Distribution Agreement

In presenting this thesis or dissertation as a partial fulfillment of the requirements for an advanced degree from Emory University, I hereby grant to Emory University and its agents the non-exclusive license to archive, make accessible, and display my thesis or dissertation in whole or in part in all forms of media, now or hereafter known, including display on the world wide web. I understand that I may select some access restrictions as part of the online submission of this thesis or dissertation. I retain all ownership rights to the copyright of the thesis or dissertation. I also retain the right to use in future works (such as articles or books) all or part of this thesis or dissertation.

Signature:

_____ _____

Ramona Rai Date

The Great Recession and American Fertility:

Trends in Fertility and Pregnancy Intention, 2001-2009

By

Ramona Rai

Master of Public Health

Epidemiology

Carol J. Rowland Hogue, PhD, MPH

Committee Chair

THE GREAT RECESSION AND AMERICAN FERTILITY:

Trends in Fertility and Pregnancy Intention, 2001-2009

BY

Ramona Rai
B.A., University of Pennsylvania, 2009

Thesis Committee Chair: Carol J. Rowland Hogue, PhD, MPH

An abstract of
A thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements of the degree of
Master of Public Health in Epidemiology

2014

Abstract

The Great Recession and American Fertility:
Trends in Fertility and Pregnancy Intention, 2001-2009

BY

Ramona Rai

OBJECTIVE & BACKGROUND: Economic conditions have been shown to have significant impacts on aggregate fertility. However, the role that pregnancy intention plays in individual-level fertility decision-making has not been explored using epidemiologic analysis. This thesis aims to address this research gap with particular regard to the Great Recession (2007-2009) in the United States for the years 2001-2009.

METHODS: To assess pregnancy intention for this period, the author used data from the Pregnancy Risk Assessment Monitoring System (PRAMS) (n=156,435). Logistic regression was used to assess the effect of giving birth during the recession (during 2008-2009) on birth intention and wantedness using general and race-specific models. The final adjusted models controlled for insurance status; whether the mother resided in a state with high, medium, or low levels of intended pregnancy; low-income status; maternal age; marital status; education level; and maternal race/ethnicity.

RESULTS: Over a fifth of the PRAMS respondents gave birth during the 2008-2009 period, but their demographic characteristics do not differ meaningfully from the respondents who gave birth during the 2001-2007 period. The odds of the birth being intended (aOR = 1.00, 95% CI: 0.96-1.10), given the birth had already taken place, were similar for both the 2001-2007 and 2008-2009 periods. Teenage respondents (15-19 year olds) exhibited a significant effect for birth wantedness: given that they had already given birth, the odds of the birth being wanted in 2008-2009 were 38 percent higher than the odds of the birth being wanted during 2001-2007 (aOR = 1.38, 95% CI: 1.10-1.70). The only race-specific model to return a significant result was for non-Hispanic white (NHW) women, where married women experienced higher odds of birth intention during the 2008-2009 period.

CONCLUSIONS: The Great Recession does not appear to have made a statistically significant impact on the distribution of fertility by wantedness status in the US, except for certain subgroups: married NHW women and teens. This suggests that reductions in recession-specific fertility rates for these groups may reflect either an increased vigilance to prevent unintended pregnancies or an increased use of pregnancy termination for mistimed and unwanted pregnancies in these subgroups.

THE GREAT RECESSION AND AMERICAN FERTILITY:

Trends in Fertility and Pregnancy Intention, 2001-2009

BY

Ramona Rai
B.A., University of Pennsylvania, 2009

Thesis Committee Chair: Carol J. Rowland Hogue, PhD, MPH

A Thesis submitted to the Faculty of the
Rollins School of Public Health of Emory University
in partial fulfillment of the requirements of the degree of
Master of Public Health in Epidemiology

2014

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Abbreviations

aOR	Adjusted Odds Ratio
CDC	Centers for Disease Control and Prevention
CI	Confidence Interval
GDP	Gross Domestic Product
GFR	General Fertility Rate
NCHS	National Center for Health Statistics
NHW	Non-Hispanic White
NHB	Non-Hispanic Black
NSFG	National Survey of Family Growth
PRAMS	Pregnancy Risk Assessment Monitoring System
SDT	Second Demographic Transition
SEER	Surveillance, Epidemiology, and End Results
TFR	Total Fertility Rate
WIC	Special Supplemental Nutrition Program for Women, Infants, and Children

INTRODUCTION

There are temporal trends in birth rates associated with economic fluctuations, particularly with economic depressions and recessions. However, it is not known whether declines in birth rates following economically "down" years and increases in birth rates following "up" years are associated with an improvement in planning pregnancies during the "down" years. In the context of the recent Great Recession (2007 – 2009), preliminary analyses indicate that a decline in births in the US has generally occurred, but whether this decline is connected to pregnancy intention is what this thesis will investigate. Because a substantial portion of mistimed pregnancies may be associated with more casual use of contraceptives among women who would be happy if they were to become pregnant, the author hypothesizes that among live births the largest drop in birth rates would be among intended pregnancies, followed by mistimed pregnancies. The author further hypothesizes that birth rates from unwanted pregnancies might fluctuate in the opposite direction; that is, that unwanted birth rates would be greatest following "down" years when affordability and access to contraception might affect its use among certain groups of women (e.g., low-income and unmarried women). This analysis focuses entirely on these trends occurring in live births during the time period, 2001-2009. A significant caveat of

this thesis, therefore, is that the impact of induced abortion on these intended, mistimed, and unwanted birth rates is not examined.

This thesis aims to address the impact the Great Recession, beginning in late 2007, has had on American fertility and birth rates. Main research questions addressed by this analysis include: Has the Great Recession precipitated a significant drop in birth rates in the US? If so, what is the effect when birth rates are stratified by pregnancy intention and birth wantedness? Do these categories of pregnancy intention differ by maternal characteristics such as race, income/education level, marital status, and/or geographic location?

LITERATURE REVIEW

Because the main research questions explored in this text relate to a number of social, economic, and demographic phenomena, the literature review is separated into several sections which expand on these various topics individually: the relationship between economic conditions and fertility, including the historic role of economic downturns such as the Great Depression and the 1973 economic crisis; major demographic trends in the United States; and pregnancy intention. Before reviewing the literature, the author will first expand on the different measures, which will be encountered in the review and the thesis itself.

Notes on Measures

Commonly Encountered Fertility Measures

The literature on major demographic trends in the US uses two categories of measurements to describe fertility: period measures (which represent a cross-sectional measurement of fertility for one year in a given population) and cohort measures (in which the same group or population's fertility is followed over a period of decades). The most commonly encountered period measure is also a primary outcome used in this analysis, along with birth intention and wantedness: general fertility rate (GFR), which describes the number of live

births per 1,000 females aged 15 through 44. This measure focuses only on potential mothers and is calculated as:

$$GFR = \frac{Number\ of\ total\ live\ births}{Number\ of\ women\ aged\ 15-44} \times 1{,}000$$

The most commonly encountered cohort measure is the total fertility rate (TFR), which describes the total number of children a woman can bear over her lifetime were she to experience the age-specific fertility rate. The age-specific fertility rate is the fertility rate experienced by each five-year age group from age 10 through age 54.

Birth and Pregnancy Rates

In the portion of the review discussing pregnancy intention, the author will refer to a variety of measures, which are also occasionally used in the demographic literature, but are more common in public health and epidemiological literature: birth rates, pregnancy rates, and proportions of births. Each measure is specific to the data source and the methods those researchers used to generate the estimates are presented below. Therefore, the author will define the measure each time to ensure clarity for the reader.

Pregnancy Intention

Three general categories of pregnancy intention are discussed in the literature and will be used in this analysis:

1) Intended pregnancies: The pregnancy was wanted and occurred at an appropriate time for the mother.

2) Unwanted pregnancies: The pregnancy was never wanted or a baby in that birth order was not wanted.

3) Mistimed pregnancies: The pregnancy occurred sooner than it was expected or wanted.

This category is sometimes parsed into two sub-categories, particularly in literature using data from the Center for Disease Control and Prevention's (CDC) National Survey of Family Growth (NSFG): moderately and seriously mistimed pregnancies. "Moderately mistimed" describes pregnancies that occur less than two years before when the mother wanted to become pregnant and "seriously mistimed" describes pregnancies that occur more than two years before when the mother wanted to become pregnant. Because the primary data source for this analysis, the Pregnancy Risk Assessment Monitoring System questionnaire, does not offer this option to its respondents during the period of interest (2001-2009), this sub-categorization of mistimed pregnancies will not be used.

"Unintended" pregnancies are the sum of the unwanted and mistimed pregnancies. Researchers have also occasionally included a fourth category of pregnancy intention, "ambivalent," which describes situations where the mother is not sure if the pregnancy is unwanted, mistimed, or intended. It has been asserted that since fertility intentions vary over time, ambivalent responses should be included in data analyses and not counted as an invalid response (1). Again, for data availability reasons, the "ambivalent" category of pregnancy intention will also be omitted from this analysis.

Economics & Fertility

Research investigating the effect of economic conditions on fertility is generally conducted in two ways: 1) an aggregate, macro level analysis that examines the impact of the national unemployment or gross domestic product (GDP) on the GFR or TFR (1, 2) (see Tables 1 and 2) or 2) a micro level analysis that examines how economic conditions impact individual fertility behaviors and fertility timing (3). This literature review examines both categories of economic research.

Macro level research not only focuses on the impact the economy has on overall fertility, but also investigates whether fertility is procyclical or countercyclical. Procyclical fertility follows general economic trends: as the economy expands or improves, fertility rises and as the economy contracts or

worsens, fertility declines. Countercyclical fertility, conversely, varies in contrast with general economic trends: as the economy improves, fertility declines and as the economy worsens, fertility rises. Though both viewpoints are prevalent in the literature, studies have found that when exploring population-level effects of the economy on fertility, fertility tends to behave in a procyclic manner (2, 4), and the unemployment rate appears to be a better predictor of the GFR and TFR than GDP in the procyclic context. Research focusing on fertility timing and individual fertility behaviors has isolated female participation in the workforce as having a significant influence on these indicators (3-6), signaling that economic conditions might play different roles in fertility timing depending on if only aggregate fertility is examined versus individual fertility behaviors. Because of how pregnancy intention is measured, this thesis will focus on an approach investigating individual fertility behaviors.

Female Participation in the Workforce

Female labor participation has been shown to affect various fertility behaviors, including birth spacing, first-birth rates, entry into parenthood, age at first marriage, and childbearing outside of marriage. Rindfuss and Brewster (2000) describe three main periods of female labor force participation: 1) women working until their first marriage; 2) women working until they have their first

child; and 3) women continuing to work to contribute to the household, only interrupting employment for maternity leave (3). The increase in women's employment is indicative of several sociocultural developments:

> …The rising demand for female labor; an increasing preference among women for nondomestic roles; the rising opportunity costs of homemaking as women's real wages rose; falling real wages for men, particularly those in the lower middle and working classes; and rising consumption aspirations (3).

The literature demonstrates that fertility and female labor force participation have a significant relationship; these factors interact both on the macro and micro levels. Labor force participation and fertility have an inverse association on an individual level, and a positive association on an aggregate scale. Rindfuss and Brewster hypothesize this is due to better management of the conflict between motherhood and pursuit of a professional career, which will often depend on the national context (e.g., availability and length of maternity leave, amount of parental benefits, etc.) (3). Because childcare and preschool programs are more plentiful in the US, women participate in the labor force at a higher rate than some European women (3). Additionally, if these women are married, in a relationship, or highly educated, they are more likely to leave work later and return sooner from maternity leave (3), though it depends on their work status. If

women return to work part-time*, these positions are less protected and often have fewer benefits than full-time positions; a change that represents a significant decrease in job security for these new mothers (3, 6). Labor force participation impacts fertility in that employed women are more likely to delay childbearing (3, 4, 6): employment could "delay transition into parenthood" (3) and this effect might be magnified for women who have already had their first child. Childbearing represents a major opportunity cost: in a situation where a choice must be made between two options (in this case, employment or parenthood), potential financial and professional gain from employment may be lost when a woman chooses to bear a child. Generally, the opportunity cost of having children increases as the female employment rate rises (3-5, 7-9) (see Tables 3 and 4).

Impact of Economic Downturns

The role of "economic uncertainty" in determining fertility behaviors is very important and is most prominently attributed to in Easterlin's financial insecurity hypothesis:

> In times of economic crisis, this personal and economic uncertainty skyrockets and can cause anxiety and depression which can negatively

* Working less than 32 hours per week

> affect childbearing intentions but again depends on the generosity of the welfare system as well as the availability of other resources from an individual's social networks (4).

Easterlin's insecurity hypothesis highlights the importance of financial security to the timing of childbearing: it is mostly based on current and recent economic status and the expectations couples have for their financial status in the future. If their expectations are not met concerning their baseline financial well-being, then they will postpone childbearing until they have reached a point of financial and economic security (Easterlin as quoted in Butz and Ward (1979)) (7).

The impact of economic downturns on fertility depends on the length of the economic contraction as well as certain demographic characteristics, among them education, income, gender, age, and length of unemployment (3, 4, 9). There is currently a paucity of research on how economic recessions and depressions can affect fertility; because economic downturns typically do not last more than a few years, their impact on birth rates and fertility is only temporary, which makes it difficult to measure (4). Information which is currently available shows that fertility declines during recessions are usually temporary and are typically followed by a slowing in the pace of fertility decline, if not a compensatory rise in fertility. The time lag between when fertility begins to

decline and when it is noted in vital statistics is approximately one to two and a half years (4).

Economic recessions also have differential impacts on various subgroups within the population, as explained by Sobotka and colleagues (2011):

> Economic downturns are not indiscriminate with respect to age, skills, sex, migrant status, and number of children already born. They first affect male-dominated jobs with a high share of migrant workers, especially in sectors that are sensitive to business-cycle volatility, such as construction. Younger and low-skilled employees, with less stable work and lower levels of job protection, are at greater risk of losing their jobs than prime-age workers. In contrast, women are often employed in public and service sectors such as health care and social services that are initially less affected by downturns (4).

Just as economic downturns do not affect all members of the population equally, the impact of economic recessions on fertility and the postponement of childbearing varies by gender, age, and income/education (4). Postponement of childbearing is more likely to occur among the young (those less than 30 years old) and those of higher education and income levels (4, 9). Along with the fact that younger populations have less job security, as explained above by Sobotka and colleagues), delayed childbearing is also more prevalent among the young

because of the greater investment in higher education, which takes more time and it can be more difficult to enter the labor market (9).

Among women, low-income women (including migrant workers) are more likely to have children than women with higher education and income due to the relatively lower opportunity cost of children among poor women (4). Economic downturns exacerbate this disparity with the number of births among high-income and highly educated women decreasing more severely during these periods. This observed disparity between high- and low-income women may be compounded by the fact that some women are electing to have children and concentrate more on creating a family than pursuing a professional career. The length of unemployment is also an important potential confounder of this relationship: long-term unemployment has a more detrimental effect on first-birth rates than short-term unemployment (4, 5). The pattern among higher order births (i.e., second births, third births, etc.), however, depends on a given society's ideal family size (4).

Fertility in the US

General Fertility Trends in the US, 1915 – 2007

In the US, from 1915-1940, the GFR declined from 120 to 80 where it remained until the start of the Baby Boom (10) at the end of World War II (11). During the

Baby Boom, which lasted from 1946-1964, the number of births peaked in 1957 at 4.3 million and began to decline steadily thereafter, though 1973. From 1957-1973, the number of births declined by 27 percent to 3.13 million births; a period which is commonly referred to as the Baby Bust (11, 12).

In 1976, the TFR reached its lowest point at 1.74 (13, 14). It slowly increased to 1.80 where it remained throughout the 1980s (13), and climbed to 2.12 in 2007 (15). From 1974 through 1990, births increased 32 percent to almost 4.2 million and between 1990 and 2002, births decreased overall by 2 percent (11). In 2007, the US experienced a record number of births, over 4.3 million, that represented a 7 percent increase in births from 2002 (15).

Important Underlying Social & Demographic Trends

Important underlying social and demographic trends which have influenced American fertility from 1915 through 2007 include:

- The introduction and utilization of hormonal contraception
- Delayed age at first marriage
- Increased female labor force participation (as previously mentioned in the above section, "Fertility & Economics")
- Delayed childbearing (as previously mentioned in the above section, "Fertility & Economics")

Below, the development of these phenomena is explored in specific historical contexts: the Great Depression and the economic crises of the mid-1970s.

The Great Depression

Considered to be the most severe economic depression to occur in modern history, the Great Depression, for the United States, began in October 1929. Though the US economy began to recover in 1933, the American GDP did not reach pre-Depression levels until after the US's entry into World War II in 1941. Numerous scholars have noted significant sociocultural and demographic changes which took place during this period that help to demonstrate the impact economic downturns can have on American fertility.

Fishback and colleagues (2007) describe the role increased federal relief spending played in increasing fertility rates during the Great Depression. During the late 1920s and early 1930s, relief spending and social welfare were exclusively in the purview of state and local governments, who solely relied on tax revenue and private charity to fulfill this need (10). With the arrival of the Great Depression in 1929, these resources were exhausted by 1933, and the federal government stepped in and increased its share of relief funding from 2 percent in 1932 to 79 percent in 1934, though it declined to 57.4 percent by 1940. The early 1930s saw a drop in the GFR and marriage rates, and this spending was

partially aimed at easing concerns about economic uncertainty so couples would begin childbearing (10). The authors found that increased federal relief spending during the Great Depression was a significant factor in the resurgence of childbirth during World War II and during the postwar period. Other important factors contributing to this development include the burgeoning family planning movement, which may have kept the GFR from fully recovering until after World War II (10).

Despite this growth in the GFR during the latter half of the 1930s, this period saw a significant increase in childlessness and single-child fertility among women who hit their prime reproductive ages during the 1930s. Davis (1982) determined this cohort consisted of non-Hispanic black (NHB) and non-Hispanic white (NHW) ever-married women who were aged 45-69 years old in 1960 (8) (see Table 5). This reduced parity was more prevalent among women of higher education levels, NHB women, and women who had postponed marriage. Though black women's health status was posited by Cutright and Shorter (1979) as a potential explanation for their lower fertility (16), Davis postulated that ultimately, the largest driver of reduced parity among this cohort (ever-married NHB and NHW women aged 45-69 years old in 1960) was the combination of changing social norms concerning family size and dynamic economic conditions (8). These long-term social changes included:

- Increased urbanization with smaller housing units and a lack of areas for families to grow food (8);
- Shifting of labor economy from farms (that benefited from child labor) to cities (where child labor was prohibited) (8);
- Higher school attendance (8);
- Increased consumerism (8, 17); and
- Increased female employment rate, especially among middle class women (8, 17).

In terms of cyclical economic changes during this period and its association with reduced parity, Davis states:

> The upturn in childlessness and single-child motherhood between the cohorts of 1891-1895 and 1906-1910 may thus be seen as a conscious response, primarily to the declining living standards and hard times of the Great Depression and secondarily to the increasing costs of children associated with structural shifts in the economy (8).

Though Davis is referring here to the Great Depression's impact on these specific cohorts' fertility behaviors, Sobotka and colleagues (2011) describe a similar phenomenon taking place during the Great Recession, which makes Davis's remarks particularly relevant to this discussion and analysis.

The 1973 Energy Crisis & Recession of 1974-1975

Because the US saw a significant decline in births during the Baby Bust, which led to an all-time-low TFR of 1.74 in 1976, more scholars began to assert that economic trends might have a meaningful effect on fertility trends. Sobotka and colleagues (2011) cite research noting a phenomenon similar to the US's Baby Bust in England and Wales during the 1970s. In this instance, some researchers suggest that the economic explanation for this decline in births is over-exaggerated. They assert that the decline in fertility was really due to other prominent sociocultural factors that are more difficult to quantify, such as public fear about the potential side effects of hormonal contraception (4). Therefore, there is still considerable debate in the literature as to *how* significant economic conditions are to fertility decision-making. While this is not a central focus of this thesis, it is important to bear in mind when interpreting the results of this analysis.

The Second Demographic Transition & Other Sociocultural Trends

Lesthaeghe's Second Demographic Transition (SDT) is uniquely characterized by delayed childbearing and higher average ages at entry to parenthood. Personal priorities are aimed at addressing the personal needs of the individual in favor of more financial or practical concerns (18): The SDT, in terms of fertility, is

anchored in the premise that people are making the conscious decision to become parents and that childbearing in general is not a foregone conclusion. According to Lesthaeghe's theory, several social phenomena prompted this new emphasis on childbearing as a personal choice: 1) the emergence of more reliable hormonal contraceptive methods (e.g., the pill, intrauterine devices); 2) a sexual revolution among the youth that led to higher rates of premarital sex; and 3) the gender equality movement which promoted women's reproductive choice (18).

The SDT is believed to have begun in the US during the early 1960s when divorce rates and the average age at first marriage began increasing, fertility began declining after the Baby Boom, and there were increased rates of cohabitation among young couples (18, 19). Gibson (1976) found that 83 percent of the fertility decline between 1961 and 1975 was due to a decline in marital fertility. He also noted that an increase in the amount of time between marriage and the first pregnancy appeared during 1970-1975 (12).

As Lesthaeghe described above, the introduction of the pill as a form of birth control represented a major step toward the SDT. When the pill was first introduced in the US, there were significant short- and long-term effects (20):

- Short-term: There was a rise in the proportion of low birth weight infants born as well as a rise in the proportion of children born into low-income families and a marked drop in fertility.

- Long-term: The drop in fertility turned out to be negligible, and there was ultimately an increase in the percentage of children born to college-educated mothers.

These seemingly contradictory results are explained by Ananat & Hungerman's (2012) study on the long-term impact of the pill in the US (see Table 6). The authors state that upwardly-mobile young women were more likely to use the pill once it was introduced, which produced these short- and long-term effects. These women were also more likely to use contraception in favor of induced abortions for birth control, so the short-term effects of the introduction of the pill appeared to be negative (20). While low birth weight is not associated with any contraceptive method, the authors explain that the prevented births of upwardly-mobile young women represent children of potentially higher income households with average, or higher than average, birth weight. Without these children in the cohort, it appeared that there was an overall increase in the incidence of low birth weight in the aftermath of the diffusion of the pill.

When the pill became readily available across the US, it also indirectly served to increase young women's access to higher education because women no longer had to interrupt their studies to have children. This prioritization of education over 'traditional' rites of passage such as marriage and childbearing was demonstrated by an increase in the average age at marriage, an increase in sexual

activity before marriage, an increase in the percentage of women pursuing higher education (e.g., attending medical school, law school, and business school), and a decrease in the desired number of children (21) (see Table 7).

Pregnancy Intention

According to the Guttmacher Institute, in 2008, the highest rates of unintended pregnancy in the US were experienced by California, Delaware, Mississippi, and Louisiana (22)[†], however, many more US jurisdictions view unintended pregnancy as an urgent public health issue because of its major financial implications. Because approximately 65 percent of unintended births are paid for by Medicaid (22), with 11 states reporting that at least 70 percent of unintended births are paid for by Medicaid/CHIP, unintended pregnancy represents an immense public cost: $11.1 billion total (2006 USD), which is composed of $4.6 billion in state funds and $6.5 billion in federal funds (23). These costs include expenses for prenatal care, labor and delivery care, postpartum care, and care for

[†] To generate these measures, the sum of unintended pregnancies for each state was divided by the total number of female residents aged 15-44. The sum of unintended pregnancies includes the number of all live births from unintended pregnancies, the number of induced abortions from unintended pregnancies, and the number of miscarriages from unintended pregnancies. For live births from unintended pregnancies, Guttmacher researchers distributed the number of total births per state using estimates of pregnancy intention prevalence from the CDC's NSFG. Data from the NSFG was also used to generate estimates of fetal losses from unintended pregnancies. For induced abortions from unintended pregnancies, researchers distributed the total number of induced abortions per state using the 2008 Abortion Patient Survey conducted by the Guttmacher Institute. For more information on this methodology, see Finer and Kost (2011).

the first year of the child's life. In 2008, these costs increased to $12.5 billion total, with 14 states and the District of Columbia reporting that at least 70 percent of unintended births are paid for by public insurance programs like Medicaid and CHIP (24). Federal funds account for about 59 percent of the cost of unintended births.

The proportion of births resulting from unintended pregnancies has not significantly changed from 1982 to 2010 and has remained around 37 percent. This is due to the fact that unintended births have decreased among ever-married NHW women, who represent a declining percentage of US births, while unintended births have increased among never-married and Hispanic women, who currently comprise a larger share of US births (25). Despite this, from 1982 to 2010, the percent of births that were unintended has declined among each major racial/ethnic group except Hispanic women. This decline is mostly due to the increase in unwanted births versus mistimed births: unwanted births have increased five percentage points (from 11 percent to 16 percent of unintended births among Hispanic women), while the share of mistimed pregnancies has remained stable (22). Groups where unintended pregnancy is highly prevalent include unmarried women, NHB women, and women with lower education and

income levels (25, 26): the unintended pregnancy rate[‡] for women living below the federal poverty line is five times the unintended pregnancy rate among women in the highest income level (22).

Aside from these general trends in unintended birth, significant trends have also emerged among subgroups of American women. Among married women, a woman's third or higher order pregnancy is most likely to be unintended, while among unmarried women, a woman's first pregnancy is most likely to be unintended (22). According to data from the CDC's NSFG from 1994-2001, the rate[§] of unintended pregnancy was highest among 18-24 year olds and is most common among unmarried cohabiting women (26). Among women with unintended births, 60 percent were not using contraception and most of those women chose not to use it because they believed they could not get pregnant. Additionally, women experiencing an unintended birth are more likely to use tubal ligation as their birth control method after the birth of their last child and were shown to use hormonal contraception, such as the birth control pill, less effectively (25).

There is a scarcity of current literature comparing unwanted pregnancies to mistimed pregnancies in the US, with the most recent study completed by

[‡] See the previous footnote regarding the Guttmacher Institute's methodology for deriving rates of unintended pregnancy.
[§] Finer and Henshaw (2006) used a methodology similar to the Guttmacher Institute's to generate rates of unintended pregnancy.

D'Angelo and colleagues (2004) using 1998 data from the CDC's Pregnancy Risk Assessment Monitoring System (PRAMS) (see Table 8). The authors show that 31.8 percent of births are mistimed while 11.3 percent are unwanted (27) and that there were no significant differences between the 'mistimed' mothers and 'unwanted' mothers except for parity: A larger share of 'unwanted' mothers already had children compared to 'mistimed' mothers (75 percent versus 50 percent) (27).

This trend was also observed in Maxson and Miranda's 2011 prospective cohort study of the association between selected demographic and psychosocial characteristics and pregnancy intention (28) (see Table 9). D'Angelo and colleagues also report that women over 35 years old were more likely to report unwanted pregnancies; this group and the parous group in their analysis are more likely to have already reached their ideal family size. This pattern of pregnancy intention among older mothers is also reported in Cheng and colleagues' (2009) analysis of 2001-2006 Maryland PRAMS and birth certificate data of unintended pregnancy and associated preconception, prenatal, and postpartum behaviors (29) (see Table 10).

