242	.723
No Coverage	.402	.337	.478	.000	.401	.337	.478	.000
Education				.000				.000
Some High School, No Diploma	.697	.517	.938	.017	.677	.503	.913	.011
HS Diploma or GED	.620	.475	.809	.000	.609	.466	.795	.000
Some College	.731	.568	.940	.014	.720	.560	.927	.011
Bachelor's Degree	.954	.739	1.232	.719	.954	.739	1.232	.719
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.193	1.027	1.385	.021	1.181	1.016	1.373	.030
Marital Status				.062				.007
Never Married	1.058	.771	1.453	.727	1.064	.772	1.467	.704
Separated	1.167	.912	1.492	.219	1.168	.913	1.494	.218
Divorced	.956	.339	2.694	.932	1.082	.384	3.049	.882
Widowed	.856	.736	.996	.044	.800	.683	.936	.005
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.003
0 (ref)					/	/	/	/
1					1.378	1.147	1.656	.001
1+					1.176	.735	1.882	.498
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't Know					.838	.692	1.014	.069
Feelings about possible unintended pregnany								.985
Upset (ref)					/	/	/	/
Pleased/Ambivalent					1.001	.845	1.186	.991
Prefer not to answer					1.011	.880	1.161	.881

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	403.019	.000
Unweighted with additional covariates	421.879	.000
Weighted without additional covariates	427.298	.000
Weighted with additional covariates	464.654	.000

Results for Table 8.2a

Table 8.2a indicates that obesity is not a significant predictor of a woman not receiving a pelvic exam in the last 12 months, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs.

When additional covariates were evaluated, results indicated that women with a BMI over 25 are associated with receiving a pelvic exam in the last 12 months as compared to women with a BMI below 25:

- Independently, black and Hispanic women with a BMI over 25, are significantly less likely to have received a pelvic exam than white women with normal weight (26%; 52%; respectively) while women in the "other" race/ethnicity category are more likely (17%).

- Women at 299% and below the FPL and a BMI over 25 are less likely to have a pelvic exam than those with incomes above 300% FPL and a normal weight (100-199%: 25%; 200-299%: 15%).

- Women without insurance and a BMI above 25 are much less likely to have had a pelvic exam in the last 12 months than those with private insurance and normal weight (60%).

- Women between the ages of 25-29 with a BMI over 25 are significantly more likely to have had a pelvic exam than younger women of normal weight (31%).

- Women with children and a BMI over 25 are more likely to have had a pelvic exam than women with no children and normal weight (18%).

Overall, the variables representing age, race, poverty, healthcare, education, parity, marital status and number of partners are significant in the model, as indicated by p-values reported from the

joint tests of coefficients. Table 8.2b examines contraceptive use among women who had a recent pelvic exam.

Table 8.2b Contraception Use by Women who had a Recent Pelvic Exam

Table 8.2b (below) presents the contraception use and characteristics of women following a recent pelvic exam. Data were presented both for the base model and with the additional covariates related to number of partners and pregnancy beliefs. Table 8.2b(w) - located in Appendix A - presents the weighted NSFG data related to this analysis.

Table 8.2b: Contraception Use for Women who received Pelvic Exam in 12 months (Multivariate Logistic Regression without weight; Analytic Sample, N=3670)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity				.000				.001
Normal (ref)	/		/	/	/		/	/
Overweight	.892	.682	1.165	.400	.919	.700	1.206	.541
Obese	.722	.536	.972	.032	.754	.557	1.020	.067
Obese II	.502	.373	.676	.000	.559	.413	.757	.000
Age				.714				.701
40-44	1.072	.716	1.607	.735	1.143	.759	1.722	.521
35-39	.948	.659	1.364	.773	1.082	.747	1.567	.678
30-34	1.072	.767	1.497	.685	1.155	.822	1.622	.406
25-29	1.172	.865	1.587	.306	1.247	.916	1.697	.161
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	1.597	1.172	2.176	.003	1.720	1.250	2.367	.001
Hispanic	1.509	.944	2.413	.085	1.588	.984	2.561	.058
Other	2.235	1.711	2.921	.000	2.350	1.789	3.087	.000
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.012				.008
Below 100% FPL	.574	.404	.815	.002	.555	.388	.793	.001
100-199% FPL	.843	.610	1.167	.304	.834	.600	1.160	.282
200-299% FPL	.829	.605	1.136	.244	.813	.590	1.119	.204
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.321				.377
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	.790	.581	1.074	.132	.801	.585	1.095	.164
No Coverage	.911	.636	1.305	.611	.891	.618	1.285	.536
Education				.002				.006
Some High School, No Diploma	.486	.282	.837	.009	.496	.286	.860	.012
HS Diploma or GED	.551	.335	.906	.019	.565	.341	.938	.027
Some College	.838	.516	1.362	.476	.837	.512	1.369	.479
Bachelor's Degree	.821	.504	1.336	.426	.814	.497	1.332	.412
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.763	.578	1.008	.057	.682	.513	.905	.008
Marital Status				.000				.000
Never Married	.577	.357	.933	.025	.592	.360	.973	.039
Separated	.754	.497	1.145	.185	.786	.514	1.200	.265
Divorced	1.489	.175	12.644	.715	2.957	.310	28.192	.346
Widowed	.521	.397	.683	.000	.483	.361	.645	.000
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.007
0 (ref)	/	/	/	/	/	/	/	/
1					1.699	1.216	2.375	.002
1+					1.823	.781	4.253	.165
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)	/	/	/	/	/	/	/	/
No/Don't Know					2.903	2.244	3.756	.000
Feelings about possible unintended pregnancy								.002
Upset (ref)	/	/	/	/	/	/	/	/
Pleased/Ambivalent					.561	.413	.762	.000
Prefer not to answer					.810	.621	1.058	.122

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	220.856	.000
Unweighted with additional covariates	309.904	.000
Weighted without additional covariates	222.289	.000
Weighted with additional covariates	310.327	.000

Results for Table 8.2b

Among women who had a pelvic exam in the last 12 months, women in obese class II are 44% less likely to use contraception (p-value= .000), after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs as compared to women with a normal weight. The overall variable for obesity is significant in the model (p-value <.000), with women being less likely to use contraception as their BMI increases.

Additionally, among women who had a pelvic exam and a BMI over 25, women with less than a high school education and those with a high school diploma were less likely to use a family planning method (51%; 44%, p-value<.05, respectively) as compared to women with a graduate school education and normal weight. Women who live 100% or more below poverty with a BMI above 25 are almost half as likely (46%, p-value= .001) to use a contraception method compared to the reference group (those who live 300% or more above poverty and are normal weight).

When tested for confounding, number of partners, perceived difficulty getting pregnant and feelings about an unintended pregnancy did not independently change the main effect of obesity more than 10% and therefore are not perceived to be confounders.

Tables 8.3 Contraception Use Subsequent to a Visit Related to Birth Control in the Past 12 Months

Tables 8.3a and 8.3b examine the characteristics and contraception use of women who participated in recent visit related to birth control.

Table 8.3a Visit Related to Birth Control

Table 8.3.a (below) presents characteristics of women in the analytic sample who have had a recent reproductive health visit related to birth control. Table 8.3a(w) – located in Appendix A - presents the weighted NSFG data related to this analysis.

Table 8.3a: Visit Related to Birth Control in the Past 12 Months
(Multivariate Logistic Regression without weight; Analytic Sample, N=5605)

	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.668				.689
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	1.037	.890	1.207	.643	1.042	.895	1.214	.596
Obese	.921	.764	1.109	.385	.926	.768	1.116	.420
Obese II	.964	.792	1.172	.711	.978	.803	1.191	.825
Age				.000				.000
40-44	.273	.206	.363	.000	.277	.208	.369	.000
35-39	.414	.326	.524	.000	.418	.330	.531	.000
30-34	.706	.580	.860	.001	.713	.585	.870	.001
25-29	.878	.741	1.040	.131	.883	.745	1.047	.153
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.005				.006
Black	1.251	1.026	1.525	.027	1.236	1.013	1.508	.037
Hispanic	.847	.638	1.123	.248	.843	.635	1.119	.237
Other	.943	.792	1.124	.512	.937	.786	1.117	.471
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.131				.121
Below 100% FPL	1.207	.980	1.486	.078	1.212	.984	1.493	.071
100-199% FPL	1.232	1.024	1.484	.027	1.236	1.027	1.488	.025
200-299% FPL	1.167	.972	1.401	.099	1.170	.975	1.406	.092
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	1.218	1.007	1.474	.043	1.216	1.005	1.472	.045
No Coverage	.686	.558	.843	.000	.687	.558	.844	.000
Education				.000				.000
Some High School, No Diploma	.579	.422	.795	.001	.580	.423	.796	.001
HS Diploma or GED	.576	.434	.765	.000	.578	.435	.767	.000
Some College	.784	.605	1.016	.065	.784	.605	1.017	.067
Bachelor's Degree	.839	.647	1.088	.184	.842	.649	1.093	.196
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.470	1.248	1.732	.000	1.455	1.235	1.715	.000
Marital Status				.051				.037
Never Married	.850	.600	1.204	.360	.883	.621	1.254	.487
Separated	1.213	.940	1.565	.138	1.216	.942	1.570	.133
Divorced	1.870	.680	5.140	.225	1.984	.717	5.489	.187
Widowed	.879	.747	1.034	.120	.861	.728	1.018	.081
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.118
0 (ref)					/	/	/	/
1					1.162	.952	1.419	.139
1+					.761	.435	1.332	.339
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't Know					1.033	.842	1.268	.753
Feelings about possible unintended pregnancy								.578
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.936	.781	1.120	.469
Prefer not to answer					.926	.800	1.073	.306

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	249.564	.000
Unweighted with additional covariates	256.028	.000
Weighted without additional covariates	296.619	.000
Weighted with additional covariates	313.795	.000

Results for Table 8.3a

Table 8.3a indicates that obesity is not a significant predictor of a woman attending a visit related to birth control, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs.

Overall, age, race, healthcare, education, parity and marital status are significant in the model. When additional covariates were evaluated, the results pertain to women with a BMI over 25 as compared to the reference group in this analysis (women with a BMI below 25). Findings include:

- Women with children (45%) were more likely to have received counseling than women without children.
- Women who are black were more likely to receive counseling than white women in the last 12 months.
- Women with a high school diploma or less are much less likely to have family planning counseling (Some HS: 42%; HS Diploma: 43%).

As noted in Table 6, only 25% of women - regardless of BMI – attended a visit related to birth control in the last 12 months. This finding should be considered in planning efforts to improve reproductive health care services. However, additional research regarding the population not attending such a visit as well as the quality and efficacy of current contraception counseling methods needs to be conducted to further understand and implement improvement efforts.

Table 8.3b Contraception Use Subsequent to a Visit Related to Birth Control in the Past 12 Months

Table 8.3b (below) investigates contraception use among women in the analytic sample who have had recent family planning counseling. Table 8.3b(w) – located in Appendix A – presents the weighted NSFG data associated with this analysis.

Table 8.3b: Contraception Use of Women with Visit Related to Birth Control in Past 12 Months (Multivariate Logistic Regression without weight; Analytic Sample, N=1437)

	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
Obesity ^				.251				.423
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.758	.477	1.150	.288	.757	.484	1.184	.223
Obese	.595	.454	1.265	.051	.792	.473	1.325	.375
Obese II	.740	.354	1.001	.181	.655	.387	1.111	.117
Age				.612				.459
40-44	1.482	.632	3.476	.366	1.591	.673	3.763	.291
35-39	1.788	.862	3.707	.119	1.969	.938	4.132	.073
30-34	1.261	.739	2.154	.395	1.405	.814	2.424	.222
25-29	1.138	.722	1.793	.578	1.205	.761	1.907	.428
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.212				.216
Black	1.641	.983	2.739	.058	1.617	.955	2.737	.074
Hispanic	1.251	.597	2.622	.552	1.277	.598	2.730	.528
Other	1.497	.942	2.379	.088	1.561	.970	2.511	.067
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.013				.025
Below 100% FPL	.420	.229	.770	.005	.434	.233	.807	.008
100-199% FPL	.812	.450	1.466	.490	.803	.440	1.464	.474
200-299% FPL	.669	.372	1.202	.179	.684	.377	1.241	.212
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.849				.919
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	1.060	.659	1.705	.810	1.077	.663	1.750	.764
No Coverage	1.202	.639	2.262	.567	1.130	.598	2.133	.707
Education				.691				.670
Some High School, No Diploma	1.020	.401	2.597	.967	.977	.379	2.520	.962
HS Diploma or GED	.981	.411	2.343	.966	.994	.410	2.410	.990
Some College	1.229	.542	2.789	.622	1.255	.545	2.889	.594
Bachelor's Degree	1.509	.633	3.593	.353	1.501	.623	3.616	.366
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.437	.252	.756	.003	.411	.236	.718	.002
Marital Status				.280				.099
Never Married	.655	.283	1.518	.324	.572	.245	1.338	.198
Separated	.858	.414	1.779	.680	.903	.428	1.904	.788
Divorced	.410	.040	4.237	.454	.615	.043	8.717	.720
Widowed	.626	.405	.968	.035	.533	.333	.852	.009
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.052
0 (ref)					/	/	/	/
1					1.769	1.043	3.000	.034
1+					.740	.209	2.621	.641
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't know					2.784	1.756	4.414	.000
Feelings about possible unintended pregnancy								.913
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.923	.556	1.531	.756
Prefer not to Answer					1.019	.677	1.534	.928

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05
~ Unstable estimate due to sample size

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	74.794	.000
Unweighted with additional covariates	99.014	.000
Weighted without additional covariates	95.063	.000
Weighted with additional covariates	113.698	.000

Results for Table 8.3b

The analysis in Table 3b was conducted to determine if obesity was associated with contraception use among women who attended a reproductive health visit related to birth control in the last 12 months. In this case, obesity is not a significant predictor of a woman using contraception, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs.

Among women who attended a visit related to birth control and had a BMI over 25, women with less than a high school education were 57% less likely to use a birth control method (p-value=.008) as compared to those with a graduate school education and normal weight.

Discussion for Tables 8.1, 8.2 and 8.3

The findings in Tables 8.1a, 8.2a and 8.3a support the premise that obese women are just as likely to see reproductive health providers as non-obese women. Specifically, there is no significant difference by BMI levels for rates of attending a family planning visit, receiving family planning counseling and/or undergoing a pelvic exam. However, despite having the same access to reproductive health services, obese women are less likely than other women to use contraception.

The analyses of contraception use were conducted with samples restricted to women who received family planning counseling, received pelvic exam and/or attended a visit related to birth control. As indicated in Tables 8.1b and 8.2b, among these women, obese women were less likely to use contraception (48% and 44%, respectively). This finding echoes earlier study findings that obese women are indeed meeting with providers in situations that would typically promote and enable contraception use, yet are not using a method despite their stated desire to not become pregnant. When considered in the context that obese women face significant health risks due to unintended pregnancy, their lower contraceptive use is an unexpected outcome of face-to-face reproductive health services.

The public health strategy to address low rates of family planning use among women seeking to prevent pregnancy fosters interventions to promote access to reproductive health care and contraceptive methods. However, given that - among women receiving care - obese women are less likely to use contraception, focusing on access for this population may not improve outcomes.

The data show that access to healthcare and/or socio-economic disparities are not the only barriers impacting the use of contraception by obese women. For example, it is possible that obese women - given that they are more likely to be impoverished and using publicly funded health care - may see doctors that have less time for each visit and are less likely to recommend contraception than non-obese women with higher income levels and private insurance. Though the NSFG format did not allow for further exploration into this hypothesis, future research should explore the quality and components of health care visits available to women who are obese and underserved. It is also possible that health care provider bias toward obese patients influences the quality of services. In that context, one hypothesis is that providers are less likely to propose reproductive services to obese patients because of a perception that the patient is not likely to be sexually active. Unfortunately, the nature of the survey and question format does not allow for further investigation to discern if the patient or the provider initiated the family planning visit, family planning counseling, and/or a pelvic exam. The qualitative interviews explored this and other aspects of reproductive access for this population. Additionally, the survey does not inquire about the gender or training of the provider, which likely impact contraception counseling and use.

Other findings listed in Table 8.1a are consistent with general reproductive health access research, including that as women age, they are less likely to seek family planning visits, likely because they have found a method that suits them.

In Tables 8.1b, 8.2b and 8.3b, analysis indicates that among women who received family planning counseling, received pelvic exam and/or attended a visit related to birth control, women with

less than a high school education were much less likely to use contraception. This is an important finding as these women are motivated to receive reproductive health services and do not want to become pregnant but still do not use a method. It is not clear if non-use is an issue of choice or access, indicating that this finding should be explored in future research. It is possible that developing a system where women receive their method of contraception directly from their provider during these visits would increase adoption of contraception.

Findings in Table 8.2a are consistent with previous literature regarding receiving a pelvic exam in the prior year. Women with fewer resources, including financial support, education and insurance, are less likely to have received a pelvic exam. A pelvic exam is required for several of the most effective methods of birth control and is a significant hurdle for women who would be better suited with more effective, long-term methods like an IUD.

Table 8.3a findings are consistent with literature, as well.[97] Women with children are more likely to have attended a visit related to birth control, given that they have demonstrated the capacity to bear children and may be more motivated to prevent unwanted pregnancies.

The next section summarizes the findings for Study Aim 1.

Summary for Study Aim 1 Results

The purpose of Study Aim 1 was to examine the relationship between obesity and rates of contraception use. Initial analysis confirmed that obese women are more likely to be racial/ethnic minorities, poor and less educated, thus justifying the inclusion of these factors in further analyses. After controlling for these disparities, additional analyses indicated that when compared to women of normal weight, obese women are similarly sexually active and interface with providers just as frequently, but are less likely to use contraception. The primary study hypothesis was upheld, mainly that obese women - already at particularly high risk for health complications from an unintended pregnancy - are less likely than other women to use contraception. The reality that obese women are just as likely to utilize care, while challenging initial study hypotheses, reiterates the importance of including provider perceptions in this study. When considered in the context that obese women face significant health risks due to unintended pregnancy, their lower contraceptive use is an unexpected outcome of face-to-face reproductive health services. Access to health care appears not to be the primary issue preventing obese women from using contraception.

In general, the addition of variables: number of partners, perceived difficulty getting pregnant and feelings about an unintended pregnancy, are not perceived to be confounders and did not substantially contribute to most analyses. The hypothesis that these variables will alter the effect of obesity on contraception use, as indicated in the conceptual model, was not upheld.

The findings for Study Aim 2 are presented via Tables 9 through 11.

Study Aim 2: Examine the relationship between obesity and type of contraception.

Aim 2 Research Question 2.1 (investigate type of contraception used)

Do obese women differ from non-obese women

in the type of contraception they use?

Tables 9 and 10 Type of Contraception

Table 9 and Tables 10.1 thru 10.3 present the findings related to investigating type of contraception used (study aim 2 research question 2.1). Table 9 analyzed types of contraception used by the analytic sample with emphasis on availability and effectiveness. Tables 10.1 thru 10.3 analyze factors related to choice of contraception method.

Table 9 Types of Contraception by Obesity

Table 9 (below) includes descriptive characteristics for the type of contraception used by women in the analytic sample.

Table 9: Type of Contraception by Obesity, NSFG 2006-2010: Analytic Sample (N= 5,605, % Values weighted)											
	Normal Weight		*Overweight*		*Obese Class I*		*Obese Class II/III*		*Test Statistic***	*Total*	*Total*
	%	N	%	N	%	N	%	N	P-Value	%	N
Type of Method									0.000		
Condom	24.7%	658	25.6%	419	26.6%	264	27.4%	243		25.6%	1584
Pill^	35.8%	818	34.1%	458	30.0%	243	25.8%	179		33.1%	1698
Diaphragm^	0.1%	4	0.5%	3		1	0.1%	1		0.2%	9
IUD^~	6.7%	164	6.7%	114	6.0%	61	8.2%	80		6.8%	419
Implant^~	0.4%	11	0.3%	8	0.4%	7	1.3%	9		0.5%	35
Depo-provera^~	3.7%	120	3.9%	95	6.1%	59	5.0%	53		4.3%	327
Lunelle^~	0.1%	2	0.1%	3	0.9%	4	0.1%	1		0.2%	10
Patch^	1.1%	42	1.6%	34	0.8%	13	0.4%	4		1.1%	93
Ring^	3.5%	103	3.8%	57	4.5%	39	2.9%	22		3.7%	221
No method	23.9%	451	23.5%	339	24.7%	215	28.7%	204		24.6%	1209
										100.0%	5605
For women using contraception:											
Contraception requires prescription(^)									0.060		
Yes	67.5%	1264	66.6%	772	64.7%	427	61.6%	349		66.1%	2812
No	32.5%	658	33.4%	419	35.3%	264	38.4%	243		33.9%	1584
											4396
Contraception requires practitioner to adminster (~)									0.000		
Yes	85.5%	1621	85.2%	968	82.1%	559	79.5%	448		84.1%	3596
No	14.5%	301	14.8%	223	17.9%	132	20.5%	144		15.9%	800
											4396
Discontinued method in last year									0.001		
Yes	48.7%	965	54.0%	621	46.9%	332	52.3%	309		49.7%	2227
No	51.3%	957	46.0%	570	53.1%	359	47.7%	283		52.3%	2169
											4396

Note: Percent values total to 100% by column, unless otherwise noted. Percent values are weighted.