Unintended pregnancies are associated with a host of adverse birth outcomes. Unwanted pregnancies are associated with a higher likelihood of preterm birth and the premature rupture of membranes (30) (see Table 11). In

terms of maternal behaviors, unintended pregnancy is associated with maternal smoking and alcohol use and late initiation of prenatal care (29, 30), as well as inadequate preconception folic acid consumption, postpartum depression, and postpartum smoking (29).

The Great Recession: Findings, 2007 to Present

According to the National Bureau for Economic Research, the Great Recession began in the United States in December 2007 and ended June 2009. Many economists consider the Great Recession to be the most severe worldwide economic downturn since the Great Depression of the 1930s. This recession has had a major impact on the real estate and financial markets, unemployment, and petroleum and food prices. Most scholarly peer-reviewed studies exploring its impact on fertility have investigated European fertility patterns (4, 31, 32) and are consistent with the findings discussed above with respect to the importance of employment and that there is a differential impact on the young.

Most of the evidence from the US has only been published or made available over the past 18 months and summarized below.

Since 2007, the US TFR has fallen to 1.89 in 2011, which is the lowest it has been since 1987 (33) and preliminary signs of a fertility decline associated with the Great Recession have appeared (13, 34). The past few years have seen not

only a drop in fertility rates, but also a drop in the number of US births, which has received considerable media coverage (35-38). Preliminary analyses show that states that were hardest hit by the Great Recession are also experiencing the largest declines in fertility (34, 39). Hispanic women, especially Mexican women, are experiencing the biggest fertility decline (39, 40) possibly because among the major racial/ethnic groups in the US, Hispanics experienced the largest drop in their employment rate, a marked rise in their unemployment rate, and the largest drop in median wealth (39). Researchers postulate that because the largest decrease in births is among young women, this current decline demonstrates that a compensatory rise in fertility will occur once the economic uncertainty has passed (34, 39). Recent findings from the Pew Research Center confirm this postulation (41).

This fertility decline is one of the factors contributing to a general decline in US population growth. Other important factors include the aging of the population and decreased immigration (40). There has been a recent decrease in immigration by 10 percent which is most likely due to the unavailability of jobs in the construction and manufacturing sectors. Additionally, those born during the US Baby Boom are approaching retirement age, which means that, along with decreased immigration rates, there is now a deficit in the number of young people of working age and a deficit in the number of births needed to replace

them (40). This dip in immigration is also important because immigrants are the primary drivers of US population growth; female immigrants are more likely to be of childbearing age (42, 43). Considering the fact that Hispanic women, both US- and foreign-born, comprise a greater share of US births, the finding that immigration has slowed may indicate an alternative explanation for the decline in US births.

There is a stark contrast in the number of births between US-born women and foreign-born women from 1990-2010 (43). Among US-born women, the number of births per year has declined overall 13 percent during this period, with a five percent decline in births taking place from 2007 to 2010. Conversely, the number of births per year among foreign-born women have increased almost every year from 1990 to hit a peak in 2007, when births declined 13 percent between 2007 and 2010 (43). Overall, the number of births per year *increased* 44 percent from 1990-2010 among foreign-born women, but the recent sharp decline in births among this group is due to increased numbers of immigrant women attending college and delaying marriage and the decreased number of young immigrants coming to the US (44).

Because foreign-born women are more likely to be married, US-born women account for the majority of births to unmarried women: among women aged 15-44, 36 percent of US-born mothers are married versus 56 percent of

foreign-born mothers (43). Among the US-born, the highest share of births to unmarried women occur among NHB women, while among the foreign-born, it is Hispanic women. Researchers have also found that the rise in unmarried births from 1990 is due to the increase in unmarried US-born women:

> The share of births to unmarried women has risen since 1990, when it was 28 percent overall. At that time, the non-marital share of births was similar for immigrant (27 percent) and US-born women (28 percent). Since then, however, the share of immigrant women of childbearing age who are unmarried has changed little (rising to 44 percent from 41 percent). The share of US-born women of childbearing age who are unmarried has risen markedly—by 14 percentage points—since 1990, when it was 50 percent (43).

In conclusion, the true impact of the Great Recession on American fertility and birth rates might be difficult to ascertain, as its effects closely align with the long-term sociocultural changes in childbearing in the US.

Conclusion: Why Is This Research Necessary?

This analysis is important because it blends ideas from different disciplines (economics, social science, and epidemiology) to investigate the impact of the Great Recession on American fertility and birth rates in the context of pregnancy

intention. As mentioned previously in the introduction, and specifically addressed in the Comments section of the tabulated literature summary below, research analyzing these effects is sparse. Most of the literature is fragmented and focuses on specific pieces: the association between economic conditions and fertility (and the additional impact made by short-term economic recessions), the association between pregnancy intention and various demographic factors and maternal behaviors, and the long-term trends in American fertility and concomitant social and cultural phenomena which have influenced it. This thesis seeks to synthesize these essential elements into one body of work, which investigates the impact of the Great Recession on American fertility in terms of pregnancy intention and birth wantedness.

Selected Literature Review Articles

Table 1. Hoem (2000)

Citation	**Hoem B (2000)**
Population/Sample	All women born in 1950 or later who resided in Sweden between 1985-1997
Study Type	Cross-sectional, using hazard regression analysis
Outcome(s)	First birth
Exposure(s)	1) Municipality employment levels (each year's data was compared to 1985 employment levels, <0.85=baseline) 2) Income earned from work for this time period, including sickness compensation
Control(s) for Confounding & Effect Modification	1) Country of birth and possible dates of immigration and emigration

	2) Municipality each woman lived in at the end of each relevant calendar year 3) Unemployment benefits/educational grants and loans from public sources 4) Woman's age at first birth
Analysis/Results	Hoem hypothesizes that because the Swedish benefits program is so generous, the impact of economic circumstances may be "limited," especially when coupled with the parental leave benefits available once the child is born. Therefore, unemployment may not be as significant a deterrent to entry into motherhood, but it can represent a serious disruption to young female students. Thus, Hoem found that the decrease in Swedish fertility between 1986 and 1997 was most significant among younger women, but becomes less prevalent in older women. Hoem also found that in her population, postponement of childbearing has not led to permanent childlessness; more Swedish women just chose to have their first child at older ages.
Comments	With her data, the author was unable to document pregnancy intention for the births occurring during the period of analysis. The author also does not include the impact of short-term economic fluctuations on Swedish fertility and only considers entry into motherhood.

Table 2. Goldstein and Orsal (2010)

Citation	**Goldstein and Orsal (2010)**
Population/Sample	Organisation for Economic Co-operation and Development data from 22 countries from 1978-2008
Study Type	Ecologic; completed 2 models to account for the outcome: Model 1 = effect of lagged total unemployment

	rate on fertility Model 2 = changes in unemployment rate are "interacted" with time
Outcome(s)	Total fertility rate
Exposure(s)	1) Overall unemployment rate 2) Female unemployment 3) Male unemployment 4) All are lagged by 1 year to account for the difference in timing between conception and birth
Control(s) for Confounding & Effect Modification	Family policy dummy variable (to account for effect of paid parental leave benefits)
Analysis/Results	Goldstein & Orsal's results show that economic factors affect fertility in a pro-cyclic manner.
Comments	The authors explored the impact short-term economic changes have on fertility, but they did not investigate individual-level decision-making. Therefore, they did not explore the role pregnancy intention plays in fertility timing in response to economic circumstances.

Table 3. Adsera (2011)

Citation	**Adsera A (2011)**
Population/Sample	1994-2000 phases of the European Community Household Panel Survey; which encompasses 47,352 women for the time period 1980-2001 for 13 European countries
Study Type	Ecologic Used Cox hazard proportional models for timing of births; used 2 different models to examine the same outcome: one focused on general economic conditions and the other focused on the individual's labor situation

Outcome(s)	Months to a birth from either the previous birth or from age 16 for first births
Exposure(s)	Economic Conditions Vector of 12-month lagged aggregate economic conditions in each country (female unemployment rates and long-term unemployment rates) Vector for country-fixed effects to account for within-country changes for fertility timing as a result of changing economic conditions Individual Labor Situation In addition to the above covariates, the author also includes employment status of each woman and what kind of job they hold
Control(s) for Confounding & Effect Modification	1) Woman's education (<upper secondary, upper secondary (omitted), tertiary) 2) Woman's birthplace 3) For models of second/third births, used age at first birth, time intervals between births, gender of previous children
Analysis/Results	Economic Conditions General pattern shows that predicted proportions of women having children (whether first, second, or third births) are still higher when female unemployment is low (5%), even when there are high rates of government employment (30%) Predicted proportions of women having children are also consistently lower when long-term unemployment is high (55%) Individual Labor Situation Proportions of women having second or third births are higher among women who are

	"inactive" vs. "unemployed" and are highest among women who work part-time in the public sector
Comments	Though Adsera describes how the general economic situation and female unemployment impacts different-order births, there is no discussion of where pregnancy intention fits in with these rates.

Table 4. Neels et al. (2013)

Citation	**Neels, Theunynck, Wood (2013)**
Population/Sample	2006 European Social Survey - 10,615 women and 10,121 men aged 15-49 from 14 European countries
Study Type	Cross-Sectional; the authors used exponentiated coefficients (hazard ratios) of random-effects complementary log-log model of first births
Outcome(s)	First birth
Exposure(s)	1) Duration since entry into the labor market 2) Overall unemployment rate
Control(s) for Confounding & Effect Modification	1) Duration since entry into first cohabitation 2) Age 3) Gender 4) Education level
Analysis/Results	The authors found a procyclic relationship between first births and the economic situation (when economic situation is good, first births are more likely to occur).
Comments	As with Hoem (2000), this study only considers first births and the overall impact of the country's economic situation on entry into parenthood. There is no discussion of the impact of short-term economic downturns on fertility.

Table 5. Davis (1982)

Citation	**Davis NJ (1982)**
Population/Sample	7 5-year birth cohorts (1891-1895 - 1921-1925) from 1960 Census 1/1000 Public Use Sample; excluded never-married women and women <35 and >69, includes just ever-married women (n=31,903) and ever-married mothers (n=26,446)
Study Type	Cross-sectional
Outcome(s)	1) Childlessness 2) Single-child fertility
Exposure(s)	Birth cohort
Control(s) for Confounding & Effect Modification	1) Race 2) Marital status (married once with spouse, marital disruption) 3) Education 4) Age at first marriage
Analysis/Results	Log-linear modified regession was analysis used to generate expected odds and odds-ratio metrics: according to the analysis, the age at which a woman first married has the strongest impact on whether a woman will be childless or single-childed; the 1906-1910 cohort has highest odds of both outcomes.
Comments	While this study looks at the propensity of childlessness and single-child fertility among women who reached their reproductive peak during the Great Depression, it does not explicitly address the Great Depression's impact on their fertility decision-making.

Table 6. Ananat and Hungerman (2012)

Citation	**Ananat and Hungerman (2012)**
Population/Sample	1970, 1980, 1990 Census data to examine lifelong fertility outcomes for women who

	were granted early access to the pill (on a state-by-state basis)
Study Type	Retrospective cohort; the authors used a difference-in-difference-style specification to measure the effect of fertility control access on short-term fertility
Outcome(s)	Birth rate of women in state *a*, in state *s*, in year *y*
Exposure(s)	Indicator variable for whether women had access to the pill during their presumed year of conception
Control(s) for Confounding & Effect Modification	1) Age 2) Set of state-specific time trends used to capture events that vary across states over time (incl. insured-unemployment rate, crime rate, % of population that's nonwhite, per capita personal income) 3) Set of interaction variables for state indicator variables with mother's age 4) Age- and region-specific moving average of outcome based on the years before and after the year in question
Analysis/Results	For the variable access to the pill: birthrate decreased: (-0.0339; logged=0.0169) For the variable access to the pill: number of children decreased: (-0.0203; logged=0.0130)
Comments	While the authors explore the impact of birth control access on short-term fertility, there is no discussion of how economic conditions affect fertility.

Table 7. Goldin and Katz (2000)

Citation	**Goldin & Katz (2000)**

Population/Sample	1) 1971 Survey of Young Women - nationally-based survey of 4,611 women aged 15-19 years in 1971 - used responses from never married women 2) 1% sample of 1980 census from Integrated Public Use Microdata Series (US natives born 1935-1957) 3) 1970, 1980, 1990 US census data
Study Type	Cross-sectional - several regression analyses were conducted
Outcome(s)	1) Ever taken the birth control pill 2) Individual is married before age 23 (age at first marriage for college women) 3) For 30-49 year olds who attended college (US natives born between 1921-1960), proportion of this age group experiencing a career/marital status outcome during the year(s) in question (those currently employed in professional position, legal profession, health-diagnosing profession, and those who were ever married and are currently divorced)
Exposure(s)	1) State law (1=nonrestrictive for minors) 2) Dummy variables to account for state laws regarding birth control & state of birth 3) Dummy variable to account for access to/use of birth control
Control(s) for Confounding & Effect Modification	1) Age, education, current school attendance, religion, race, census division 2) Year of birth, racial group, dummy variable for abortion access 3) Measure of access to/use of abortion, age,

	race, census year
Analysis/Results	1) The authors stratified results into 15-19 year olds, 17-19 year olds, and 17-19 year olds who attend college and then into an "all" group and "sexually active group" - as expected, pill use is greater among sexually active 17-19 year olds who attend college (coefficient=0.128). 2) The authors included coefficient estimates for various iterations of this model. 3) As with Model 2, there are several iterations of this model included in the article; but overall, results indicate that the growth in birth control usage accounts for an increase in the number of women working in professional occupations.
Comments	Though this article discusses how birth control impacted rates of higher education among women in the US, and indirectly addresses pregnancy intention, there is no discussion of the relationship between economic factors, pregnancy intention, and fertility.

Table 8. D'Angelo et al. (2004)

Citation	**D'Angelo, Gilbert, Rochat, Santelli, Herold (2004)**
Population/Sample	1998 PRAMS data from all 15 participating states (n=25,057)
Study Type	Cross-sectional
Outcome(s)	Pregnancy intention (unwanted, mistimed, intended) - primarily contrasting unwanted births to mistimed births
Exposure(s)	1) Smoking/drinking during third trimester 2) Received prenatal care 3)Whether they breastfed

	4) Physical abuse during pregnancy 5) Partner wanted pregnancy 6) Infant birth weight
Control(s) for Confounding & Effect Modification	1) Age 2) Marital status 3) Education 4) Race 5) Ethnicity 6) Parity 7) Medicaid coverage
Analysis/Results	"The distribution of intended, mistimed and unwanted pregnancies differed on nearly every variable examined; risky behaviors and adverse experiences were more common among women with mistimed than intended pregnancies and were most common among those whose pregnancies were unwanted. The likelihood of having an unwanted rather than mistimed pregnancy was elevated for women 35 or older (relative risk, 2.3) and was reduced for those younger than 25 (0.8); the pattern was reversed for the likelihood of mistimed rather than intended pregnancy (0.5 vs. 1.7–2.7). Parous women had an increased risk of an unwanted pregnancy (2.1–4.0) but a decreased risk of a mistimed one (0.9). Increased risk of an unintended pregnancy was associated with women who smoked in the third trimester, received delayed or no prenatal care, did not breastfeed, were physically abused during

	pregnancy, said their partner had not wanted a pregnancy or had a low birth weight infant; the size of the increase depended on whether the pregnancy was unwanted or mistimed."
Comments	1) The authors cited the biases associated with using PRAMS data: that it represents a subset of the population and recall bias can be an issue as mothers complete the questionnaire 2-6 months after giving birth. 2) It is difficult to measure pregnancy intention (these three categories (intended, mistimed, unwanted) may work on a population level, but does it accurately capture all of the factors influencing individual decision-making concerning fertility?). 3) The authors chose not to do a multivariate analysis controlling for socioeconomic status because the primary populations they're interested in (unwanted and mistimed births) tend to have similar socioeconomic backgrounds.

Table 9. Maxson and Miranda (2011)

Citation	**Maxson and Miranda (2011)**
Population/Sample	n=1,321 pregnant women >18 years of age in Durham, North Carolina - restricted analysis to NHW and NHB women because of negligible numbers of Asian and Hispanic women
Study Type	Prospective cohort Authors conducted two models with the same outcome and two different exposures
Outcome(s)	Pregnancy intention (unwanted, mistimed, intended)
Exposure(s)	1) Demographic variables (race, age, education, marital status, yearly household income, parity)

	2) Psychosocial variables (depression, self-efficacy, perceived stress, social support, positive paternal support, negative paternal support)
Control(s) for Confounding & Effect Modification	N/A
Analysis/Results	"Sixty-two percent of the women indicated an unintended pregnancy, with 44% (578) mistimed and 18% (245) unwanted. Only 38% of the pregnancies were characterized as wanted. Women with unwanted and with mistimed pregnancies were similar demographically, but they differed significantly on psychosocial profiles and maternal characteristics. Women with mistimed and with wanted pregnancies differed in demographics and psychosocial profiles. Wanted pregnancies had the healthiest, mistimed an intermediate, and unwanted the poorest psychosocial profile. Women with unwanted pregnancies had the highest depression, perceived stress, and negative paternal support scores ($p < 0.05$) and the lowest self-efficacy, social support, and positive paternal support scores ($p < 0.05$). In multivariate analyses, women with riskier psychosocial profiles had higher odds of being in the unwanted category. Controlling for psychosocial and demographic variables, perceived stress and positive paternal support remained significant predictors of belonging to the unwanted and mistimed groups."
Comments	1) The authors identified issues with self-reported pregnancy intention--women may be less likely to want to admit to not wanting or not intending to get pregnant. 2) Because they recruited subjects from a

	prenatal clinic, the authors also knew the participants wanted to carry the baby to term, so this analysis doesn't account for those women who might seek induced abortions. 3) The study group did not include teen pregnancies; a significant number of which are unintended. 4) The authors did not acknowledge the economic factors, other than household yearly income, which might also influence pregnancy intention.

Table 10. Cheng et al. (2009)

Citation	**Cheng, Schwarz, Douglas, Horon (2009)**
Population/Sample	2001-2006 Maryland PRAMS data (n=9,048) linked to birth certificate data
Study Type	Cross-sectional
Outcome(s)	Maternal behaviors before, during, and after pregnancy: 1) Using a multivitamin with folic acid during 3 months before pregnancy 2) Smoking during the last 3 months of pregnancy 3) Smoking postpartum 4) Drinking during the last 3 months of pregnancy 5) Time of initiation of prenatal care 6) Breastfeeding initiation 7) Breastfeeding for 8+ weeks 8) Infant sleep position

	9) Postpartum contraception use
Exposure(s)	Unintended pregnancy (includes both unwanted and mistimed births)
Control(s) for Confounding & Effect Modification	Socio-demographic factors: 1) Maternal age 2) Maternal race/ethnicity 3) Medicaid status 4) Parity 5) Marital status 6) Educational level
Analysis/Results	"Compared to women with intended pregnancies, mothers with unwanted pregnancies were more likely to consume less than the recommended amount of preconception folic acid (adjusted odds ratio (OR) 2.39, 95% confidence interval (CI) 1.7–3.2), smoke prenatally (OR 2.03, 95% CI 1.5–2.9), smoke postpartum (OR 1.86, 95% CI 1.35–2.55) and report postpartum depression (OR 1.98, 95% CI 1.48–2.64); they were less likely to initiate prenatal care during the first trimester (OR 0.34, 95% CI 0.3–0.5) and breastfeed for 8 or more weeks (OR 0.74, 95% CI 0.57–0.97). Compared to women with intended pregnancies, women with mistimed pregnancies were also more likely to consume inadequate folic acid, delay prenatal care and report postpartum depression."
Comments	As with Mohllajee and colleagues (2007) (Table 11), this study doesn't explore the economic conditions which might markedly influence pregnancy intention.

Table 11. Mohllajee et al. (2007)

Citation	**Mohllajee, Curtis, Morrow, Marchbanks (2007)**
Population/Sample	1996-1999 PRAMS data for 18 states (n=87,087) linked to birth certificate data
Study Type	Cross-sectional
Outcome(s)	Negative birth outcomes such as low birth weight, preterm birth, small for gestational age, premature labor, hypertension
Exposure(s)	Pregnancy intention (intended, unwanted, mistimed, ambivalent)
Control(s) for Confounding & Effect Modification	1) Maternal age 2) Maternal race 3) Maternal ethnicity 4) Education 5) Marital status 6) Parity 7) Prenatal care 8) Previous low birth weight infant or premature delivery 9) Smoking during pregnancy 10) Drinking during pregnancy
Analysis/Results	"In analyses controlling for demographic and behavioral factors, women with unwanted pregnancies had an increased likelihood of preterm delivery (adjusted odds ratio = 1.16, 95% confidence interval = 1.01–1.33) and premature rupture of membranes (adjusted OR 1.37, 95% CI 1.01–1.85) compared with women

	with intended pregnancies. Women who were ambivalent toward their pregnancies had increased odds of delivering a low birth weight infant (adjusted OR 1.15, 95% CI 1.02–1.29); in contrast, women with mistimed pregnancies had a lower likelihood (adjusted OR 0.92, 95% CI 0.86–0.97)."
Comments	1) Retrospective assessment of pregnancy intention at the time of contraception is problematic because women tend to underreport unintended pregnancy. 2) Misclassification of "ambivalence" ("I don't know") - women interviewed by phone were less likely to choose this option than women responding via mail. 3) The authors explain that generally, PRAMS underestimates maternal morbidity and there is an issue with PRAMS data not completely agreeing with birth certificate records. 4) This study does not take into account the economic circumstances which might also impact pregnancy intention such as income level or federal poverty level status.

MATERIALS & METHODS

This thesis was submitted for review to the Emory University Institutional Review Board (IRB). It was determined that no IRB review was necessary for this project, as it entailed an analysis using publicly available, de-identified data.

Pregnancy Risk Assessment Monitoring System

To carry out this analysis, the author used data from PRAMS, which is an ongoing population- based surveillance system that has been active since 1987. In collaboration with state health departments, the CDC administers this monitoring system which examines health behaviors and conditions for women who have had recent live births in the United States to produce a stratified random sample. Currently, 40 states participate in PRAMS as well as New York City. As discussed in the literature review, this thesis will focus on carrying out analyses to investigate the impact of the Great Recession on US live births in the context of pregnancy intention, which PRAMS provides. All PRAMS respondents were asked "Thinking back to *just before* you got pregnant with your *new* baby, how did you feel about becoming pregnant?" Answer options included:

- I wanted to be pregnant sooner.
- I wanted to be pregnant later.
- I wanted to be pregnant then.

- I didn't want to be pregnant then or at any time in the future.

For this thesis, intended births refer to the total number of births reported as being wanted "then" or "sooner." Mistimed births refer to the total number of births reported as being wanted "later" and unwanted births were counted as those where the respondent reported not wanting the pregnancy then or at any time in the future.

To examine the context of birth rates and fertility during this period, only PRAMS data from 2000-2010 (Phases 4-6) was eligible for inclusion in the analysis. As a result, 12 states' data are utilized in the final analysis: Arkansas, Colorado, Hawaii, Illinois, Maine, Maryland, Michigan, Nebraska, Oklahoma, Utah, Washington, and West Virginia. Initially, this analysis also included data from Alaska as well as the other 12 states mentioned above. However because the author is only focusing on NHW women, NHB women, and women of Hispanic origin, it was necessary to omit Alaska Native and American Indian women. This, in turn, eliminated a considerable proportion of Alaska's live births[**], therefore Alaska was omitted from the final analysis.

[**] According to vital statistics data for 2007-2011, Alaska Native and American Indian births accounted for 25.4 percent of all births in Alaska for that period.

Because of PRAMS's sampling methodology[††], all analyses with PRAMS data in this thesis were performed using SAS-callable SUDAAN 11.0 (Research Triangle Park, NC) procedures as well as survey sample SAS procedures (e.g., PROC SURVEYFREQ, PROC SURVEYMEANS) in SAS 9.3 (Cary, NC).

To simplify the analysis, the 12 states were collapsed into categories based on the percentage of live births that were intended and how these percentages compared with the average percentage for all states, 58 percent. In all, there were three categories:

- High intention states: where the percentage of intended live births exceeded 58 percent and includes Colorado, Maine, Nebraska, Utah, and Washington (percentages ranged from 67.1 percent in Utah to 59.5 percent in Nebraska)
- Medium intention states: where the percentage of intended live births was approximately 58 percent and includes Maryland, Michigan, and West Virginia (percentages ranged from 57.3 percent in West Virginia to 57.7 percent in Michigan)
- Low intention states: where the percentage of intended live births was less than 58 percent and includes Arkansas, Hawaii, Illinois, and Oklahoma

[††] Detailed information concerning PRAMS's methodology has been discussed in numerous peer-reviewed publications and is available on the PRAMS website (http://www.cdc.gov/prams/methodology.htm).

(percentages ranged from 49.1 percent in Arkansas to 56.9 percent in Illinois)

The weighted counts for intended and unintended (the sum of mistimed and unwanted births) births were derived using the unweighted counts of births from the PRAMS sample and the weighted proportion of intended and unintended births. The weighted counts for intended births were compared to the weighted counts for unintended births for each group of states using a Chi-squared test (see Appendix I) to determine if each group overall had similar intendedness proportions. Though the High and Low Intention groups of states showed significant p-values ($p < 0.05$) for these tests, this statistical significance does not translate into a meaningful difference among the states within each group. Some misclassification due to this categorization may influence the results, but the number of births which would have to be shifted between the intended and unintended groups to give each state comparable counts was found to be negligible; for the High Intention group, this accounts for 2.99 percent of the total births in the group and for the Low Intention group, this accounts for 2.73 percent of the total births in the group.

As mentioned above, this analysis focuses on NHW, NHB, and Hispanic women. To derive the three main racial groups investigated in this analysis, Hispanic ethnicity as reported on the birth certificate and maternal race as

reported on the PRAMS questionnaire were used. If the respondent reported being Hispanic on the birth certificate, she was counted as Hispanic in this analysis, no matter what race she reported on the PRAMS questionnaire. However, if the respondent reported being non-Hispanic on the birth certificate, then her PRAMS-reported race was used.

To further simplify the analysis, the author derived six age groups for the respondents based on the scheme utilized by the CDC's National Center for Health Statistics (NCHS) (15-19 year olds, 20-24 year olds, 25-29 year olds, 30-34 year olds, 35-39 year olds, and 40-44 year olds) and used categorical age in the models instead of continuous maternal age.

Prior to modeling, the PRAMS sample's age and race distributions were compared with vital statistics data extracted from NCHS using the VitalStats tool. The proportions of age and race were deemed to be similar enough that extrapolations for the general population of the 12 states could be made based on the PRAMS sample. This comparison of distributions is displayed in Appendix I.

The initial dataset consisted of 219,837 respondents for the years 2000 through 2010. However, because Maryland and Michigan data were missing for the year 2000 and Illinois data was missing for 2010, the time period for this analysis is 2001-2009. Eliminating the years 2000 and 2010 from the analysis reduced the dataset to 184,248 respondents. Additionally, because the analysis only focused

on NHW, NHB, and Hispanic respondents, the dataset was further reduced to 156,435 women.