** Pearson chi-squared calculated for categorical dependent variables. Kruskal-Wallis test calculated for ordinal/dependent variables.

Results for Table 9

The most common method reported by all women were birth control pills (33.1%) and second were condoms (25.6%). The third largest proportion of women reported using no method (24.6%).

For women using contraception, methods were grouped into two categories for further analysis: method requires a prescription and method requires physician to administer. Methods were not exclusively in one category or another, for example an IUD requires both a prescription and a physician to administer. The sample of women for these categories includes only women who indicated that they used a method in the last year. The table also includes the proportion of the study sample that discontinued a method due to dissatisfaction.

The chi-square statistic is significant for type of method used in the last year, indicating the type of method differs based between obesity classifications. Methods that require a physician to administer and women who reported discontinuing a method due to dissatisfaction also differ by level of obesity.

Discussion for Table 9

The study differentiated the population of contraception users because methods vary substantially in efficacy, access and administration. Those at highest risk for significant health complications due to an unintended pregnancy should be using the most efficacious method suitable. In that context, the large proportion of obese women who do choose to use contraception relying on condoms is disconcerting.

These descriptive statistics indicate that method use differs by obesity level. Regression analysis in subsequent tables examines the distribution of method choices in the analytic sample.

Tables 10.1, 10.2 and 10.3

Given that obese women are just as sexually active as non-obese women, but face higher risk of pregnancy-related health complications, obese women should be using the most efficacious method appropriate. The next three tables analyze factors influencing their choice of method.

Table 10.1 Type of Contraception by Obese Women Who Used a Method

Table 10.1 displays the results from the multinomial logistic regression of contraceptive type by obesity level controlling for health care and number of partners. Table 10.1a (below) incorporates unweighted NSFG data. Table 10.1b – located in Appendix A – presents weighted NSFG data.

Table 10.1a: Type of Contraception
(Multinomial Logistic Regression with each type of method; Analytic Sample, N=5605)

Reference Group: Condoms	*Obesity*				*Health Care*			*Number of Partners*		
Demographic Characteristics (/ = reference)	Obese II	Obese	Overweight	/Normal	No Coverage	Public	/Private	/0	1	1+
Pill										
OR*	.637	.778	.927	/	.438	.580	/	/	.632	1.312
CI*	.510,.795	.634,.955	.782,1.098	/	.357,.536	.478,.703	/	/	.361,1.106	1.069,1.611
P-Value	.000	.017	.379	/	.000	.000	/	/	.108	.009
Diaphragm										
OR	.748	.674	1.290	/	~	.415	/	/	~	1.380
CI	.083,6.766	.075,6.099	.286,5.816	/	~	.051,3.368	/	/	~	.171,11.128
P-Value	.796	.726	.740	/	~	.410	/	/	~	.762
IUD										
OR	1.313	.882	1.071	/	.932	1.474	/	/	.624	1.707
CI	.964,1.787	.635,1.226	.818,1.403	/	.693,1.253	1.133,1.917	/	/	.234,1.667	1.204,2.420
P-Value	.084	.455	.618	/	.640	.004	/	/	.347	.003
Implant										
OR	1.830	1.296	.992	/	2.538	5.042	/	/	~	.722
CI	.741,4.524	.492,3.411	.394,2.499	/	.992,6.496	2.264,11.229	/	/	~	.322,1.618
P-Value	.190	.600	.987	/	.052	.000	/	/	~	.428
Depo-Provera										
OR	1.014	1.007	1.094	/	1.783	4.220	/	/	.542	1.228
CI	.705,1.457	.710,1.429	.810,1.478	/	1.278,2.487	3.192,5.580	/	/	.202,1.455	.868,1.737
P-Value	.942	.968	.556	/	.001	.000	/	/	.224	.246
Lunelle										
OR	1.204	4.353	2.119	/	3.077	3.658	/	/	~	.778
CI	.107,13.503	.782,24.242	.351,12.804	/	.617,15.359	.803,16.664	/	/	~	.163,3.717
P-Value	.880	.093	.413	/	.171	.094	/	/	~	.753
Patch										
OR	.250	.717	1.242	/	.433	1.601	/	/	.714	1.921
CI	.088,.707	.377,1.363	.775,1.992	/	.204,.917	.990,2.589	/	/	.087,5.886	.916,4.030
P-Value	.009	.310	.367	/	.029	.055	/	/	.754	.084
Ring										
OR	.582	.938	.884	/	.318	.975	/	/	.797	1.117
CI	.358,.946	.630,1.398	.624,1.252	/	.187,.541	.684,1.389	/	/	.266,2.387	.740,1.686
P-Value	.029	.754	.488	/	.000	.887	/	/	.686	.597
No Method										
OR	1.311	1.209	1.216	/	.722	.815	/	/	.614	2.088
CI	1.047,1.641	.972,1.504	1.007,1.468	/	.588,.888	.666,.997	/	/	.304,1.238	1.626,2.681
P-Value	.018	.089	.042	/	.002	.047	/	/	.173	.000

* All OR and CI values are exponentiated.

/ Reference Categories, omitted from regression.

P-value= <.05

~ Unstable estimate due to sample size

Omnibus Tests of Model		
Model	**Chi-square**	**Sig.**
Unweighted	470.131	.000

Results for Table 10.1

Due to the large categorical "type of contraception" variable, only two additional variables could be included in the model to ensure stability. Health care was included because women's choice in contraception may differ based on financial assistance with methods that require a prescription. "Number of partners" was included as the need for a barrier method likely changes when women report having more than one partner. Reference category for type of contraception is condoms as that was the most popular method reported by women, regardless of obesity.

Women in obese I and obese II categories are less likely to use birth control pills than condoms (22%, 36%; respectively). Women in the obese II category are also less likely to use the patch (75%) and ring (42%) than condoms. They are also 31% more likely to not use a method than use condoms. Women who are overweight are also more likely to not use a method (22%) than use condoms.

Women with no health care coverage are less likely to use birth control pills (56%), patch (57%) or the ring (68%) than condoms. However, they are more likely use condoms than no method at all (28% less likely to choose no method). Women with publicly available health care coverage are more 47% more likely to use the IUD, and 44% more likely to use an implant than condoms. They are, however, less likely to use birth control pills (42%) than condoms and less likely to choose no method at all than condoms (18%).

Women who have more than one partner are more likely to choose birth control pills (31%), the IUD (71%) or no method at all (108%) over condoms.

Discussion for Table 10.1

Characteristics of family planning methods vary significantly and determining if women's choices in method differ by obesity is important in understanding issues of access and efficacy. In Table 10.1,

obese women are clearly less likely to use short term hormonal methods than condoms, including birth control pills, ring and patch.

Given that previous analysis has demonstrated that obese women are just as likely to access reproductive health care services, it is not likely that this discrepancy is due solely to lack of access to prescription methods. For example, it is possible that physicians are less likely to prescribe methods of hormonal contraception to obese women. A contributing factor may be lingering misconceptions as early research in this field suggested that hormonal methods were not as effective in obese women as non-obese women.[98,99] Additionally, physicians have cited concerns of prescribed contraceptives impacting blood pressure and cardiovascular health in a population already at risk for these conditions.

However, new research shows that many hormonal methods are effective regardless of obesity, including the pill, ring and IUD, and physicians should not discriminate in prescribing these methods based on BMI.[100] A meta-analysis of research investigating contraceptive failure in obese women concluded that many of the early studies were flawed and that new research into hormonal methods and obesity that incorporate contraceptive use patterns show no difference in contraceptive failure by BMI or increased risk of cardiovascular events. [101] Additionally, birth control pills are more effective than barrier methods for obese women during perfect use or during typical use.[93]

Avoidance of hormonal methods leaves obese women primarily with condoms, which are less effective and require partner negotiation. As discussed previously, obese women may be less likely to engage in negotiation with partners to use condoms due to feelings of low self-efficacy and may ultimately end up not using any method at all. Ultimately, authors conclude that choosing not to use a method and increasing one's risk of unintended pregnancy is far more harmful to a woman's health than hormonal family planning methods.[101]

Also of interest in this analysis is that women with no health care coverage are less likely to use pills, ring or patch than condoms, as compared to women with private insurance. This is likely a result of

limited access to care. However, they are more likely to use condoms than no method at all, a stark contrast from obese women.

Tables 10.2 and 10.3 further differentiate contraceptive method choice with regard to physician involvement.

Table 10.2 Contraception that Requires a Prescription

Table 10.2a (below) presents NSFG unweighted data examining the use of contraception that require a prescription. Table 10.2b – located in Appendix A – presents the weighted NSFG data related to this analysis.

Table 10.2a: Contraception Requires RX; Women Using a Method in Past Year (Multivariate Logistic Regression without weight; N= 4,396, Analytic Sample)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
*Obesity^*				.227				.343
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	1.003	.857	1.175	.968	1.019	.869	1.194	.820
Obese	.910	.753	1.100	.330	.921	.761	1.114	.395
Obese II	.828	.678	1.012	.065	.856	.699	1.047	.131
Age				.000				.000
40-44	.402	.307	.526	.000	.409	.312	.535	.000
35-39	.555	.438	.702	.000	.566	.447	.717	.000
30-34	.882	.718	1.084	.233	.902	.733	1.110	.330
25-29	.901	.755	1.074	.244	.913	.765	1.090	.315
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	1.198	.979	1.466	.079	1.166	.952	1.429	.139
Hispanic	.720	.548	.946	.018	.708	.538	.931	.014
Other	1.555	1.303	1.855	.000	1.536	1.285	1.834	.000
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.294				.342
Below 100% FPL	.826	.667	1.022	.078	.836	.675	1.036	.101
100-199% FPL	.912	.753	1.105	.347	.921	.760	1.118	.406
200-299% FPL	.874	.724	1.053	.157	.877	.727	1.058	.170
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Public (State/Federal Program)	1.143	.933	1.400	.196	1.144	.933	1.403	.195
No Coverage	.644	.530	.783	.000	.645	.530	.785	.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.394				.372
Some High School, No Diploma	.917	.666	1.264	.597	.913	.662	1.260	.580
HS Diploma or GED	.865	.651	1.149	.317	.861	.647	1.145	.303
Some College	.970	.748	1.259	.820	.967	.744	1.256	.800
Bachelor's Degree	1.077	.830	1.398	.578	1.078	.830	1.400	.576
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.147	.973	1.352	.102	1.122	.951	1.324	.174
Marital Status				.033				.031
Never Married	1.037	.733	1.468	.836	1.135	.798	1.614	.482
Separated	1.462	1.122	1.904	.005	1.467	1.125	1.913	.005
Divorced	2.826	.748	10.682	.126	3.287	.862	12.541	.081
Widowed	1.155	.978	1.364	.089	1.085	.912	1.289	.357
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.000
0 (ref)					/	/	/	/
1					1.354	1.115	1.643	.002
1+					.611	.377	.992	.046
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't know					1.112	.893	1.384	.343
Feelings about possible unintended pregnancy								.824
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.938	.781	1.127	.495
Prefer not to answer					.936	.807	1.085	.381

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Table 10.2 Omnibus Tests of Model		
Model	**Chi-square**	**Sig.**
Unweighted w/out additional covariates	181.112	.000
Unweighted with additional covariates	201.944	.000
Weighted without additional covariates	228.209	.000
Weighted with additional covariates	267.400	.000

Results for Table 10.2

Table 10.2 indicates that obesity is not a significant predictor of using a contraceptive method that requires a prescription, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs.

Overall, the variables representing age, race, healthcare, and marital status are significant in the model. When evaluating additional covariates in the model, the findings pertain to women with a BMI over 25 as compared to the reference group in this analysis (women with a BMI below 25.)

Hispanic women are 29% less likely to use a method that requires a prescription while women who cited "Other" race/ethnicity are 54% more likely to use a method that requires a prescription. Women with no health care coverage are 35% less likely to use a method that requires a prescription than women with private coverage.

Discussion for Table 10.2 is presented in conjunction with that for Table 10.3.

Table 10.3 MD Administered Contraception

Table 10.3a (below) presents NSFG unweighted data examining the use of contraception that requires an MD to administer. Table 10.3b – located in Appendix A – presents the weighted NSFG data related to this analysis.

Table 10.3a: Contraception Requires MD to Administer: Women Using a Method in Past Year (Multivariate Logistic Regression without weight; N= 4,396, Analytic Sample)								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
*Obesity^*				.057				.046
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.947	.772	1.162	.603	.962	.783	1.181	.710
Obese	.867	.680	1.105	.250	.878	.688	1.121	.296
Obese II	1.258	.985	1.607	.066	1.291	1.008	1.652	.043
Age				.163				.114
40-44	.643	.446	.925	.017	.623	.432	.900	.012
35-39	.819	.607	1.106	.193	.819	.605	1.108	.196
30-34	.910	.702	1.179	.475	.908	.699	1.179	.470
25-29	.950	.755	1.195	.660	.958	.761	1.207	.717
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.108				.193
Black	.983	.770	1.255	.888	.949	.741	1.215	.675
Hispanic	.669	.456	.982	.040	.695	.473	1.023	.065
Other	.841	.673	1.052	.129	.840	.670	1.051	.127
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.402				.465
Below 100% FPL	1.128	.851	1.495	.403	1.115	.840	1.481	.452
100-199% FPL	1.245	.963	1.609	.094	1.227	.948	1.587	.120
200-299% FPL	1.110	.854	1.444	.435	1.114	.856	1.451	.422
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.001				.001
Public (State/Federal Program)	1.560	1.233	1.976	.000	1.550	1.223	1.964	.000
No Coverage	1.274	.989	1.642	.061	1.249	.968	1.612	.087
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.004				.003
Some High School, No Diploma	1.479	.964	2.270	.073	1.532	.996	2.356	.052
HS Diploma or GED	1.109	.741	1.658	.616	1.134	.757	1.700	.541
Some College	1.058	.723	1.547	.773	1.084	.740	1.587	.679
Bachelor's Degree	.762	.512	1.136	.183	.775	.519	1.156	.212
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	4.251	3.313	5.455	.000	4.294	3.341	5.519	.000
Marital Status				.047				.033
Never Married	1.078	.720	1.615	.714	1.153	.766	1.737	.495
Separated	1.334	.974	1.828	.072	1.360	.991	1.865	.057
Divorced	4.164	1.262	13.738	.019	3.900	1.166	13.042	.027
Widowed	1.245	1.005	1.542	.045	1.304	1.045	1.628	.019
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.214
0 (ref)					/	/	/	/
1					.921	.708	1.198	.539
1+					.518	.248	1.082	.080
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't Know					1.281	.956	1.717	.101
Feelings about possible unintended pregnancy								.000
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.847	.674	1.063	.152
Prefer not to answer					.662	.548	.798	.000

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Table 10.3 Omnibus Tests of Model		
Model	**Chi-square**	**Sig.**
Unweighted without mechanisms	457.341	.000
Unweighted with mechanisms	483.408	.000
Weighted without mechanisms	443.829	.000
Weighted with mechanisms	485.230	.000

Results for Table 10.3

Women who have a BMI above 35 are 29% more likely to use a method that requires a physician to administer, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs. The majority of women who use a method in this category chose the IUD. The overall variable for obesity is significant in the model (p-value =.048).

Overall, the variables representing healthcare, education, parity and marital status are significant in the model, as indicated by the p-values listed for the joint tests of coefficients. More specifically, women with publicly-financed health coverage and a BMI over 25 are 55% more likely to use a method that requires a physician to administer than women with private coverage.

Discussion for Tables 10.2-10.3

When evaluating all methods that require seeing a physician, obese women currently using a contraceptive method are not significantly less likely to use a method that requires a prescription or practitioner insertion. In fact, women in obese II category are more likely to use a method that is inserted by a physician, primarily the IUD. Though the survey does not distinguish between the hormonal or non-hormonal IUD, both IUD options would have substantially lower rates of estrogen and progestin than other hormonal options. It is quite possible that physicians are still hesitant to prescribe other contraceptive methods for fear of efficacy or cardiovascular complications.

An initial study hypothesis proposed that obtaining a prescription or undergoing an exam to insert a method, such as an IUD, would be a barrier to utilizing specific methods. However, study findings indicate that obese women are not reluctant to interface with physicians and health care

providers. It appears that obtaining methods that require a physician's assistance, whether due to prescription or application, does not appear to dissuade obese women in their method choice. Within the context of other findings, this contributes important insight to the population of obese women:

When compared to other women, obese women are just as sexually active, face more serious pregnancy-related risks, are just as likely to access reproductive health care and – when prescribed - use the most efficacious methods of contraception.

Collectively these and other findings framed the focus of the qualitative phase of the study:

Why are obese women who engage in reproductive health services much less likely to use contraception than non-obese women?

Aim2 Research Question 2.2 (examine discontinuation of contraception)

Are obese women more likely to report method dissatisfaction and discontinue use?

Table 11 Discontinuation of Contraception

Analysis in Table 11a (below) explored the hypothesis that obese women are more likely than other women to discontinue a method of contraception using unweighted NSFG data. Table 11b – located in Appendix A – presents weighted NSFG data related to this analysis.

Table 11a: Discontinuation of Contraception of Women Using a Method (Multivariate Logistic Regression without weight; N= 4,396, Analytic Sample								
	Base model				*Additional Covariates*			
Demographic Characteristics	OR	CI (l)	CI (u)	P-Value	OR	CI (l)	CI (u)	P-Value
*Obesity^*				.204				.184
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	1.021	.879	1.186	.782	1.031	.887	1.198	.695
Obese	.840	.700	1.008	.061	.840	.699	1.008	.061
Obese II	.998	.822	1.212	.984	.999	.822	1.215	.996
Age				.183				.121
40-44	.932	.717	1.211	.599	.931	.716	1.211	.595
35-39	1.046	.833	1.313	.701	1.062	.845	1.335	.608
30-34	1.023	.842	1.243	.820	1.047	.861	1.274	.646
25-29	1.178	.997	1.392	.054	1.201	1.016	1.421	.032
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.024				.033
Black	1.034	.849	1.259	.740	1.055	.865	1.288	.595
Hispanic	.873	.665	1.147	.330	.878	.668	1.154	.351
Other	1.193	1.005	1.417	.044	1.191	1.002	1.416	.047
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.422				.460
Below 100% FPL	.885	.722	1.086	.243	.889	.724	1.091	.258
100-199% FPL	1.014	.845	1.217	.884	1.013	.843	1.216	.894
200-299% FPL	1.038	.869	1.241	.680	1.035	.866	1.238	.703
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.236				.302
Public (State/Federal Program)	1.183	.974	1.437	.091	1.166	.959	1.417	.123
No Coverage	1.049	.866	1.272	.623	1.050	.865	1.273	.624
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.016				.020
Some High School, No Diploma	.634	.466	.862	.004	.626	.459	.852	.003
HS Diploma or GED	.750	.572	.985	.039	.744	.566	.978	.034
Some College	.864	.674	1.107	.247	.844	.658	1.083	.182
Bachelor's Degree	.776	.606	.993	.044	.772	.603	.989	.041
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.834	1.567	2.147	.000	1.802	1.538	2.111	.000
Marital Status				.003				.002
Never Married	1.280	.910	1.800	.156	1.276	.904	1.802	.166
Separated	1.503	1.169	1.934	.002	1.510	1.173	1.944	.001
Divorced	1.067	.352	3.237	.909	1.196	.390	3.668	.754
Widowed	.933	.797	1.092	.389	.918	.779	1.082	.308
Married (ref)	/	/	/	/	/	/	/	/
Number of Partners								.035
0 (ref)					/	/	/	/
1					1.278	1.057	1.545	.011
1+					1.383	.854	2.238	.187
Pregnancy Beliefs								
Perceived difficulty getting pregnant								
Yes (ref)					/	/	/	/
No/Don't know					.803	.649	.994	.044
Feelings about possible unintended pregnancy								.009
Upset (ref)					/	/	/	/
Pleased/Ambivalent					.762	.640	.908	.002
Prefer not to answer					.879	.763	1.013	.074

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Table 11 Omnibus Tests of Model		
Model	**Chi-square**	**Sig.**
Unweighted without mechanisms	134.109	.000
Unweighted with mechanisms	153.369	.000
Weighted without mechanisms	131.634	.000
Weighted with mechanisms	142.740	.000

Results for Table 11

Obesity is not a significant predictor, as whole or each level independently, of a woman discontinuing a method of contraception because of dissatisfaction, after controlling for age, race, poverty level, health care, education level, parity, marital status, number of partners, and pregnancy beliefs.