General Fertility Rates

In order to calculate GFRs for the 2000-2010 period, several data sources were used. The author extracted the number of births for NHW, NHB, and Hispanic women from the CDC WONDER database (available at wonder.cdc.gov). Counts for NHW, NHB, and Hispanic women aged 15-44 years were extracted from the Surveillance, Epidemiology, and End Results (SEER) Program. Because the CDC WONDER and SEER data categorize Hispanic status separately from race, Hispanic counts were derived from the number of births and women in each state who reported Hispanic ethnicity regardless of race (e.g., the total number of white Hispanic, black Hispanic, American Indian or Alaska Native Hispanic, and Asian or Pacific Islander Hispanic births and women).

As discussed above in the literature review, the GFR describes the number of live births per 1,000 females aged 15 through 44. This measure focuses only on potential mothers and is calculated as:

$$GFR = \frac{Number\ of\ total\ live\ births}{Number\ of\ women\ aged\ 15-44} \times 1{,}000$$

The author calculated yearly GFRs for each state in the analysis as well as yearly GFRs for each state pregnancy intention category, race, and age group. See

Appendix III for these rates. Pregnancy intention GFRs were calculated by multiplying the yearly GFR for all states by the percentage of intended, mistimed, and unwanted births. A similar procedure was performed to determine pregnancy intention-specific GFRs for each state category; the yearly GFR for each group of states was multiplied by the percentage of intended, mistimed, and unwanted births in each state group.

All analyses using SEER and CDC WONDER data were performed using descriptive procedures (e.g., PROC FREQ) in SAS 9.3.

Modeling

Variable Consideration & Model Development

Two outcomes were explored in this analysis; birth wantedness and birth intention. For the wantedness models, the outcome is the proportion of wanted births (births that were intended as well as mistimed). For the intention models, the outcome is the proportion of intended births. The main exposure was whether the birth occurred during 2008 or 2009 (hereafter referred to as RECNBIRTH). Unexposed respondents were those who gave birth between 2001 and 2007, prior to the onset of the Great Recession.

Important covariates under consideration for the general models included maternal race, the year the birth took place, categorical maternal age, marital status, maternal education, insurance status (privately insured / Medicaid / other

insurance vs. uninsured), and state intention category. Maternal income and federal poverty level status were also considered for inclusion in the models, but this information was only available for Phases 5 and 6 (2004-2010). Maternal WIC status is used as a proxy for low-income status. Crude, informal models revealed that maternal race was an important effect modifier for wantedness; therefore the author chose to run an additional six race-specific models for birth wantedness and intention. Results of these crude analyses are included in Appendix II.

A total of eight logistic models were run in this analysis:

- General, wantedness model
- General, intention model
- Wantedness among NHW women
- Wantedness among NHB women
- Wantedness among Hispanic women
- Intention among NHW women
- Intention among NHB women
- Intention among Hispanic women

Interaction Assessment & Multicollinearity

Initially, the models adjusted for the year the respondent gave birth, but because it is so highly correlated with RECNBIRTH (correlation coefficient = -0.7194, $p < 0.0001$), it was no longer included as a covariate to avoid multicollinearity.

Interaction with the exposure was assessed using backwards elimination with p-values. For the general, wantedness model there was significant interaction between RECNBIRTH and maternal age; there was no interaction present for the general intention model. For the race-specific models, there was significant interaction present only for NHW women: for the NHW intention model, marital status was an effect modifier and for the NHW wantedness model, maternal age was also an effect modifier.

Confounding Assessment

For the general models, removing eligible confounders (e.g., those not present in interaction terms) did not affect the point estimate for the adjusted odds ratio (aOR). However, in order to maintain comparability with similar models in epidemiologic literature (such as those discussed in the literature review), all eligible covariates were retained because they did not obscure the association between the exposure and wantedness or intention.

Final Models

The final, adjusted models used for this thesis are presented below with EVW notation:

- General wantedness model:

  $P(\text{wanted}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg}) + \gamma 8(\text{mrace}) + \delta 9(\text{recnbirth x gr\_age})$

- General intention model:

  $P(\text{intended}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg}) + \gamma 8(\text{mrace})$

- Wantedness among NHW women:

  $P(\text{wanted}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg}) + \delta 8(\text{recnbirth x gr\_age})$

- Wantedness among NHB women:

  $P(\text{wanted}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg})$

- Wantedness among Hispanic women:

  $P(\text{wanted}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg})$

- Intention among NHW women:

  $P(\text{intended}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg}) + \delta 8(\text{recnbirth x married})$

- Intention among NHB women:

  $P(\text{intended}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg})$

- Intention among Hispanic women:

  $P(\text{intended}) = \beta 0 + \beta 1(\text{recnbirth}) + \gamma 2(\text{gr\_age}) + \gamma 3(\text{married}) + \gamma 4(\text{mat\_ed}) + \gamma 5(\text{gr\_int\_state}) + \gamma 6(\text{insured}) + \gamma 7(\text{wic\_preg})$

All modeling was performed using SAS-callable SUDAAN 11.0 in SAS 9.3.

RESULTS

Demographic Characteristics

Detailed demographic characteristics for the PRAMS sample are displayed below in Table 12 and includes statistics for NHW, NHB, Hispanic, and "other" respondents. Of the 184,248 total respondents in the sample, 21.6 percent gave birth during 2008-2009. Generally, most respondents were between the ages of 25 and 34, 58.82 percent were NHW, 11.93 percent were NHB, and 14.14 percent were Hispanic. Additionally, 56 percent of respondents were insured privately or had another form of insurance, 14.48 percent were Medicaid beneficiaries, and 29 percent were uninsured. Almost 90 percent of respondents reported their pregnancy and birth as wanted and 57.34 reported their pregnancy and birth as intended. Thirty percent of respondents resided in a Low Intention state, 19 percent resided in a Medium Intention state, and 34 percent resided in a High Intention state. Forty-six percent of respondents were on WIC during their pregnancy and almost 65 percent were married. In terms of educational level, most respondents had at least a high school education (31.84 percent had 12 years of education, 23 percent had 13-15 years, and 26.64 had at least 16 years).

There were no meaningful differences in demographic characteristics between those respondents who had given birth 2001-2007 and those who gave birth 2008-2009.

Table 12. Demographic Characteristics of a Cohort of U.S. Live Births by Birth Status Based on CDC PRAMS Data, 2001-2009[a]

Demographic Characteristic	Total Births (n=184,248)		Births (2001-2007)[b] (n=144,519)		Births (2008-2009) (n=39,729)	
	No.	%	No.	%	No.	%
Maternal age, years						
15-19	17,453	9.60	14,160	9.94	3,293	8.39
20-24	45,634	25.11	36,204	25.41	9,430	24.03
25-29	49,075	27.01	38,064	26.71	11,011	28.06
30-34	39,438	21.70	30,714	21.56	8,724	22.23
35-39	24,129	13.28	18,754	13.16	5,375	13.70
40-44	5,996	3.30	4,592	3.22	1,404	3.58
Missing	2,523	1.37	2,031	1.41	492	1.24
	181,725		142,488		39,237	
Maternal race/ethnicity						
White, non-Hispanic	108,260	58.82	85,601	59.29	22,659	57.09
African American, non-Hispanic	21,963	11.93	16,853	11.67	5,110	12.87
Hispanic	26,027	14.14	20,004	13.86	6,023	15.17
Other	27,813	15.11	21,913	15.18	5,900	14.86
Missing	185	0.10	148	0.10	37	0.09
	184,063		144,371		39,692	
Maternal Insurance Status before Pregnancy (1 Month)						
Private/other insurance	103,451	56.41	81,332	56.57	22,119	55.84
Medicaid	26,554	14.48	19,909	13.85	6,645	16.78
Uninsured	53,383	29.11	42,538	29.59	10,845	27.38
Missing	860	0.47	740	0.51	120	0.30
	183,388	83.8	143,779		39,609	

Pregnancy Wanted?						
Wanted	162,690	89.62	127,745	89.66	34,945	89.46
Missing	2,714	1.47	2,046	1.42	668	1.68
	181,534		142,473		39,061	
Pregnancy intention						
Intended	104,097	57.34	81,737	57.37	22,360	57.24
Missing	2,714	1.47	2,046	1.42	668	1.68
	181,534		142,473		39,061	
Did birth take place during or after the Recession?						
Yes	39,729	21.56	-	-	-	-
	184,248					
State Intention Group						
High Intention	75,641	34.41	59,405	41.11	16,236	40.87
Medium Intention	41,149	18.72	31,236	21.61	9,913	24.95
Low Intention	67,458	30.69	53,878	37.28	13,580	34.18
	184,248		144,519		39,729	
Marital Status						
Married	119,147	64.71	94,509	65.43	24,638	62.06
Missing	115	0.06	85	0.06	30	0.08
	184,133		144,434		39,699	
Was mother on WIC during pregnancy?						
Yes	83,959	46.02	65,210	45.55	18,749	47.70
Missing	1,790	0.97	1,365	0.94	425	1.07
	182,458		143,154		39,304	
Maternal education,years						
0-8 years	7,796	4.28	6,266	4.39	1,530	3.89
9-11 years	25,954	14.25	20,543	14.39	5,411	13.75
12 years	57,992	31.84	46,516	32.57	11,476	29.17

13-15 years	41,877	22.99	32,047	22.44	9,830	24.98
≥16 years	48,528	26.64	37,427	26.21	11,101	28.21
Missing	2,101	1.14	1,720	1.19	381	0.96
	182,147		142,799		39,348	

[a]Only unweighted counts are reported

[b]The 2001-2009 time period is used because 3 states are missing for the entire 2000-2010 period (Maryland and Michigan are missing for 2000 and Illinois is missing for 2010).

General Models

Detailed model results for the general wantedness and intention models are displayed in Appendix II. For the general intention model, given that respondents had already experienced the birth, the odds of that birth having been intended were the same for births during 2001-2007 and 2008-2009 (aOR = 1.00, 95 percent confidence interval (CI): 0.96 – 1.10, p = 0.8632). Because maternal age was an effect modifier for RECNBIRTH in the general wantedness model, six adjusted ORs are reported for each age interval. The only significant result is for 15-19 year olds; among teens, given that they had already experienced the birth, the odds of the birth having been wanted in 2008-2009 were 38 percent higher than the odds of the birth being wanted during 2001-2007 (aOR = 1.38, 95 percent CI: 1.10 – 1.70, p = 0.0059). For every other age group, the odds of the birth having been wanted, given the respondents had already experienced the birth, were the same for both time periods.

Race-Specific Models

Detailed model results for the race-specific wantedness and intention models are displayed in Appendix II. There were no significant effects noted for either the Hispanic intention and wantedness models or the NHB models. The only significant result obtained was for the NHW intention model, where among

married women, given that they had already experienced the birth, the odds of the birth being intended were 15 percent higher during the 2008-2009 period than during the 2001-2007 period.

DISCUSSION

The author's original hypothesis, as discussed in the background section of this thesis, was that those women with higher rates of intended pregnancies and births (e.g., NHW, well-educated, married, middle- or high-income) would be more likely to reduce childbearing during the recession. The preliminary evidence from this analysis indicates that those women were actually more likely to keep having children during the recession. In all, the results from the statistical models are not surprising; it is possible that with greater distance from the recession, the effect will be better illustrated.

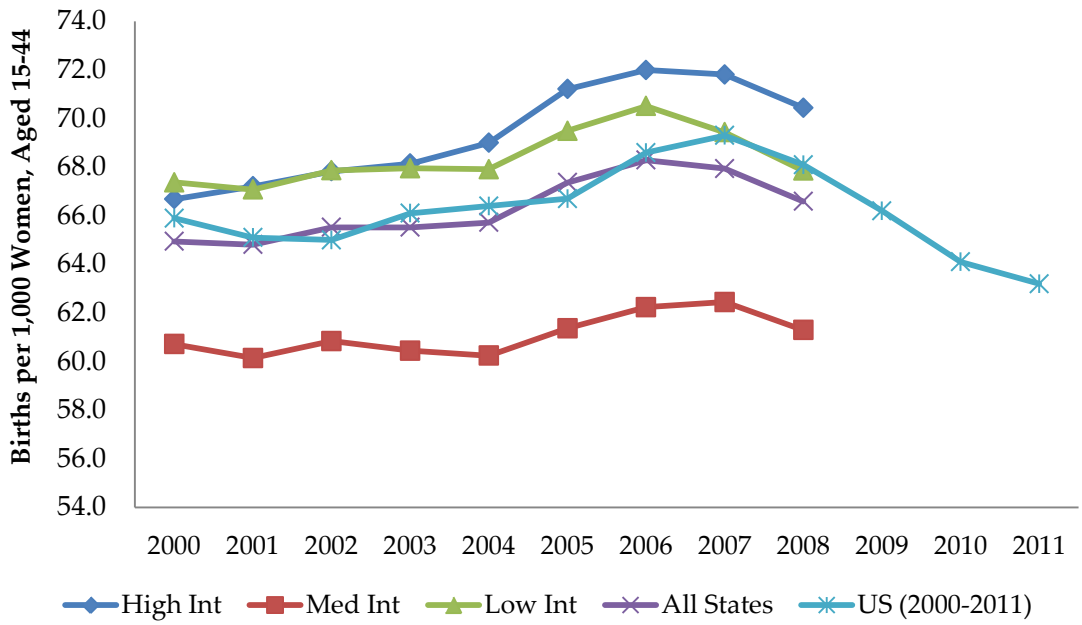
A significant detail which needs to be considered when interpreting the above results is that the analysis in this thesis spans only nine years: 2001-2009. It is entirely possible that the effect that the author was hoping to observe is present, it just cannot be ascertained with such an abbreviated time range. Therefore, the author also created a number of linear plots of GFRs utilizing vital statistics and SEER data to get a sense of what is occurring in these 12 states at the aggregate level. While I present some findings from selected plots here, the full series can be found in Appendix III.

Generally, these plots show that there are changes occurring in aggregate fertility over the 2000-2010 time period, but these changes are not yet (or may never be) evident in statistical analysis, as this thesis demonstrates. One series of

plots displays the percentage of live births which are intended, mistimed, and unwanted for all states and each state intention category with an overlay of the GFR during that period (Figures 1-4). In order to contextualized these figures, the author has also included a general plot showing GFRs from 2001-2009 for each state intention group and for all 12 states combined as well as the GFR for the US for 2000-2011. All of these plots illustrate a dip in live births around 2008, especially in comparison with 2007, which is the peak GFR for the 2000-2010 time period. When the GFRs are stratified by state category, this dip in fertility around 2008 is still present; it is just dependent on the states' baseline fertility over the entire decade. This is consistent with the findings published by Pew and the Population Reference Bureau discussed in the literature review.

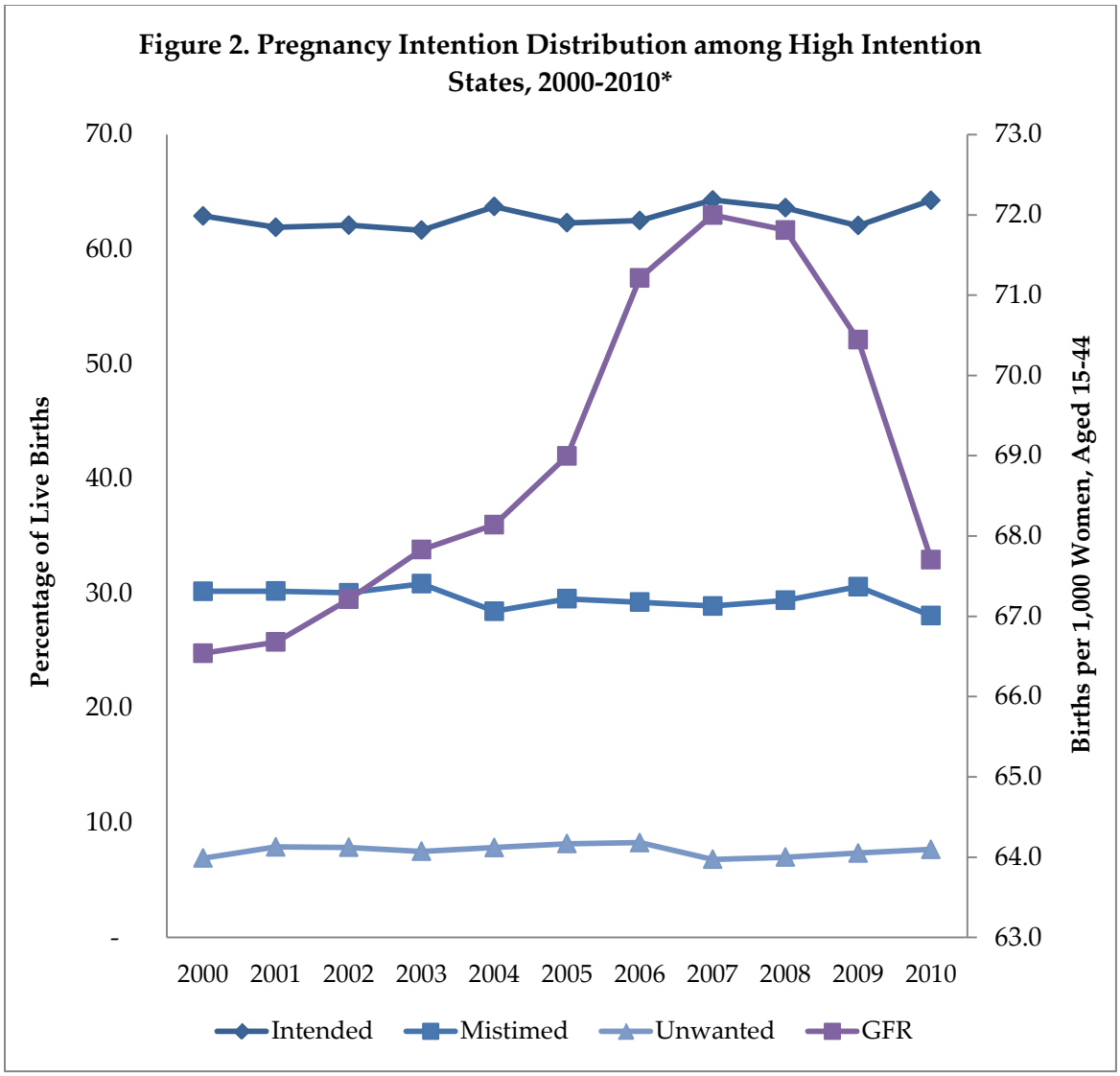
Figure 1 on next page.

Figure 1. GFRs for All Races, All Ages by State Intention Group, 2001-2009*



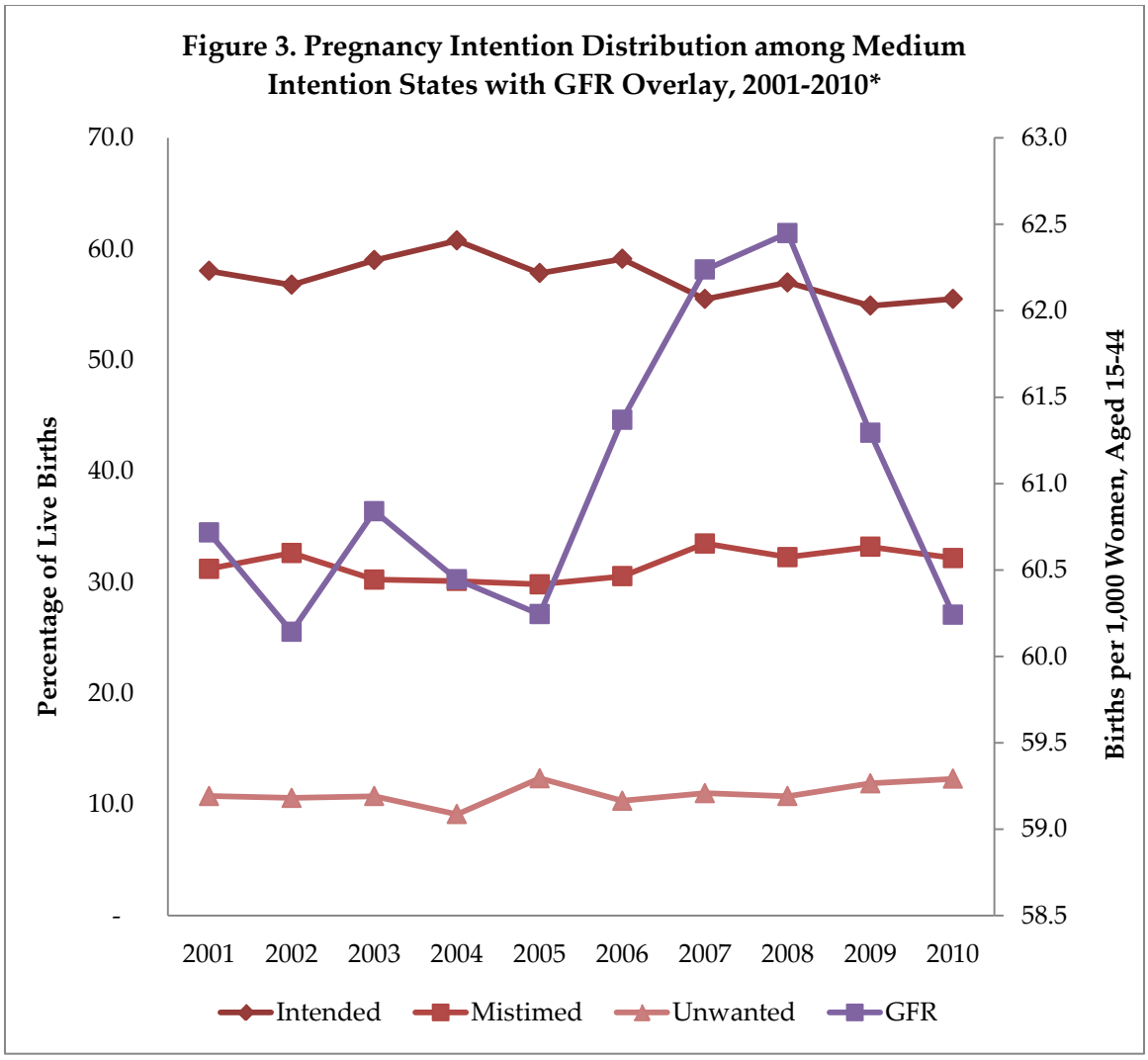
*Though only GFRs for 2001-2009 are shown for the state intention categories and the combined states, the author chose to display US data for 2000-2011 to contextualize the states' data.

Figure 2 on next page.



*High intention states include Colorado, Maine, Nebraska, Utah, and Washington. Pregnancy intention information was available for all five states for the 2000-2010 period.

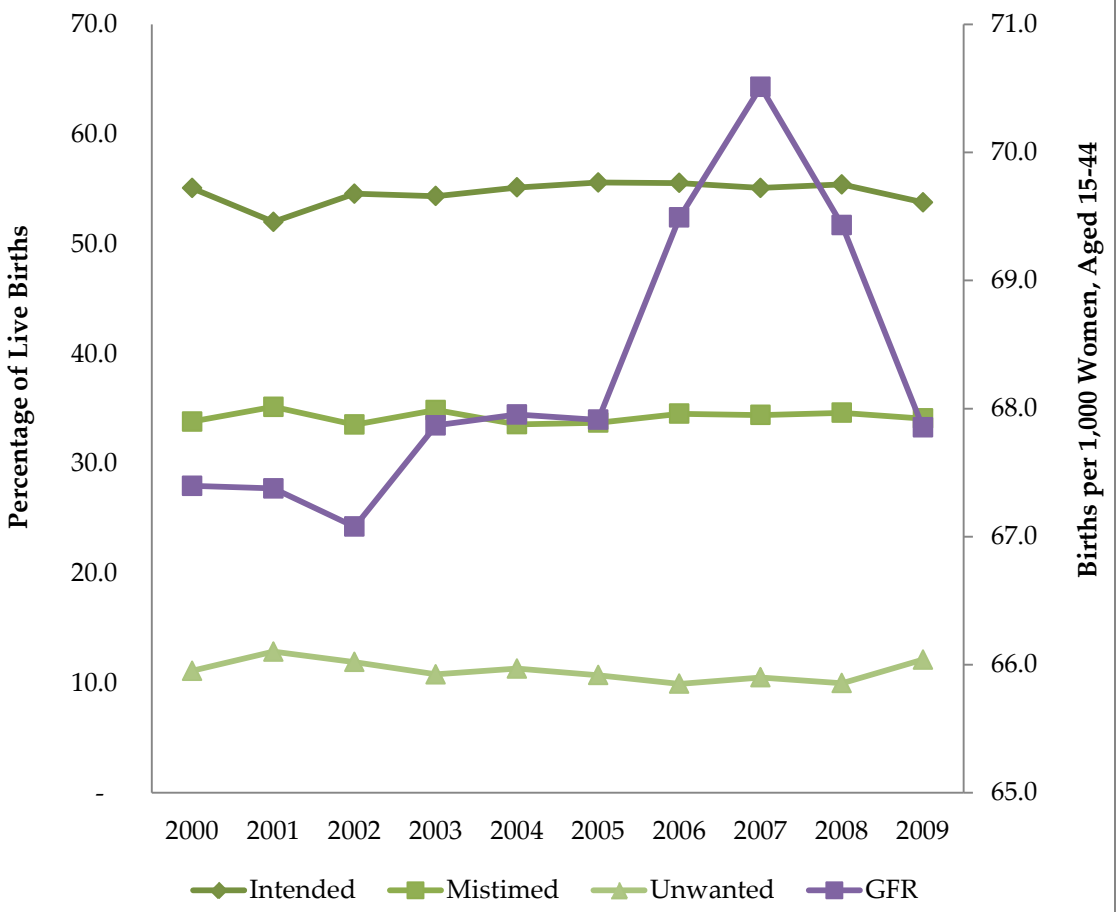
Figure 3 on next page.



*Medium intention states include Maryland, Michigan, and West Virginia. Pregnancy intention information was only available for all three states for the 2001-2010 period.

Figure 4 on next page.

Figure 4. Pregnancy Intention Distribution among Low Intention States with GFR Overlay, 2000-2009*



*Low intention states include Arkansas, Hawaii, Illinois, and Oklahoma. Pregnancy intention information was only available for all four states for the 2000-2009 period.

The race-specific plots for the 2000-2010 time period (Figures 5 and 6) also reflect the preliminary findings of Pew and the Population Reference Bureau. For all states as well as for each state intention group, these plots show that Hispanic women have experienced significantly higher fertility than their NHW and NHB counterparts over the decade; therefore, their dip in fertility since 2008 is the most evident in the plot.

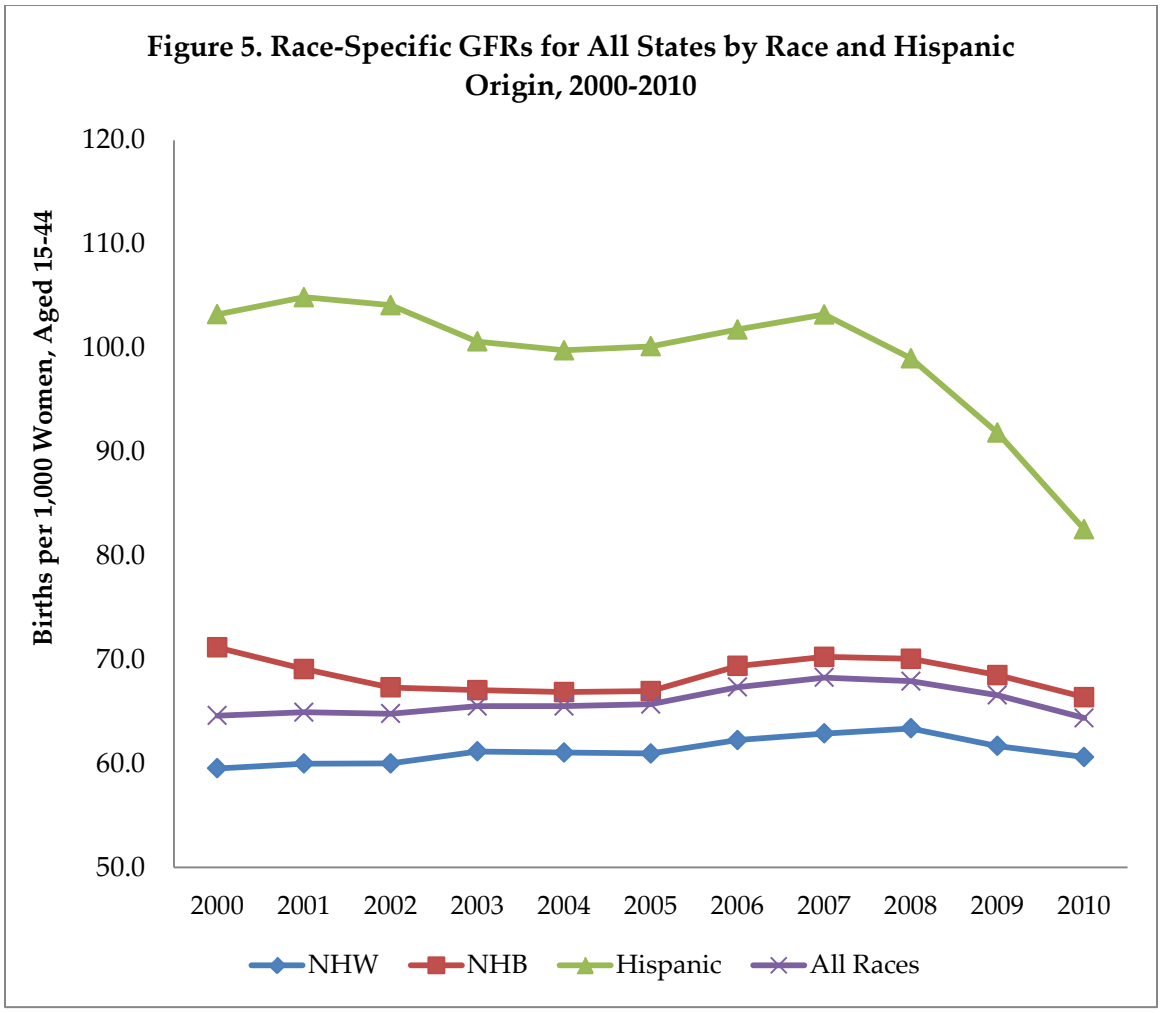
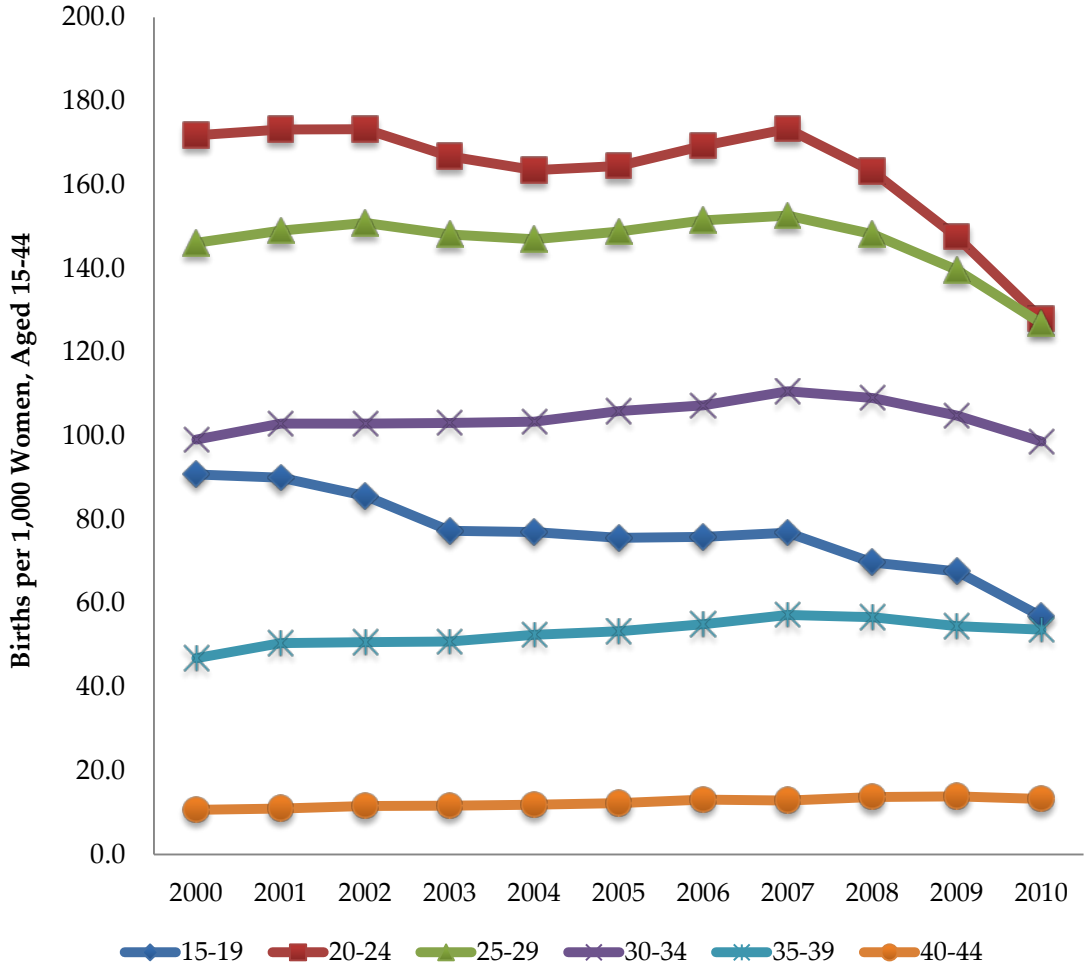


Figure 6 on next page.

Figure 6. GFRs among Hispanic Women for All States by Age Group, 2001-2009



Though their decline in births since 2007 is substantial, it may not have been detected in the PRAMS data because there were not enough of them in the sample to be able to reveal this impact. For Hispanic women in particular, it appears that the largest proportion of the decline may be from 20-29 year olds, and to a lesser extent, from the decline in births among 15-19 year olds.

The author also utilized PRAMS data on pregnancy intention to create pregnancy intention-specific GFRs (Figures 7-9), the plots of which are displayed

on the following pages; the entire series of plots are also included in Appendix III. These plots revealed an interesting finding which could support the author's hypothesis: among Low Intention states, starting in 2008, the decline in intended GFR and increase in unwanted GFR is apparent; however, it was not seen in the above statistical analysis. Additionally, Low Intention states contribute the most to mistimed and unwanted births during this period. An interesting implication of these pregnancy intention GFR plots is the influence access to contraception can have on these findings and how these factors interact. These plots illustrate, albeit preliminarily, that when there is less access to contraceptive and family planning services, there is an increase in mistimed and unwanted live births.

January 2014 data from the Population Institute shows that two out of the four Low Intention states, Arkansas and Oklahoma, have failed to provide adequate reproductive health coverage and services.[‡‡] The Institute investigated each state's performance in four categories: effectiveness, prevention, affordability, and access. Arkansas has restrictive legislation governing the procurement of induced abortions (which has been researched and discussed extensively by organizations such as the Guttmacher Institute); does not mandate sex education in public schools; has a high teen pregnancy rate (82 pregnancies

[‡‡] The Population Institute's report investigates all 50 states' status and is available online at http://www.populationinstitute.org/external/report-card/2013/All_50_States.pdf.

per 1,000 women) (45); and has a high unintended pregnancy rate (which this analysis has shown). Oklahoma has similar restrictive legislation concerning induced abortion; has a similarly high teenage pregnancy rate (80 pregnancies per 1,000 women); but diverges from Arkansas with regard to the affordability measures. While the other three Low Intention states (Arkansas, Hawaii, and Illinois) are expanding Medicaid under the Affordable Care Act (ACA), Oklahoma is opting not to. Instead it is offering Medicaid expansions for family planning services to cover individuals up to 250 percent of the federal poverty level, women under age 19, men, and women who lost their Medicaid coverage because they are over six weeks postpartum (45). Because the ACA represents significant change in health coverage and health service delivery in all of the states in this analysis, not just the Low Intention group, it will undoubtedly have an impact on pregnancy intention over the coming years and bears consideration when interpreting the results of this thesis.

Figure 7 on next page.

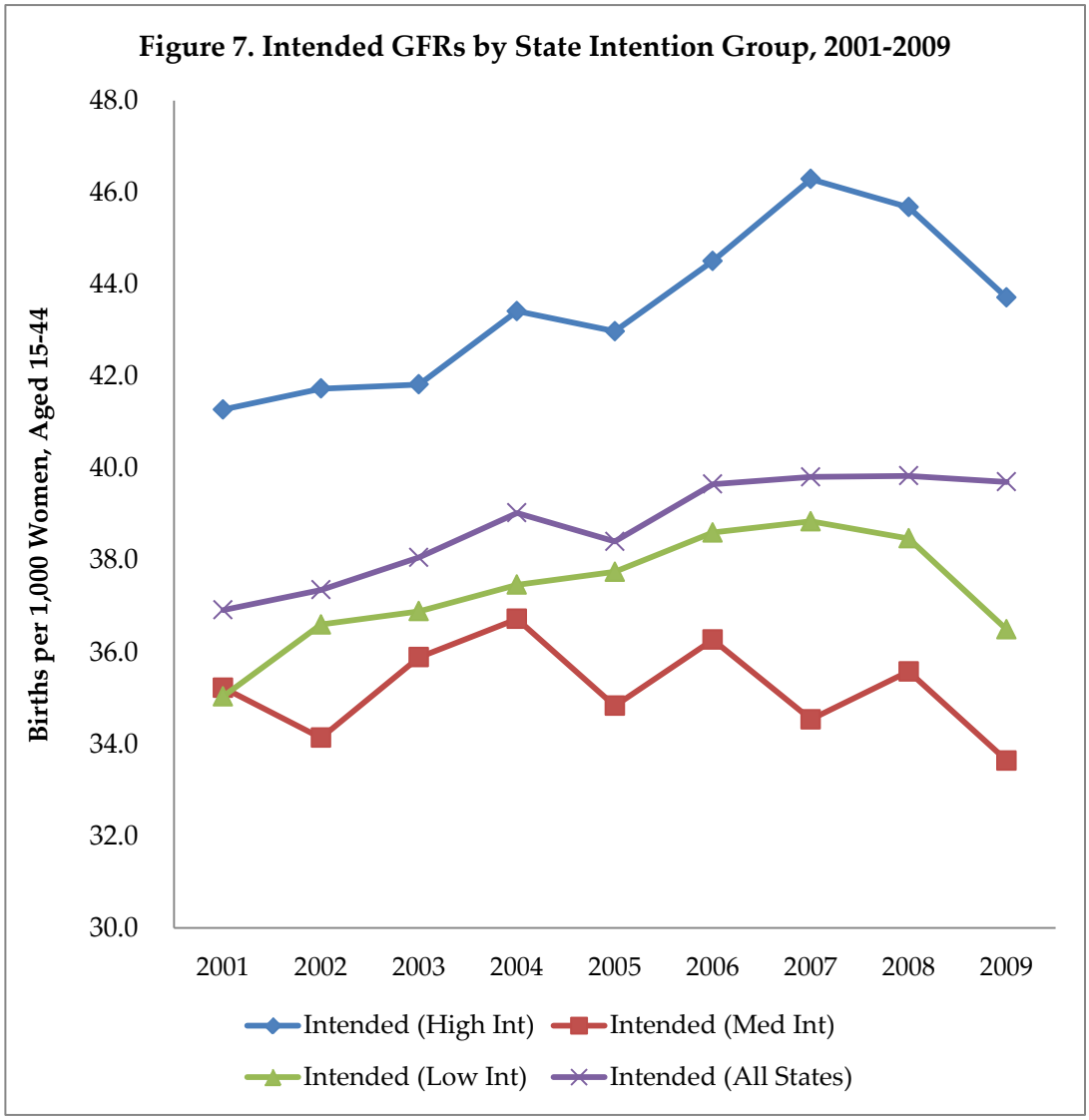


Figure 8 on next page.

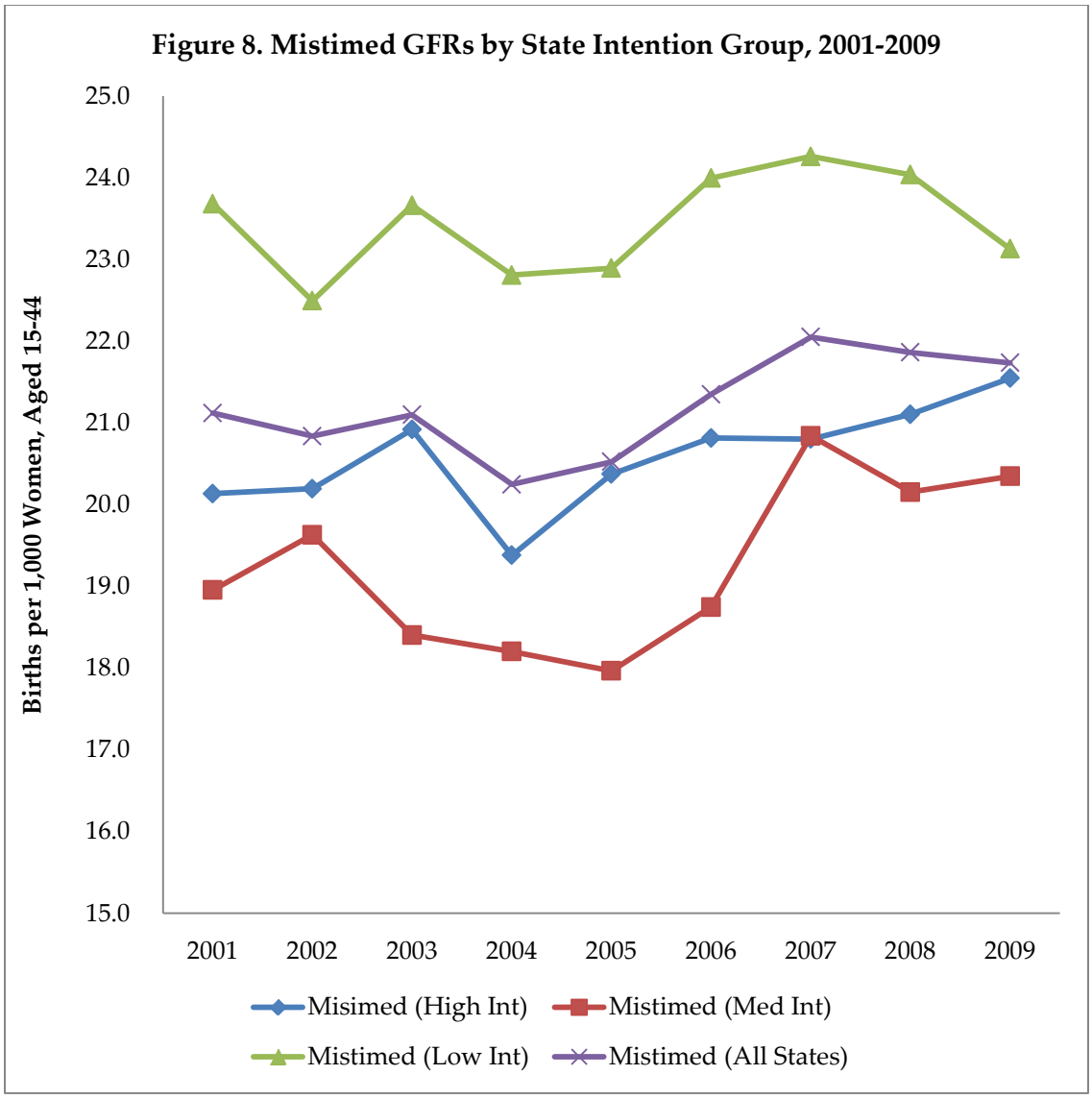
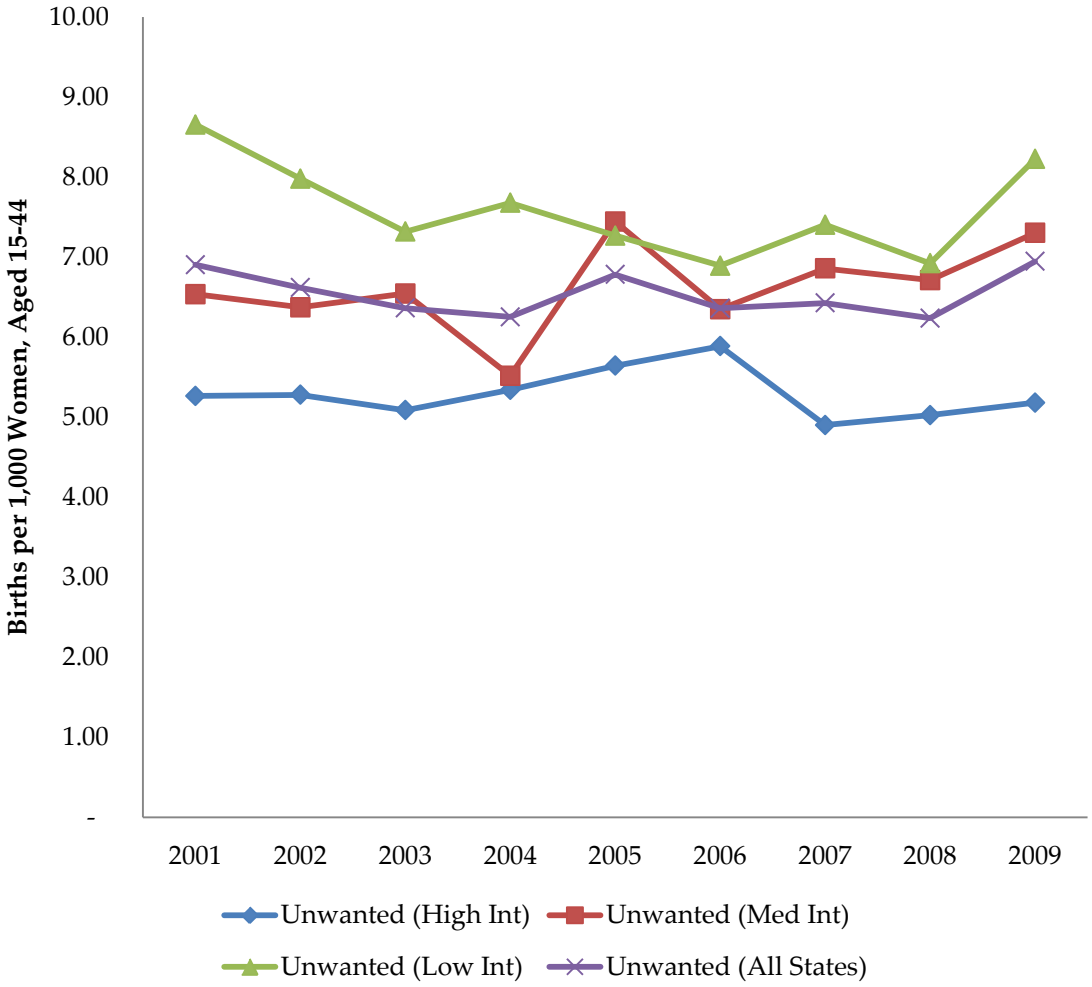


Figure 9 on next page.

Figure 9. Unwanted GFRs by State Intention Group, 2001-2009



In terms of how the author's results compare with those obtained by researchers using pregnancies as their primary indicator, instead of live births, they appear to be consistent. Finer and Zolna (2014) analyzed pregnancy rates for the US using pregnancy intention information from the NSFG for the years 2001-2008 (46). They found a "small shift from intended to unintended pregnancies" (46) over this period; these results which are consistent with the GFR plots included in this thesis. Other findings reported here which are consistent with

Finer and Zolna's analysis: teen births declined throughout the 2001-2009 period, there were considerable dips in fertility among 20-24 year olds in 2008-2010, and intention differed by marital status. Marital status was an effect modifier for the NHW, intention analysis and showed that the odds of the pregnancy being intended among married NHW were higher for the 2008-2009 period than for the 2001-2007 interval.

Strengths

This study has several strengths. One major strength of this thesis is it is the first study to use PRAMS data to explore the relationship between the Great Recession and birth intention and wantedness. PRAMS uses standardized data collection protocols, so it is useful for comparing data across states or comparing multi-state data. PRAMS is also a population-based instrument, so the findings generated using this data can be extrapolated to the larger population of the states under investigation. Therefore, because extrapolation is possible, it is also possible to derive pregnancy intention-specific GFRs, which are also helpful in assessing aggregate levels of fertility in the context of intention. This, along with total fertility rates, is a tool often used by demographers, but not with pregnancy intention in mind. Because pregnancy intention is such an integral part of fertility fluctuations, being able to illustrate it at a general population level is very useful.

Additionally, the PRAMS sample used here is very large, so the estimates provided in the Results are very precise.

A further strength of this study is that the breadth of data available in the PRAMS sample is such that numerous sub-analyses could be performed to further attempt to detect an impact of the Great Recession on pregnancy intention. While these analyses were not performed for this thesis, they are listed below as possible future directions for research. This study also explores the differences in pregnancy intention for the 2001-2009 period between states in the PRAMS analysis, instead of just focusing on the entire sample.

Limitations

There are numerous limitations present in this study. Because only 12 states fit the eligibility criteria for the analysis—complete data available for 2000-2010—the results are only applicable for some states. Even the implications discussed regarding Low Intention states do not necessarily represent the experiences of states with even lower pregnancy intention rates such as Louisiana or California. Additionally, induced and spontaneous abortions are not counted in the PRAMS dataset, which may impact how often intention was reported.

Also, because the 12 states were further collapsed into three categories of unequal size (the Medium Intention group was substantially smaller in terms of

population size than the other two categories), this may have affected the variance in fertility for the Medium Intention states. Additionally, the Medium Intention states in this analysis have markedly lower fertility levels than its High and Low Intention counterparts; this is due to the distribution of Hispanic women aged 15-44 in Medium Intention States. For the 1990-2010 period, the proportion of Hispanic women aged 15-44 overall doubled for these states (all states combined: 5.15 percent in 1990 to 13.42 percent in 2010). This increase occurred more rapidly in the High (6.49 percent to 16.37 percent) and Low (6.91 percent to 16.67 percent) Intention state groups. While an increase occurred in the Medium Intention states as well, it was much more gradual (2.99 percent in 1990 to 6.72 percent in 2010). Figure 10 displays the percentages of this population over time in all 12 states and each state intention group and Figure 11 displays the GFRs for Hispanic women in these groups and for all 12 states for 1990-2010 derived from vital statistics and SEER data. Similar figures displaying NHW and NHB fertility for the same period are in Appendix III.

Figure 10 on next page.