Overall, the variables representing race, education, parity, marital status, number of partners and feelings about an unintended pregnancy are significant in the model. When evaluating the relationships of additional covariates in the model, the findings pertain to women with a BMI over 25 as compared to the reference group in this analysis (women with a BMI below 25.)

Women with a bachelor's degree, high school diploma or less than a high school diploma are less likely to stop a method due to dissatisfaction than a woman with a graduate school education and a normal BMI (22%; 25%; 37%, respectively). Women with at least one child and BMI over 25 are more likely to stop a method due to dissatisfaction than women with no children (80%).

Discussion for Table 11

The findings indicated in Table 11 do not confirm study's hypotheses suggesting that obese women may be more likely to discontinue a method due to method dissatisfaction than other women. However, parity and BMI over 25 are associated with discontinuing a method, representing a population that may need additional counseling when choosing a method of contraception. Furthermore, given that approximately 50% of all women reported discontinuing a method of birth control due to

dissatisfaction, more research needs to be conducted regarding method satisfaction for women, regardless of BMI.

Additionally, women with graduate degrees are more likely to discontinue methods than those with lower educational attainment. This indicates that method dissatisfaction is not necessarily an issue of health literacy, access to quality care or other issues that influence contraception use in underserved populations.

The next section summarizes the findings for Study Aim 2.

Summary for Study Aim 2 Results

The goal of Study Aim 2 was to explore the type of contraception method used by obesity status. There are substantial differences in types of contraception chosen when comparing obese women to non-obese women. Primarily, obese women are more likely to choose no method or use condoms than use birth control pills, ring or patch as compared to non-obese women. Given that previous analysis has demonstrated that obese women are just as likely to access reproductive health care services, it is not likely that this discrepancy is due solely to lack of access to prescription methods. A contributing factor may be lingering misconceptions as early research in this field suggested that hormonal methods were not as effective in obese women as non-obese women.

Further analyses evaluated methods by prescription status and whether a physician needs to administer the method, among women who did use a method in the last 12 months. This analysis was intended to test the hypothesis that among those using contraception, obese women would be more hesitant to seek methods that required additional interface with physicians. However, when grouped in these categories, the higher rates of IUD use among obese women became apparent, rendering findings insignificant. That is - similar to earlier study findings - obese women are not less likely to choose a method that requires interfacing with a physician, whether for a prescription or for administration. Essentially, when compared to other women, obese women are just as sexually active, face more serious pregnancy-related risks, are just as likely to access reproductive health care and – when they do use a method – they often use the most efficacious methods of contraception. However, in general, they are less likely to use contraception. These findings frame the focus of the qualitative phase of the study.

The findings related to Study Aim 3 were derived from qualitative analysis and are presented in Chapter 5.

CHAPTER 5: QUALITATIVE RESULTS

Overview

This study employed a sequential mixed-method research design with the quantitative analysis for study aim 1 and aim 2 followed by qualitative data collection and analysis to accomplish study aim 3 (below).

The qualitative analysis incorporated the perspective of physicians - not directly included in the NSFG data - and provided the opportunity for clarification from practitioners regarding the quantitative findings. The interview questions were designed to discuss quantitative findings, and obtain suggestions as to how to address the issue of lower rates of contraception use among obese women. The findings are presented below in context to this phase of the study's three aims rather than presented as a list of questions and answers. When referenced, codes will initially be italicized and quotes will include the source transcript. Also, codes overlap throughout the quotes so although examples are generally used to highlight one general idea, the quote may also contain additional codes.

Study Aim 3: Examine Perspectives and Options for Support

Explore physicians' perceptions of presence/implications of health care provider bias through qualitative interviews to evaluate possible effects of provider bias on obese women's contraceptive decision-making.

Solicit ideas on improving rates of contraception use among obese women.

Aim 3 Research Questions 3.1 (examine physician's perspectives)

Primary Research Question:

What are physician's perspectives as to why obese women

are less likely to use contraception?

Follow-up Research Questions:

Have physicians witnessed examples of patients being treated differently

by colleagues in regard to obesity?

Does obesity affect physician's intentions to discuss sexual activity

and family planning with female patients? If so, how?

The primary purpose of conducting the qualitative interviews was to gain insight from physicians as to why they believe obese women are less likely to use contraception than other women. This topic was explored in several ways. First, the interviewees were directly asked:

First Interview Question

"In my preliminary research with the National Survey for Family Growth (NSFG),

analysis shows that obese women have similar rates of sexual activity as non-obese women.

However, obese women are 30% less likely to use contraception,

after controlling for individual and socioeconomic factors.

Why do you think that is?"

This was the first interview question and was intended to seek direct reflection on this finding, before considering study hypotheses and introducing the concept of provider bias. After discussing this question, residents were then asked to reflect on follow-up interview questions:

Topical Interview Questions

- Do you think social views of obesity impact clinician/patient interactions? How might this affect obese women's use of contraception?

- During your training, have you noticed patients being treated differently in healthcare settings based on obesity status?

- Obese women are more likely to interface with physicians but have lower rates of contraception use. Why do you think than may be? Do you think there may be a bias against discussing family planning with obese patients in the family medicine field?

- How does obesity impact your level of comfort in discussing sexuality with patients?

- Do obese patients seem more hesitant about exams and methods that require vaginal insertion?

Directly addressing the study's hypotheses, these questions conveyed to the resident the intent and focus of the study. The responses to these questions were coded and grouped under the parent category of, "*Why do obese women use contraception less often?*"

Extensive consideration was paid to the sequence and wording of the questions. In particular, the pros and cons of whether or not to mention provider bias was considered and opinions from outside researchers were sought. Ultimately, protecting the relationship and trust with each interviewee was prioritized over attempting to have physicians admit to bias in the field before acknowledging the research question at hand. Residents were informed that the researcher was interested in provider bias and social views of obesity but was inquiring about observations or general trends in the field, rather than solely personal views and actions. The residents also discussed sources of provider bias before being asked directly and raised concerns about the influence of social views of obesity in their field and cited examples of negatively impacted patient care.

Results

When asked to reflect on the lower rates of contraception for obese women as compared to non-obese women, residents discussed reasons that were specific to patients as well as those specific to providers. Therefore, results for research questions 3.1 are grouped into patient-centered and provider-centered findings.

Patient Centered Findings -

Many residents purported that the patients, themselves, were the primary barrier to the population using contraception. Of the reasons cited to bolster this argument, the three most common were weight gain, negative self-perceptions and complicated perceptions of pregnancy.

Reason 1: Weight-gain

Over half of the residents indicated that obese women may be less likely to use contraception because of the potential for weight gain associated with certain types of contraception.

> *"I mean, just in general, I think—am just hypothesizing why they don't use contraception as opposed to non-obese people, I mean some of the methods out there such as, you know, OCPs, they are notorious for weight gain and I think they might be more self-conscious about, you know, their weight already and they don't want to do anything to add to the weight." (Transcript 14)*

> *"There is the fear of weight gain. In general, most women think that all birth control pills or birth control causes weight gain which is not true. So maybe they have a fear of that. Pills or patches, injections or anything will cause them to gain weight. I feel that perhaps that might be a fear that they have." (Transcript 4)*

During discussion about this factor, some residents indicated that they concurred in the assumption that contraception can cause weight gain:

"Many contraception pills they can cause weight gain. So some obese women they are more resistant to take pills. I think this is the main issue for them." (Transcript 17)

"So, yeah. And also, one more thing could be that some of these medications we give people make them gain weight." (Transcript 15)

Other residents discussed weight gain in the context of the "myth" that women will gain weight, highlighting a misconception in the population:

"The first thing that comes to mind is just like kind of myth out there that contraceptives can cause weight gain. If they are conscious about their weight then they are less likely to want to take a medication that will make them gain weight." (Transcript 6)

"So I definitely mention that to them and I talk to them about how the other forms don't necessarily make you gain weight but they may stimulate your appetite and if you eat more you gain weight." (Transcript 4)

The theme of concern over weight gain was not only discussed in reference to why obese women were not using contraception, but was also addressed frequently when physicians were asked about ways to improve contraception use:

"As far as like doing something separately just for obese females to make them be more compliant with this, ah, I think I would probably target them with option that would technically not lead to weight gain that would be more kind of more appealing to them and that might increase their rate of using contraception." (Transcript 12)

Reason 2: Negative self-perceptions

Half of the residents cited obese women's negative *self-perceptions* as a reason that women may be reluctant to use contraception. Primarily, these discussions revolved around the patient feeling *uncomfortable* and reluctant to broach the issue of family planning with providers due to *embarrassment* and *low self-esteem*, events they had personally witnessed as providers. These concepts were most often discussed together, proposing that patients were self-conscious of their

weight which led them to feel embarrassed and uncomfortable when being seen by a provider and less likely to advocate for themselves.

> *"If it has to do with the patient—obese women, and adolescent group, they are pretty self-conscious. They might be even less likely to talk about their sexual habits and practices. With lower self-esteem they might not be able to speak up and say 'oh what about condoms for their partners,' and they might be less likely in general to advocate for themselves." (Transcript 1)*

> *"I mean, just, I think obese women, you know, they have more image problems and what not and so that's why they might be more inhibited in talking about their sexuality and asking those questions to their clinicians. So, you know, it's about making them feel comfortable and just bring out the issue to light otherwise they are not really going to mention it if you don't ask." (Transcript 14)*

> *"Yeah, I think maybe just it has to be brought it up by the physician. Obese women are maybe less likely to bring that issue up because they're embarrassed or, you know, they already assume that they know the side effects of that and so they don't want to discuss it. Or maybe they feel like there's some sort of judgment on them, that they're using contraception in addition to the judgment they fell society has towards obesity. And that may prevent the communication between physicians—or between patient and physician to get them on oral contraceptives." (Transcript 16)*

These ideas were discussed both in terms of why women may be less likely to use contraception as well as how physicians can better serve this population. Of the residents that cited negative self-perceptions as a reason for lower rates of contraception, every resident also cited concerns that were physician-centered.

Reason 3: Complicated Perceptions of Pregnancy

Several residents proposed the possibility that even though the sample was restricted to women who did not currently want to become pregnant, that obese women may have *complicated perceptions of pregnancy* that could negatively impact their contraception use. These perceptions include concerns

that they may be *infertile*, fears that providers may not think *obese women should have children* and that even though they do not openly want to become pregnant, they subconsciously *may desire a child* for the unconditional love a child provides.

> *"Okay, so I think this might just be from my own prejudice. I think a lot of it has to do with psyche issues. So, maybe they are feeling unloved in some way so maybe obese women even though they might say they don't want to get pregnant they know deep down they want to have a child that will be unconditionally loving them no matter what." (Transcript 8)*

> *"And they are here for refills or anything like that, or you know what nowadays I think that every year something new comes up so I think they all deserve to know okay so we have a new medication or a newer device would you be interested in this? And don't push it you know, yes or no, you know. You kind of get that feeling because if you push it they might be thinking what, you don't think am worth having babies, you know what am saying?" (Transcript 15)*

> *"Maybe that a lot of obese women may have desires to become pregnant but because maybe in the past they have had issues becoming pregnant because of obesity. So, although they may express some interest in wanting to use some type of contraception, there is that thought that since they have had difficulty to getting pregnant maybe they should not go forth with this type of contraception, if that makes any sense?" (Transcript 7)*

Topical Follow-up Interview Question (pelvic exam)

Are obese women more likely to refuse pelvic exams?

After residents were given an opportunity to reflect on why they felt obese women were less likely to use contraception, they were asked to assess, from their experience, if obese women were more hesitant to undergo pelvic exams than non-obese women. Though the first question regarding contraception use in this population left the source of the reason open (patient or provider), this question was intended to have physicians focus directly on obese women in medical settings. Overwhelmingly, residents indicated that obese women were *not less likely to refuse pelvic exam.* A few

residents indicated that they felt obese women were *more likely to refuse or resist pelvic exams* than non-obese women. In general, residents reflected on this aspect of women's health to be generally sensitive for most women but felt that obesity did not play a role in women's willingness to undergo an exam.

> *"I would not say in my practice thus so far, obese women have been more hesitant." (Transcript 3)*
>
> *"I don't think it just pertains to obese women. It can be any woman." (Transcript 9)*
>
> *"I am just thinking back into Medical School during my OB rotation. We kind of gave them an option but I did not really see any hesitancy. I don't think they realize—I think the average obese woman, I don't believe that they realize that they are more difficult to do those exams on them." (Transcript 8)*

When residents did acknowledge that obesity may play a role limiting women's willingness to have a pelvic exam, concerns of body image issues were also raised:

> *"Yeah I have seen a lot of, in the rural clinic, a lot of overweight patients that are just, I mean, I have to talk to them through step by step for, and I usually talk to them through pap smears anyway but just because like even just moving the drape a little bit or exposing the thighs kind of, they want to keep the shirt on while they have the gown on and it's kind of hard to explain that, you know, I need to examine everything. When they lay back on the gown, you know, its, the gown doesn't fit as well so it automatically just kind of sits open, their belly is kind of showing and you can tell they're trying to shift their bodies to cover it. So, I think it is an issue we try to provide like extra drapes and just kind of go a little bit slower with the exam, but there is definitely body issues." (Transcript 13)*

This question was not intended to determine if obese women were actually more or less likely to undergo exams but rather gauge if residents felt that to be the case.

Discussion of "Patient-centered"

The majority of residents did not initially cite patient-centered reasons to explain why obese women were less likely to use contraception. For those who did, the reasons were cited in conjunction with provider-centered issues.

By far the most common issue raised was that obese women may avoid contraception because of associated weight gain. This finding was surprising and not predicted by study hypotheses. Though it is not clear if obese women are resistant to using methods because of the fear of weight gain and/or that physicians are sensitive to prescribing methods that may increase their obese patient's weight, it is clear that this theme is consistent from the physicians' perspective. Furthermore, the discordant result that some providers felt weight gain was "a myth" and some were confident that estrogen-based methods did indeed cause weight gain was concerning. It appears that residents frequently factor this side effect into prescribing methods and providing family planning counseling, often limiting the methods they suggest out of concern that patients will be resistant. Clarification about which methods may or may not cause weight gain and tools to broach this topic with obese patients is a candidate topic for corrective action. This finding led to a review of literature regarding concerns with side effects among obese women. In a recent article intended to educate physicians about efficacy and use of contraception in obese populations, authors suggested that obese women may be hesitant to use contraception because of concern of weight gain.[79] Though not supported by original or previous data and again presented from the perspective of providers, this misperception is clearly a concern among physicians and should be investigated further.

Beyond weight gain, residents also cited reasons related to negative self-perceptions. This finding is consistent with study hypotheses and literature regarding obesity in health care settings. Though neither analysis suggested disparities in rates of accessing health care, this finding suggests that upon meeting with a physician, obese women may be embarrassed and uncomfortable discussing family

planning. This may result in obese women being less likely to advocate for themselves if a physician does not broach contraception or recommends a method that does not entirely meet the patient's needs. Based on this finding, the effort to address the disparity of contraception use should include educating providers about the possible reluctance of obese women to initiate discussion.

The discussion with residents regarding their perceptions of obese women being reluctant to undergo a pelvic exam suggested that obese women were not more resistant than other women. This mirrors findings in the quantitative analysis that obese women have similar rates of receiving pelvic exams as non-obese women. Pairing these findings suggests that when physicians do recommend a course of treatment or a method that requires vaginal insertion, such as the IUD, obese women will likely be as receptive as other women.

The findings indicate that physicians need to be cognizant of possible complicated perceptions of pregnancy their obese patients may harbor. The idea that obese women may believe themselves to be infertile is consistent with the literature and study hypotheses. Being sensitive to perceived infertility will allow physicians to discuss the source of this assumption and clarify the patient's understanding of the likelihood of becoming pregnant. Approaching this topic with particular sensitivity for obese women is needed to alleviate patients' concerns that physicians believe they are not worthy of a pregnancy or that having a child will fill a void in companionship. Though these matters were not discussed in the majority of interviews, those who raised the topic felt that prior consideration about how to address these topics should they arise would be useful for physicians.

Research shows that entering a health care setting is an intimidating and often de-humanizing experience for obese women. [8-15] It is incumbent upon providers to recognize this and approach these issues with empathetic professionalism.

Provider-Centered Findings

Every resident cited provider-centered reasons why obese women are less likely to use contraception. The study acknowledges that the nature of the follow-up questions contributed to this outcome by probing about possible biases in the field, quality of care and how physicians could support obese patients. Further, subsequent discussion purposefully led the conversation to engage the topic of the provider's role. However, it is significant that a large majority of residents addressed provider-centered reasons before any prompting. Additionally, it is important to emphasize that residents were not pushed toward blaming physicians for the disparity. Rather, they were asked to suggest ways in which providers could improve rates of contraception use. It was in that context that many residents self-reflected and individually identified sources of bias and misperceptions that may be contributing to the lower rates of contraception use. Coding highlighted three provider-centered reasons as follows.

Reason 1: Emphasis on Comorbidities

The majority of residents identified the complex issue of *comorbidities* of obesity as a significant reason that obese women have lower rates of contraception use. Prominent in this thought process was a comparison of *healthy v. unhealthy*, mainly that with healthy women, physicians have only preventive care to consider and default to reproductive health. With unhealthy patients, physicians become *distracted* by the accompanying health issues that need to be discussed such as diabetes, hypertension and weight loss, leaving *no time* for family planning conversations.

> *"I'm not good about going into it any other time because I am so focused on 'you're here for your diabetes and your high blood pressure.' You have such a limited amount of time that you really do get focused on those things unless they make a specific appointment to come in for something related to reproductive health. In my experience, I probably overlook it a lot." (Transcript 4)*

"I think family planning is probably like the last priority we discuss with the patient when they come in for the other issues. I mean, different clinics have different populations, the clinic that I come from patients literally have 10 different problems, each problem needs to be addressed at every visit or they will be super unhealthy for the next 3 months until you treat them again… So, that's why it becomes really hard to discuss family planning and particularly my clinic. So I think in the level of priority, I think it's probably like the last thing I discuss with my patients. Unless they're really young, you know, adolescent patients or even like the ones that ask for help, those definitely we would address right away, but the ones that don't ask—that are like not, you know, you don't think that there's planning, you know, babies [laughing] in the near future you're not really going to bring that up with them because you have so many other things to talk about." (Transcript 18)

The concept of comorbidities dominating the focus on obese patients was consistent across the interviews. In particular, this was cited for limiting providers' time when meeting with patients, as well as distracting providers from discussing the topic when time was available. This finding was distinct from the concept of physician bias or physician frustration with lack of patient progress toward comorbidities, which will be discussed shortly. Rather, residents cited that they simply ran out of time or were overwhelmed by the pre-existing health conditions and subsequently neglected preventive care.

Reason 2: Provider Bias

Provider bias was a prominent theme throughout the qualitative interviews. Over half of the residents introduced the concept before follow-up questions encouraged the exploration of bias against obese patients. By the end of the interviews, all residents had reflected on the presence and implications of bias with only one resident indicating a lack of belief that bias existed among providers:

"I don't really think there is a bias at least from my experience which is very limited. I don't really feel like there is any type of bias towards that actually. I mean, from the little that I have been involved with, everybody seems to be doing a good job with their patients." (Transcript 9)

For the remaining residents, provider bias was described in a variety of ways. Primarily, residents preserved the manner in which the question was framed and responded with their views of other physicians having bias or suggesting a system-wide bias against obesity. Occasionally, residents were self-reflective and admitted that they likely had a bias toward obese patients. Frequently, residents suggested that providers may consider obese women as *asexual*. The theme of bias cited emphasized society's views of obese women being unattractive with the resumption that others would not engage in sexual relationships with obese women. The findings revealed that it simply did not occur to some providers that obese women would be sexually active. This was often discussed in the context of other *populations that get overlooked* when it comes to reproductive health care, like elderly people, mentally disabled adults and younger adolescents.

> *"Maybe there might be some incorrect assumptions that obese women might not be as sexually active so they might not provide that education and care regarding that subject. Maybe that might cause a decrease in use and knowledge." (Transcript 10)*

> *"I think if you're, like if the assumption is that if clinicians think of obese females as they are not—or we think of them as they might not be very sexually involved or they're not as attractive, that could come up as, I mean I am saying that could be something that…can drive that thought is what I am trying to say—like they're going to have that thought in the back of their mind." (Transcript 12)*

> *"So, I am thinking sometimes the topic does not come up in the talk. Sometimes it is uncomfortable. Maybe the medical assistants are asking the questions about their sexual activity. It sort of reminds me of the elderly population or comparing to the disable populations. Sometimes, you think 'I am not going to ask them about their sexual activity because they are probably not doing it.' So, I think that maybe everyone is just slightly uncomfortable with this topic so maybe having staff meetings about what you should be asking every patient when they come in regardless of their weight or age or anything else." (Transcript 8)*

"One of it may be that providers are not taking into account that obese women are not sexually active because they might think of them as a non-sexual group much like the elderly or younger teens. They might not think to provide contraceptive options." (Transcript 3)

Residents also discussed the many pejorative views that providers have regarding obese patients. These comments reflected perceived patient *apathy*, with phrases like "*unmotivated*," "*lazy*," and "*poor self-care*" frequently used.

"I am not telling anything you don't know. Yeah, there is as a—you already have a bias to begin with. And I don't know I've thought about that, where it comes from, I think it's from thinking that maybe they don't care about their health, ah do you see what am I saying?" (Transcript 15)

"I think our population is, it's what's common. Every one of our patient is heavy you know, through the roof and that's not an unusual thing to see someone that's overweight, so I don't think it really skews our view of them. Some previously held health notions, I think that people are overweight maybe some clinicians might think it would be harder for them to do like take something daily because they might associate them with laziness or inability to kind of keep, keep track of---or have less control over their life's since their eating is kind of a reflection of less control of their lives, but I don't think in general that really is in our mindset just because it's so prevalent nowadays you know in patients. (Transcript 13)

"So, again I think of the stereotypes that if because someone is obese they probably don't care about their selves as much and they have low self-worth. I think it is the stereotypes in society that sometimes gets rubbed off on physicians that are supposed to be more open minded. Sometimes we do judge by appearance. Sometimes it is underlined. You think this person might even be, I don't know just have a lower self-worth than someone who is thin." (Transcript 8)

Reason 3: Frustration with Non-compliance

Over half of the residents reported that physician-held negative views of obese individuals leads to *frustration* and ultimately, lower quality of care. Additionally, patterns of *non-compliance* and *no improvement in health status* leave physicians *blaming the patients* for their obesity and being unwilling or neglecting to consider non-obesity related health care concerns.

"You might be thinking they don't care about their health and am sure a lot of people have told them to go diet and exercise and they haven't so far you know, how much more can I do, which is a little sad way of looking at it but its true- just in everything, but yeah, and there are like jokes, you know, oh which lady, oh the obese lady, the 400 pound lady, you know like that. That's how you kind of identify them." (Transcript 15)

"So that's one way in which, I think, the pre-conceived notion of if they're fat it's their fault and they need to do something about it and that they let it get out of control and kind of a blame theme because it's not in our control so we can't just fix it right away and that's what frustrates a lot of physicians because we are used to fixing things and we just feel like this is not in our control so we get frustrated and hence it can impact how we treat patients differently when it comes to other aspects of their healthcare like contraception, for instance. Maybe, not necessarily counseling them because you come to a pre-conceived notion that they're not going to listen to you anyway, so there is no point in counseling them. So that might be one factor to why they are a segment of the population that don't get as much counseling." (Transcript 18)

Application of non-compliance in other aspects of care being interpreted as possible non-compliance with contraception was a common theme in many of the interviews.

"I think obesity overall is not viewed favorably by most or largely of our society and in this case by providers. Because, I think that sometimes the provider's perspective and thinking is that if the patient is not complying with the exercise then they will most likely not be compliant with contraception use." (Transcript 7)

"In just my practice so far I have a little bit more of—like the minute I walk into the room and there's a patient that is morbidly obese and non-compliant with all of their medication, you know, the non-compliance is a separate factor but the minute you see a patient whose morbidly obese or even obese you automatically have like a—an instinctive feeling that they are not going to listen to your advice about other aspects of their healthcare." (Transcript 18)

As mentioned previously, the pattern of non-compliance leading to blame and ultimately disregard of the patient was referenced frequently.

"They can be seen as I guess not doing their part. When you see a patient, it is great when both are making an effort and sometimes when you have patients that are overweight; you really try to work with them. You talk about diet, you talk about exercise and try to give them some type of plan and it does not happen and as physicians sometimes we do end up blaming them when really it should be a partnership. It is hard. We are still learning how to manage that relationship so that we can have successful outcomes." (Transcript 4)

"So we might not [discuss contraception]—if we are already on the pathway of treating them differently and kind of saying 'well they don't care about their health and they are not going to follow through with what we are recommending, then we might as well not bring it up.' We are just sort of going through the motions with them instead of trying to make some type of change." (Transcript 4)

Topical Follow-up Interview Question (broaching sexuality):

How does obesity impact your level of comfort in discussing sexuality with patients?

In order to redirect the line of questioning to the residents' individual practice, interviewees were asked if they felt obesity impacted their own level of comfort in discussing issues related to sexuality. This question was asked after they had reflected on possible obesity bias in the family medicine field and most had acknowledged that bias existed and negatively impacted care. The majority of residents (12) indicated that they did not feel obesity impacted their comfort level while the remaining residents acknowledged that - to some extent - obesity likely impacts their comfort level. Of those residents that indicated it does not affect them, a few indicated that knowing the bias exists encourages them to reach out to this population:

"I am not aware that it does for me. The fact that I know—just having a little bit more of a family planning background that it is a neglected population. It just probably makes me want to focus even more." (Transcript 1)

"If you have an obese patient coming in for reproductive health, I would almost be more likely to offer them birth control or more likely make sure that knew that it was available, not to force it

on them. [Laughing] Just so they understood that the co-morbidities of having babies—the fact that most people who gain weight in pregnancy do not lose it and to just make sure they are not being disenfranchised in any way because any population has a bias on it culturally can be disenfranchised." (Transcript 2)

Among those who admitted to experiencing feelings of discomfort, a discussion would arise regarding the difficulty of being neutral or unbiased along with the recognition that doctors are not perfect in that regard.

"I would say it probably impacts my level of comfort. Again, I would like to say that I am completely neutral. It is uncomfortable for me to discuss sexuality with most of my patients… it is part of our societal tendencies but especially with obese, elderly and younger patients it is difficult. It becomes almost a little awkward to try to discuss sexuality with them." (Transcript 3)

"Yeah, you know, and I think that just as provider, I mean we want to acknowledge the thoughts that come into our minds to, as providers we try to be as non-judgmental as possible, but we all have our preformed biases and discussed before just, you know, obese women in general in my practice they haven't been as open in discussing their sexuality and sexual practices and what not and as a provider I felt more uncomfortable bringing up those particular questions." (Transcript 14)

Topical Follow-up Interview Question (clinical observations):

In your training, have you noticed patients being treated

differently based on their obesity status?

Though many residents discussed this topic prior to the question being raised, the interviewer directly asked whether or not residents had witnessed patients being treated differently based on their weight. All residents interpreted this question to be "treated poorly" and responded accordingly. Only a few residents indicated that they had not witnessed patients being treated differently.

Among the residents who noted discrepancies, many cited specific instances when they felt that the quality of care was worse for obese patients than it would have been for non-obese patients. Sometimes this was attributed to result of bias and other times residents cited inadequate equipment as preventing them from providing the best care possible.

> *"There was a morbidly obese patient that came in with a fungal infection. I did not think they were adequately treated before she was discharged. She had other problems too but, the attendee decided probably because there was a lot of problems stemming from the obesity that she felt she was too far gone to get it under control so she discharged her. I did not feel there was adequate treatment." (Transcript 10)*

> *"Sure. Yeah, I think that there's--physical exam is something people shy away from in patients that are bigger, I've noticed that. But, you know, that's just in terms of, you know, being complete; things that are necessary to do people usually don't shy away from but a complete physical exam I think would be what I would add there." (Transcript 16)*

> *"The obese exam can be very difficult even the best speculum, you're not going to see the cervix. So, that can really hinder your reproductive healthcare. I'm like 'mcgivering' these condoms on top of the speculums so that I can actually open it without everything folding in. There aren't tools to even do a proper pelvic exam at times and to just get the line of vision. It affects patient care if you have a morbidly obese patient. There is no way if I refer them to an OB-GYN that it's going to be a straightforward like a surgical form of non-reversible contraception like sterilization. They are not probably going to offer that or an Essure. Even having the tools to offer them contraception might be a problem." (Transcript 1)*

Discussion of Provider-centered

It is important to consider the limited training residents have in regard to family planning when compared to senior physicians. However, many of the concerns raised were relevant and impactful early in a physician's career and likely to worsen if not addressed. When considering "provider-centered" reasons that obese women may be less likely to use contraception, the idea of a cycle of practical and social barriers influencing physicians emerged. This pattern clearly begins developing early

in a physician's training, likely starting with feelings of inadequacy or being overwhelmed when trying to address the comorbidities that accompany obesity in less than 15 minutes. At the same time, young physicians are trying to resist letting perceptions that their obese patients are lazy or apathetic affect patient care. This effort is undermined when patients admit to being non-compliant with medications and/or prescribed lifestyle changes and physicians become frustrated. As a result, negative societal views of obesity tend to become common place assumptions in the medical field. As noted, patient care suffers and - from the perspective patients - they are apt to feel embarrassed and/or ignored. At this point, it seems readily apparent that the patient-provider relationship has eroded into a poor environment for discussing family planning. Though a dim picture, there are many opportunities to engage physicians and address systemic issues early in the cycle, before biases are cemented and cyclical frustrations impair care. These opportunities are proposed and discussed later in the findings.

The themes and codes confirmed study hypotheses and reflect previous literature. Mainly, there is a prevalent bias against obese women in the family medicine field and that bias negatively impacts obese individuals' health care, including access to contraception. [12-16,29-31] Whether that bias is caused by negative views of obese women or frustrations with systemic limitations, it must be addressed to improve rates and efficacy of contraception. In particular, it is critical that physicians' dispel erroneous assumptions that obese women are asexual or will be non-compliant with contraception even if there is little improvement in other aspects of their health. Effectively using contraception is far easier than adhering to diabetic care management or losing weight. Moreover, there is a compelling argument to be made that physicians ought to prioritize the significant risks of an unintended pregnancy when providing for a patient that already has an overwhelming list of comorbidities because quantitative analysis in this study confirms that obese women have similar rates of sexual activity as other women. Further, when considering the patient-centered issues discussed previously, it is apparent that unless the physician asks, the topic of contraception may not arise.

The evidence in this study demonstrates that physicians want to provide better care to obese women and improve rates of contraception use. The willingness of residents to discuss and admit to bias in their field, as well as to reflect personally on their own judgments, is both significant and admirable. The manner in which they affirmed evidence of bias and were willing to discuss other colleagues' missteps with patient care is insightful and underscores the reality that the issue is pervasive in the field. Fostering discussions on these topics elicits insights as to how to improve circumstances for physicians and patients to ensure obese women receive high quality reproductive health care.

Aim 3 Research Question 3.2 (improve provider support to patents)

How can providers help improve rates of contraception use among obese women?

After residents shared perspectives regarding lower rates of contraception use in obese populations, they were asked to cite specific examples as to how physicians could help improve contraception use rates. Quantitative analysis showed that obese women are not less likely to visit providers or receive pelvic exams than non-obese women yet were less likely to use contraception. These findings led to the development of an interview question that explored how providers can help obese patients in this regard:

Topical Interview Question:

Do you have any suggestions as to how providers can help improve rates of contraception use in this population?

The findings confirmed study hypotheses that residents would be receptive to offering suggestions for areas of improvement among physicians.

Results for Research Question 3.2

By far, the most common recommendation centered on broaching and discussing the topic of contraception. Second in frequency were recommendations related to ways to improve provider/patient interaction. Excerpts evidencing each theme are included below.

Provider Solution 1: Ask Everyone

The majority of residents responded that physicians needed to *ask everyone* about their contraception use and pregnancy intentions, regardless of obesity status or time constraints. By asking each patient of reproductive age, physicians would avoid bias impacting decision-making regarding who should be asked and when.

"I actually would like to see this one thing called ONE KEY QUESTION, where in every visit encounter whether it is acute care or it is their well women preventative exam, you ask about birth control. So it is like their fifth vital sign. You always ask not just on their once a year pap smear when you are doing by the way of birth control. So if providers took that approach on then they would not neglect any sub-population, right? It would just be a common practice." (Transcript 1)

"Even though there is limited time, I think that maybe is should be based on women of child-bearing age, even if they are not sexually active, but I think every woman that is of age- it should be made a priority." (Transcript 10)

"Yeah, one thing would be just to ask because most providers wait for the patient to come and say, 'hey am here for contraception.'" (Transcript 15)

While identifying the need to discuss contraception with every patient, residents reflected on current practices. Some admitted that contraception was a *low priority*, and if addressed, was done *only when conducting pelvic exams* or when the *patient-initiated* the conversation.

"I think family planning is probably like the last priority we discuss with the patient when they come in for the other issues. I mean, different clinics have different populations, the clinic that I come from patients literally have 10 different problems, each problem needs to be addressed at every visit or they will be super unhealthy for the next 3 months until you treat them again." (Transcript 18)

"It gets priority to be discussed in every annual exam. There isn't any compulsion to have the annual exam anymore but whenever a woman comes in for a pap smear then that is the perfect opportunity for me to address it." (Transcript 7)

"I usually don't ask about contraception unless they bring the issue to me. So I think asking about contraception to these women may help to increase the contraception rate." (Transcript 17)

Provider Solution 2: Improve Provider/Patient Relationship

Several residents also discussed the importance of *improving the patient/provider relationship* in general with obese patients. Improving *communication*, actively *listening* to concerns and trying to be more *patient* were prominent themes that emerged throughout the interviews.

> *"I think just knowing your patient well, like, what their treatments are, and what priorities to shed. With any appointment that you have, a patient can come with a million problems. I think it is important to limit it to the most important. In regards to the family planning, some patients come with that being their number one priority and may want to start a family. It is all about communication." (Transcript 9)*

> *"I feel that they are kind of brushed off especially if the patient is overweight and diabetic, is overly overweight has a foot ulcer and everyone is just sort of annoyed and frustrated even though they may not say it out loud. Even when you are making rounds, everyone is like 'oh yeah' but in reality who wants to get injected insulin every day? It is harder than we all think it is. I think that it is worth having more patience for that." (Transcript 8)*

Residents also stressed the importance of supporting women in sharing family planning goals and *letting them choose a method*, after presenting the full array of options, side effects and scope of use.

> *"As with every patient who needs birth control we can always help add to access to care by having that talk with them as providers saying, 'You are a woman of child-bearing age, what are you goals as far as having children?'" (Transcript 2)*

> *"Probably the best option, just kind of see what they prefer and just give them the option and sort of explain to them this might be beneficial for you just because it's more effective and then it will less likely, you're less likely to gain weight with this. Kind of give them the incentive to do it as well." (Transcript 12)*

Additionally, beyond simply asking about contraception, two residents suggested physicians employ *motivational interviewing* when inquiring about contraception use to improve communication

and outcomes. The principle of motivational interviewing is to have patients state their goals and together, develop a plan that the provider and patient can support in achieving those goals.

> *"With any population that has co-morbid illnesses and added stress, my approach is to use motivation interviewing. So my approach is to always figure out what their goals are and to get them to state their goals. If their goal is to not become pregnant. Help them kind of make a reality put into words, bring to the light of day their goal of not becoming pregnant and then prepare a plan." (Transcript 2)*

Discussion: How Providers Can Help

Residents were more than willing to discuss ways in which providers could help improve contraception use in obese patient populations. Overwhelmingly, they indicated that if providers were to ask every patient of child-bearing age about their family planning goals, the rates would likely increase. Though this would impact their already limited time with patients, most residents acknowledged the importance of incorporating this question with other high priority concerns that are initially measured and discussed, such as blood pressure, heart rate and weight. This concept also emerged later on when residents were asked to reflect on how providers could be better supported. Ultimately, the idea that establishing a policy to ask all patients of reproductive age about family planning should be the first step and needed to be initiated by health providers rather than patients, was nearly universal.

Residents also offered insight into current practices, providing evidence that more frequent inquiries were necessary. For example, several residents indicated that they only ask during women's health exams. However, new recommendations indicate that women now only need pelvic exams every three years. Addressing contraception in three year intervals will not meet many women's changing family planning goals, address concerns with side effects or allow women access to the newer methods that may better meet their needs. Incorporating questions regarding contraception each time a patient

interacts with a provider may eliminate the general discomfort surrounding sexuality often cited by providers and patients alike. Also, it will prevent individual patients from being discriminated against based on obesity or other factors that are often incorrectly linked with lower rates of sexual activity.

Essentially, physicians understand the precarious health of their obese patients and would agree that an unintended pregnancy would incur additional significant risks. Residents suggested that the next steps include improving provider/patient relationships so that - when asked about family planning - patients feel comfortable discussing their needs and concerns. Also, the proposal of motivational interviewing indicates that some providers understand that how a physician broaches and discusses contraception may be as important as asking in the first place. The practical implications of implementing a universal ask would likely require targeted provider education, a theme that emerged when residents were asked how providers could be better supported. Residents suggested that the ground work should be straightforward and offered systematic approaches to supporting physicians in improving rates of contraception among their obese patients.

Aim 3 Research Questions 3.3 (improve support to providers)

Primary Research Question:

In what ways can physicians be better supported to increase contraception use in this population?

Follow-up Research Questions:

How does obesity affect physicians'' recommendations for specific type of contraception?

How does obesity impact physicians' recommendations of methods that require vaginal insertion (such as the IUD)?

Though physician buy-in is essential to improving contraception use among obese women, many of the barriers that residents cited will require systematic changes and external support. Residents were asked to reflect on this issue through the following question:

First Topical Interview Question:

In what ways can physicians be better supported to ensure that obese women receive the same access to family planning as non-obese women?

Residents easily identified areas of improvement, from modifying clinic practices to additional training that would prepare them to engage obese women regarding their contraception practices. Follow up questions encouraged residents to expand on their own experiences and provide insight into processes that can be improved to better support obese women:

Follow-up Topical Interview Questions:

How does obesity affect your recommendations for specific type of contraception?

How does obesity impact your recommendations of methods that require vaginal insertion (such as the IUD)?

These questions allowed residents to self-reflect about their own knowledge about obesity and contraception. Though not necessarily reflecting personal bias, the pattern of answers did indicate a degree of hesitancy and concern when recommending contraception due to issues of side effects and administration.

Results of Questions 3.3

Residents were able to identify aspects of the health care setting that if improved, could result in the increased use of contraception among obese women. These suggestions largely fell into three categories: addressing time constraints; improving equipment; and providing training for physicians. Excerpts reflecting these themes follow.

Support Providers Solution 1: Address time constraints

Nearly every resident indicated that time was the primary barrier to addressing all necessary issues in a medical appointment.

Along the lines of the proposal to ask everyone about family planning, most residents indicated that an automatic reminder in conjunction with electronic medical records, would be helpful in reminding providers to inquire about contraception. Several residents (7) suggested that medical assistants or nurses were qualified to initially inquire about contraception with all patients. Before each exam, clinic support staff could do a contraception screening during their review of weight, blood pressure and heart rate. Residents felt that adding a simple question about contraception would open the door for physicians to discuss the issue further and save time.

"There a number of ways. Again, I'm early in my training so I can give definite things but I think setting up a system where there is an automatic check for that and to provided them with information regarding this would probably be the best method to move forward. We are all human. We are all capable of making mistakes forgetting things here and there. The average physician visit is ten to fifteen minutes and we have to get in and out because that is what we are scheduled to do. So having some sort of automated, either a pop up reminder or an education sheet that goes home with every patient between these ages like 'Btw speak to your provider if you are interested in contraception, we deal with this all the time and your confidentiality is key.' That is the sort of thing that I would love to see clinic to clinic." (Transcript 3)

Another suggestion that emerged is to have the *patient fill out a survey* that could either be reviewed by a medical assistant, nurse or physician, encouraging the patient to consider their circumstances and options before discussing it during the appointment.

Support Providers Solution 2: Improve Equipment

Residents cited several instances where *inadequate equipment* impaired their ability to provide the same level of care to obese women as non-obese women. The concept of *improving equipment* arose indirectly, primarily inferred from extensive comments made throughout the interviews about issues of visibility and access. Improving equipment would allow for more thorough health exams and address many concerns that were raised regarding access during pelvic exams in obese patients.

"We have a scale that only goes up to three-hundred pounds and so when I have a morbidly obese patient, I can't tell if they are losing weight or not. I think that is a little bit sad that it is one of their main goals and I keep bringing them back for follow up visits and I can't tell them. I can only tell them, 'do your pants feel looser,' I can't say 'you've actually done so well, you've lost thirty pounds.' I can't say that and I feel that is strange. How I can really tackle it and get to what—I mean, for me, if they feel like they are losing and even if they are just exercising, it is becoming muscle mass and they're gaining, they are measuring their success a lot of times by

their pounds and so I wish we had a healthcare system that kind of just acknowledged the obesity epidemic in the U.S. and tailored some of its healthcare towards it." (Transcript 1)

The concept of inadequate equipment also arose when residents were asked the follow up question regarding recommending methods that require vaginal insertion, essentially the IUD. Most residents said that they would certainly recommend IUD's to obese patients. However, several noted that inadequate equipment, primarily poorly designed speculums, prevented insertion of IUD's in women with high BMI's. Ensuring equipment is available to meet contraceptive needs in clinics, rather than referring patients elsewhere, was strongly emphasized.