Figure 10. Change in Hispanic Population for All States by State Intention Category, 1990-2010

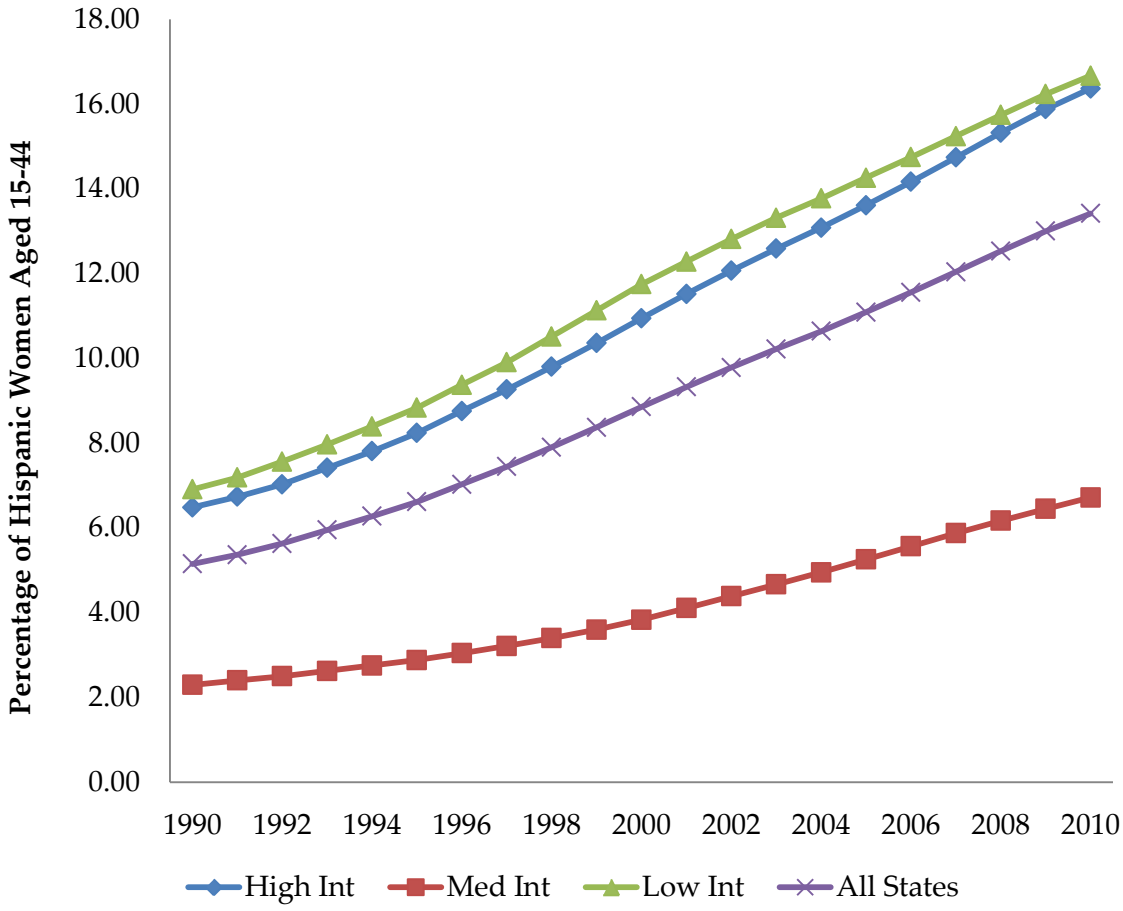
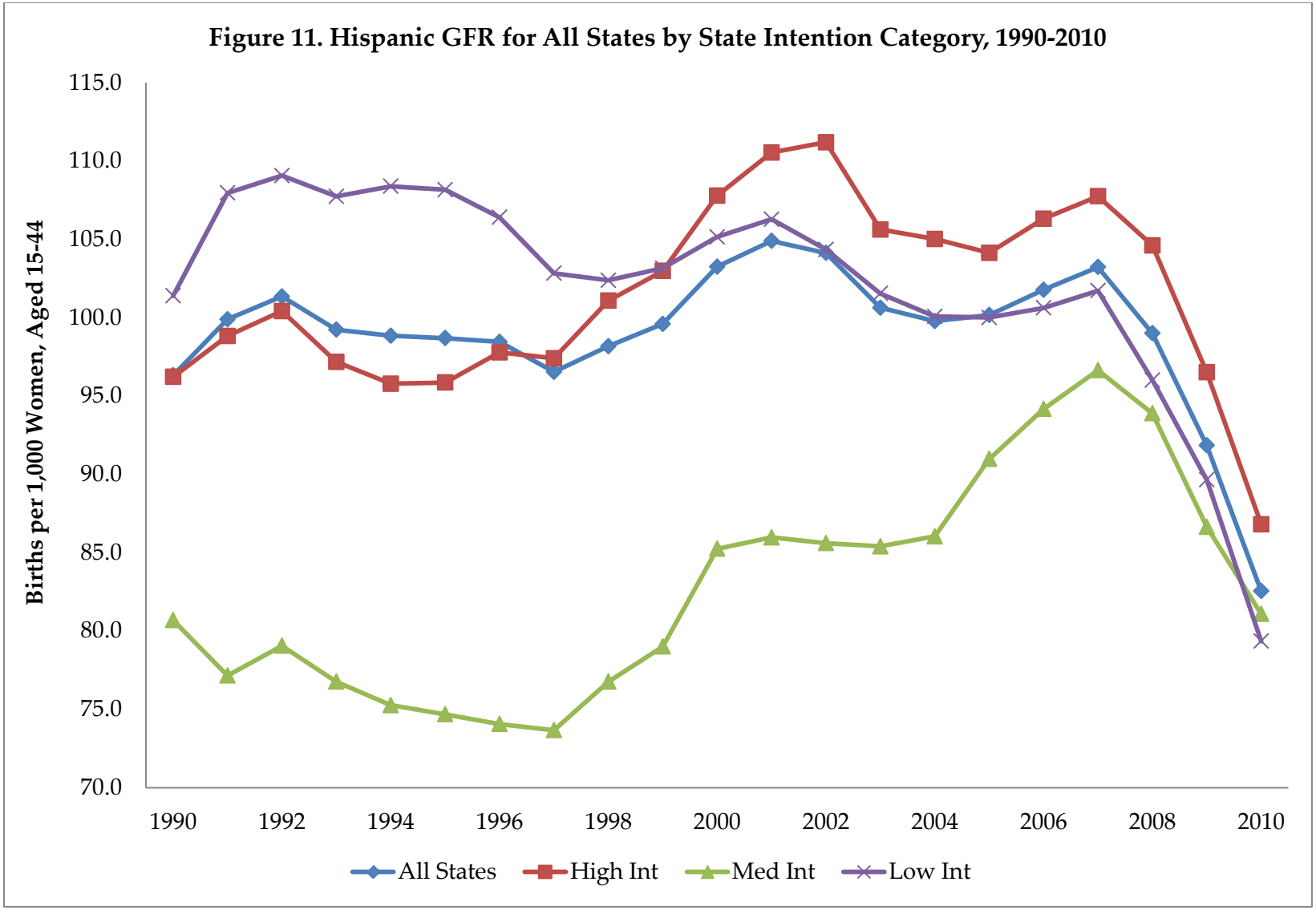


Figure 11 on next page

Figure 11. Hispanic GFR for All States by State Intention Category, 1990-2010



Another limitation of this analysis is that the effects measured need to take into account the circumstances of the respondent. Because the birth has already taken place when the respondent completed the questionnaire, her feelings toward the intention and wantedness of the pregnancy may have changed since she conceived. Pregnancy intention is inherently difficult to measure because it is a retrospective metric, which is undoubtedly subject to recall bias. Therefore, these results should be interpreted with caution when applied to populations of reproductive-aged, nulliparous women.

As discussed in the literature review, birth order has a strong association with birth wantedness. As birth order increases, wantedness tends to decrease because women are more likely to have reached their ideal family size. Unfortunately, there was not enough information in the dataset concerning birth order. Therefore, it was not possible for the author to perform an analysis controlling for birth order or complete a sub-analysis with just first births. Performing an analysis focusing on first births can often be more informative than just looking at all births; it better describes the phenomenon of childbirth initiation, which is of particular concern to demographers and epidemiologists when trying to detect an effect on fertility from the Great Recession or any other economic downturn. There is also a relationship between wantedness and age,

which may have been obscured in this analysis because the author included teenage respondents.

In this thesis, the statistical and GFR analysis did not stratify Hispanic women by nativity. This would yield more revealing data which would be more consistent with what the Pew Hispanic Center has recently discovered about births among Hispanic women: that the highest decline in births is among Latinas, especially immigrants (39).

Finally, a major limitation which the author noted for numerous pregnancy intention studies in the literature, especially those using PRAMS data, was that there was little or no consideration for the respondent's economic situation when discussing unintended pregnancy. Unfortunately, this also manifested itself in this thesis. In terms of the information available in PRAMS which has demonstrated an impact on childbirth and fertility decision making (such as female labor participation, as discussed in the literature review) it was fairly sparse and could not inform the statistical, individual-level analysis seen here.

Future Directions for Research

There are numerous future directions in which to investigate this research question:

- Performing a sub-analysis for wantedness with PRAMS data that omits births to 15-19 year olds. Because these respondents are more likely to report that their birth was mistimed, it may inflate the number of births in the sample that were "wanted," and eliminating these women from consideration in the analysis might yield a more revealing result.
- Performing an individual-level analysis similar to the one completed by the author, but focusing on just first births. As discussed above, the initiation of childbearing is what appears to be most affected by economic downturns, so narrowing the focus to first births would be more informative about this phenomenon in the United States.
- Performing an individual-level analysis on birth wantedness that stratifies on birth order. As birth order has a strong impact on whether the pregnancy and birth is reported as unwanted, this is an important potential confounder to consider; however, due to data limitations, it was not addressed in this thesis.
- Performing an analysis using PRAMS data much like the one done here, but coupling it with an aggregate-level, demographic analysis which examines the change in GFR seen during the 2008-2010 period in the context of pregnancy intention for each of the groups of states utilized in the PRAMS analysis. While this was the initial scope of this thesis, the

demographic analysis component is not included here due to time constraints.

- Using total fertility rates (TFR) in lieu of GFRs in the linear plots and demographic statistical analysis. Because GFRs are more subject to period or temporal distortions due to cohort effects, the TFR is a better illustrator of what is occurring over time concerning fertility.

CONCLUSION

The Great Recession does not appear to have made a statistically significant impact on the distribution of wanteded, mistimed, and unwanted fertility in the US, despite the evidence from the GFRs presented here, except for certain subgroups: married non-Hispanic white women and teens. This suggests that reductions in recession-specific fertility rates for these groups may reflect either an increased vigilance to prevent unintended pregnancies or an increased use of pregnancy termination for mistimed and unwanted pregnancies in these subgroups.

The GFR plots displayed in the Discussion above and in the following appendices illustrate that the Great Recession made an impact on births, but it is not so pronounced that it may be detected in a statistical analysis with the PRAMS sample used for this thesis.

CITED REFERENCES

1. Hoem B. Entry into motherhood in Sweden: The influence of economic factors on the rise and fall in fertility, 1986-1997. Demographic Research 2000;2(4).

2. Karaman Örsal DD, Goldstein JR. The increasing importance of economic conditions on fertility: Max Planck Institute for Demographic Research, Rostock, Germany; 2010.

3. Brewster KL, Rindfuss RR. Fertility and women's employment in industrialized nations. Annual review of sociology 2000;26:271-296.

4. Sobotka T, Skirbekk V, Philipov D. Economic recession and fertility in the developed world. Popul Dev Rev 2011;37(2):267-306.

5. Adsera A. Where are the babies? Labor market conditions and fertility in Europe. European Journal of Population / Revue européenne de Démographie 2011;27(1):1-32.

6. Frejka T, Calot G. Cohort Reproductive patterns in low-fertility countries. Population and Development Review 2001;27(1):103-132.

7. Butz WP, Ward MP. The emergence of countercyclical US fertility. The American Economic Review 1979;69(3):318-328.

8. Davis NJ. Childless and single-childed women in early twentieth-century America. Journal of family issues 1982;3(4):431-458.

9. Neels K, Theunynck Z, Wood J. Economic recession and first births in Europe: recession-induced postponement and recuperation of fertility in 14 European countries between 1970 and 2005. Int J Public Health 2013;58(1):43-55.

10. Fishback PV, Haines MR, Kantor S. Births, deaths, and New Deal relief during the Great Depression. The Review of Economics and Statistics 2007;89(1):1-14.

11. Hamilton BE, Ventura SJ. Fertility and abortion rates in the United States, 1960-2002. Int J Androl 2006;29(1):34-45.

12. Gibson C. The US fertility decline, 1961-1975: The contribution of changes in marital status and marital fertility. Family Planning Perspectives 1976;8(5):249-252.

13. Haub C. The U.S. recession and the birth rate. Population Reference Bureau 2009.

14. Jarosz B. Birth Rate at Record Low for Young Women in U.S. Population Reference Bureau 2013.

15. Martin J, Hamilton B, Sutton P, Ventura S, Mathews T. National Vital Statistics Reports. Births: Final data for 2008. Centers for Disease Control and Prevention. 2010.

16. Cutright P, Shorter E. The effects of health of the completed fertility of nonwhite and white US women born between 1867 and 1935. Journal of Social History 1979;13(2):191-217.

17. Bolin WDW. The economics of middle-income family life: Working women during the Great Depression. The Journal of American History 1978:60-74.

18. Lesthaeghe R. The unfolding story of the Second Demographic Transition. Population and Development Review 2010;36(2):211-251.

19. Cherlin A. Recent changes in american fertility, marriage, and divorce. The Annals of the American Academy of Political and Social Science 1990:145-154.

20. Ananat EO, Hungerman DM. The power of the pill for the next generation: Oral contraception's effects on fertility, abortion, and maternal and child characteristics. Review of Economics and Statistics 2012;94(1):37-51.

21. Goldin C, Katz LF. The power of the pill: oral contraceptives and women's career and marriage decisions: National Bureau of Economic Research; 2000.

22. Guttmacher Institute. Facts on Unintended Pregnancy in the United States. Guttmacher Institute 2012.

23. Sonfield A, Kost K, Gold RB, Finer LB. The public costs of births resulting from unintended pregnancies: national and state‐level estimates. Perspectives on Sexual and Reproductive Health 2011;43(2):94-102.

24. Sonfield A, Kost K. Public costs from unintended pregnancies and the role of public insurance programs in paying for pregnancy and infant care: Estimates for 2008. New York: Guttmacher Institute; 2013.

25. Mosher WD, Jones J, Abma JC. Intended and unintended births in the United States: 1982-2010: US Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Health Statistics; 2012.

26. Finer LB, Henshaw SK. Disparities in rates of unintended pregnancy in the United States, 1994 and 2001. Perspectives on sexual and reproductive health 2006;38(2):90-96.

27. D'Angelo DV, Gilbert BC, Rochat RW, Santelli JS, Herold JM. Differences between mistimed and unwanted pregnancies among women who have live births. Perspectives on Sexual and Reproductive Health 2004;36(5):192-197.

28. Maxson P, Miranda ML. Pregnancy intention, demographic differences, and psychosocial health. Journal of Women's Health 2011;20(8):1215-1223.

29. Cheng D, Schwarz EB, Douglas E, Horon I. Unintended pregnancy and associated maternal preconception, prenatal and postpartum behaviors. Contraception 2009;79(3):194-198.

30. Mohllajee AP, Curtis KM, Morrow B, Marchbanks PA. Pregnancy intention and its relationship to birth and maternal outcomes. Obstetrics & Gynecology 2007;109(3):678-686.

31. Goldstein JR, Kreyenfeld M, Jasilioniene A, Örsal DK. Fertility reactions to the "Great Recession" in Europe: Recent evidence from order-specific data. Demographic Research 2013;29:85-103.

32. Testa M, Basten S. Have lifetime fertility intentions declined during the "Great Recession"? (Working Paper 1209). Vienna Institute of Demography of the Austrian Academy of Sciences in Vienna 2012.

33. Martin J, Hamilton B, Ventura S, Osterman M, Williams T. Births: Final data for 2011. US Department of Health and Human Services, Centers for Disease Control and Prevention. National Center for Health Statistics 2013.

34. Cherlin A, Cumberworth E, Morgan SP, Wimer C. The effects of the Great Recession on family structure and fertility. Annals of the American Academy of Political and Social Science 2013;650(1):214-231.

35. Virility symbols: American fertility is now lower than that of France. The Economist 2012 11 Aug 2012.

36. Kurtz A. Baby bust: U.S. births at record low. CNN Money 2013 6 Sept 2013.

37. Kadlec D. Birth rate plunges during recession. Time 2012 4 Dec 2012.

38. Kotkin J. America's Baby Bust: How the Great Recession has jeopardized our demographic health. Forbes 2012 21 Aug 2012.

39. Livingston G. In a down economy, fewer births. Pew Research - Social and Demographic Trends 2011.

40. Mather M. What's driving the decline in U.S. population growth? Population Reference Bureau 2012.

41. Livingston G, Cohn D. Chart of the Week: Big drop in birth rate may be leveling off. In: Pew Research Center; 2013.

42. Pew Hispanic Center. The Mexican-American boom: Births overtake immigration. Pew Research Center 2011.

43. Livingston G, Cohn D. U.S. birth rate falls to a record low: Decline is greatest among immigrants. Pew Research - Social and Demographic Trends 2012.

44. Mather M. Changes in U.S. Foreign Birth May Slow Population Growth. Population Reference Bureau 2012.

45. Population Institute. The state of reproductive health and rights: 50-State report card. January 2014.

46. Finer LB, Zolna MR. Shifts in intended and unintended pregnancies in the United States, 2001–2008. American Journal of Public Health 2014;104(S1):S43-S48.

APPENDICES

Appendix I: Pregnancy Intention Distribution

State Pregnancy Intention Tables

Chi-Squared Test for Pregnancy Intention State Categories

Age and Race Distribution Comparison: PRAMS vs. NCHS Data

Appendix II: Descriptive Statistics and Modeling

Crude Analysis between Major Covariates and Both Outcomes (Intention and Wantedness)

Crude Analysis between Major Covariates and RECNBIRTH (main exposure)

Final, Adjusted Model Results

Appendix III: Pregnancy Intention & GFR Plots

State GFR Tables

Pregnancy Intention Distribution Plots

Pregnancy Intention Distribution Plots with GFR Overlay

Race-Specific & Age-Specific GFRs

Pregnancy Intention-Specific GFRs

APPENDIX I

Pregnancy Intention Distribution among States

State Pregnancy Intention Tables

Table 13. Distribution of pregnancy intention categories in PRAMS dataset for all states using PRAMS data for 2000-2010

	All Births (unweighted n=292,075)		Intended Births* (unweighted n=166,775)		Mistimed Births (unweighted n=94,435)		Unwanted Births (unweighted n=30,865)	
	N	%	N	%	N	%	N	%
2000	517,956	5.37	303,274	58.55	166,941	32.23	47,741	9.22
2001	632,899	6.56	359,794	56.85	205,833	32.52	67,272	10.63
2002	701,784	7.27	404,514	57.64	225,614	32.15	71,656	10.21
2003	710,646	7.37	412,783	58.09	228,845	32.20	69,018	9.71
2004	702,971	7.29	418,736	59.57	217,187	30.90	67,048	9.54
2005	700,612	7.26	409,526	58.45	218,799	31.23	72,287	10.32
2006	686,601	7.12	404,226	58.87	217,576	31.69	64,799	9.44
2007	731,789	7.59	426,633	58.30	236,326	32.29	68,830	9.41
2008	722,183	7.49	423,514	58.64	232,394	32.18	66,275	9.18
2009	706,218	7.32	402,049	56.93	230,511	32.64	73,658	10.43
2010	530,099	5.49	312,178	58.89	163,542	30.85	54,379	10.26
Total	9,647,357	100	5,610,341	58.15	3,068,459	31.81	968,557	10.04
Average	459,398		267,159		146,117		46,122	
Weighted	**292,075**		**169,841.613**		**92,909.058**		**29,324.330**	

*Intended births include those who answered "then" and "sooner"
**9,681 observations missing from this data
***Percentages may not add up to 100

Table 14. Distribution of pregnancy intention categories in PRAMS dataset for Arkansas using PRAMS data for 2000-2010

	All Births (unweighted n=25,155)		Intended Births* (unweighted n=12,222)		Mistimed Births (unweighted n=9,302)		Unwanted Births (unweighted n=3,631)	
	N	%	N	%	N	%	N	%
2000	34,193	7.00	15,940	46.62	13,536	39.59	4,717	13.80
2001	33,979	6.96	16,226	47.75	13,166	38.75	4,587	13.50
2002	34,601	7.08	17,308	50.02	12,656	36.58	4,637	13.40
2003	34,915	7.15	16,820	48.17	13,368	38.29	4,727	13.54
2004	35,721	7.31	16,985	47.55	13,689	38.32	5,047	14.13
2005	36,233	7.42	18,849	52.02	13,179	36.37	4,205	11.61
2006	37,610	7.70	18,558	49.34	14,479	38.50	4,573	12.16
2007	38,145	7.81	19,672	51.57	13,753	36.05	4,720	12.37
2008	36,878	7.55	17,754	48.14	13,903	37.70	5,221	14.16
2009	36,343	7.44	17,363	47.78	14,317	39.39	4,663	12.83
2010	35,270	7.22	17,853	50.62	13,405	38.01	4,012	11.38
Total	488,491	100	239,738	49.08	183,868	37.64	64,885	13.28
Average	34,892		17,124		13,133		4,635	
Weighted	**25,155**		**12,346.074**		**9,468.342**		**3,340.584**	

*Intended births include those who answered "then" and "sooner"
**596 observations missing from this data
***Percentages may not add up to 100

Table 15. Distribution of pregnancy intention categories in PRAMS dataset for Colorado using PRAMS data for 2000-2010

	All Births (unweighted n=26,545)		Intended Births* (unweighted n=16,337)		Mistimed Births (unweighted n=7,915)		Unwanted Births (unweighted n=2,293)	
	N	%	N	%	N	%	N	%
2000	62,806	7.47	37,802	60.19	20,642	32.87	4,362	6.95
2001	64,347	7.65	38,848	60.37	20,812	32.34	4,687	7.28
2002	66,535	7.91	40,685	61.15	19,924	29.95	5,926	8.91
2003	66,998	7.97	39,548	59.03	21,910	32.70	5,540	8.27
2004	66,826	7.95	40,586	60.73	20,532	30.72	5,708	8.54
2005	66,852	7.95	40,070	59.94	21,257	31.80	5,525	8.26
2006	68,705	8.17	41,344	60.18	21,276	30.97	6,085	8.86
2007	68,891	8.19	43,207	62.72	20,588	29.88	5,096	7.40
2008	68,144	8.11	42,973	63.06	20,481	30.06	4,690	6.88
2009	66,000	7.85	39,906	60.46	20,279	30.73	5,815	8.81
2010	63,516	7.56	40,800	64.24	16,692	26.28	6,024	9.48
Total	840,671	100	513,182	61.04	257,274	30.60	70,215	8.35
Average	64,667		39,476		19,790		5,401	
Weighted	**26,545**		**16,203.07**		**8,122.77**		**2,216.51**	

*Intended births include those who answered "then" and "sooner"
**591 observations missing from this data
***Percentages may not add up to 100

Table 16. Distribution of pregnancy intention categories in PRAMS dataset for Hawaii using PRAMS data for 2000-2010

	All Births (unweighted n=20,517)		Intended Births* (unweighted n=11,308)		Mistimed Births (unweighted n=7,009)		Unwanted Births (unweighted n=2,200)	
	N	%	N	%	N	%	N	%
2000	17,049	8.78	9,659	56.65	5,953	34.92	1,437	8.43
2001	16,656	8.58	9,063	54.41	6,026	36.18	1,567	9.41
2002	16,957	8.73	9,638	56.84	6,029	35.55	1,290	7.61
2003	17,609	9.07	9,904	56.24	6,258	35.54	1,447	8.22
2004	17,505	9.01	9,791	55.93	5,358	30.61	2,356	13.46
2005	17,215	8.87	9,284	53.93	5,397	31.35	2,534	14.72
2006	18,036	9.29	9,762	54.13	5,662	31.39	2,612	14.48
2007	18,246	9.40	9,647	52.87	6,242	34.21	2,357	12.92
2008	18,445	9.50	10,451	56.66	6,228	33.77	1,766	9.57
2009	18,164	9.35	9,559	52.63	6,371	35.07	2,234	12.30
2010	18,300	9.42	9,935	54.29	6,591	36.02	1,774	9.69
Total	194,182	100	106,693	54.94	66,115	34.05	21,374	11.01
Average	17,653		9,699		6,010		1,943	
Weighted	**20,517**		**11,272.04**		**6,986.04**		**2,258.92**	

*Intended births include those who answered "then" and "sooner"
**378 observations missing from this data
***Percentages may not add up to 100

Table 17. Distribution of pregnancy intention categories in PRAMS dataset for Illinois using PRAMS data for 2000-2009

	All Births (unweighted n=22,548)		Intended Births* (unweighted n=13,030)		Mistimed Births (unweighted n=7,023)		Unwanted Births (unweighted n=2,495)	
	N	%	N	%	N	%	N	%
2000	179,167	8.45	102,265	57.08	57,304	31.98	19,598	10.94
2001	170,407	8.04	91,591	53.75	55,598	32.63	23,218	13.63
2002	170,830	8.06	97,318	56.97	53,051	31.05	20,461	11.98
2003	170,874	8.06	96,042	56.21	56,953	33.33	17,879	10.46
2004	170,016	8.02	99,782	58.69	52,421	30.83	17,813	10.48
2005	169,084	7.97	97,726	57.80	53,798	31.82	17,560	10.39
2006	170,006	8.02	99,075	58.28	55,987	32.93	14,944	8.79
2007	170,247	8.03	97,160	57.07	56,877	33.41	16,210	9.52
2008	165,752	7.82	97,256	58.68	53,773	32.44	14,723	8.88
2009	160,698	7.58	89,598	55.76	52,537	32.69	18,563	11.55
Total	2,120,458	100	1,207,371	56.94	679,963	32.07	233,124	10.99
Average	163,112		92,875		52,305		17,933	
Weighted	**22,548**		**12,838.83**		**7,231.14**		**2,478.03**	

*Intended births include those who answered "then" and "sooner"
**574 observations missing from this data
***Percentages may not add up to 100

Table 18. Distribution of pregnancy intention categories in PRAMS dataset for Maryland using PRAMS data for 2001-2010

	All Births (unweighted n=15,368)		Intended Births* (unweighted n=9,735)		Mistimed Births (unweighted n=3,724)		Unwanted Births (unweighted n=1,869)	
	N	%	N	%	N	%	N	%
2001	58,339	9.09	33,764	57.88	18,219	31.23	6,356	10.89
2002	63,431	9.89	35,623	56.16	21,222	33.46	6,586	10.38
2003	65,318	10.18	38,421	58.82	19,528	29.90	7,369	11.28
2004	63,864	9.95	39,694	62.15	18,657	29.21	5,513	8.63
2005	54,795	8.54	31,231	57.00	17,031	31.08	6,533	11.92
2006	67,396	10.50	40,238	59.70	21,240	31.52	5,918	8.78
2007	68,397	10.66	38,743	56.64	22,455	32.83	7,199	10.53
2008	68,252	10.64	39,285	57.56	22,859	33.49	6,108	8.95
2009	66,796	10.41	36,433	54.54	22,261	33.33	8,102	12.13
2010	65,072	10.14	36,333	55.84	19,567	30.07	9,172	14.10
Total	641,660	100	369,765	57.63	203,039	31.64	68,856	10.73
Average	64,166		36,977		20,304		6,886	
Weighted	**15,368**		**8,856.578**		**4,862.435**		**1,648.986**	

*Intended births include those who answered "then" and "sooner"
**352 observations missing from this data
***Percentages may not add up to 100

Table 19. Distribution of pregnancy intention categories in PRAMS dataset for Maine using PRAMS data for 2000-2010

	All Births (unweighted n=22,918)		Intended Births* (unweighted n=11,985)		Mistimed Births (unweighted n=6,098)		Unwanted Births (unweighted n=1,865)	
	N	%	N	%	N	%	N	%
2000	12,954	4.76	8,431	65.08	3,647	28.15	876	6.76
2001	13,008	4.78	8,231	63.28	3,848	29.58	929	7.14
2002	12,831	4.72	8,552	66.65	3,426	26.70	853	6.65
2003	13,046	4.79	8,670	66.46	3,474	26.63	902	6.91
2004	13,123	4.82	8,456	64.44	3,547	27.03	1,120	8.53
2005	13,407	4.93	8,427	62.86	4,012	29.92	968	7.22
2006	13,421	4.93	8,255	61.51	4,068	30.31	1,098	8.18
2007	13,234	4.86	8,349	63.09	3,644	27.54	1,241	9.38
2008	12,715	4.67	8,070	63.47	3,571	28.08	1,074	8.45
2009	12,753	4.69	7,779	61.00	3,686	28.90	1,288	10.10
2010	12,195	4.48	7,437	60.98	3,520	28.86	1,238	10.15
Total	272,125	100	174,391	64.08	76,227	28.01	21,507	7.90
Average	12,754		8,166		3,569		1,018	
Weighted	**22,918**		**14,685.85**		**6,419.33**		**1,810.52**	

*Intended births include those who answered "then" and "sooner"
**1,176 observations missing from this data
***Percentages may not add up to 100

Table 20. Distribution of pregnancy intention categories in PRAMS dataset for Michigan using PRAMS data for 2001-2010

	All Births (unweighted n=20,058)		Intended Births* (unweighted n=10,551)		Mistimed Births (unweighted n=6,740)		Unwanted Births (unweighted n=2,767)	
	N	%	N	%	N	%	N	%
2001	64,137	4.01	38,112	59.42	19,068	29.73	6,957	10.85
2002	123,957	7.75	70,474	56.85	39,983	32.26	13,500	10.89
2003	125,955	7.87	74,935	59.49	37,877	30.07	13,143	10.43
2004	124,756	7.80	75,317	60.37	37,891	30.37	11,548	9.26
2005	122,340	7.65	71,175	58.18	35,315	28.87	15,850	12.96
2006	81,533	5.10	48,146	59.05	24,257	29.75	9,130	11.20
2007	120,173	7.51	66,287	55.16	40,220	33.47	13,666	11.37
2008	116,647	7.29	66,644	57.13	36,718	31.48	13,285	11.39
2009	112,855	7.05	62,562	55.44	37,012	32.80	13,281	11.77
2010	109,961	6.87	61,006	55.48	36,398	33.10	12,557	11.42
Total	1,600,091	100	922,566	57.66	496,325	31.02	181,200	11.32
Average	114,292		65,898		35,452		12,943	
Weighted	**20,058**		**11,565.44**		**6,221.99**		**2,270.57**	