"I would actually recommend the IUD more so for obese patients. I mean, me, whether I could I do it in particular versus another provider, you know, based on the technical skills, I mean I might have to—depending on her anatomy, how big she is I might have to refer her to a more skilled provider versus someone who is smaller I could do the IUD a lot easier so I mean that might be the only reason." (Transcript 14)

"Well, I try to make the procedure [vaginal insertion of IUD] as comfortable as possible and if I don't have the necessary equipment or personnel then I might need to refer. But, in doing so they may not come back and that can be a bit of a problem." (Transcript 7)

Support Providers Solution 3: Training

Similar to concerns about equipment, the concept of *training* emerged from the interviews both directly and indirectly. Some residents indicated outright that additional training would be helpful, specifically informing physicians about improvements in the field and new studies. Others acknowledged that providers were not aware of side effects of contraception or were relying on out-of-date information when prescribing methods. Analysis of this data led to the proposed solution that additional training in family planning for obese populations would be helpful for physicians. Following is a brief overview of the topics that could be addressed in training sessions for providers based on concerns voiced by residents.

A few residents indicated that it would be helpful for providers to be reminded about the overall concern regarding *unintended pregnancies and obesity* as compared to risks associated with contraception.

> *"In addition, providing the educational opportunities so that they can learn about how to take care of those patients like providing birth control and reminding them of women health issues and that all women should be offered birth control and not assuming that the obese must not be having sex and their obesity medical problems that we don't need to worry about them becoming pregnant. Because, it is a big issue when a woman becomes pregnant and she is obese, she is at higher risk of many things. That awareness of this could be improved in the physician community by lectures in that topic." (Transcript 2)*

> *"I think there are some misconceptions. If a women gets pregnant she would gain a lot more weight. She would actually have an increased risk of having an embolism anyway." (Transcript 1)*

Beyond pregnancy prevention, there are many *benefits to contraception* that this population may miss out on with lower rates of contraception use. Physician training programs could clarify these benefits as overall preventive health for women, regardless of sexual activity.

> *"Any women between thirteen and forty five, absolutely, before they leave, I know what sort of birth control form they want and when they want to get pregnant. For me, at that point in their life, I think that is what is going to keep them the healthiest if they don't want to have an unintended pregnancy. Certainly, even the forms of contraception have a lot of protective benefits in terms of ovarian and uterine cancers and other things. That's where I fill in that age group, that it's okay and that is my focus." (Transcript 1)*

By far, the area in most need of clarification was *side effects* of contraception in obese populations. This issue arose early on in interviews and was the prominent theme when residents were asked the follow up question pertaining to how obesity impacted their recommendations for contraception. Several residents personally stated that they were unclear if and how risks such as blood clots or weight gain differed for obese women as compared to non-obese women. Others indicated that

studies proved that many methods do not cause weight gain and that misconceptions prevent providers from recommending methods that may better fit a woman's needs.

> *"I mean the only thing is—I am not really sure about this. I think there is a higher risk of blood clots with obesity but I am not positive about that. But, it is not going to change my views or which ones." (Transcript 6)*

> *"I guess if there was a contraceptive that didn't do that [cause weight gain]. I think IUDs don't have so much weight gain but I propose more options for them. I suppose addressing their weight issue prior to the contraception issue, or at least in conjunction with it may be useful. But yeah, am not quite sure." (Transcript 16)*

In the same context of side effects, concerns over *efficacy* arose when comparing contraception recommendations between obese and non-obese women. In general, many residents noted a personal concern with being *unsure about literature* or acknowledged that physicians in general are unclear.

> *"I guess I addressed that earlier, you know the, if you are more obese, you know the birth control pills are not as effective as some of the other options so the chance, they are just not as effective. (Transcript 11)"*

> *"So, I think that in theory that if somebody was three hundred fifty pounds or four hundred pounds we would probably opt for something inserted like a Nexplanon and I would also review the literature to make sure that whatever type did not have decrease rates of efficacy in obese women. Because, I feel like there are some research floating out there about that and I don't know how strong that is." (Transcript 2)*

> *"I think there are some studies—there are some studies that support how much you gain on Depo with the shots and whether or not the combined oral contraceptive is as effective in obese women." (Transcript 1)*

Discussion: Improve Support to Providers

Residents identified aspects of the health care setting that, if improved, could result in the increased use of contraception among obese women. These suggestions largely fell into three categories: addressing time constraints; improving equipment; and providing training for physicians.

The concern over lack of time was brought up both as a primary reason why obese women may not be using contraception, as well as what could be systematically fixed. Ideally, physicians would be granted more time with patients, allowing them to discuss the high-priority comorbidities as well as necessary preventive care. Unfortunately, reimbursement rates and increased patient load may prevent providers from spending more time with patients. If providers find they aren't asking about contraception because of time constraints, looking beyond physicians for help may be appropriate. With the changing roles of nurses and medical assistants, contraception counseling could be put under their purview, freeing up physicians to address more complicated conditions and medications. At the very least, having clinic staff broach the subject before physicians enter the room will prevent physicians from getting distracted and neglecting the subject.

Another suggested approach was to have electronic medical record (EMR) systems notify physicians when patients of a certain demographic, women of reproductive age, were being seen and should be interviewed about contraception. Though EMRs may not save time initially, including a question about family planning in every health interview in every appointment would help to desensitize the subject and circumvent biases physicians may have regarding sexual activity. Residents felt that enlisting the help of automated systems and/or clinic staff would be helpful in ensuring that women are approached about contraception when appropriate.

Concerns over inadequate equipment were mentioned throughout the interviews, often leading to proposed solutions of improving medical equipment to better serve obese populations. In regard to general equipment, residents cited the need for scales that allowed for higher weight measurements

and exam tables that were wider and adjustable. For reproductive health care, speculums are used to visually inspect the cervix, conduct screenings and insert IUDs. In obese women, speculums are problematic and an increase in adipose tissue either prevents the speculum from working or does not allow for visual inspection. This results in lower quality exams and difficulty inserting IUDs. This is consistent with literature evaluating the appropriateness of IUD's for obese women.[33,34] IUDs are arguably the best long-acting contraceptive methods available, given that there is no estrogen and few side effects.[33] Further, residents unanimously indicated that they would recommend the IUD for obese women if insertion was possible. Impairing access to this method is an extreme disservice to obese women and should be addressed as soon as possible.

Improving equipment would likely improve the patient-provider relationship as well, ensuring that obese women would not be avoidably discomfited or have to see other providers or different clinics for standard procedures, making them more comfortable and maintaining continuity in care. This proposal is consistent with research demonstrating the importance of a positive, close relationship with one's provider in appropriately meeting women's contraceptive needs.[46] Additionally, research shows that the more appointments required to obtain a specific contraception, the less likely women will utilize it, regardless of how effective or appropriate it may be, known as process hurdles.[102] This research has led to innovations in patient care centered on prescription and application/insertion in the same visit. Given their lower rates of contraception use, obese women should be afforded the same courtesy.

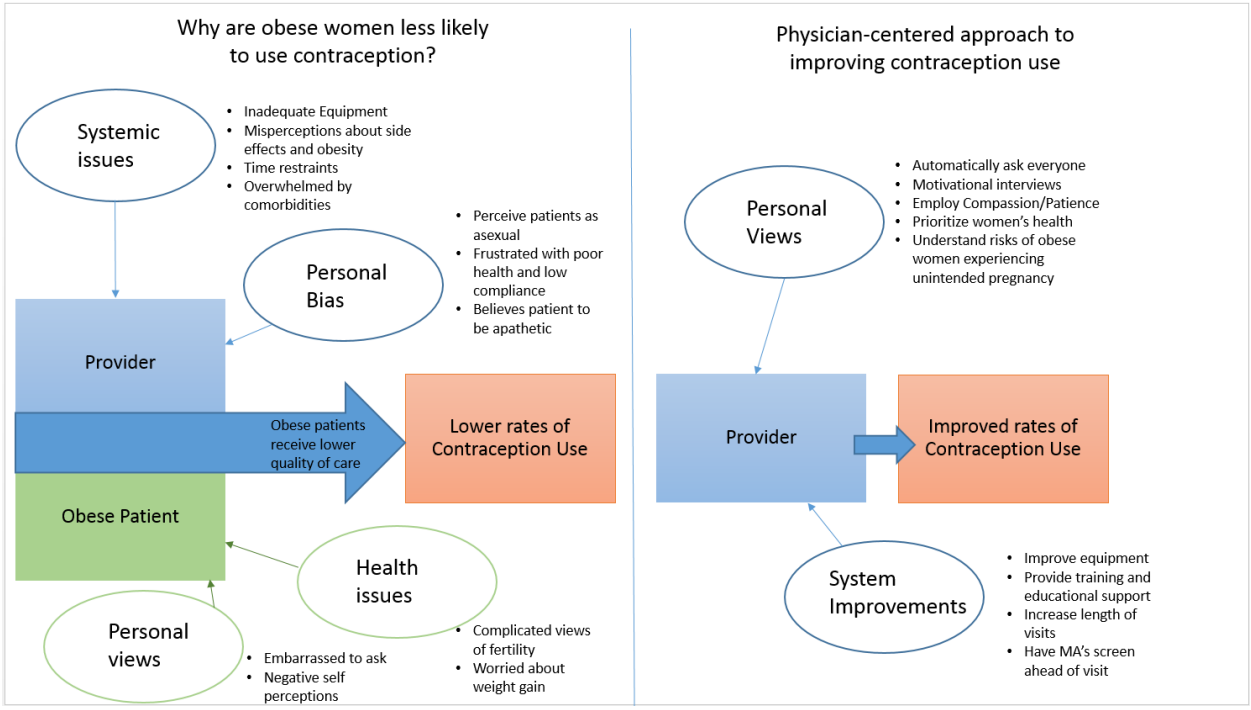
Finally, informing physicians about current science behind contraception use and obesity will help clarify many of the uncertainties voiced by residents. By discussing the topic in a training setting, providers will be reminded about the importance of preventing unintended pregnancies for obese women while emphasizing that this population is sexually active and warrants sexual health screening. Additionally, framing risks of unintended pregnancies and the general benefits of contraception against

the risks of side effects is a more informed metric for providers to consider than just side effects alone. For example, pregnancy has substantially higher risks of blood clots and weight gain than those associated with contraception. [6] Furthermore, though side effects are important to consider, current research shows little to no weight gain associated with most methods and very little increased risk of blood clots.[103] During training, current research into methods efficacy can be shared, e.g. that there is no difference in efficacy for dual-hormonal methods for obese women as compared to non-obese women. [44,45]

Notably missing from the conversation were insights into overcoming negative views of obesity and frustration with perceived apathy. Despite the extensive discussion regarding provider bias and concerns with quality of patient care, residents did not directly propose that providers be made aware of the importance of positive patient relationships and the dangers of negative views of obese patients influencing care. Never the less, training regarding contraception use in this population should address the issue of provider bias and allow physicians to objectively consider the possibility of internal dialogue hampering their ability to professionally and compassionately care for their obese patients. Perhaps introducing the cycle of frustration, discussed previously, would spur physicians to contemplate how these views develop and perpetuate.

The next section summarizes the findings for Study Aim 3.

Summary for Study Aim 3



Study Aim 3 was designed to explore the quantitative findings with physicians, seeking suggestions as to why these disparities exist and how the medical field can adapt practices to better support obese women. Residents cited, "patient-centered" and "provider-centered" theories, depicted above in Figure 3. The overwhelming majority of residents proposed that obese women may be less likely to use contraception because of the potential for weight gain associated with certain types of contraception. Perceived negative self-perceptions on behalf of obese women were also cited as primarily evidenced by their feeling reluctant and uncomfortable in broaching the issue of family planning with providers due to embarrassment and low self-esteem.

When assessing "provider-centered" theories, there is evidence of a cycle of both practice-related and social barriers constraining the ability of physicians to address reproductive health care. Survey results indicate that young physicians tend to feel inadequate or overwhelmed when trying to prioritize the health ramifications of obesity during the short time available during a visit. Given the

challenges presented by obesity's co-morbidities, addressing reproductive health was typically not a priority topic - often not broached at all - among residents. Moreover, when the physician is striving to provide appropriate care and advice related to chronic problems, the physician's empathy can be undermined when patients admit to being non-compliant. When frustration ensues, negative societal stereotypes of obesity tend to proliferate. In combination, practice-related limitations and society's obesity stigma erode the efficacy of patient care and can further isolate the patient despite her willingness to attend a health care visit.

These barriers can be overcome by a policy that requires that the topic of contraception be broached with all appropriate female patients. Via the survey, the concept that needs to be initiated by providers was nearly universal. To increase the likelihood that contraception uptake improves after the initial ask, residents also suggested addressing the provider/patient relationship to ensure that patients are receptive to the recommendations and feel comfortable discussing their needs and concerns. Additionally, residents identified aspects of the health care setting that, if improved, could result in the increased use of contraception among obese women. These suggestions largely fell into three categories: addressing time constraints; improving equipment; and providing training for physicians.

CHAPTER 6: DISCUSSION & CONCLUSION

Summary of Study

The quantitative analysis tested and expanded upon initial study hypotheses to estimate contraception use among obese women and explore trends in type of method used. Findings confirmed that sexually active obese women - though facing a high risk for health complications from an unintended pregnancy - are less likely than other women to use contraception. After controlling for individual and socioeconomic factors, the analysis of longitudinal NSFG data revealed that obese women are just as likely as other women to access reproductive health services. From the analytic sample:

- 67% of all women received pelvic exams in the last year and - among those women- obese women are less likely to use contraception.
- 33% of women in the restricted sample attended a visit related to birth control and 24% specifically received family planning counseling and again - among these women - obese women were less likely to use contraception.

Given that many obese women desiring not to become pregnant are meeting with providers in situations that would typically promote and enable contraception use and yet, are not using a method, the study examined the data for evidence of causal factors. The data related to women who had used a method in the past year were examined to evaluate type of contraception used by obesity status. Initial hypotheses predicted that obese women were less likely to use methods that required a prescription and/or physician administration. This hypothesis was not supported by the data. Though obese women had higher rates of condom use, they had similar rates of IUD use to non-obese women, a highly effective method requiring both a prescription and physician insertion.

At this point in the study, the results indicated that:

When compared to other women, obese women are just as sexually active, face more serious pregnancy-related risks, are just as likely to access reproductive health care and – when they do use a method – they often use the most efficacious, reversible method available.

Given that obese women are not avoiding physicians and are not resistant to methods that require interface with physicians, the study examined the implication that physicians are not addressing family planning with obese female patients as often as non-obese women. Since physicians were not interviewed on this topic via the NSFG, qualitative research was needed to gather and assess their perspectives. The quantitative findings informed the questions asked of 18 family medicine residents during in-depth, individual interviews.

The sequential mixed methods approach to research enabled the study to leverage the findings from the quantitative analysis to inform interview questions. In turn, the interviews helped frame the quantitative findings as residents suggested circumstances that contribute to the discrepancies in contraception use among obese and non-obese women.

Residents were receptive and reflective when discussing lower rates of contraception use among obese women. When considering the disparity, residents cited "patient-centered" and "provider-centered" theories. The majority of residents proposed that obese women may be less likely to use contraception because of the potential for weight gain associated with certain types of contraception. They also cited that obese women are prone to negative self-perceptions that are inhibiting, e.g. reluctance to broach the issue of family planning with providers due to embarrassment and low self-esteem.

When considering "provider-centered" theories, evidence of a cycle of practical and social barriers influencing physicians emerged, starting with young physicians feeling overwhelmed when trying to address the comorbidities that accompany obesity in time-constrained visits. Moreover,

physicians tend to feel undermined and frustrated when patients are non-compliant. As a result, negative societal views of obesity can merge with the frustrating professional experience and contribute to erroneous assumptions. Via this lens, obese patients are viewed as asexual, lazy and non-compliant. In this context, physicians will tend to overlook preventative health measures, including family planning, in lieu of controlling chronic health complications related to obesity despite the fact that obese women face much more serious pregnancy-related health risks.

These findings imply that focusing intervention efforts on improving access to reproductive health care for this population may not improve outcomes as expected. Ultimately, the findings of both the qualitative and quantitative analyses imply that provider-centered solutions are apt to be the most effective. For example, a significant majority of residents concluded that a policy that incorporates a universal "ask" about contraception for every appropriate patient would significantly improve reproductive health care. Additionally, residents identified aspects of the health care setting that, if improved, could result in the increased use of contraception among obese women. These suggestions largely fell into three categories: addressing time constraints; improving equipment; and providing training for physicians.

Strengths and Limitations

Strengths

There are several notable strengths to this study and analysis. In the quantitative analysis, the sample sizes in the unrestricted and restricted datasets are substantial and allow for robust analyses. This was especially helpful when evaluating the contraceptive preferences of women who choose to use contraception as the inclusion criteria is particularly narrow.

The scope and depth of questions pertaining to individuals' sexual practices and contraception use in the NSFG is another strength of this study. The questions allow for significant quantitative exploration at each level of the conceptual model in regard to the individuals' contraceptive practices.

The qualitative portion of this study is effective in addressing the perspective of health care providers, a view not directly addressed by the NSFG. Physicians are rarely interviewed regarding bias in their field as it may reflect discrepancies in care. However, the willingness of the residents to discuss this sensitive material is extremely important and identified sources of bias as well as opportunities to improve rates of contraception among obese women.

Limitations

The self-report nature of the NSFG calls into question the accuracy of measures used in the analyses. Specifically, BMI is not the ideal measure for obesity as both height and weight are self-reported. However, it is widely used and accepted in population health and medical research as an estimate of the obesity.

Other variables may also be impacted by self-report and topic sensitivity, especially given that answers were dictated to study personnel and participants may have been embarrassed to share information such as number of sexual partners and sexual risk behavior. However, if anything, this hesitancy would bias analyses toward the null. Likewise, the qualitative interviews could have been impacted by the physicians' concerns discussing sensitive information. In an effort to address this issue, the IRB application requested that signed consents be waived and non-identifying ID assigned, preserving anonymity. The forthcoming nature of the respondents indicates this approach was effective.

Another limitation of the NSFG is the lack of questions pertaining to the quality of health care provider-patient interaction. Therefore, information regarding source of care, frequency of visits, types of services received and use of contraception are used to infer whether an individual consistently

obtained care and had a reasonable relationship with their health care provider. Further research, either qualitative or quantitative, could explore patient-health care provider interactions with obese and non-obese women directly to ascertain whether they perceive health care provider obesity bias impacts their care. Additionally, the sample selected was cross-sectional. This prevents longitudinal analysis that could explore changes over time, for example as individual women gain weight, the focus of their health care visits shift and contraception use becomes less of a priority.

Limitations of the qualitative analysis included interview length, sample size and homogeneity of sample. Given the nature of the profession, physicians were unwilling and/or unable to participate for longer than 20 minutes. However, given the similarity of responses, the study appears to have achieved data saturation and though more interviews would have been interesting, they do not appear to be necessary.

Implications for Public Health

Lowering the rates of unintended pregnancy is a universally stated goal across the public health and medical fields. This study delved into this priority by examining a population with a higher likelihood of poor health outcomes for both the woman and fetus should an unintended pregnancy occur. Since the most effective contraception methods are primarily available by prescription, an investigation of any obesity-specific impediments to efficacious reproductive health care services was appropriate. The findings from this study identified important implications and opportunities for the public health and medical fields.

Ultimately, analysis resulted in the finding that - of sexually active women desiring not to become pregnant - *obese women are less likely to use contraception*, even after controlling for the most oft-cited socioeconomic and individual causal factors.

Surprisingly, these disparities persist when the data were restricted to women who attended reproductive health-related visits within the past year. This suggests that current public health efforts

focused on encouraging women to take the initiative and seek family planning counseling may not be entirely effective for obese women. Even when obese women attend a reproductive health visit, they are less likely than other women to depart with the most efficacious form of contraception suitable for their needs. This implies - as supported by qualitative analysis - that contraception is not a high priority topic during these visits despite the looming obese-specific dangers of an unintended pregnancy. Physicians asked to comment on these disparities were not surprised by the lower rates of contraception use and cited several aspects of the health care system that directly contribute to this outcome.

The following recommendations should be piloted as soon as possible by a multidisciplinary research effort, targeting systemic health care practices and provider education:

A policy requiring contraception use to be discussed with all female patients of reproductive age regarding their family planning intentions would broach the topic

This policy would reinforce the priority of preventing unintended pregnancy in the medical setting. As the recommended frequency of pelvic exams decreases to every three years while annual rates of discontinuation of contraception hold steady at 50%, discussing contraception method use would benefit all women. To ensure compliance, this question could be framed as one of the initial "vital sign" questions asked by non-MD level staff. To prove effective, this topic would need to be followed up with more targeted discussions and evaluation of preferences.

Eradicate misinformation and out-of-date perceptions among practitioners.

The qualitative interviews produced evidence of rampant misinformation and out-of-date perceptions related to contraception for obese women. Though public health researchers routinely publish on important topics in the field of family planning, it appears that these updates may not be reaching practicing physicians. This is especially concerning given that the interviewees were residents,

less than 3 years out of medical school and receiving weekly tutorials on important topics in the field. One would surmise that - of any group of physicians - these individuals would be privy to the most up-to-date, accurate information available. For example, the majority of physicians cited personal and patients' concerns with a potential side effect of contraception related to weight gain. This is despite numerous studies disproving this erroneous assumption. Moreover, of those few methods that may contribute to weight gain, the maximum reported weight gain is less than 5 lbs. and those methods are used by only 5% of obese women. Bridging the gap between public health research and medical practice will ensure that practitioners are well-informed. Though this aspect was not investigated, it is likely that the perception that obese women are more concerned about potential weight gain from contraception than other women may be more a reflection of bias than reality. In any case, the opportunity to educate physicians and patients alike appears to be an important step to reducing reticence of prescribing and using hormonal contraception.

Perceived Risks of Hormonal Birth Control Methods

Similarly, physicians cited efficacy concerns for hormonal birth control methods for obese women. Again, research has disproved this notion.[2-4] Furthermore, public health researchers have proven that the risk of unintended pregnancy is far higher among women not using a contraception method than those using a method.[3] Public health efforts need to concentrate on partnering with the medical field to educate providers about the misconceptions of obesity and contraception use while reinforcing the importance of preventing unintended pregnancy in this population. Put in context of their existing priorities, providers should be persuaded that given that co-morbidities in this population are dangerous, adding an unintended pregnancy could be disastrous.

Implications for Future research

Finally, this study identifies specific avenues of research that should be pursued to clarify findings. These include, pilot studies seeking to test the efficacy of educational interventions with physicians and the uptake of contraception use among obese women need to be conducted. Additionally, qualitative interviews with obese women would further clarify aspects of the provider-patient interaction that may impair use of contraception, particularly in reproductive health care visits.

Conclusion

When compared to non-obese women, obese women are less likely to use contraception. However, obese women are just as sexually active, as likely to access reproductive health care and - when prescribed - are more likely to use the most efficacious method of reversible contraception, as compared to non-obese women. Preventing unplanned pregnancies for women who are obese is especially important given the likelihood of co-morbidities that would endanger both the woman and fetus should an unintended pregnancy occur. Providers need to address family planning with all appropriate patients, regardless of obesity status, preoccupation with comorbidities and/or time restraints. In addition to promoting family planning counseling among patients, public health interventions need to prioritize dissemination of accurate information to providers regarding obesity and contraception use, particularly in regard to side effects and efficacy. Additionally internal health care system procedures need to balance the evolving priorities and time constraints facing physicians and invoke policies and procedures that negate the impact of erroneous assumptions based upon bias. Of the potential solutions, instituting a universal policy of inquiring about the family planning priorities of all patients of reproductive age will broach the topic in a way that overcomes patient embarrassment and provider hesitancy.

APPENDICIES

APPENDIX A:

Quantitative Analysis Tables Presenting Weighted NSFG Data

The NSFG includes survey weights for statistical analyses to account for the oversample of some populations and the multi-stage study design. The weight variable was used for comparison to the un-weighted dataset in the final models. The tables in Appendix A present weighted NSFG data related to the analysis presented by their counterparts that present unweighted NSFG data in Chapter 4.

The following tables are included in Appendix A:

- Table 7 Weighted Data: Contraception Use in last 12 months
- Tables 8 Weighted Data
    - Table 8.1a Weighted Data: Family Planning Counseling in past 12 months
    - Table 8.1b Weighted Data: Contraception Use for Women with Family Planning Counseling in past 12 months
    - Table 8.2a Weighted Data: Pelvic exam in 12 months
    - Table 8.2b Weighted Data: Contraception Use for Women who received Pelvic Exam in 12 months
    - Table 8.3a Weighted Data: Visit Related to Birth Control in the Past 12 Months
    - Table 8.3b Weighted Data: Contraception Use of Women with Visit Related to Birth Control in Past 12 Months
- Tables 10
    - Table 10.1b Weighted Data : Type of Contraception for Analytic Sample
    - Table 10.2b Weighted Data: Contraception Requires an Rx
    - Table 10.3b Weighted Data: Contraception Requires MD to Administer
- Table 11 Weighted Data: Discontinuation of Contraception

Table 7 Weighted Data: Contraception Use in last 12 months (Multivariate Logistic Regression; Analytic Sample, N=5605)								
	WeightedBase Model				*Weighted withAdditional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.000				.000
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	-.049	.110	.952	.654	-.006	.111	.994	.957
Obese	-.116	.124	.891	.071	-.039	.126	.962	.102
Obese II	-.640	.121	.527	.000	-.525	.123	.592	.000
Age				.121				.307
40-44	-.430	.162	.651	.008	-.336	.164	.715	.040
35-39	-.312	.153	.732	.042	-.196	.156	.822	.209
30-34	-.269	.151	.764	.075	-.207	.153	.813	.177
25-29	-.208	.136	.812	.124	-.083	.138	.920	.546
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	.694	.152	2.002	.000	.716	.155	2.047	.000
Hispanic	.026	.173	1.026	.883	.007	.175	1.007	.970
Other	.578	.122	1.783	.000	.644	.124	1.904	.000
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.046				.049
Below 100% FPL	-.388	.145	.679	.008	-.386	.147	.680	.009
100-199% FPL	-.287	.127	.750	.024	-.287	.129	.750	.026
200-299% FPL	-.140	.128	.870	.274	-.210	.129	.810	.104
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.054				.025
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
No Coverage	-.320	.134	.726	.017	-.369	.136	.692	.007
Public (State/Federal Program)	-.084	.135	.920	.537	-.121	.137	.886	.379
Education				.000				.000
Some High School, No Diploma	-.572	.194	.565	.003	-.540	.196	.583	.006
HS Diploma or GED	-.029	.172	.771	.094	-.018	.174	.782	.117
Some College	.506	.168	1.658	.003	.487	.170	1.627	.004
Bachelor's Degree	.331	.165	1.392	.045	.313	.167	1.368	.062
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	-.080	.113	.923	.480	-.191	.114	.826	.094
Marital Status				.000				.000
Never Married	-.926	.203	.396	.000	-.884	.211	.413	.000
Separated	-.230	.182	.795	.206	-.277	.183	.758	.130
Divorced	.629	.816	1.876	.441	1.024	.837	2.783	.222
Widowed	-.349	.115	.705	.002	-.395	.122	.674	.001
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.025
0 (ref)					/	/	/	/
1					.411	.157	1.509	.009
1+					.060	.389	1.062	.878
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.000
Yes (ref)					/	/	/	/
No					.966	.109	2.626	.000
Don't Know					1.345	.679	3.837	.048
Feelings about possible unintended pregnancy								.000
Upset (ref)					/	/	/	/
Pleased					-.779	.135	.459	.000
Wouldn't Care					.466	1.064	1.594	.661
Prefer not to answer					-.394	.119	.674	.001

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

CI= Exponentiated 95% Confidence level for lower (l) and upper (u) limits

Table 8.1a Weighted Data: Family Planning Counseling in past 12 months (Multivariate Logistic Regression with weight; Analytic Sample, N=5605)								
	Weighted				*Weighted with Mechanisms*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.024				.030
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.044	.074	1.045	.549	.044	.074	1.045	.554
Obese	.138	.088	1.148	.115	.133	.088	1.142	.132
Obese II	-.196	.097	.822	.044	-.194	.099	.824	.050
Age				.000				.000
40-44	-1.218	.123	.296	.000	-1.200	.124	.301	.000
35-39	-.805	.109	.447	.000	-.790	.110	.454	.000
30-34	-.333	.102	.717	.001	-.321	.103	.725	.002
25-29	-.189	.086	.827	.028	-.178	.088	.837	.042
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	.038	.118	1.039	.745	.037	.119	1.038	.753
Hispanic	-.564	.154	.569	.000	-.553	.155	.575	.000
Other	.150	.096	1.162	.119	.146	.097	1.157	.134
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.044	/			.045
Below 100% FPL	.058	.103	1.060	.573	.068	.104	1.070	.515
100-199% FPL	-.045	.088	.956	.607	-.054	.089	.948	.546
200-299% FPL	-.208	.085	.813	.015	-.202	.086	.817	.018
300% and Above FPL (ref)	/	/	/	/		/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	.026	.105	1.027	.802	.589	.105	1.802	.000
No Coverage	-.573	.104	.564	.000	.592	.122	.807	.000
Education				.001				.001
Some High School, No Diploma	-.119	.155	.888	.443	-.124	.156	.884	.429
HS Diploma or GED	-.189	.130	.828	.148	-.176	.131	.838	.179
Some College	.090	.118	1.094	.447	.083	.119	1.087	.486
Bachelor's Degree	.205	.117	1.228	.079	.216	.117	1.241	.066
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	-.049	.077	.952	.527	-.066	.078	.937	.401
Marital Status				.036				.037
Never Married	-.158	.187	.853	.396	-.110	.191	.896	.563
Separated	.016	.133	1.016	.907	.005	.134	1.005	.973
Divorced	.107	.508	1.113	.834	.197	.510	1.218	.699
Widowed	-.225	.079	.798	.004	-.236	.082	.790	.004
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.001
0 (ref)					/	/	/	/
1					.385	.112	1.470	.001
1+					-.054	.319	.947	.865
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.038
Yes (ref)					/	/	/	/
No					-.199	.093	.819	.033
Don't Know					-.894	.518	.409	.084
Feelings about possible unintended pregnancy								.000
Upset (ref)					/	/	/	/
Pleased					-.330	.090	.719	.000
Wouldn't Care					.396	.491	1.486	.420
Prefer not to answer					-.379	.073	.684	.000

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	275.571	.000
Unweighted with additional covariates	297.346	.000
Weighted without additional covariates	362.104	.000
Weighted with additional covariates	409.953	.000

Table 8.1b Weighted Data: Contraception Use for Women with Family Planning Counseling (Multivariate Logistic Regression; Analytic Sample, N=1864)

	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.468				.568
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	-.362	.291	.696	.213	-.379	.295	.685	.200
Obese	-.279	.324	.757	.389	-.343	.327	.710	.294
Obese II	-.494	.347	.610	.155	-.327	.357	.721	.360
Age				.101				.084
40-44	.957	.597	2.603	.109	1.010	.605	2.745	.095
35-39	1.121	.492	3.068	.023	1.235	.500	3.437	.014
30-34	.216	.356	1.241	.544	.227	.359	1.255	.527
25-29	.026	.297	1.027	.929	.118	.306	1.125	.701
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.005				.004
Black	.530	.364	1.698	.146	.620	.373	1.858	.097
Hispanic	-.354	.440	.702	.420	-.173	.450	.842	.701
Other	.864	.309	2.372	.005	.976	.315	2.653	.002
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.016				.020
Below 100% FPL	-.761	.365	.467	.037	-.797	.367	.450	.030
100-199% FPL	.258	.390	1.295	.508	.182	.392	1.200	.642
200-299% FPL	-.284	.357	.752	.426	-.409	.363	.664	.259
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.171				.169
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	.377	.335	1.458	.260	.337	.345	1.401	.329
No Coverage	.848	.463	2.335	.067	.877	.468	2.403	.061
Education				.001				.001
Some High School, No Diploma	-1.900	.840	.150	.024	-2.091	.852	.124	.014
HS Diploma or GED	-1.495	.803	.224	.063	-1.558	.810	.211	.054
Some College	-.418	.799	.658	.601	-.466	.804	.628	.563
Bachelor's Degree	-.750	.790	.472	.343	-.832	.795	.435	.295
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	-.537	.333	.585	.107	-.542	.340	.582	.111
Marital Status				.573				.463
Never Married	-.832	.540	.435	.123	-1.013	.576	.363	.078
Separated	-.293	.498	.746	.556	-.262	.510	.770	.608
Divorced	~	~	~	.999	~	~	~	.999
Widowed	-.317	.285	.728	.266	-.334	.306	.716	.276
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.810
0 (ref)	/	/	/	/	/	/	/	/
1					-.166	.447	.847	.710
1+					.633	1.519	1.884	.677
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.000
Yes (ref)	/	/	/	/	/	/	/	/
No					1.358	.281	3.890	.000
Don't Know					~	~	~	.999
Feelings about possible unintended pregnancy								.533
Upset (ref)	/	/	/	/	/	/	/	/
Pleased					-.441	.350	.643	.207
Wouldn't Care					~	~	~	.999
Prefer not to answer					-.421	.302	.657	.164

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

~ Unstable estimate due to sample size

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	104.392	.000
Unweighted with additional covariates	138.477	.000
Weighted without additional covariates	97.767	.000
Weighted with additional covariates	121.874	.000

Table 8.2a Weighted Data: Pelvic exam in 12 months
(Multivariate Logistic Regression with weight; Analytic Sample, N=5605)

	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.181				.158
Normal (ref)			/	/		/	/	/
Overweight	.152	.076	1.164	.045	.152	.076	1.164	.046
Obese	.034	.088	1.035	.695	.017	.088	1.017	.850
Obese II	-.022	.094	.978	.818	-.034	.095	.967	.722
Age				.020				.018
40-44	-.088	.115	.916	.443	-.118	.116	.889	.309
35-39	-.045	.108	.956	.675	-.070	.109	.932	.518
30-34	.111	.106	1.117	.294	.098	.107	1.103	.359
25-29	.198	.091	1.218	.031	.181	.092	1.199	.049
20-24 (ref)		/	/	/		/	/	/
Race				.000				.000
Black	-.261	.112	.770	.020	-.258	.113	.772	.022
Hispanic	-.736	.134	.479	.000	-.737	.135	.478	.000
Other	.305	.095	1.356	.001	.285	.096	1.330	.003
White (ref)		/	/	/		/	/	/
Poverty Level				.000				.001
Below 100% FPL	-.171	.103	.843	.098	-.150	.104	.861	.150
100-199% FPL	-.348	.088	.706	.000	-.344	.088	.709	.000
200-299% FPL	-.239	.085	.787	.005	-.221	.086	.802	.010
300% and Above FPL (ref)		/	/	/		/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)		/	/	/		/	/	/
Public (State/Federal Program)	-.222	.103	.801	.031	-.235	.104	.790	.023
No Coverage	-1.014	.092	.363	.000	-1.016	.093	.362	.000
Education				.007				.003
Some High School, No Diploma	-.332	.155	.717	.032	-.370	.156	.691	.017
HS Diploma or GED	-.419	.132	.658	.002	-.442	.133	.642	.001
Some College	-.336	.124	.714	.007	-.352	.124	.703	.004
Bachelor's Degree	-.141	.124	.868	.255	-.143	.125	.867	.252
Graduate School (ref)		/	/	/		/	/	/
Parity								
No children (ref)		/	/	/		/	/	/
1+ Children	.152	.079	1.164	.055	.142	.080	1.153	.074
Marital Status				.037				.003
Never Married	.366	.185	1.441	.048	.396	.189	1.485	.036
Separated	.125	.135	1.133	.355	.138	.136	1.148	.310
Divorced	-.133	.488	.875	.784	-.035	.489	.966	.944
Widowed	-.115	.081	.891	.152	-.195	.084	.822	.020
Married (ref)		/	/	/		/	/	/
Relationship Dynamics								
Number of Partners								.000
0 (ref)						/	/	/
1					.455	.109	1.577	.000
1+					.326	.304	1.386	.283
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.000
Yes (ref)						/	/	/
No					-.387	.101	.679	.000
Don't Know					.064	.434	1.066	.882
Feelings about possible unintended pregnany								.287
Upset (ref)						/	/	/
Pleased					-.033	.092	.968	.724
Wouldn't Care					1.137	.687	3.117	.098
Prefer not to answer					.046	.075	1.047	.542

^P-value for joint test of coefficient listed by each variable name.
/ Reference Categories, omitted from regression.
P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	403.019	.000
Unweighted with additional covariates	421.879	.000
Weighted without additional covariates	427.298	.000
Weighted with additional covariates	464.654	.000

Table 8.2b Weighted Data: Contraception Use for Women who received Pelvic Exam (Multivariate Logistic Regression with weight; Analytic Sample, N=3670)

	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity				.001				.008
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.005	.140	1.005	.970	.040	.142	1.041	.777
Obese	-.152	.157	.859	.332	-.072	.160	.930	.652
Obese II	-.603	.158	.547	.000	-.486	.161	.615	.002
Age				.992				.954
40-44	.021	.205	1.021	.919	.115	.207	1.121	.581
35-39	-.050	.191	.951	.795	.056	.194	1.058	.771
30-34	.030	.190	1.030	.876	.101	.193	1.107	.600
25-29	-.001	.170	.999	.997	.128	.173	1.137	.460
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	.752	.196	2.121	.000	.865	.201	2.374	.000
Hispanic	.530	.253	1.699	.036	.584	.257	1.792	.023
Other	.867	.150	2.380	.000	.966	.154	2.628	.000
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.013				.028
Below 100% FPL	-.547	.183	.578	.003	-.543	.186	.581	.003
100-199% FPL	-.313	.165	.731	.057	-.291	.167	.748	.082
200-299% FPL	-.014	.164	.986	.931	-.097	.166	.908	.559
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.854				.780
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	-.039	.176	.962	.827	-.102	.180	.903	.571
No Coverage	.079	.199	1.082	.691	.037	.202	1.038	.855
Education				.000				.000
Some High School, No Diploma	-.779	.252	.459	.002	-.766	.256	.465	.003
HS Diploma or GED	-.212	.221	.809	.337	-.181	.224	.834	.419
Some College	.441	.218	1.554	.043	.443	.221	1.558	.045
Bachelor's Degree	.167	.208	1.182	.423	.162	.211	1.175	.443
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	-.244	.145	.784	.092	-.345	.147	.709	.019
Marital Status				.000				.000
Never Married	-1.012	.258	.363	.000	-1.043	.270	.352	.000
Separated	-.389	.229	.678	.090	-.425	.232	.654	.068
Divorced	2.844	2.849	17.184	.318	3.375	2.870	29.229	.240
Widowed	-.597	.148	.551	.000	-.611	.157	.543	.000
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.101
0 (ref)	/	/	/	/	/	/	/	/
1					.441	.215	1.554	.040
1+					.685	.560	1.984	.221
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.000
Yes (ref)	/	/	/	/	/	/	/	/
No					.975	.133	2.652	.000
Don't Know					2.781	1.727	16.131	.107
Feelings about possible unintended pregnancy								.000
Upset (ref)	/	/	/	/	/	/	/	/
Pleased					-.901	.175	.406	.000
Wouldn't Care					.366	1.175	1.442	.756
Prefer not to answer					-.428	.157	.652	.006

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	220.856	.000
Unweighted with additional covariates	309.904	.000
Weighted without additional covariates	222.289	.000
Weighted with additional covariates	310.327	.000

Table 8.3a Weighted Data: Visit Related to Birth Control in the Past 12 Months
(Multivariate Logistic Regression with weight; Analytic Sample, N=5605)

	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.199				.286
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	-.067	.081	.935	.411	-.062	.082	.940	.447
Obese	-.086	.098	.918	.381	-.084	.098	.920	.393
Obese II	-.230	.108	.795	.133	-.208	.109	.812	.096
Age				.000				.000
40-44	-1.452	.143	.234	.000	-1.435	.144	.238	.000
35-39	-.991	.122	.371	.000	-.974	.123	.377	.000
30-34	-.429	.111	.651	.000	-.418	.112	.658	.000
25-29	-.252	.094	.777	.007	-.234	.095	.791	.013
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.001				.000
Black	.296	.124	1.344	.017	.298	.125	1.347	.017
Hispanic	-.171	.156	.843	.271	-.175	.156	.840	.263
Other	-.100	.105	.905	.339	-.110	.106	.896	.296
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.131				.102
Below 100% FPL	.253	.112	1.288	.024	.271	.112	1.311	.016
100-199% FPL	.167	.097	1.182	.085	.166	.097	1.180	.089
200-299% FPL	.081	.094	1.085	.386	.083	.094	1.086	.379
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	.222	.110	1.249	.044	.271	.111	1.229	.062
No Coverage	-.514	.116	.598	.000	.166	.117	.594	.000
Education				.000				.000
Some High School, No Diploma	-.578	.168	.561	.001	-.594	.169	.552	.000
HS Diploma or GED	-.747	.145	.474	.000	-.755	.145	.470	.000
Some College	-.223	.128	.800	.081	-.239	.128	.787	.062
Bachelor's Degree	-.191	.127	.826	.132	-.197	.127	.821	.122
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.377	.088	1.459	.000	.356	.089	1.427	.000
Marital Status				.044				.021
Never Married	-.227	.210	.797	.280	-.166	.213	.847	.435
Separated	.260	.146	1.297	.076	.259	.147	1.296	.078
Divorced	.697	.518	2.008	.179	.817	.522	2.264	.117
Widowed	-.093	.087	.911	.287	-.132	.090	.876	.141
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.007
0 (ref)					/	/	/	/
1					.373	.126	1.452	.003
1+					-.073	.369	.929	.843
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.326
Yes (ref)					/	/	/	/
No					.009	.107	1.009	.933
Don't Know					-1.009	.687	.365	.142
Feelings about possible unintended pregnancy								.208
Upset (ref)					/	/	/	/
Pleased					-.185	.100	.831	.063
Wouldn't Care					.412	.533	1.510	.440
Prefer not to answer					-.109	.080	.896	.172