*Intended births include those who answered "then" and "sooner"
**652 observations missing from this data
***Percentages may not add up to 100

Table 21. Distribution of pregnancy intention categories in PRAMS dataset for Nebraska using PRAMS data for 2000-2010

	All Births (unweighted n=20,021)		Intended Births* (unweighted n=11,189)		Mistimed Births (unweighted n=6,714)		Unwanted Births (unweighted n=2,118)	
	N	%	N	%	N	%	N	%
2000	23,980	8.73	14,631	61.01	7,322	30.53	2,027	8.45
2001	24,100	8.77	14,898	61.82	7,143	33.37	2,059	8.54
2002	24,497	8.92	14,005	57.17	8,042	33.55	2,450	10.00
2003	25,026	9.11	14,494	57.92	8,219	35.35	2,313	9.24
2004	25,572	9.31	14,276	55.83	8,847	30.25	2,449	9.58
2005	25,034	9.11	15,073	60.21	7,736	31.45	2,225	8.89
2006	25,901	9.43	15,587	60.18	7,873	31.35	2,441	9.42
2007	24,857	9.05	14,962	60.19	8,121	32.76	1,774	7.14
2008	25,016	9.11	14,790	59.12	8,142	31.46	2,084	8.33
2009	25,669	9.34	15,423	60.08	7,871	29.77	2,375	9.25
2010	25,088	9.13	15,446	61.57	7,641	30.46	2,001	7.98
Total	274,740	100	163,585	59.54	86,957	31.65	24,198	8.81
Average	24,976		14,871		7,905		2,200	
Weighted	**20,021**		**11,920.503**		**6,336.647**		**1,763.850**	

*Intended births include those who answered "then" and "sooner"
**365 observations missing from this data
***Percentages may not add up to 100

Table 22. Distribution of pregnancy intention categories in PRAMS dataset for Oklahoma using PRAMS data for 2000-2010

	All Births (unweighted n=38,664)		Intended Births* (unweighted n=20,807)		Mistimed Births (unweighted n=13,578)		Unwanted Births (unweighted n=4,279)	
	N	%	N	%	N	%	N	%
2000	46,728	4.92	24,797	53.07	16,913	36.19	5,018	10.74
2001	47,244	4.97	22,645	47.93	19,510	41.30	5,089	10.77
2002	47,604	5.01	23,071	48.46	18,810	39.51	5,723	12.02
2003	47,999	5.05	24,753	51.57	18,040	37.58	5,206	10.85
2004	48,826	5.14	23,457	48.04	19,852	40.66	5,517	11.30
2005	48,930	5.15	25,044	51.18	19,133	39.10	4,753	9.71
2006	51,546	5.42	26,595	51.59	19,588	38.00	5,363	10.40
2007	52,250	5.50	27,177	52.01	19,083	36.52	5,990	11.46
2008	52,200	5.49	25,968	49.75	20,699	39.65	5,533	10.60
2009	51,345	5.40	26,854	52.30	17,641	34.36	6,850	13.34
2010	50,489	5.31	27,448	54.36	16,096	31.88	6,945	13.76
Total	950,671	100	491,846	51.74	350,061	36.82	108,764	11.44
Average	48,132		24,592		17,503		5,438	
Weighted	**38,664**		**20,004.75**		**14,236.09**		**4,423.16**	

*Intended births include those who answered "then" and "sooner"
**1,639 observations missing from this data
***Percentages may not add up to 100

Table 23. Distribution of pregnancy intention categories in PRAMS dataset for Utah using PRAMS data for 2000-2010

	All Births (unweighted n=20,725)		Intended Births* (unweighted n=13,385)		Mistimed Births (unweighted n=5,890)		Unwanted Births (unweighted n=1,450)	
	N	%	N	%	N	%	N	%
2000	45,641	7.71	31,205	68.37	11,693	25.62	2,743	6.01
2001	46,826	7.91	30,679	65.52	13,035	27.84	3,112	6.65
2002	47,547	8.03	32,104	67.52	12,433	26.15	3,010	6.33
2003	48,470	8.19	32,193	66.42	13,505	27.86	2,772	5.72
2004	49,017	8.28	33,636	68.62	12,461	25.42	2,920	5.96
2005	49,765	8.41	32,880	66.07	13,750	27.63	3,135	6.30
2006	51,946	8.78	34,192	65.82	14,311	27.55	3,443	6.63
2007	53,451	9.03	36,956	69.14	14,073	26.33	2,422	4.53
2008	53,997	9.12	36,173	66.99	14,910	27.61	2,914	5.40
2009	52,222	8.82	34,686	66.42	14,478	27.72	3,058	5.86
2010	50,204	8.48	33,950	67.62	13,092	26.08	3,162	6.30
Total	591,869	100	397,017	67.08	134,649	22.75	35,414	5.98
Average	49,322		33,085		13,287		2,951	
Weighted	**20,725**		**13,902.33**		**4,714.94**		**1,239.36**	

*Intended births include those who answered "then" and "sooner"
**368 observations missing from this data
***Percentages may not add up to 100

Table 24. Distribution of pregnancy intention categories in PRAMS dataset for Washington using PRAMS data for 2000-2010

	All Births (unweighted n=27,928)		Intended Births* (unweighted n=16,189)		Mistimed Births (unweighted n=9,124)		Unwanted Births (unweighted n=2,615)	
	N	%	N	%	N	%	N	%
2000	77,212	5.91	47,945	62.10	23,875	30.92	5,392	6.98
2001	75,913	5.81	46,144	60.79	22,858	30.11	6,911	9.10
2002	74,937	5.74	45,211	60.33	24,187	32.28	5,539	7.39
2003	76,248	5.84	46,787	61.36	23,758	31.16	5,703	7.48
2004	78,572	6.02	51,589	65.66	20,914	26.62	6,069	7.72
2005	79,224	6.07	49,496	62.48	22,423	28.30	7,305	9.22
2006	82,667	6.33	52,284	63.25	23,394	28.30	6,989	8.45
2007	85,269	6.53	54,517	63.94	24,560	28.80	6,192	7.26
2008	85,754	6.57	54,252	63.26	25,081	29.25	6,421	7.49
2009	85,127	6.52	52,251	61.38	27,635	32.46	5,241	6.16
2010	82,470	6.32	52,422	63.56	24,544	29.76	5,504	6.67
Total	1,305,828	100	814,226	62.35	389,090	29.80	102,512	7.85
Average	78,465		47,896		22,888		6,030	
Weighted	**27,928**		**17,413.11**		**8,322.54**		**2,192.35**	

*Intended births include those who answered "then" and "sooner"
**1,243 observations missing from this data
***Percentages may not add up to 100

Table 25. Distribution of pregnancy intention categories in PRAMS dataset for West Virginia using PRAMS data for 2000-2010

	All Births (unweighted n=31,628)		Intended Births* (unweighted n=17,027)		Mistimed Births (unweighted n=11,318)		Unwanted Births (unweighted n=3,283)	
	N	%	N	%	N	%	N	%
2000	18,225	4.97	10,598	58.15	6,056	33.23	1,571	8.62
2001	17,944	4.90	9,595	53.47	6,549	36.50	1,800	10.03
2002	18,057	4.93	10,524	58.28	5,853	32.41	1,680	9.30
2003	18,189	4.96	10,216	56.17	5,957	32.75	2,016	11.08
2004	9,174	2.50	5,168	56.33	3,018	32.90	988	10.77
2005	17,732	4.84	10,270	57.92	5,768	32.53	1,694	9.55
2006	17,833	4.86	10,187	57.12	5,443	30.52	2,203	12.35
2007	18,630	5.08	9,958	53.45	6,711	36.02	1,961	10.53
2008	18,382	5.01	9,899	53.85	6,028	32.79	2,455	13.36
2009	18,247	4.98	9,634	52.80	6,424	35.21	2,189	12.00
2010	17,534	4.78	9,548	54.45	5,996	34.20	1,990	11.35
Total	366,571	100	209,953	57.27	120,108	32.77	36,510	9.96
Average	17,184		9,998		5,719		1,739	
Weighted	**31,628**		**18,113.36**		**10,364.50**		**3,150.15**	

*Intended births include those who answered "then" and "sooner"
**1,774 observations missing from this data
***Percentages may not add up to 100

Table 26. Summary table displaying weighted counts of intended, mistimed, and unwanted births per state using PRAMS data, 2000-2010, for all years available (used weighted average counts for each state).

	Intended Births****		Mistimed Births		Unwanted Births	
	N	%	N	%	N	%
All States	8,087.70	58.15	4,424.24	31.81	1,396.40	10.04
Arkansas	882	49.08	676	37.64	239	13.28
Colorado	1,246	61.04	625	30.60	171	8.35
Hawaii	1,025	54.94	635	34.05	205	11.01
Illinois	988	56.94	556	32.07	191	10.99
Maine	699	64.08	306	28.01	86	7.90
Maryland	886	57.63	486	31.64	165	10.73
Michigan	826	57.66	444	31.02	162	11.32
Nebraska	1,084	59.54	576	31.65	160	8.81
Oklahoma	1,000	51.74	712	36.82	221	11.44
Utah	1,159	67.08	393	22.75	103	5.98
Washington	1,024	62.35	490	29.80	129	7.85
West Virginia	863	57.27	494	32.77	150	9.96

*9,681 observations missing from this data
**P-values derived using a Chi-square test comparing each state's average number of births in each category with the median value (Michigan)
***Percentages may not add up to 100
****Intended births include those who answered "then" and "sooner"

low intended LB - p<0.01
med intended LB - p = 0.968
high intended LB - p<0.01

APPENDIX I

Pregnancy Intention Distribution among States

Chi-Squared Test for Pregnancy Intention State Categories

HIGH INTENTION GROUP

OBSERVED

	Intended	Unintended	
CO	1246	796	2042
ME	699	392	1091
NE	1084	736	1820
UT	1159	496	1655
WA	1024	619	1643
	5212	3039	8251

EXPECTED

	Intended	Unintended	
CO	1289.893	752.1074	2042
ME	689.164	401.836	1091
NE	1149.659	670.3406	1820
UT	1045.432	609.5679	1655
WA	1037.852	605.1481	1643
	5212	3039	8251

Observed	Expected	|O-E|	(O-E)^2	(O-E)^2/E
1246	1289.893	-43.893	1926.595	1.493609
796	752.1074	43.8926	1926.56	2.56155
699	689.164	9.836	96.7469	0.140383
392	401.836	-9.836	96.7469	0.240762
1084	1149.659	-65.659	4311.104	3.749898
736	670.3406	65.6594	4311.157	6.431293
1159	1045.432	113.568	12897.69	12.33719
496	609.5679	-113.568	12897.67	21.15871
1024	1037.852	-13.852	191.8779	0.18488
619	605.1481	13.8519	191.8751	0.317071
				48.61534

w/ 4 df, p < 0.001

The number of women who have to be moved equal the number who move only one way (not both ways). For example, for Colorado, only 43.893 women would have to be moved (say from intended to unintended). Thus, the number that would have to be moved is:

246.8079

The percentage of women who would be moved moved to equalize: 2.99125

MEDIUM INTENTION GROUP

OBSERVED

	Intended	Unintended	
MD	886	651	1537
MI	826	606	1432
WV	863	644	1507
	2575	1901	4476

EXPECTED

	Intended	Unintended	
MD	884.2214	652.7786	1537
MI	823.8159	608.1841	1432
WV	866.9627	640.0373	1507
	2575	1901	4476

Observed	Expected	|O-E|	(O-E)^2	(O-E)^2/E
886	884.2214	1.7786	3.163418	0.003578
651	652.7786	-1.7786	3.163418	0.004846
826	823.8159	2.1841	4.770293	0.00579
606	608.1841	-2.1841	4.770293	0.007844
863	866.9627	-3.9627	15.70299	0.018113
644	640.0373	3.9627	15.70299	0.024534
				0.064705

w/ 2 df, p = 0.968

Number of women who would have to be "moved" to make all of the intendedness averages the same:

7.9254 <-- sum of (O-E) for intended births

0.17706 <--percentage of women who would have to be moved

LOW INTENTION GROUP

OBSERVED

	Intended	Unintended	
AR	882	915	1797
HI	1025	840	1865
IL	988	747	1735
OK	1000	933	1933
	3895	3435	7330

EXPECTED

	Intended	Unintended	
AR	954.8861	842.1139	1797
HI	991.0198	873.9802	1865
IL	921.9407	813.0593	1735
OK	1027.153	905.8465	1933
	3895	3435	7330

Observed	Expected	|O-E|	(O-E)^2	(O-E)^2/E
882	954.8861	-72.8861	5312.384	5.563369
915	842.1139	72.8861	5312.384	6.308391
1025	991.0198	33.9802	1154.654	1.165117
840	873.9802	-33.9802	1154.654	1.321144
988	921.9407	66.0593	4363.831	4.73331
747	813.0593	-66.0593	4363.831	5.367174
1000	1027.153	-27.153	737.2854	0.717795
933	905.8465	27.1535	737.3126	0.813949
				25.99025

w/ 3 df, p =0.00000958

Number of women who would have to be "moved" to make all of the intendedness averages the same:

200.079 <-- sum of (O-E) for intended births

2.72959 <--percentage of women who would have to be moved

APPENDIX I

Pregnancy Intention Distribution among States

Age and Race Distribution Comparison: PRAMS vs. NCHS Data

2001: All States

NCHS

Total Women (all states)

	All Births	
	N	%
15-19	75,320	10.89
20-24	180,815	26.13
25-29	185,744	26.84
30-34	160,872	23.25
35-39	74,435	10.76
40-44	14,765	2.13
Total	691,951	

PRAMS

Total Women (all states)

	All Births	
	N	%
15-19	2,165	12.37
20-24	4,675	26.72
25-29	4,443	25.39
30-34	3,698	21.13
35-39	2,034	11.62
40-44	483	2.76
Total	17,498	

NHW Women (all states)

	All Births	
	N	%
15-19	39,804	8.18
20-24	115,296	23.68
25-29	134,243	27.57
30-34	127,114	26.11
35-39	58,741	12.06
40-44	11,699	2.40
Total	486,897	

NHW Women (all states)

	All Births	
	N	%
15-19	1,272	10.30
20-24	3,072	24.87
25-29	3,222	26.08
30-34	2,861	23.16
35-39	1,560	12.63
40-44	367	2.97
Total	12,354	

NHB Women (all states)

	All Births	
	N	%
15-19	19,171	19.02
20-24	32,263	32.01
25-29	23,032	22.85

NHB Women (all states)

	All Births	
	N	%
15-19	509	21.09
20-24	761	31.54
25-29	483	20.02

30-34	16,302	16.17	30-34	353	14.63
35-39	8,315	8.25	35-39	240	9.95
40-44	1,721	1.71	40-44	67	2.78
Total	100,804		Total	2,413	

Hispanic Women (all states)

Hispanic Women (all states)

	All Births			All Births	
	N	%		N	%
15-19	16,345	15.68	15-19	384	14.06
20-24	33,256	31.90	20-24	842	30.83
25-29	28,469	27.31	25-29	738	27.02
30-34	17,456	16.74	30-34	484	17.72
35-39	7,379	7.08	35-39	234	8.57
40-44	1,345	1.29	40-44	49	1.79
Total	104,250		Total	2,731	

For the Year 2001:

ALL WOMEN

	NCHS	PRAMS
15-19	10.89	12.37
20-24	26.13	26.72
25-29	26.84	25.39
30-34	23.25	21.13
35-39	10.76	11.62
40-44	2.13	2.76

NHB WOMEN

	NCHS	PRAMS
15-19	19.02	21.09
20-24	32.01	31.54
25-29	22.85	20.02
30-34	16.17	14.63
35-39	8.25	9.95
40-44	1.71	2.78

NHW WOMEN

	NCHS	PRAMS
15-19	8.18	10.30
20-24	23.68	24.87
25-29	27.57	26.08
30-34	26.11	23.16
35-39	12.06	12.63
40-44	2.40	2.97

HISPANIC WOMEN

	NCHS	PRAMS
15-19	15.68	14.06
20-24	31.90	30.83
25-29	27.31	27.02
30-34	16.74	17.72
35-39	7.08	8.57
40-44	1.29	1.79

APPENDIX II

Descriptive Statistics and Modeling

Crude Analysis between Major Covariates and Both Outcomes (Intention and Wantedness)

SIMPLE LOG MODELS WITH EACH COVARIATE AND THE OUTCOME
INTENDED VS. UNINTENDED

Variable	Parameter Estimate	Std Error	OR	95% CI	Wald P-value
recnbirth (exposure, 2001-2009)	-0.02	0.02	0.98	(0.95, 1.02)	0.2670
mage	0.11	0.00	1.11	(1.11, 1.12)	0.0000
married	1.61	0.02	5.01	(4.84, 5.17)	0.0000
mat_ed (REF=12 yrs)					
0-8 years	0.25	0.04	1.29	(1.20, 1.38)	0.0000
9-11 years	-0.39	0.03	0.68	(0.65, 0.71)	0.0000
13-15 years	0.37	0.02	1.45	(1.39, 1.51)	0.0000
≥16 years	1.27	0.02	3.57	(3.43, 3.72)	0.0000
gr_int_state (REF=high int)					
Medium	-0.21	0.02	0.81	(0.78, 0.84)	0.0000
Low	-0.33	0.02	0.72	(0.69, 0.74)	0.0000
insured	0.74	0.02	2.09	(2.02, 2.16)	0.0000
mrace (REF=NHW)					
NHB	-1.23	0.03	0.29	(0.28, 0.31)	0.0000
Hispanic	-0.36	0.02	0.70	(0.67, 0.72)	0.0000
wic_preg (ref=YES)	1.07	0.02	2.93	(2.84, 3.02)	0.0000
gr_age (REF=25-29)					
15-19	-1.58	0.03	0.20	(0.19, 0.22)	0.0000
20-24	-0.80	0.02	0.45	(0.43, 0.47)	0.0000
30-34	0.44	0.02	1.56	(1.49, 1.62)	0.0000
35-39	0.53	0.03	1.70	(1.61, 1.79)	0.0000
40-44	0.43	0.05	1.54	(1.40, 1.70)	0.0000

SIMPLE LOG MODELS WITH EACH COVARIATE AND THE OUTCOME
WANTED VS. UNWANTED

Variable	Parameter Estimate	Std Error	OR	95% CI	Wald P-value
recnbirth (exposure, 2001-2009)	-0.01	0.03	0.99	(0.93, 1.05)	0.7484
mage	-0.02	0.00	0.98	(0.98, 0.98)	0.0000
married	0.97	0.02	2.63	(2.51, 2.77)	0.0000
mat_ed (REF=12 yrs)					
0-8 years	0.41	0.06	1.51	(1.33, 1.71)	0.0000
9-11 years	-0.08	0.04	0.92	(0.86, 0.99)	0.0306
13-15 years	0.24	0.03	1.27	(1.19, 1.35)	0.0000
≥16 years	1.13	0.04	3.10	(2.88, 3.34)	0.0000
gr_int_state (REF=high int)					
Medium	-0.39	0.03	0.68	(0.64, 0.72)	0.0000
Low	-0.41	0.03	0.66	(0.62, 0.70)	0.0000
insured (REF=uninsured)	0.33	0.03	1.39	(1.32, 1.47)	0.0000
mrace (REF=NHW)					
NHB	-1.18	0.03	0.31	(0.29, 0.33)	0.0000
Hispanic	0.09	0.04	1.1	(1.02, 1.18)	0.0161
wic_preg (ref=YES)	0.60	0.03	1.82	(1.73, 1.91)	0.0000
gr_age (REF=25-29)					
15-19	-0.27	0.05	0.76	(0.69, 0.84)	0.0000
20-24	-0.11	0.04	0.90	(0.84, 0.97)	0.0035
30-34	-0.03	0.04	0.97	(0.90, 1.04)	0.3901
35-39	-0.43	0.04	0.65	(0.60, 0.71)	0.0000
40-44	-1.08	0.06	0.34	(0.30, 0.38)	0.0000

APPENDIX II

Descriptive Statistics and Modeling

Crude Analysis between Major Covariates and RECNBIRTH (main exposure)

SIMPLE LOG MODELS WITH EACH COVARIATE AND THE MAIN EXPOSURE (RECNBIRTH)					
Variable	Parameter Estimate	Std Error	OR	95% CI	Wald P-value
mage	0.00	0.00	1.00	(1.00, 1.01)	0.0381
married	-0.15	0.02	0.86	(0.83, 0.89)	0.0000
mat_ed (REF=12 yrs)					
0-8 years	-0.07	0.04	0.93	(0.85, 1.01)	0.0996
9-11 years	0.06	0.03	1.06	(1.00, 1.13)	0.0373
13-15 years	0.19	0.02	1.21	(1.15, 1.26)	0.0000
≥16 years	0.14	0.02	1.15	(1.10, 1.20)	0.0000
gr_int_state (REF=high int)					
Medium	0.01	0.00	1.01	(1.01, 1.02)	0.0003
Low	-0.05	0.00	0.95	(0.95, 0.96)	0.0000
insured (REF= uninsured)	0.10	0.02	1.11	(1.07, 1.15)	0.0000
mrace (REF=NHW)					
NHB	0.05	0.03	1.05	(1.00, 1.11)	0.0445
Hispanic	0.12	0.02	1.13	(1.08, 1.17)	0.0000
wic_preg (ref=YES)	-0.14	0.02	0.87	(0.84, 0.90)	0.0000
gr_age (REF=25-29)					
15-19	-0.04	0.03	0.96	(0.90, 1.03)	0.2289
20-24	-0.09	0.02	0.91	(0.87, 0.96)	0.0002
30-34	-0.04	0.02	0.96	(0.92, 1.01)	0.0838
35-39	-0.05	0.03	0.96	(0.90, 1.01)	0.1053
40-44	0.06	0.05	1.07	(0.97, 1.18)	0.2072

APPENDIX II

Descriptive Statistics and Modeling

Final Adjusted Model Results

Final Model Results, 2001-2009

Name	Model	Adj OR for RECNBIRTH	95% CI LL	95% CI UL	Wald P-value	CI Width
Intended model (all races)	P(intended) = β0 + β1(recnbirth12) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(mrace) + γ8(wic_preg)	1.00	0.96	1.05	0.8632	1.0938
Wanted model (all races)	P(wanted) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(mrace) + γ8(wic_preg) + δ9(recnbirth x gr_age)					
	Adj OR - RECNBIRTH for 15-19	1.38	1.10	1.74	0.0059	1.581818182
	Adj OR - RECNBIRTH for 20-24	1.03	0.90	1.18	0.6994	1.311111111
	Adj OR - RECNBIRTH for 25-29	1.12	0.99	1.28	0.0770	1.292929293
	Adj OR - RECNBIRTH for 30-34	0.95	0.83	1.09	0.4658	1.313253012
	Adj OR - RECNBIRTH for 35-39	0.89	0.76	1.06	0.1858	1.394736842
	Adj OR - RECNBIRTH for 40-44	1.01	0.75	1.36	0.9389	1.813333333
Hispanic, intended model	P(intended) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg)	0.97	0.89	1.06	0.5589	1.191011236

NHB, intended model	P(intended) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg)	0.93	0.83	1.05	0.2554	1.265060241
NHW, intended model	P(intended) = β0 + β1(recnbirth) + γ2(mage) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg) + δ8(recnbirth x married)					
	Adj OR - RECNBIRTH for married vs other	1.17	1.04	1.31	0.0093	1.259615385
Hispanic, wanted model	P(wanted) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg)	0.95	0.81	1.12	0.5464	1.382716049
NHB, wanted model	P(wanted) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg)	1.09	0.95	1.24	0.2283	1.305263158
NHW, wanted model	P(wanted) = β0 + β1(recnbirth) + γ2(gr_age) + γ3(married) + γ4(mat_ed) + γ5(gr_int_state) + γ6(insured) + γ7(wic_preg)	1.04	0.96	1.13	0.3620	1.177083333

APPENDIX III

Pregnancy Intention & GFR Plots

State GFR Tables

Table 27. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women for All States Available Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2010

	Total Women[b]	Total Births	GFR [c]	NHW Women	NHB Women	Hisp Women[f]	NHW GFR	NHB GFR	Hisp GFR	NHW Births	NHB Births	Hisp Births
2000	10,704,638	691,698	64.6	8,289,237	1,466,950	948,451	59.5	71.2	103.3	489,352	104,413	97,933
2001	10,683,212	693,805	64.9	8,218,413	1,468,375	996,424	60.0	69.1	104.9	487,811	101,468	104,526
2002	10,640,475	689,618	64.8	8,130,430	1,468,737	1,041,308	60.0	67.3	104.1	482,288	98,893	108,437
2003	10,583,939	693,487	65.5	8,035,122	1,466,714	1,082,103	61.2	67.1	100.6	486,212	98,376	108,899
2004	10,536,418	690,399	65.5	7,947,508	1,467,669	1,121,241	61.1	66.9	99.8	480,358	98,155	111,886
2005	10,499,129	689,974	65.7	7,865,827	1,468,728	1,164,574	61.0	67.0	100.2	474,940	98,382	116,652
2006	10,474,531	705,624	67.4	7,789,547	1,474,061	1,210,923	62.3	69.4	101.8	480,087	102,288	123,249
2007	10,439,732	712,921	68.3	7,709,656	1,472,698	1,257,378	62.9	70.3	103.2	479,634	103,484	129,803
2008	10,400,651	706,600	67.9	7,625,694	1,471,506	1,303,451	63.4	70.1	99.0	474,409	103,138	129,053
2009	10,366,046	690,258	66.6	7,546,277	1,471,425	1,348,344	61.7	68.5	91.9	465,603	100,808	123,847
2010	10,345,521	666,227	64.4	7,484,358	1,472,636	1,388,527	60.6	66.4	82.5	453,844	97,765	114,618

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 28. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Arkansas Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	552,167	36,899	66.8	429,640	102,790	19,737	62.5	77.3	116.3	26,657	7,946	2,296
2001	550,432	36,098	65.6	426,274	102,393	21,765	61.8	72.5	119.3	26,081	7,420	2,597
2002	548,145	36,395	66.4	422,330	101,979	23,836	61.9	72.6	125.4	26,000	7,407	2,988
2003	547,446	36,800	67.2	419,877	101,462	26,107	63.3	70.8	120.2	26,476	7,185	3,139
2004	548,208	37,528	68.5	418,402	101,561	28,245	64.2	72.3	120.2	26,793	7,339	3,396
2005	550,376	38,028	69.1	417,575	101,751	31,050	64.1	72.8	126.0	26,712	7,403	3,913
2006	553,587	39,788	71.9	416,759	102,932	33,896	66.7	76.2	126.2	27,670	7,842	4,276
2007	553,705	40,211	72.6	414,575	102,770	36,360	67.4	78.4	121.6	27,731	8,058	4,422
2008	553,301	39,547	71.5	411,623	103,042	38,636	66.7	77.9	110.5	27,253	8,026	4,268
2009	552,454	38,698	70.0	408,499	103,192	40,763	66.0	74.0	100.7	26,960	7,632	4,106