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	249.564	.000
Unweighted with additional covariates	256.028	.000
Weighted without additional covariates	296.619	.000
Weighted with additional covariates	313.795	.000

Table 8.3b Weighted Data: Contraception Use of Women with Visit Related to Birth Control (Multivariate Logistic Regression with weight; Analytic Sample, N=1437)

	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
Obesity ^				.063				.153
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	-.689	.276	.502	.013	-.590	.280	.555	.035
Obese	-.592	.307	.553	.054	-.479	.311	.619	.124
Obese II	-.417	.259	.659	.108	-.414	.264	.661	.116
Age				.249				.196
40-44	.338	.492	1.402	.492	.406	.495	1.501	.412
35-39	.240	.389	1.271	.538	.406	.401	1.501	.311
30-34	-.362	.321	.696	.260	-.310	.325	.733	.340
25-29	-.231	.287	.794	.422	-.166	.291	.847	.569
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.161				.156
Black	.706	.354	2.026	.046	.689	.359	1.992	.055
Hispanic	-.106	.394	.899	.787	-.121	.403	.886	.765
Other	.236	.278	1.267	.395	.333	.287	1.395	.246
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.005				.005
Below 100% FPL	-.883	.347	.413	.011	-.886	.355	.412	.013
100-199% FPL	-.466	.330	.627	.158	-.495	.337	.609	.142
200-299% FPL	-.991	.297	.371	.001	-1.039	.304	.354	.001
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.421				.582
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Public (State/Federal Program)	.275	.281	1.317	.328	.194	.289	1.215	.502
No Coverage	.478	.410	1.612	.244	.406	.413	1.500	.326
Education				.009				.003
Some High School, No Diploma	-.027	.466	.973	.953	.052	.478	1.053	.913
HS Diploma or GED	.412	.420	1.509	.327	.542	.430	1.719	.207
Some College	.805	.386	2.236	.037	.941	.398	2.564	.018
Bachelor's Degree	1.000	.401	2.718	.013	1.121	.409	3.069	.006
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	-1.062	.324	.346	.001	-1.054	.329	.349	.001
Marital Status				.604				.711
Never Married	.611	.686	1.843	.373	.490	.694	1.632	.480
Separated	-.422	.393	.655	.283	-.360	.404	.698	.373
Divorced	1.497	2.886	4.467	.604	1.367	2.946	3.925	.643
Widowed	-.144	.251	.866	.566	-.211	.267	.809	.428
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.524
0 (ref)					/	/	/	/
1					.396	.386	1.486	.304
1+					-.122	.972	.886	.901
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.000
Yes (ref)					/	/	/	/
No					1.109	.263	3.031	.000
Don't Know					~	~	~	.999
Feelings about possible unintended pregnancy								.811
Upset (ref)					/	/	/	/
Pleased					-.256	.301	.774	.395
Wouldn't Care					-.402	1.532	.669	.793
Prefer not to answer					-.033	.249	.967	.893

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

~ Unstable estimate due to sample size

Omnibus Test of Model	Chi-square	Sig.
Unweighted w/out additional covariates	74.794	.000
Unweighted with additional covariates	99.014	.000
Weighted without additional covariates	95.063	.000
Weighted with additional covariates	113.698	.000

Table 10.1b Weighted Data: Type of Contraception for Analytic Sample
(Multinomial Logistic Regression with each type of method, N=5,605; weighted)

Reference Group: Condoms	Obesity				Health Care			Number of Partners		
Demographic Characteristics (/ = reference)	Obese II	Obese	Overweight	/Normal	No Coverage	Public	/Private	/0	1+	1.000
Pill										
OR*	.688	.785	.961	/	.354	.640	/	/	.366	1.376
CI*	.549,.863	.640,.963	.809,1.141	/	.286,.439	.515,.795	/	/	.183,.729	1.095,1.730
P-Value	.001	.021	.651	/	.000	.000	/	/	.004	.006
Diaphragm										
OR	.851	.365	4.754	/	.000	7.109	/	/	~	16.991
CI	.063,11.554	.011,11.640	.934,24.200	/	0.000,.c	1.949,25.929	/	/	~	.024,11862.002
P-Value	.903	.568	.060	/	.997	.003	/	/	~	.397
IUD										
OR	1.053	.761	.928	/	1.016	1.679	/	/	.305	2.430
CI	.752,1.477	.540,1.072	.699,1.232	/	.749,1.378	1.242,2.271	/	/	.055,1.684	1.534,3.849
P-Value	.762	.119	.606	/	.920	.001	/	/	.173	.000
Implant										
OR	2.710	.868	.621	/	1.660	3.661	/	/	~	.909
CI	1.062,6.916.	249,3.025	.184,2.093	/	.581,4.741	1.505,8.904	/	/	~	.311,2.657
P-Value	.037	.824	.442	/	.344	.004	/	/	~	.862
Depo-Provera										
OR	.937	1.241	.872	/	2.295	5.369	/	/	.323	1.365
CI	.615,1.430	.855,1.802	.609,1.250	/	1.601,3.289	3.855,7.478	/	/	.070,1.498	.869,2.143
P-Value	.764	.257	.458	/	.000	.000	/	/	.149	.177
Lunelle										
OR	.717	9.749	.960	/	2.760	12.216	/	/	~	1.242
CI	.036,14.469	1.752,54.260	.088,10.513	/	.420,18.135	2.861,52.171	/	/	~	.179,8.623
P-Value	.828	.009	.974	/	.291	.001	/	/	~	.826
Patch										
OR	.353	.576	1.366	/	.688	1.686	/	/	.747	3.571
CI	.112,1.110	.244,1.359	.771,2.419	/	.316,1.497	.873,3.257	/	/	.023,24.056	.955,13.350
P-Value	.075	.208	.285	/	.345	.120	/	/	.869	.059
Ring										
OR	.766	1.187	1.083	/	.434	.804	/	/	.345	.908
CI	.467,1.259	.793,1.777	.754,1.554	/	.268,.704	.517,1.251	/	/	.075,1.589	.585,1.410
P-Value	.293	.405	.667	/	.001	.334	/	/	.172	.668
No Method										
OR	1.155	.947	.978	/	.603	.774	/	/	.307	2.714
CI	.921,1.449	.763,1.176	.811,1.180	/	.489,.745	.616,.972	/	/	.109,.862	2.027,3.633
P-Value	.213	0.622	0.817	/	0	0.027	/		0	.025

* All OR and CI values are exponentiated.

/ Reference Categories, omitted from regression.

P-value= <.05

~ Unstable estimate due to sample size

Omnibus Tests of Model		
Model	Chi-square	Sig.
Weighted	527.400	.000

Table 10.2b Weighted Data: Contraception Requires RX; Women Using a Method in Past Year (Multivariate Logistic Regression with weight; N= 4,396, Analytic Sample)								
	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
*Obesity^*				.166				.216
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.023	.084	1.023	.784	.019	.085	1.019	.821
Obese	-.002	.100	.998	.984	-.024	.101	.976	.812
Obese II	-.219	.109	.804	.045	-.211	.110	.810	.056
Age				.000				.000
40-44	-.881	.136	.414	.000	-.860	.137	.423	.000
35-39	-.347	.123	.707	.005	-.365	.124	.694	.003
30-34	-.163	.117	.850	.164	-.185	.118	.831	.116
25-29	-.075	.098	.928	.444	-.099	.099	.906	.319
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.000				.000
Black	.316	.124	1.372	.011	.251	.125	1.286	.045
Hispanic	-.395	.149	.673	.008	-.435	.150	.647	.004
Other	.627	.103	1.872	.000	.593	.104	1.809	.000
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.201				.253
Below 100% FPL	.012	.117	1.012	.918	.034	.118	1.035	.771
100-199% FPL	-.149	.100	.862	.139	-.134	.101	.874	.184
200-299% FPL	-.149	.097	.862	.125	-.127	.098	.881	.193
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Public (State/Federal Program)	.232	.119	1.261	.050	.232	.120	1.262	.052
No Coverage	-.555	.104	.574	.000	-.542	.105	.582	.000
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.308				.219
Some High School, No Diploma	-.048	.173	.953	.780	-.082	.174	.921	.637
HS Diploma or GED	-.098	.144	.907	.498	-.123	.145	.884	.397
Some College	.047	.130	1.048	.716	.038	.131	1.039	.772
Bachelor's Degree	.131	.129	1.140	.308	.130	.130	1.139	.317
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.025	.088	1.026	.774	-.001	.089	.999	.992
Marital Status				.388				.747
Never Married	-.182	.197	.833	.354	.035	.204	1.035	.864
Separated	.204	.149	1.227	.171	.196	.150	1.217	.191
Divorced	.141	.610	1.152	.817	.296	.611	1.344	.628
Widowed	.103	.088	1.109	.243	.024	.092	1.025	.791
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.000
0 (ref)					/	/	/	/
1					.390	.115	1.477	.001
1+					-1.055	.315	.348	.001
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.846
Yes (ref)					/	/	/	/
No					-.064	.115	.938	.579
Don't Know					-.130	.461	.878	.778
Feelings about possible unintended pregnancy								.303
Upset (ref)					/	/	/	/
Pleased					.136	.101	1.146	.179
Wouldn't Care					.221	.614	1.248	.718
Prefer not to answer					-.033	.080	.967	.676

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Table 10.3b Weighted Data: Contraception Requires MD to Administer (Multivariate Logistic Regression with weight; N= 4,396, Analytic Sample)								
	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
*Obesity^*				.261				.276
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	-.204	.115	.815	.075	-.202	.116	.817	.080
Obese	-.114	.130	.892	.380	-.094	.131	.910	.473
Obese II	.021	.140	1.021	.183	.029	.142	1.030	.237
Age				.210				.167
40-44	-.327	.187	.721	.081	-.345	.189	.709	.068
35-39	-.050	.159	.951	.754	-.080	.161	.923	.621
30-34	-.213	.155	.808	.168	-.249	.156	.779	.110
25-29	.009	.134	1.009	.946	.001	.136	1.001	.994
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.044				.047
Black	-.138	.156	.871	.376	-.211	.159	.810	.183
Hispanic	-.599	.216	.549	.005	-.579	.217	.561	.008
Other	-.102	.133	.903	.443	-.103	.134	.902	.442
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.155				.148
Below 100% FPL	.332	.156	1.394	.033	.347	.158	1.415	.028
100-199% FPL	.251	.140	1.286	.072	.249	.141	1.282	.078
200-299% FPL	.215	.137	1.240	.117	.210	.138	1.234	.129
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.000				.000
Public (State/Federal Program)	.734	.140	2.084	.000	.728	.141	2.072	.000
No Coverage	.478	.137	1.613	.000	.450	.139	1.568	.001
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.027				.040
Some High School, No Diploma	.436	.229	1.546	.058	.443	.231	1.558	.055
HS Diploma or GED	.095	.208	1.099	.648	.108	.210	1.114	.606
Some College	.136	.191	1.146	.477	.142	.193	1.152	.463
Bachelor's Degree	-.159	.196	.853	.418	-.128	.197	.880	.516
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	1.468	.138	4.340	.000		.139	4.484	.000
Marital Status				.000				.000
Never Married	-.183	.250	.833	.464	-.106	.255	.899	.677
Separated	-.231	.204	.794	.257	-.242	.205	.785	.239
Divorced	.039	.862	1.040	.964	-.084	.870	.920	.923
Widowed	.403	.119	1.497	.001	.457	.124	1.579	.000
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.181
0 (ref)					/	/	/	/
1					-.076	.176	.926	.664
1+					-1.123	.607	.325	.064
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.308
Yes (ref)					/	/	/	/
No					.244	.159	1.277	.125
Don't Know					.150	.808	1.162	.853
Feelings about possible unintended pregnancy								.000
Upset (ref)					/	/	/	/
Pleased					-.011	.125	.989	.928
Wouldn't Care					-.025	.709	.975	.972
Prefer not to answer					-.537	.106	.585	.000

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

Table 11b Weighted Data: Discontinuation of Contraception (Multivariate Logistic Regression with weight; N= 4,396, Analytic Sample								
	Weighted Base Model				*Weighted with Additional Covariates*			
Demographic Characteristics	B	SE	OR	P-Value	B	SE	OR	P-Value
*Obesity^*				.038				.032
Normal (ref)	/	/	/	/	/	/	/	/
Overweight	.116	.078	1.123	.137	.123	.079	1.131	.118
Obese	-.168	.094	.845	.073	-.168	.094	.846	.075
Obese II	.054	.104	1.055	.605	.058	.105	1.060	.576
Age				.105				.093
40-44	-.192	.130	.825	.139	-.193	.130	.824	.139
35-39	-.092	.115	.913	.428	-.088	.116	.916	.449
30-34	-.130	.108	.878	.229	-.112	.109	.894	.304
25-29	.090	.091	1.094	.319	.104	.091	1.109	.256
20-24 (ref)	/	/	/	/	/	/	/	/
Race				.065				.075
Black	.135	.121	1.145	.264	.150	.122	1.161	.220
Hispanic	.097	.148	1.102	.509	.094	.148	1.098	.527
Other	.250	.100	1.283	.013	.247	.101	1.280	.014
White (ref)	/	/	/	/	/	/	/	/
Poverty Level				.031				.033
Below 100% FPL	-.205	.109	.815	.060	-.201	.109	.818	.066
100-199% FPL	-.161	.094	.851	.089	-.165	.095	.848	.082
200-299% FPL	.093	.091	1.098	.304	.093	.091	1.097	.310
300% and Above FPL (ref)	/	/	/	/	/	/	/	/
Health Care				.815				.800
Public (State/Federal Program)	.005	.111	1.005	.961	-.010	.111	.990	.928
No Coverage	.063	.102	1.065	.538	.061	.103	1.063	.554
Private/Employer Based Coverage (ref)	/	/	/	/	/	/	/	/
Education				.039				.036
Some High School, No Diploma	-.278	.165	.757	.091	-.276	.165	.759	.095
HS Diploma or GED	-.264	.137	.768	.054	-.267	.137	.766	.052
Some College	-.164	.122	.849	.180	-.168	.123	.845	.170
Bachelor's Degree	-.339	.120	.712	.005	-.346	.120	.708	.004
Graduate School (ref)	/	/	/	/	/	/	/	/
Parity								
No children (ref)	/	/	/	/	/	/	/	/
1+ Children	.624	.083	1.867	.000	.621	.083	1.860	.000
Marital Status				.003				.002
Never Married	.243	.193	1.275	.208	.224	.197	1.251	.254
Separated	.479	.142	1.614	.001	.475	.143	1.607	.001
Divorced	-.085	.586	.918	.884	.004	.591	1.004	.994
Widowed	-.034	.082	.967	.678	-.073	.085	.930	.391
Married (ref)	/	/	/	/	/	/	/	/
Relationship Dynamics								
Number of Partners								.098
0 (ref)					/	/	/	/
1					.230	.112	1.258	.040
1+					.376	.297	1.457	.206
Pregnancy Beliefs								
Perceived difficulty getting pregnant								.403
Yes (ref)					/	/	/	/
No					-.103	.107	.902	.335
Don't Know					.311	.440	1.365	.480
Feelings about possible unintended pregnancy								.183
Upset (ref)					/	/	/	/
Pleased					-.123	.094	.884	.188
Wouldn't Care					-.558	.560	.573	.320
Prefer not to answer					.040	.075	1.041	.589

^P-value for joint test of coefficient listed by each variable name.

/ Reference Categories, omitted from regression.

P-value= <.05

APPENDIX B

Qualitative Interview Questions

This is the sequence of questions that framed each interview with a family planning resident.

First, I just have a few general questions to ask regarding obesity and contraception.

- In my preliminary research with the National Survey for Family Growth (NSFG), analysis shows that obese women have similar rates of sexual activity as non-obese women. However, obese women are 30% less likely to use contraception, after controlling for individual and socioeconomic factors. Why do you think that is?

- Do you have any suggestions as to how providers can help improve rates of contraception use in this population?

- In what ways can physicians be better supported to ensure that obese women receive the same access to family planning as non-obese women?

- How do you think social views of obesity impact clinician/patient interactions?

- How might this affect obese women's use of contraception?

Next, I'd like to ask you about possible interactions you have seen between other physicians' and patients.

- During your training, have you noticed patients being treated differently in healthcare settings based on obesity status?

- How were they treated differently?

- Why do you think that is?

- How does this affect patient care, specifically reproductive health care?

- How might this affect provision of contraception?

- Obese women are more likely to interface with physicians but have lower rates of contraception use. Do you think there is a bias against discussing family planning with obese patients in the family medicine field?

Next, I'm going to ask a few questions about family planning counseling.

- Given the limited amount of time providers have with patients, how do you determine if family planning is a priority to discuss in each appointment?

- What circumstances contribute to family planning not being discussed (with patients who are of reproductive age)?

- How does obesity impact your level of comfort in discussing sexuality with patients?

Finally, I'm now going to ask a few questions about recommending specific types of contraception.

- How does obesity affect your recommendations for specific type of contraception?

- How does obesity impact your recommendations of methods that require vaginal insertion (such as the IUD)?

- What do you do if patients seem hesitant about exams and methods that require insertion?

- Do obese women seem more hesitant about these methods?

APPENDIX C

Study Information Sheet for Interview Participants

Each interviewee received the following study information sheet. To preserve anonymity, information that would identify the residency program has been removed as denoted by: {**REDACTED**}.

University of California, Los Angeles

{REDACTED}

STUDY INFORMATION SHEET

Obesity and Contraception

My name is Lauren Lessard and I am currently a PhD Candidate at UCLA Fielding School of Public Health and research fellow at **{ REDACTED }.** I am conducting interviews with family medicine residents as part of my mixed-methods dissertation study.

You were selected as a possible participant in this study because of your position as a family medicine resident with **{ REDACTED }.** Your participation in this research study is voluntary.

Why is this study being done?

The purpose of this research study is to explore how obesity impacts contraception use. This study aims to provide knowledge for use in policy and health care settings regarding why obese women are less likely to use contraception and are subsequently at an increased risk for unintended pregnancy.

What will happen if I take part in this research study?

If you agree to participate, I will conduct a 20-minute structured interview with you. You will be asked questions about aspects of the family medicine field that may impact obese women rate of contraception use.

How long will I be in the research study?

Participation will take a total of about *20 minutes.*

Are there any potential risks or discomforts that I can expect from this study?

The only possible risk is that physician participants may implicate members of their field as having bias against obese women. However, given that no identifying information will be collected, the risk applies to the general field of medicine and not individual participants. Additionally, any published articles will eliminate the name of the residency program and instead cite "California family medicine residency program." The benefits outweigh the risks in this regard because physicians pledge to provide the same,

high-quality of care to every patient, regardless of physical characteristics. Acknowledging the possibility of bias will improve the quality of care for one of their highest risk patient populations. More specifically:

a. Psychological: The psychological risks to you will be minimal; no intrusive methods will be utilized, nor will sensitive or identifiable information be collected.

b. Social: There will be minimal social risks to you. Though the analysis will focus on physicians' bias in health care settings, there will be no identifying information to link a specific interviewee to their interview. If the study finds that physician bias is impairing obese women's ability to access contraception, the results will be shared in medical communities so that physicians can improve their interactions with patients, rather than emphasize past discretion. Additionally, if results are published, the residency program will not be specifically mentioned to protect the program's reputation.

c. Physical: There will be no physical risks to you, since data is collected through a conventional real-time interview.

d. Economic: The methods implemented and data collected will be unlikely to harm your economic standing.

e. Legal: The methods implemented and data collected will be unlikely to harm your legal standing.

f. Violations of normal expectations: Your data will be collected via tape recorder, stored in an encrypted database in a password protected file in a locked office until transcribed and deleted, analyzed and reported in aggregate form to preserve your identity and to avoid violations of normal expectations.

Are there any potential benefits if I participate?

There are no direct benefits to you by participating in this research.

Preventing unplanned pregnancies benefits society as a cost-saving measure as well as contributes to the empowerment and advancement of women. Additionally, preventing unplanned pregnancies for obese women reduces the risk of severe illnesses associated with obesity and pregnancy which can be dangerous for both the woman and fetus as well as costly for society.

What other choices do I have if I choose not to participate?

Your participation is completely voluntary and you can refuse to participate at any time. If you wish not to participate, you can refuse now or at any point during the interview. If at any point you wish to stop the interview, please let me know. You will not be penalized and you will receive $5 for your time.

Will I be paid for participating?

If you choose to participate and complete the interview, you will be compensated $10.

Will information about me and my participation be kept confidential?

Your participation will be completely anonymous. The interview will be recorded but the file will be immediately erased after transcription occurs, which will take place within 48 hours of this interview. No identifying information will be collected. If the findings from this study are published, your residency program will be described as a California Family Medicine Residency program.

What are my rights if I take part in this study?

- You can choose whether or not to be in this study. If you choose to participate, you may withdraw from the study at any time.
- Whatever decision you make, there will be no penalty to you, and no loss of benefits to which you were otherwise entitled.
- You may refuse to answer any questions that you do not want to answer and still remain in the study.

Who can I contact if I have questions about this study?

- **The research team:**

  If you have any questions, comments or concerns about the research, you can talk to one of the researchers. Please contact:

Lauren Lessard, MPH PhD Candidate
University of California, Los Angeles

Anne Pebley, PhD
University of California, Los Angeles
UCLA Department of Sociology

{ REDACTED }, MD

If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call **{ REDACTED }**

- **UCLA Office of the Human Research Protection Program (OHRPP):**
  If you have questions about your rights while taking part in this study, or you have concerns or suggestions and you want to talk to someone other than the researchers about the study, please call the OHRPP at (310) 825-7122 or write to:

  UCLA Office of the Human Research Protection Program
  11000 Kinross Avenue, Suite 211, Box 951694
  Los Angeles, CA 90095-1694

APPENDIX D

Recruitment Letter (PI)

This letter was sent to the interviewees. To preserve anonymity, information that would identify the residency program has been removed as denoted by: {**REDACTED**}.

Dear Residents,
My name is Lauren Lessard and I am a PhD Candidate at UCLA Fielding School of Public Health and research fellow at { **REDACTED** }. I am conducting interviews with family medicine residents as part of my mixed-methods dissertation study.

The purpose of this research study is to explore how obesity impacts contraception use. Sexually active obese women are less likely to use contraception than sexually active non-obese women, after controlling for social and demographic factors. Initially, I used national survey data to explore contraceptive use patterns among obese women. Unfortunately, the national survey did not have information regarding possible circumstances that may limit obese women's use of contraception in health care settings. I would sincerely appreciate your involvement and expert opinion regarding these findings. Unintended pregnancies among obese women may have serious consequences for both the women and fetus. Supporting this population in improving their health and preventing further complications is becoming increasingly important as we see the rates of obesity increase throughout the United States.

I will be conducting 20-minute structured interviews with family medicine residents in {} and would appreciate your consideration in participating. If you choose to participate, you will be compensated $10. Interviews will be scheduled at a time and location convenient to you. Your participation will be completely anonymous; no identifying information will be collected.

Your participation is absolutely voluntary and will have no effect on your position with {**REDACTED**} Family Medicine Residency program. If you are interested in learning more, please contact me and I would be happy to answer any questions and schedule the 20-minute interview at your convenience. Additionally, please feel free to contact the following faculty sponsors with any questions or concerns:

{ **REDACTED** }, MD

Anne Pebley, PhD
University of California, Los Angeles

Thank you for your time and consideration.
Sincerely,
Lauren Lessard, MPH PhD Candidate
UCLA, Fielding School of Public Health

APPENDIX E:

Recruitment Letter (Department)

This letter was sent to the interviewees from their department head. To preserve anonymity, information that would identify the residency program has been removed as denoted by: {**REDACTED**}.

Dear Residents,

I am writing to tell you about the Obesity and Contraception study being conducted by Lauren Lessard, PhD Candidate at UCLA and Research Fellow at {**REDACTED**}. Lauren will be conducting 20-minute structured interviews with family medicine residents and would appreciate your consideration in participating. If you choose to participate, you will be compensated $10 cash. Interviews will be scheduled at a time and location convenient to you.

The purpose of this research study is to explore how obesity impacts contraception use. Sexually active obese women are less likely to use contraception than sexually active non-obese women, after controlling for social and demographic factors. Lauren aims to explore possible circumstances that may limit obese women's use of contraception.

Your participation is voluntary and will have no effect on your position with {**REDACTED**} Family Medicine Residency program. If you choose to be interviewed, your participation will be completely anonymous; no identifying information will be collected. If you are interested in learning more, please contact Lauren at {**REDACTED**}. She will also be emailing you directly. You do not have to respond if you are not interested in this study.

Thank you for your time and consideration in supporting this important research.

Sincerely,

{REDACTED}

CITATIONS

1. Mosher WD, Jones J. Use of contraception in the United States: 1982-2008. Vital Health Stat 23 2010:1-44.
2. Andreasen KR, Andersen ML, Schantz AL. Obesity and pregnancy. Acta Obstet Gynecol Scand 2004;83:1022-9.
3. Wolfe HM, Gross TL. Obesity in pregnancy. Clin Obstet Gynecol 1994;37:596-604.
4. Stotland NE. Obesity and pregnancy. Obstetric Anesthesia Digest 2009;29:178.
5. Sarwer DB, Allison KC, Gibbons LM, Markowitz JT, Nelson DB. Pregnancy and obesity: a review and agenda for future research. J Womens Health (Larchmt) 2006;15:720-33.
6. Brown K, Apuzzio J, Weiss G. Maternal obesity and associated reproductive consequences. Womens Health (Lond Engl) 2010;6:197-203.
7. Flegal KM, Carroll MD, Kit BK, Ogden CL. PRevalence of obesity and trends in the distribution of body mass index among us adults, 1999-2010. JAMA 2012;307:491-7.
8. Kristeller JL, Hoerr RA. Physician attitudes toward managing obesity: differences among six specialty groups. Am J Prev Med 1997;26:542-9.
9. Davis-Coelho K, Waltz J, Davis-Coelho B. Awareness and prevention of bias against fat clients in psychotherapy. Prof Psychol: Res Pract 2000;31:682-4.
10. Schwartz MB, O'Neal H, Brownell KD, Blair S, Billington C. Weight Bias among health professionals specializing in obesity. Obes Res 2003;11:1033-9.
11. Teachman BA, Brownell KD. Implicit anti-fat bias among health professionals: is anyone immune? Int J Obes Relat Metab Disord 2001;25:1525-31.
12. Puhl RM, Heuer CA. The Stigma of Obesity: A Review and Update. Obesity 2009;17:941-64.
13. Adams CH, Smith NJ, Wilbur DC, Grady KE. The relationship of obesity to the frequency of pelvic examinations: do physician and patient attitudes make a difference? Women & health 1993;20:45-57.
14. Wee CC, McCarthy EP, Davis RB, Phillips RS. Obesity and Breast Cancer Screening. Journal of General Internal Medicine 2004;19:324-31.
15. Wear D, Aultman JM, Varley JD, Zarconi J. Making fun of patients: medical students' perceptions and use of derogatory and cynical humor in clinical settings. Acad Med 2006;81:454-62.
16. Brownell KD. Weight bias: Nature, consequences, and remedies: Guilford Press; 2005.
17. McCormick B, Stone I. Economic costs of obesity and the case for government intervention. Obes Rev 2007;8 Suppl 1:161-4.
18. Rudman LA, Feinberg J, Fairchild K. Minority Members' Implicit Attitudes: Automatic Ingroup Bias As A Function Of Group Status. Social Cognition 2002;20:294-320.
19. Gilman SL. Fat: a cultural history of obesity: Polity; 2008.
20. Crocker J, Major B, Steele C. Social stigma: McGraw-Hill, New York, NY; 1998.
21. Greenleaf C, Weiller K. Perceptions of youth obesity among physical educators. Soc Psychol Educ 2005;8:407-23.
22. O'Brien KS, Hunter JA, Banks M. Implicit anti-fat bias in physical educators: physical attributes, ideology, and socialisation. Int J Obes 2007;31:308-14.
23. Neumark-Sztainer D, Story M, Harris T. Beliefs and attitudes about obesity among teachers and school health care providers working with adolescents. J Nutr Educ 1999;31:3-9.
24. Puhl R, Brownell KD. Confronting and coping with weight stigma: An investigation of overweight and obese individuals. Obesity 2006;14:1802-15.
25. Paul RJ, Townsend JB. Shape up or ship out? Employment discrimination against the overweight. Empl Respons Rights J 1995;8:133-45.
26. Roehling MV. Weight-based discrimination in employment: psychological and legal aspects. Pers Psychol 1999;52:969-1017.

27. Vartanian LR, Shaprow JG. Effects of weight stigma on motivation to exercise and exercise behavior: a preliminary investigation among college-aged females. Health Psychol 2008;13:131-8.
28. Puhl R, Moss-Racusin C, Schwartz MB. Internalization of weight bias: implications for binge eating and emotional well-being. Obesity (Silver Spring) 2007;15:19-23.
29. Hebl M, Xu J, Mason M. Weighing the care: patients' perceptions of physician care as a function of gender and weight. International journal of obesity 2003;27:269-75.
30. Mulherin K, Miller YD, Barlow FK, Diedrichs PC, Thompson R. Weight stigma in maternity care: women's experiences and care providers' attitudes. BMC Pregnancy Childbirth 2013;13:19.
31. Puhl R, Brownell KD. Bias, Discrimination, and Obesity. Obesity Research 2001;9:788-805.
32. Woolley FR, Kane RL, Hughes CC, Wright DD. The effects of doctor-patient communication on satisfaction and outcome of care. Social Science & Medicine Part A: Medical Psychology & Medical Sociology 1978;12:123-8.
33. Hatcher RA. Contraceptive technology. 19th revised ed. New York, NY: Ardent Media; 2007.
34. Grimes DA, Shields WC. Family planning for obese women: challenges and opportunities. Contraception 2005;72:1-4.
35. Griffiths LJ, Wolke D, Page AS, Horwood JP. Obesity and bullying: different effects for boys and girls. Arch Dis Child 2006;91:121-5.
36. Janssen I, Craig WM, Boyce WF, Pickett W. Associations between overweight and obesity with bullying behaviors in school-aged children. Pediatrics 2004;113:1187-94.
37. Lu MC. Healthcare reform and women's health: a life-course perspective. Curr Opin Obstet Gynecol 2010;22:487-91.
38. Bajos N, Wellings K, Laborde C, Moreau C. Sexuality and obesity, a gender perspective: results from French national random probability survey of sexual behaviours. BMJ: British Medical Journal 2010;340.
39. Eisenberg ME, Neumark-Sztainer D, Lust KD. Weight-Related Issues and High-Risk Sexual Behaviors Among College Students. Journal of American College Health 2005;54:95-101.
40. Ratcliff MB, Jenkins TM, Reiter-Purtill J, Noll JG, Zeller MH. Risk-Taking behaviors of adolescents with extreme obesity: Normative or not? Pediatrics 2011;127:827-34.
41. Averett S, Corman H, Reichman NE. Effects of overweight on risky sexual behavior of adolescent girls. Economic Inquiry 2013;51:605-19.
42. Akers AY, Lynch CP, Gold MA, et al. Exploring the relationship among weight, race, and sexual behaviors among girls. Pediatrics 2009;124:e913-20.
43. Wiederman MW, Hurst SR. Body size, physical attractiveness, and body image among young adult women: Relationships to sexual experience and sexual esteem. Journal of Sex Research 1998;35:272-81.
44. Xu H, Wade JA, Peipert JF, Zhao Q, Madden T, Secura GM. Contraceptive failure rates of etonogestrel subdermal implants in overweight and obese women. Obstet Gynecol 2012;120:21-6.
45. Marnach ML, Long ME, Casey PM. Current issues in contraception. Mayo Clin Proc 2013;88:295-9.
46. Lessard LN, Karasek D, Ma S, et al. Contraceptive features preferred by women at high risk of unintended pregnancy. Perspect Sex Reprod Health 2012;44:194-200.
47. Ingraham N, Roberts S, Weitz TA. Prior Family Planning Experiences of Obese Women Seeking Abortion Care. Women's Health Issues 2014;24:e125-e30.
48. Brown SS, Eisenberg L. The best intentions: Unintended pregnancy and the well-being of children and families: National Academies Press; 1995.
49. Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. Perspect Sex Reprod Health 2006;38:90-6.

50. Gesink Law DC, Maclehose RF, Longnecker MP. Obesity and time to pregnancy. Human Reproduction 2007;22:414-20.
51. Bonne OB, Rubinoff B, Berry EM. Delayed detection of pregnancy in patients with anorexia nervosa: two case reports. Int J Eat Disord 1996;20:423-25.
52. Finer LB, Henshaw SK. Abortion incidence and services in the United States in 2000. Perspectives on Sexual and Reproductive Health 2003;35:6-15.
53. Foster DG, Jackson RA, Cosby K, Weitz TA, Darney PD, Drey EA. Predictors of delay in each step leading to an abortion. Contraception;77:289-93.
54. Lacoursiere DY, Baksh L, Bloebaum L, Varner MW. Maternal body mass index and self-reported postpartum depressive symptoms. Matern Child Health J 2006;10:385-90.
55. Oddy WH, Li J, Landsborough L, Kendall GE, Henderson S, Downie J. The association of maternal overweight and obesity with breastfeeding duration. J Pediatr 2006;149:185-91.
56. Rasmussen SA, Chu SY, Kim SY, Schmid CH, Lau J. Maternal obesity and risk of neural tube defects: a metaanalysis. Am J Obstet Gynecol 2008;198:611-9.
57. Hendler I, Blackwell SC, Bujold E, et al. The impact of maternal obesity on midtrimester sonographic visualization of fetal cardiac and craniospinal structures. Int J Obes Relat Metab Disord 2004;28:1607-11.
58. Barker DJ. The fetal and infant origins of adult disease. BMJ 1990;301:1111.
59. Fiske ST, Cuddy AJC, Glick P, Xu J. A model of (often mixed) stereotype content: Competence and warmth respectively follow from perceived status and competition. Journal of Personality and Social Psychology 2002;82:878-902.
60. Weiner B, Perry RP, Magnusson J. An attributional analysis of reactions to stigmas. Journal of Personality and Social Psychology 1988;55:738.
61. Hebl MR, Mannix LM. The weight of obesity in evaluating others: A mere proximity effect. Personality and Social Psychology Bulletin 2003;29:28-38.
62. Miller CT, Kaiser CR. A Theoretical Perspective on Coping With Stigma. Journal of Social Issues 2001;57:73-92.
63. Miller CT, Major B. Coping with stigma and prejudice. The social psychology of stigma 2000:243-72.
64. Lazarus RS, Folkman S. Stress, appraisal, and coping: Springer Publishing Company; 1984.
65. Compas BE, Connor-Smith JK, Saltzman H, Thomsen AH, Wadsworth ME. Coping with stress during childhood and adolescence: problems, progress, and potential in theory and research. Psychol Bull 2001;127:87-127.
66. Connor-Smith JK, Compas BE, Wadsworth ME, Thomsen AH, Saltzman H. Responses to stress in adolescence: measurement of coping and involuntary stress responses. J Consult Clin Psychol 2000;68:976-92.
67. Allison KW. Stress and oppressed social category membership. 1998.
68. Clark R, Anderson NB, Clark VR, Williams DR. Racism as a stressor for African Americans: A biopsychosocial model. American Psychologist 1999;54:805.
69. Mogg K, Bradley BP, Hallowell N. Attentional bias to threat: Roles of trait anxiety, stressful events, and awareness. The Quarterly Journal of Experimental Psychology 1994;47:841-64.
70. Jost JT, Banaji MR. The role of stereotyping in system-justification and the production of false consciousness. British Journal of Social Psychology 1994;33:1-27.
71. Jost JT, Banaji MR, Nosek BA. A Decade of System Justification Theory: Accumulated Evidence of Conscious and Unconscious Bolstering of the Status Quo. Political Psychology 2004;25:881-919.
72. Janoff-Bulman R. Shattered assumptions: SimonandSchuster. com; 2010.
73. Crocker J, Cornwell B, Major B. The stigma of overweight: Affective consequences of attributional ambiguity. Journal of Personality and Social Psychology 1993;64:60-70.

74. Puhl R, Brownell KD. Ways of coping with obesity stigma: review and conceptual analysis. Eating Behaviors 2003;4:53-78.
75. Quinn DM, Crocker J. Vulnerability to the affective consequences of the stigma of overweight. 1998.
76. Corrigan P. How Stigma Interferes With Mental Health Care. American Psychologist 2004;59:614-25.
77. Corrigan PW, Kerr A, Knudsen L. The stigma of mental illness: Explanatory models and methods for change. Applied and Preventive Psychology 2005;11:179-90.
78. Wang Ss Fau - Brownell KD, Brownell Kd Fau - Wadden TA, Wadden TA. The influence of the stigma of obesity on overweight individuals.
79. MODY SK, HAN M. Obesity and Contraception. Clinical Obstetrics and Gynecology 2014;57:501-7 10.1097/GRF.0000000000000047.
80. Levine JA. Poverty and Obesity in the US. Diabetes 2011;60:2667-8.
81. Lepkowski JM, Mosher WD, Davis KE, Groves RM, Van Hoewyk J. The 2006-2010 National Survey of Family Growth: sample design and analysis of a continuous survey. Vital Health Stat 2 2010:1-36.
82. Martinez G, Chandra A, Febo-Vazquez I, Mosher W. Use of Family Planning and Related Medical Services Among Women Aged 15–44 in the United States: National Survey of Family Growth, 2006–2010. National Health Stat Reports 2013;68:1-17.
83. Deurenberg P, Weststrate JA, Seidell JC. Body mass index as a measure of body fatness: age- and sex-specific prediction formulas. Br J Nutr 1991;65:105-14.
84. Romero-Corral A, Somers VK, Sierra-Johnson J, et al. Accuracy of body mass index in diagnosing obesity in the adult general population. Int J Obes (Lond) 2008;32:959-66.
85. Rothman KJ. BMI-related errors in the measurement of obesity. Int J Obes (Lond) 2008;32 Suppl 3:S56-9.
86. Hatcher RA, Trussell J, Nelson AL. Contraceptive Technology: Ardent Media; 2007.
87. Morgan DL. Practical strategies for combining qualitative and quantitative methods: applications to health research. Qual Health Res 1998;8:362-76.
88. Cooper RA, Getzen TE, McKee HJ, Laud P. Economic and demographic trends signal an impending physician shortage. Health Aff (Millwood) 2002;21:140-54.
89. Herbitter C, Greenberg M, Fletcher J, Query C, Dalby J, Gold M. Family planning training in US family medicine residencies. Fam Med 2011;43:574-81.
90. Scholle SH, Chang JC, Harman J, McNeil M. Trends in women's health services by type of physician seen: data from the 1985 and 1997-98 NAMCS. Womens Health Issues 2002;12:165-77.
91. Rubin SE, Fletcher J, Stein T, Segall-Gutierrez P, Gold M. Determinants of intrauterine contraception provision among US family physicians: a national survey of knowledge, attitudes and practice. Contraception 2011;83:472-8.
92. Ulin P, Robinson E, Tolley E. Qualitative methods in public health a field guide for applied research. San Francisco, CA: Jossey-Bass; 2005.
93. Trussell J. Contraceptive failure in the United States. Contraception 2004;70:89-96.
94. Chu SY, Callaghan WM, Bish CL, D'Angelo D. Gestational weight gain by body mass index among US women delivering live births, 2004-2005: fueling future obesity. American Journal of Obstetrics and Gynecology 2009;200:271.e1-.e7.
95. Wang Y, Beydoun MA. The Obesity Epidemic in the United States—Gender, Age, Socioeconomic, Racial/Ethnic, and Geographic Characteristics: A Systematic Review and Meta-Regression Analysis. Epidemiologic Reviews 2007;29:6-28.
96. Committee opinion no. 460: the initial reproductive health visit. Obstetrics and gynecology 2010;116:240-3.

97. Thapa S, Kumar S, Cushing J, Kennedy K. Contraceptive Use Among Postpartum Women: Recent Patterns and Programmatic Implications. International Family Planning Perspectives 1992;18:83-92.
98. Holt VL, Cushing-Haugen KL, Daling JR. Body weight and risk of oral contraceptive failure. Obstetrics and gynecology 2002;99:820-7.
99. Holt VL, Scholes D, Wicklund KG, Cushing-Haugen KL, Daling JR. Body mass index, weight, and oral contraceptive failure risk. Obstetrics and gynecology 2005;105:46-52.
100. Westhoff CL, Hait HI, Reape KZ. Body weight does not impact pregnancy rates during use of a low-dose extended-regimen 91-day oral contraceptive. Contraception 2012;85:235-9.
101. Trussell J, Schwarz EB, Guthrie K. Obesity and oral contraceptive pill failure. Contraception 2009;79:334-8.
102. Bertrand JT, Hardee K, Magnani RJ, Angle MA. Access, Quality Of Care and Medical Barriers In Family Planning Programs. International Family Planning Perspectives 1995;21:64-74.
103. Gallo M, Lopez L, Grimes D, Schulz K, Helmerhorst F. Combination contraceptives: effects on weight (Review). 2011.