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 29. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Colorado Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	936,007	62,911	67.2	721,385	39,226	175,396	58.0	73.6	103.8	41,819	2,888	18,204
2001	948,650	64,290	67.8	724,620	40,153	183,877	57.6	70.5	107.1	41,763	2,829	19,698
2002	952,133	65,600	68.9	720,327	40,792	191,014	58.1	67.7	109.9	41,844	2,760	20,996
2003	948,656	65,998	69.6	711,876	40,372	196,408	59.5	69.3	106.2	42,334	2,796	20,868
2004	945,233	65,346	69.1	703,194	40,968	201,071	58.6	68.1	106.3	41,190	2,791	21,365
2005	946,578	65,884	69.6	698,851	40,900	206,827	59.3	72.2	103.9	41,451	2,951	21,482
2006	951,987	67,612	71.0	697,164	41,760	213,063	60.4	71.1	105.7	42,114	2,968	22,530
2007	958,291	67,118	70.0	696,731	42,124	219,436	60.0	73.7	101.1	41,827	3,106	22,185
2008	965,510	66,424	68.8	696,942	42,843	225,725	59.5	73.1	96.6	41,489	3,132	21,803
2009	972,032	64,898	66.8	696,911	43,582	231,539	59.1	71.3	89.1	41,159	3,107	20,632

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 30. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Hawaii Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	76,687	5,973	77.9	50,809	5,741	20,137	64.5	75.2	112.4	3,278	432	2,263
2001	77,193	5,800	75.1	50,265	6,242	20,686	61.9	78.5	106.2	3,113	490	2,197
2002	77,975	6,008	77.1	50,052	6,648	21,275	63.8	65.9	111.7	3,194	438	2,376
2003	78,288	5,544	70.8	49,980	6,532	21,776	85.5	71.6	36.9	4,273	468	803
2004	79,473	5,623	70.8	50,573	6,412	22,488	85.1	73.9	37.6	4,304	474	845
2005	80,248	5,469	68.2	50,721	6,430	23,097	82.5	59.9	39.0	4,184	385	900
2006	81,283	6,006	73.9	50,986	6,414	23,883	89.8	76.1	39.3	4,579	488	939
2007	81,016	7,821	96.5	50,552	6,093	24,371	88.7	65.6	120.5	4,485	400	2,936
2008	81,980	8,239	100.5	50,717	6,100	25,163	94.6	75.2	118.6	4,796	459	2,984
2009	82,775	8,032	97.0	50,618	6,019	26,138	90.7	66.3	116.4	4,590	399	3,043

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 31. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Illinois Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	2,617,821	176,620	67.5	1,788,738	453,060	376,023	57.7	75.2	104.5	103,260	34,079	39,281
2001	2,605,521	175,605	67.4	1,767,168	449,579	388,774	57.5	73.4	105.3	101,660	32,995	40,950
2002	2,586,457	171,931	66.5	1,740,063	445,867	400,527	57.1	70.9	102.3	99,346	31,604	40,981
2003	2,565,371	173,227	67.5	1,712,631	441,801	410,939	58.1	70.9	103.1	99,562	31,303	42,362
2004	2,546,589	171,214	67.2	1,688,137	438,555	419,897	58.0	70.1	101.4	97,913	30,732	42,569
2005	2,527,823	169,443	67.0	1,663,050	435,473	429,300	57.5	69.8	101.0	95,693	30,408	43,342
2006	2,513,355	170,611	67.9	1,640,343	433,598	439,414	58.0	72.0	100.6	95,200	31,204	44,207
2007	2,503,080	170,796	68.2	1,621,025	431,884	450,171	58.7	73.1	98.0	95,135	31,556	44,105
2008	2,492,921	166,507	66.8	1,601,347	430,101	461,473	58.1	71.7	92.5	92,976	30,840	42,691
2009	2,482,776	161,201	64.9	1,581,583	429,161	472,032	57.5	69.7	85.5	90,929	29,923	40,349

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 32. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Maine Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	262,450	13,190	50.3	258,629	1,553	2,268	50.3	65.0	34.4	13,011	101	78
2001	261,089	13,315	51.0	256,794	1,770	2,525	50.9	79.7	41.6	13,069	141	105
2002	260,087	13,082	50.3	255,385	1,946	2,756	50.3	83.2	27.6	12,844	162	76
2003	258,708	13,350	51.6	253,525	2,211	2,972	51.8	71.0	16.5	13,144	157	49
2004	256,423	13,383	52.2	250,807	2,445	3,171	52.4	77.3	18.9	13,134	189	60
2005	253,961	13,584	53.5	247,910	2,673	3,378	53.7	88.7	13.0	13,303	237	44
2006	250,618	13,665	54.5	244,183	2,900	3,535	54.4	95.2	32.0	13,276	276	113
2007	246,892	13,571	55.0	240,128	3,121	3,643	54.9	97.7	25.3	13,174	305	92
2008	243,358	13,043	53.6	236,238	3,318	3,802	53.4	102.2	22.4	12,619	339	85
2009	238,911	12,951	54.2	231,525	3,476	3,910	54.0	110.5	18.2	12,496	384	71

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 33. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Maryland Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NH B GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	1,127,444	70,458	62.5	690,761	377,860	58,823	59.4	65.3	81.1	41,011	24,674	4,773
2001	1,130,158	69,098	61.1	684,105	382,128	63,925	58.2	62.9	82.3	39,793	24,046	5,259
2002	1,133,213	69,116	61.0	676,910	386,663	69,640	57.7	62.1	86.5	39,087	24,004	6,025
2003	1,133,302	70,041	61.8	667,967	389,892	75,443	58.7	61.8	88.9	39,219	24,114	6,708
2004	1,132,656	69,481	61.3	657,743	393,493	81,420	57.9	61.4	89.3	38,062	24,151	7,268
2005	1,131,631	69,571	61.5	647,271	396,373	87,987	57.3	61.3	93.2	37,057	24,317	8,197
2006	1,128,363	71,922	63.7	635,268	398,581	94,514	58.3	63.7	100.8	37,005	25,394	9,523
2007	1,120,684	72,821	65.0	621,811	398,271	100,602	58.2	65.7	104.3	36,170	26,154	10,497
2008	1,113,288	72,021	64.7	609,368	397,927	105,993	58.5	65.1	98.8	35,628	25,923	10,470
2009	1,106,711	69,522	62.8	598,199	397,628	110,884	56.8	62.8	95.1	34,004	24,978	10,540

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 34. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Michigan Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	2,085,665	123,333	59.1	1,669,644	340,094	75,927	55.4	70.2	91.1	92,551	23,867	6,915
2001	2,069,643	127,044	61.4	1,651,590	338,368	79,685	58.3	69.2	91.6	96,342	23,399	7,303
2002	2,047,470	123,276	60.2	1,628,838	335,917	82,715	57.6	66.1	87.5	93,823	22,215	7,238
2003	2,026,611	123,222	60.8	1,606,844	334,342	85,425	58.3	66.7	85.4	93,623	22,301	7,298
2004	2,005,016	120,875	60.3	1,583,755	333,411	87,850	57.5	66.7	85.9	91,108	22,225	7,542
2005	1,983,896	118,639	59.8	1,560,307	333,187	90,402	56.5	66.4	91.9	88,207	22,126	8,306
2006	1,958,179	118,212	60.4	1,532,547	333,036	92,596	56.9	68.1	90.7	87,151	22,664	8,397
2007	1,927,883	116,773	60.6	1,501,609	331,716	94,558	57.3	66.7	91.7	85,981	22,121	8,671
2008	1,891,718	115,821	61.2	1,466,743	328,942	96,033	57.7	68.2	91.8	84,567	22,442	8,812
2009	1,856,919	112,047	60.3	1,433,624	325,683	97,612	57.3	68.0	80.2	82,086	22,136	7,825

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 35. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Nebraska Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	354,446	23,103	65.2	315,897	16,867	21,682	60.8	80.3	117.5	19,200	1,355	2,548
2001	352,509	23,280	66.0	311,886	17,138	23,485	61.1	79.0	122.6	19,047	1,354	2,879
2002	350,654	23,794	67.9	308,136	17,356	25,162	62.1	81.2	129.7	19,121	1,410	3,263
2003	349,268	24,154	69.2	304,819	17,593	26,856	63.6	80.8	124.3	19,394	1,421	3,339
2004	347,269	24,505	70.6	301,393	17,851	28,025	65.2	85.0	119.0	19,654	1,517	3,334
2005	345,720	24,857	71.9	298,116	18,027	29,577	66.2	84.5	121.2	19,748	1,523	3,586
2006	343,867	25,324	73.6	294,519	18,346	31,002	67.8	93.1	117.8	19,963	1,708	3,653
2007	342,039	25,758	75.3	290,895	18,563	32,581	68.7	96.1	122.0	19,999	1,784	3,975
2008	340,821	25,809	75.7	287,660	18,876	34,285	69.2	91.2	121.7	19,916	1,722	4,171
2009	340,887	25,673	75.3	285,427	19,361	36,099	69.3	90.2	115.1	19,770	1,747	4,156

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 36. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Oklahoma Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	650,068	43,131	66.3	543,561	64,510	41,997	62.8	72.8	102.7	34,120	4,699	4,312
2001	645,728	43,837	67.9	536,070	64,385	45,273	64.1	71.0	108.3	34,360	4,573	4,904
2002	642,726	44,268	68.9	529,980	64,213	48,533	64.9	72.8	107.7	34,370	4,673	5,225
2003	639,430	44,402	69.4	523,769	64,219	51,442	65.6	70.9	107.1	34,338	4,553	5,511
2004	635,661	44,534	70.1	517,518	63,935	54,208	66.1	72.3	105.5	34,194	4,623	5,717
2005	634,109	44,618	70.4	512,630	63,952	57,527	66.2	73.7	103.4	33,954	4,713	5,951
2006	635,619	46,542	73.2	510,108	64,546	60,965	68.4	75.7	110.6	34,909	4,888	6,745
2007	636,423	47,301	74.3	507,181	64,743	64,499	69.6	75.8	109.6	35,321	4,910	7,070
2008	636,343	47,092	74.0	504,068	64,805	67,470	69.8	76.5	103.3	35,168	4,955	6,969
2009	639,000	46,990	73.5	502,402	65,492	71,106	69.1	77.6	101.2	34,715	5,082	7,193

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 37. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Utah Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	505,534	45,027	89.1	452,884	3,960	48,690	85.7	79.3	121.3	38,805	314	5,908
2001	510,997	45,503	89.0	454,926	4,107	51,964	85.0	77.4	125.1	38,682	318	6,503
2002	515,541	46,750	90.7	456,284	4,292	54,965	86.6	70.4	125.8	39,532	302	6,916
2003	518,175	47,400	91.5	456,122	4,358	57,695	88.0	73.7	120.3	40,139	321	6,940
2004	522,251	48,070	92.0	457,422	4,494	60,335	89.0	81.4	116.3	40,690	366	7,014
2005	529,329	49,051	92.7	460,867	4,694	63,768	89.4	89.3	116.7	41,192	419	7,440
2006	537,586	50,751	94.4	465,006	5,013	67,567	90.8	87.8	119.7	42,223	440	8,088
2007	548,244	52,323	95.4	470,317	5,298	72,629	91.1	99.8	123.4	42,834	529	8,960
2008	557,820	52,692	94.5	474,593	5,638	77,589	90.1	96.3	121.3	42,739	543	9,410
2009	566,198	51,625	91.2	478,677	6,089	81,432	88.5	88.2	107.0	42,377	537	8,711

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 38. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in Washington Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	1,167,265	70,402	60.3	1,013,304	48,833	105,128	55.0	67.5	107.8	55,773	3,298	11,331
2001	1,168,707	69,784	59.7	1,007,084	49,968	111,655	54.1	64.4	108.4	54,464	3,216	12,104
2002	1,167,859	68,954	59.0	998,864	51,094	117,901	53.4	63.7	104.5	53,383	3,253	12,318
2003	1,163,878	68,778	59.1	988,206	51,889	123,783	54.5	59.1	95.9	53,841	3,066	11,871
2004	1,166,341	69,305	59.4	982,735	52,564	131,042	54.4	58.9	97.1	53,490	3,094	12,721
2005	1,167,165	70,367	60.3	975,899	53,357	137,909	55.1	60.3	97.3	53,726	3,219	13,422
2006	1,174,078	74,674	63.6	972,862	54,804	146,412	57.8	68.3	100.4	56,240	3,741	14,693
2007	1,177,636	76,888	65.3	967,673	55,746	154,217	58.2	68.2	108.8	56,305	3,803	16,780
2008	1,182,411	78,281	66.2	962,272	57,329	162,810	59.3	68.9	106.1	57,051	3,948	17,282
2009	1,188,107	77,747	65.4	956,902	59,042	172,163	59.1	69.0	99.4	56,558	4,073	17,116

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

Table 39. State-specific, Year-specific General Fertility Rates (GFR) for Non-Hispanic White, Non-Hispanic Black, and Hispanic Women in West Virginia Using U.S. Surveillance, Epidemiology, and End Results Data and U.S. Birth Certificate Data[a], 2000-2009

	Women (All Races)[b]	Births (All Races)	GFR (All Races)[c]	NHW[d] Women	NHB[e] Women	Hispanic Women[f]	NHW GFR	NHB GFR	Hispanic GFR	NHW Births	NHB Births	Hispanic Births
2000	369,084	20,651	56.0	353,985	12,456	2,643	56.1	61.0	9.1	19,867	760	24
2001	362,585	20,151	55.6	347,631	12,144	2,810	55.9	56.6	9.6	19,437	687	27
2002	358,215	20,444	57.1	343,261	11,970	2,984	57.5	55.6	11.7	19,744	665	35
2003	354,806	20,571	58.0	339,506	12,043	3,257	58.5	57.4	3.4	19,869	691	11
2004	351,298	20,535	58.5	335,829	11,980	3,489	59.0	54.6	15.8	19,826	654	55
2005	348,293	20,463	58.8	332,630	11,911	3,752	59.3	57.2	18.4	19,713	681	69
2006	346,009	20,517	59.3	329,802	12,131	4,076	59.9	55.6	20.9	19,757	675	85
2007	343,839	21,540	62.6	327,159	12,369	4,311	63.2	61.3	25.5	20,672	758	110
2008	341,180	21,124	61.9	324,123	12,585	4,472	62.3	64.3	24.2	20,207	809	108
2009	339,276	20,874	61.5	321,910	12,700	4,666	62.0	63.8	22.5	19,959	810	105

[a]Accessed through the CDC WONDER database <wonder.cdc.gov> and the National Vital Statistics System <http://www.cdc.gov/nchs/vitalstats.htm>

[b]All counts are for women aged 15-44 inclusive

[c]Calculated per 1,000 women

[d]Non-Hispanic white women

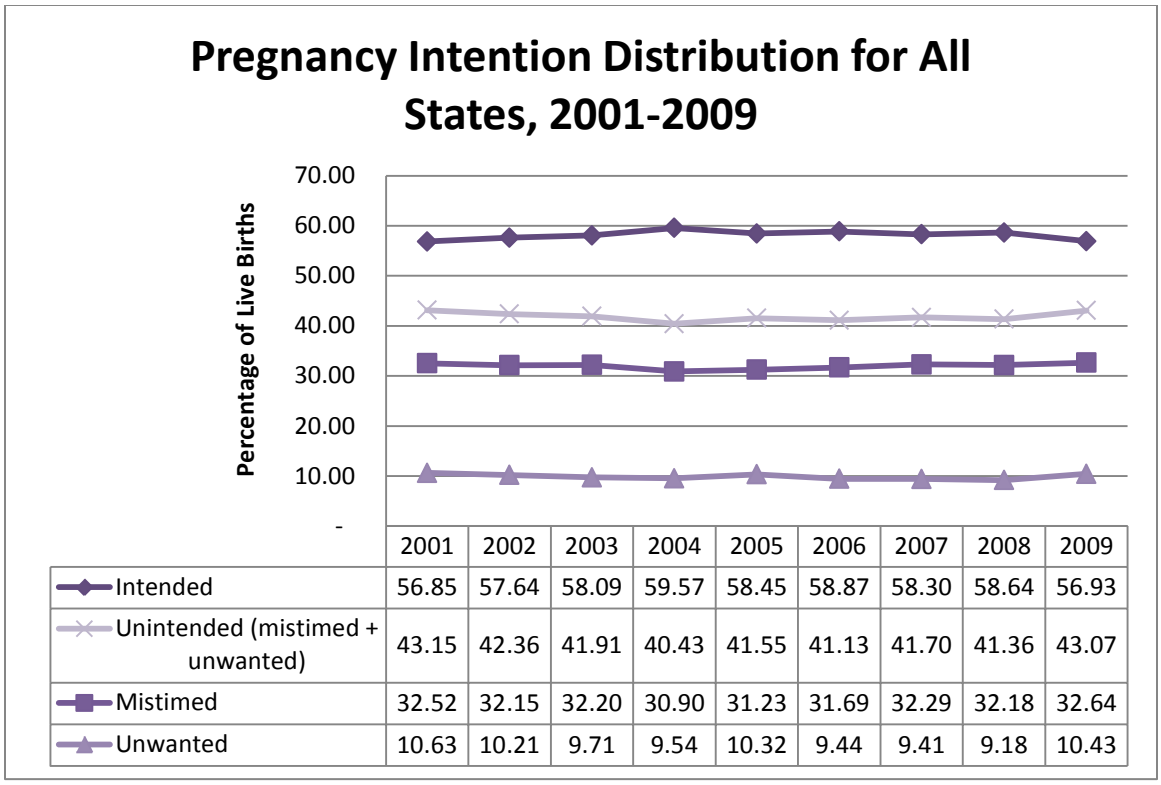
[e]Non-Hispanic black women

[f]The sum of all Hispanic women from each racial background: non-Hispanic white, non-Hispanic black, American Indian/Alaska Native, and Asian/Pacific Islander

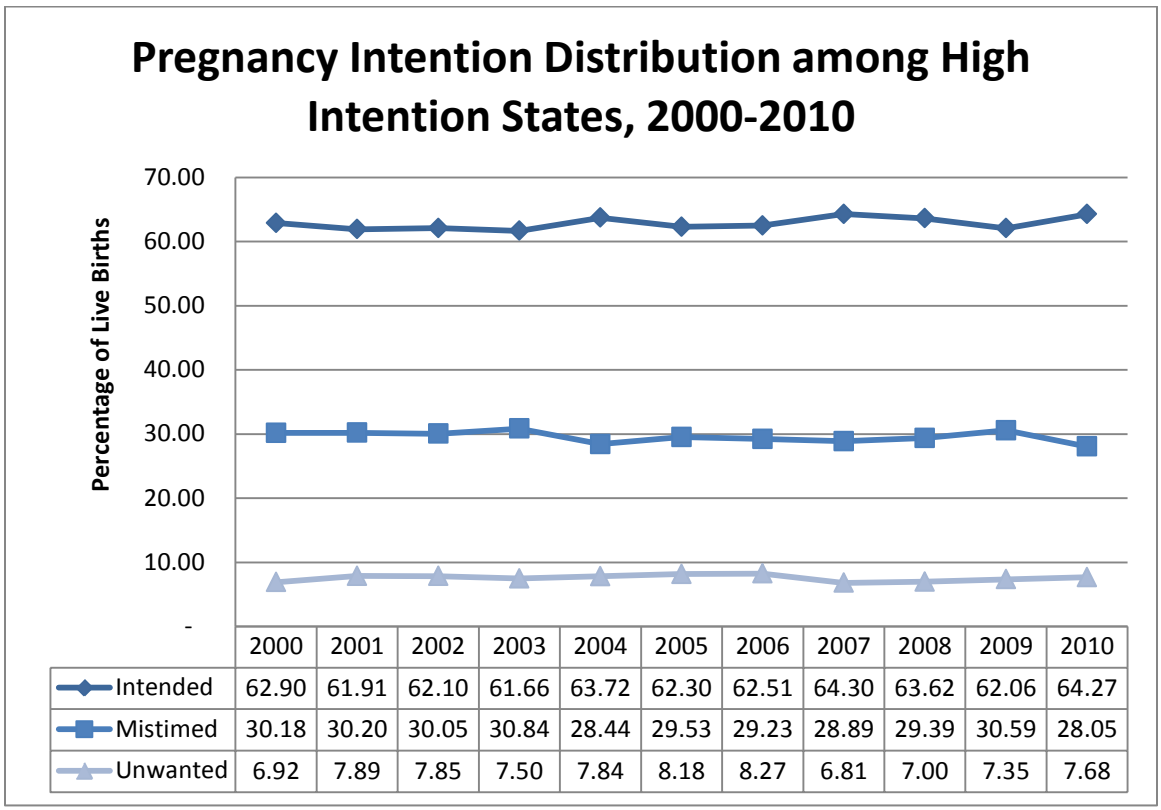
APPENDIX III

Pregnancy Intention & GFR Plots

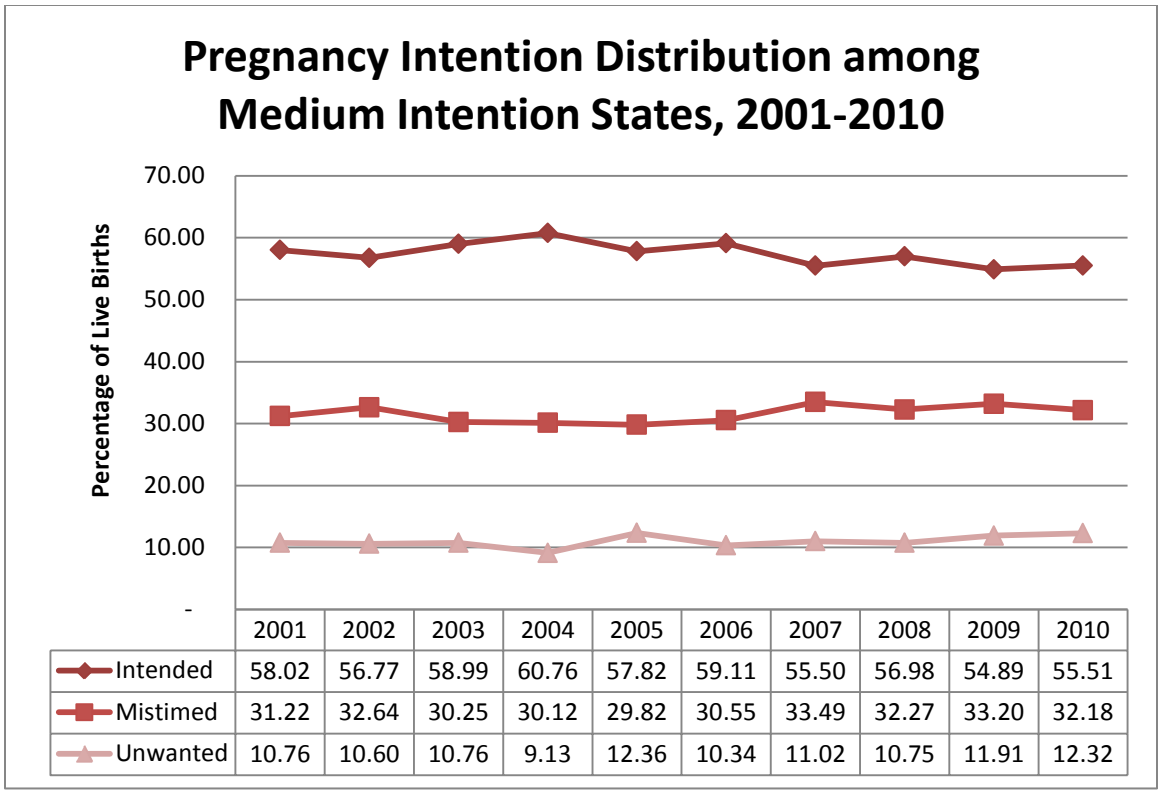
Pregnancy Intention Distribution Plots



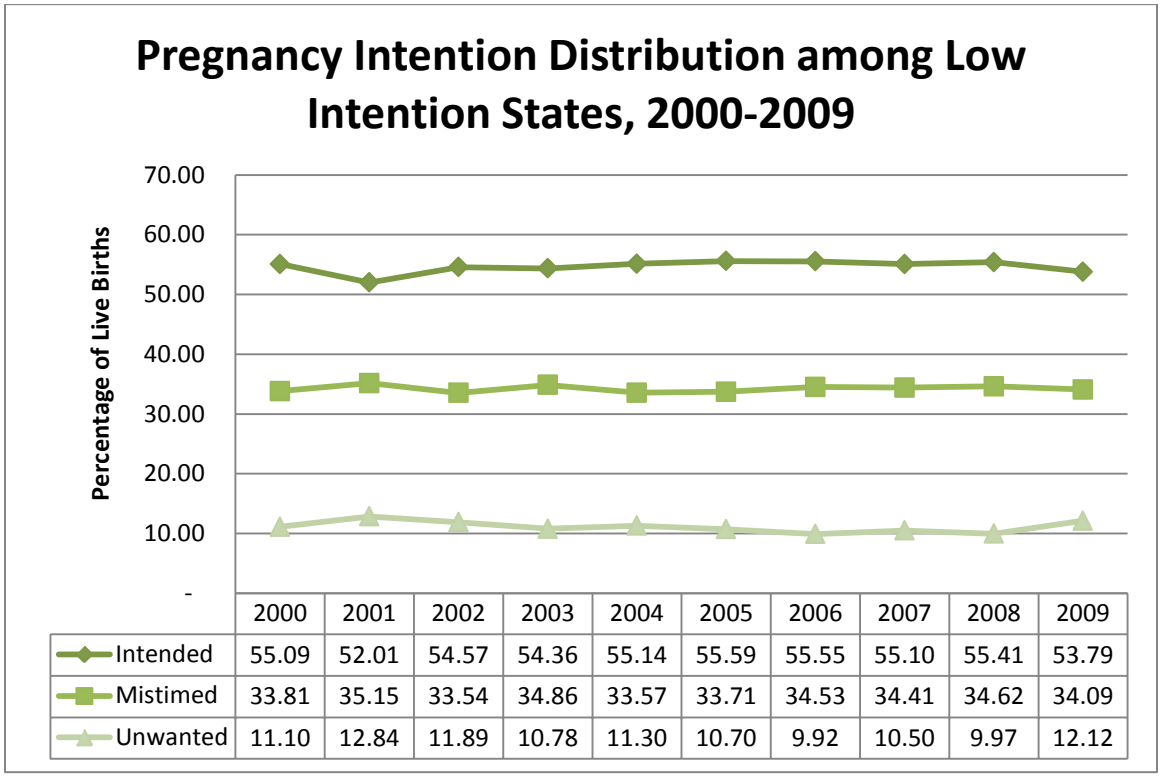
	2001	2002	2003	2004	2005	2006	2007	2008	2009
Intended	56.85	57.64	58.09	59.57	58.45	58.87	58.30	58.64	56.93
Unintended (mistimed + unwanted)	43.15	42.36	41.91	40.43	41.55	41.13	41.70	41.36	43.07
Mistimed	32.52	32.15	32.20	30.90	31.23	31.69	32.29	32.18	32.64
Unwanted	10.63	10.21	9.71	9.54	10.32	9.44	9.41	9.18	10.43



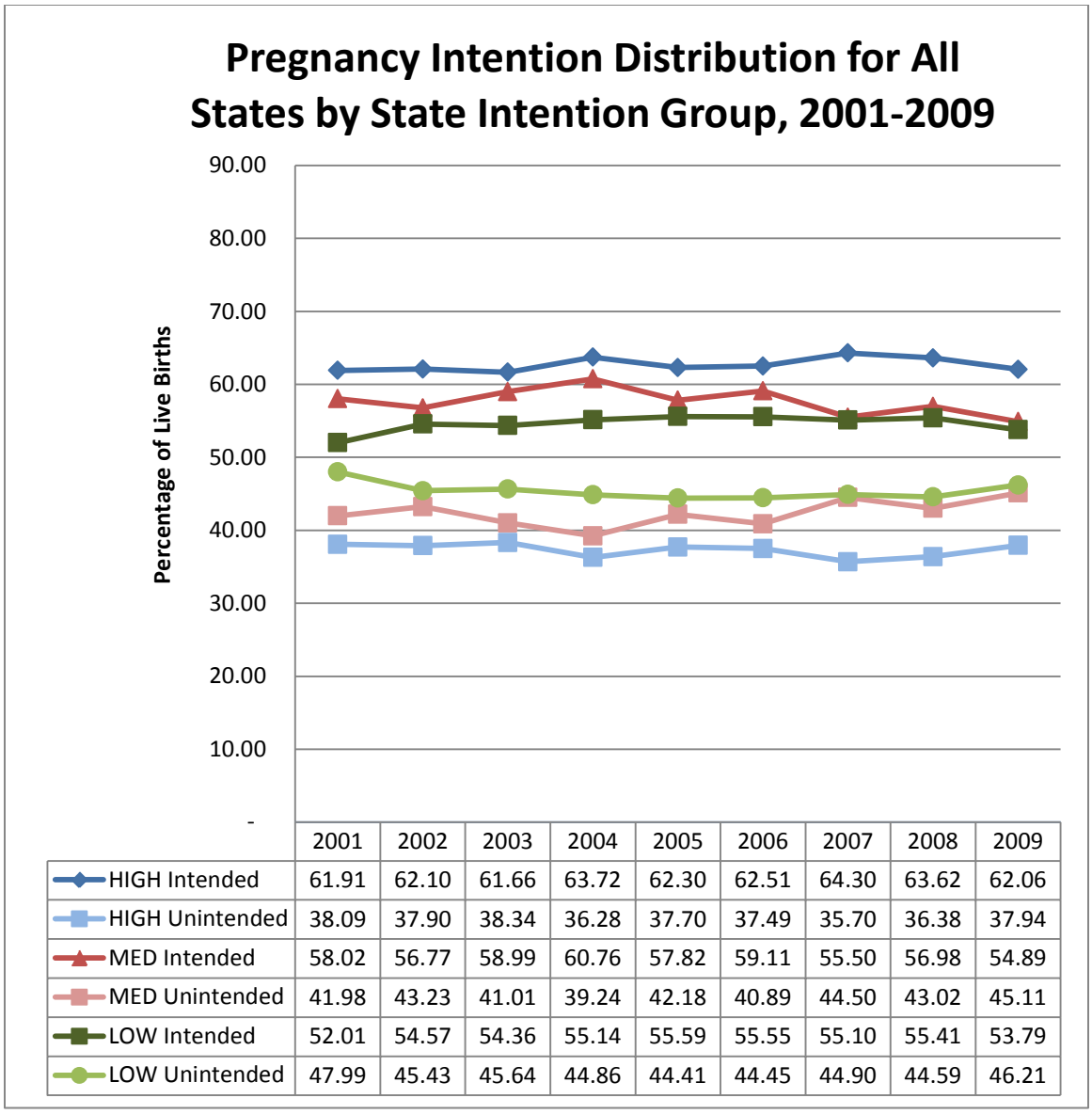
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Intended	62.90	61.91	62.10	61.66	63.72	62.30	62.51	64.30	63.62	62.06	64.27
Mistimed	30.18	30.20	30.05	30.84	28.44	29.53	29.23	28.89	29.39	30.59	28.05
Unwanted	6.92	7.89	7.85	7.50	7.84	8.18	8.27	6.81	7.00	7.35	7.68



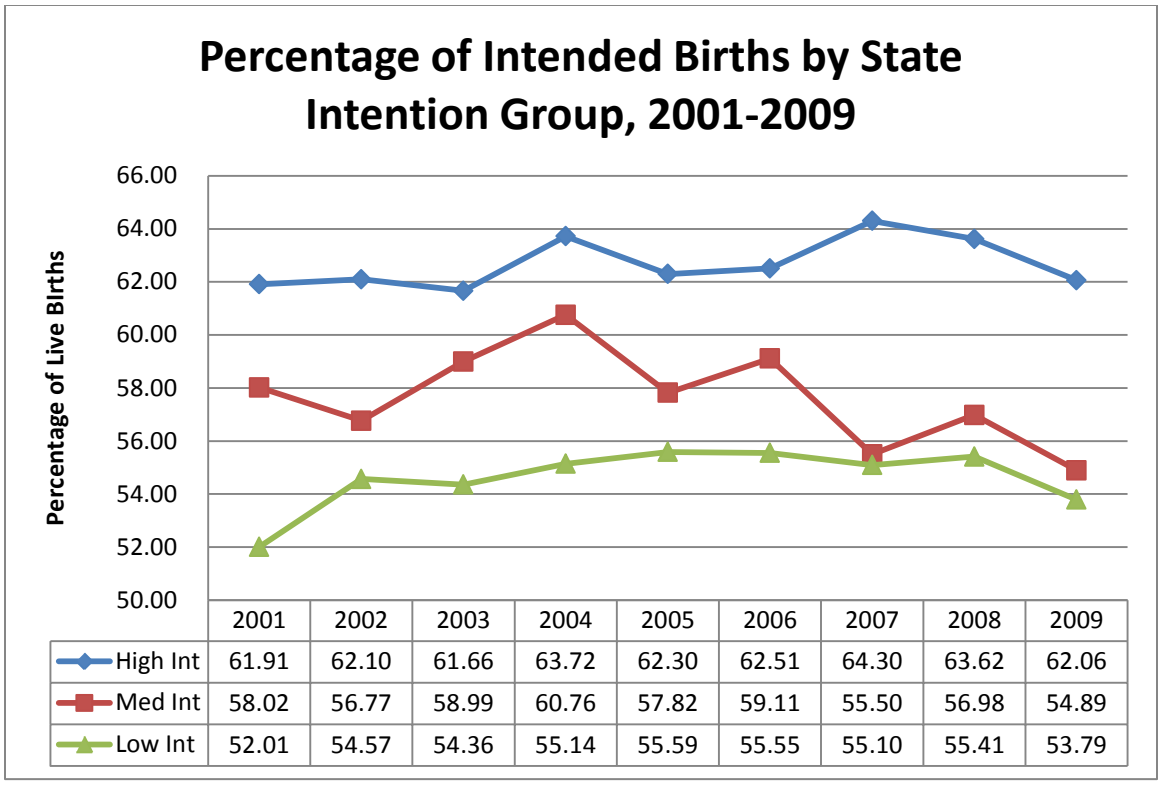
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Intended	58.02	56.77	58.99	60.76	57.82	59.11	55.50	56.98	54.89	55.51
Mistimed	31.22	32.64	30.25	30.12	29.82	30.55	33.49	32.27	33.20	32.18
Unwanted	10.76	10.60	10.76	9.13	12.36	10.34	11.02	10.75	11.91	12.32



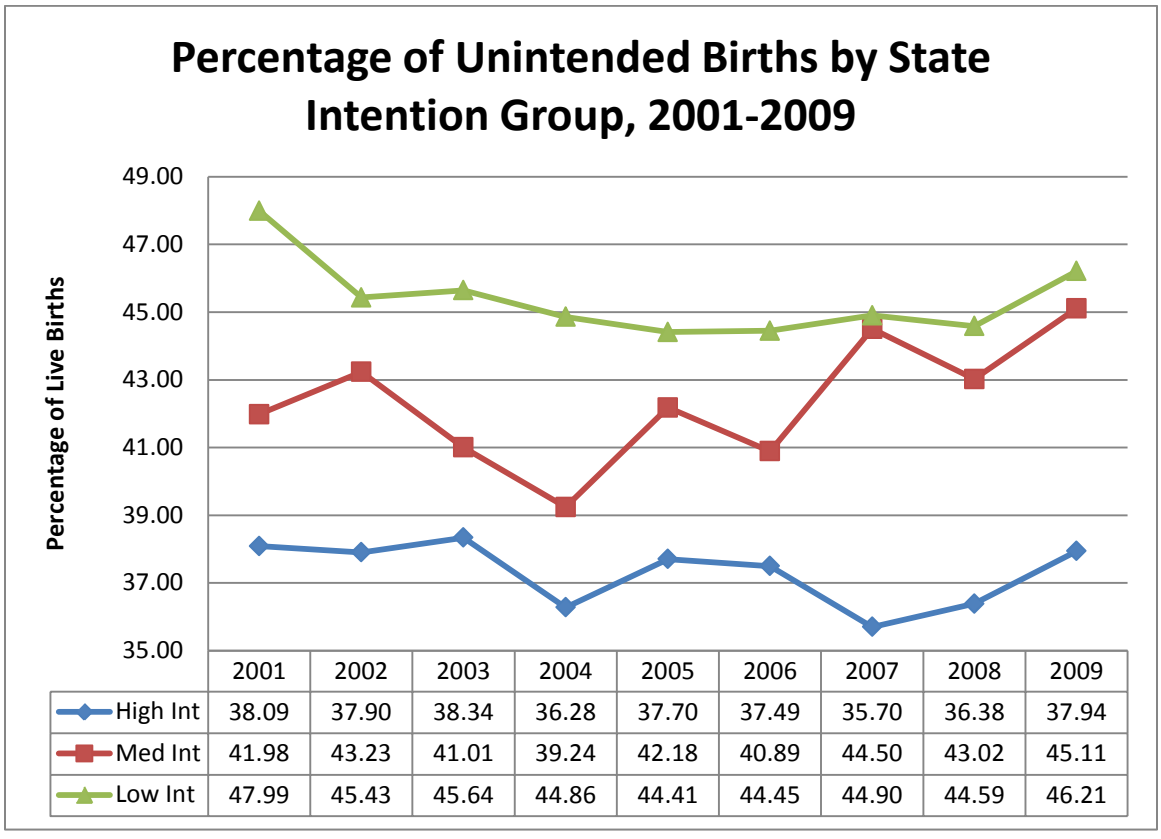
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Intended	55.09	52.01	54.57	54.36	55.14	55.59	55.55	55.10	55.41	53.79
Mistimed	33.81	35.15	33.54	34.86	33.57	33.71	34.53	34.41	34.62	34.09
Unwanted	11.10	12.84	11.89	10.78	11.30	10.70	9.92	10.50	9.97	12.12



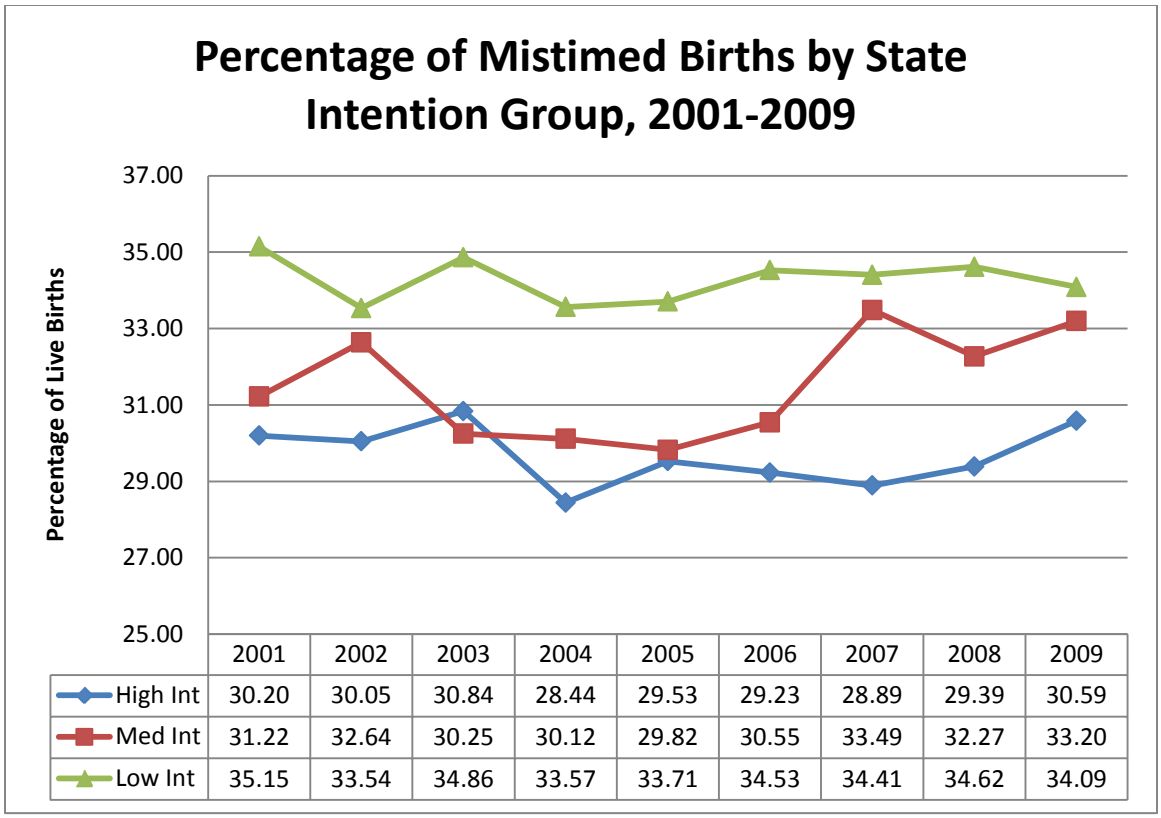
	2001	2002	2003	2004	2005	2006	2007	2008	2009
HIGH Intended	61.91	62.10	61.66	63.72	62.30	62.51	64.30	63.62	62.06
HIGH Unintended	38.09	37.90	38.34	36.28	37.70	37.49	35.70	36.38	37.94
MED Intended	58.02	56.77	58.99	60.76	57.82	59.11	55.50	56.98	54.89
MED Unintended	41.98	43.23	41.01	39.24	42.18	40.89	44.50	43.02	45.11
LOW Intended	52.01	54.57	54.36	55.14	55.59	55.55	55.10	55.41	53.79
LOW Unintended	47.99	45.43	45.64	44.86	44.41	44.45	44.90	44.59	46.21



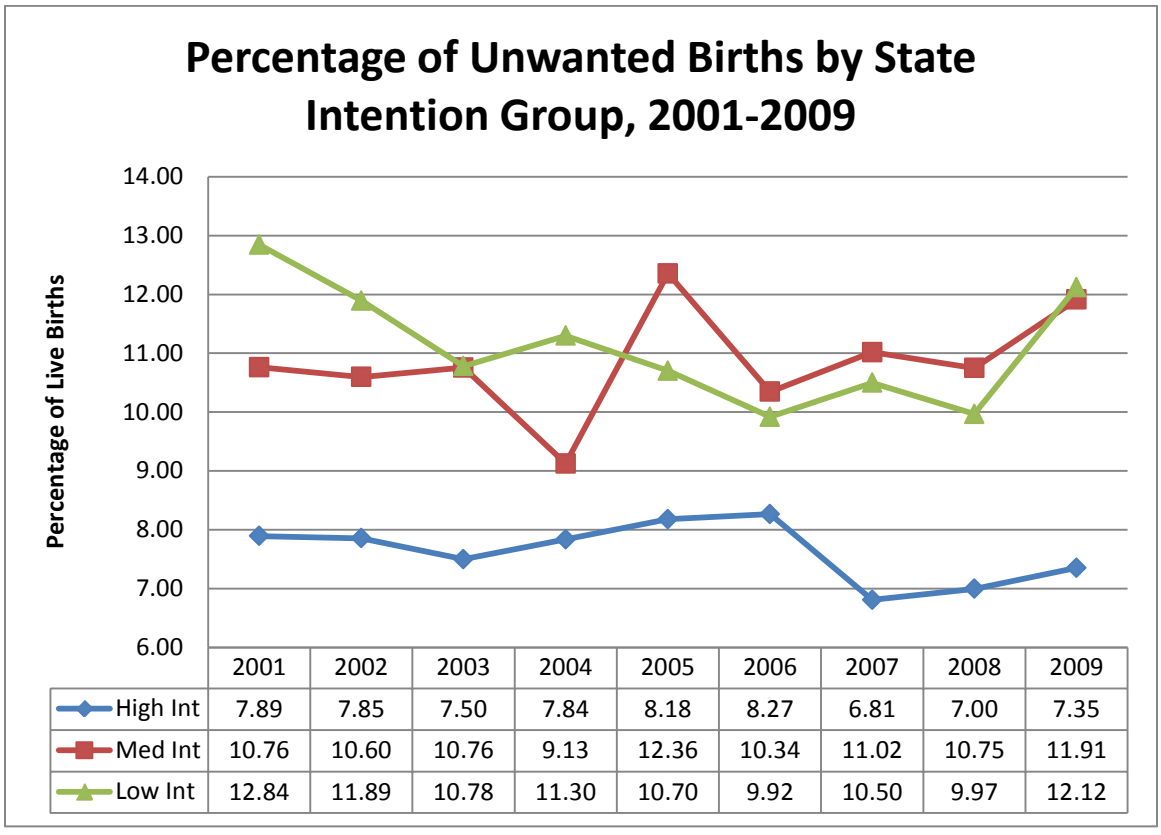
	2001	2002	2003	2004	2005	2006	2007	2008	2009
High Int	61.91	62.10	61.66	63.72	62.30	62.51	64.30	63.62	62.06
Med Int	58.02	56.77	58.99	60.76	57.82	59.11	55.50	56.98	54.89
Low Int	52.01	54.57	54.36	55.14	55.59	55.55	55.10	55.41	53.79



	2001	2002	2003	2004	2005	2006	2007	2008	2009
High Int	38.09	37.90	38.34	36.28	37.70	37.49	35.70	36.38	37.94
Med Int	41.98	43.23	41.01	39.24	42.18	40.89	44.50	43.02	45.11
Low Int	47.99	45.43	45.64	44.86	44.41	44.45	44.90	44.59	46.21



	2001	2002	2003	2004	2005	2006	2007	2008	2009
High Int	30.20	30.05	30.84	28.44	29.53	29.23	28.89	29.39	30.59
Med Int	31.22	32.64	30.25	30.12	29.82	30.55	33.49	32.27	33.20
Low Int	35.15	33.54	34.86	33.57	33.71	34.53	34.41	34.62	34.09

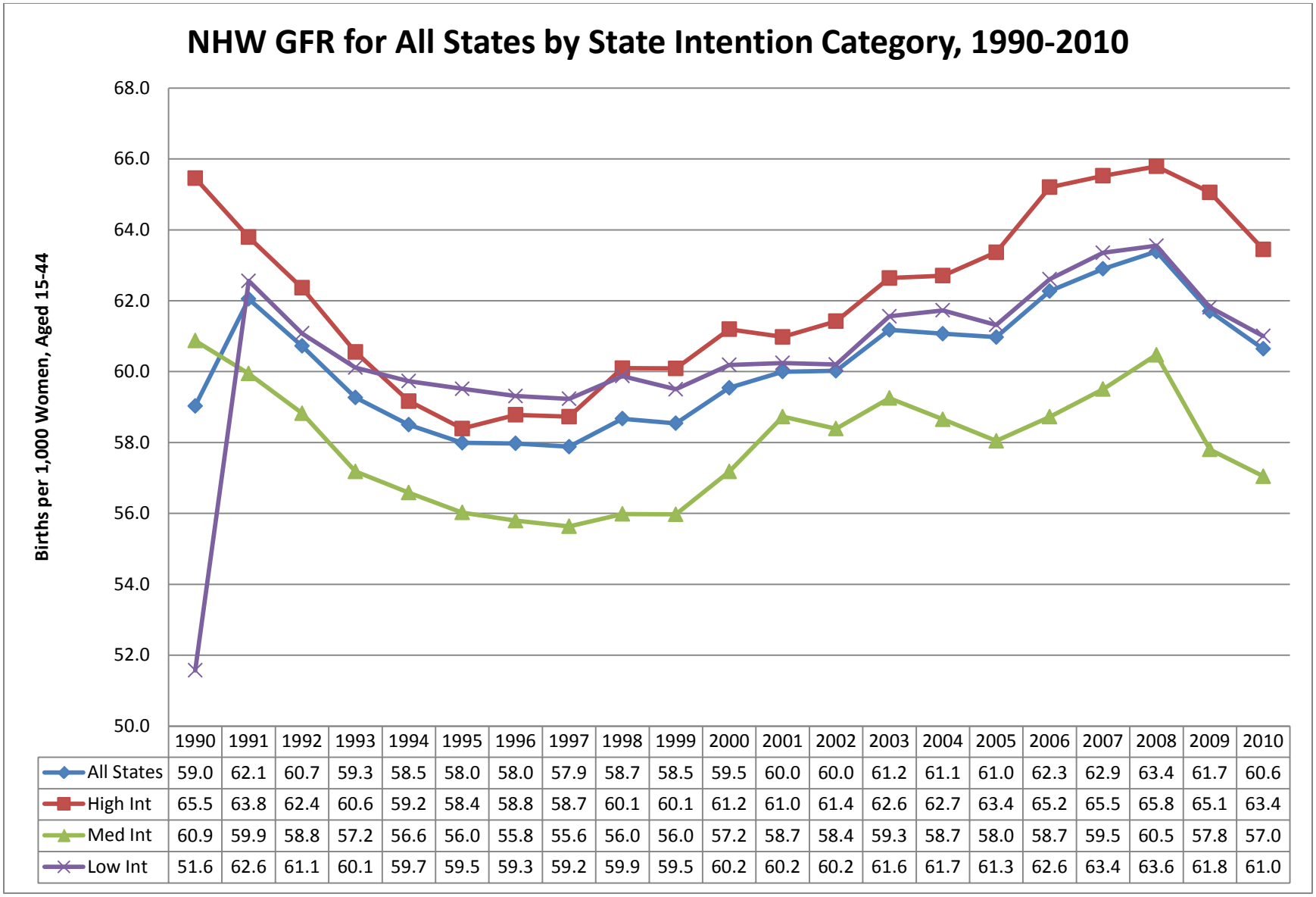


	2001	2002	2003	2004	2005	2006	2007	2008	2009
High Int	7.89	7.85	7.50	7.84	8.18	8.27	6.81	7.00	7.35
Med Int	10.76	10.60	10.76	9.13	12.36	10.34	11.02	10.75	11.91
Low Int	12.84	11.89	10.78	11.30	10.70	9.92	10.50	9.97	12.12

APPENDIX III

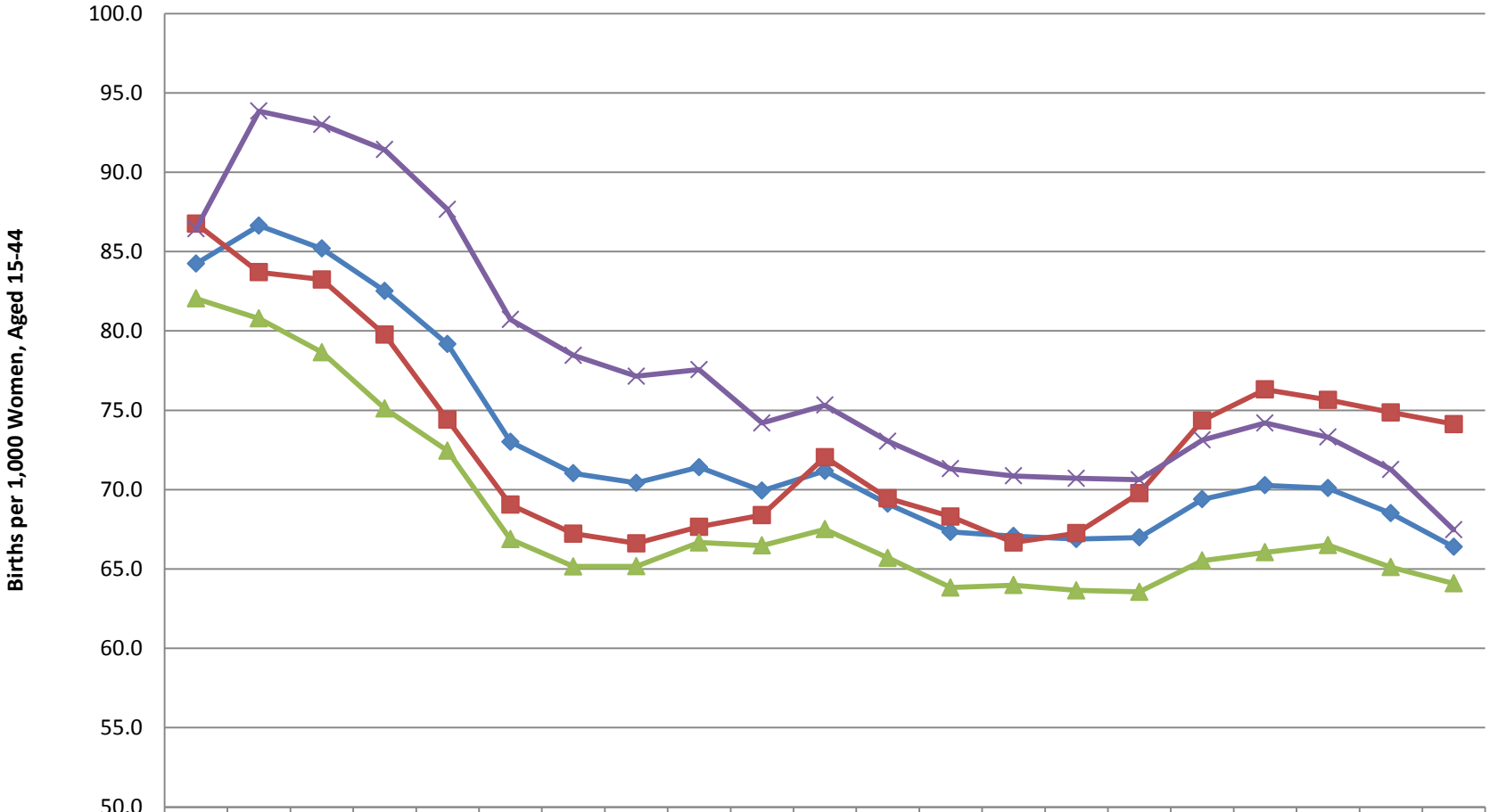
Pregnancy Intention & GFR Plots

Race-Specific & Age-Specific GFRs



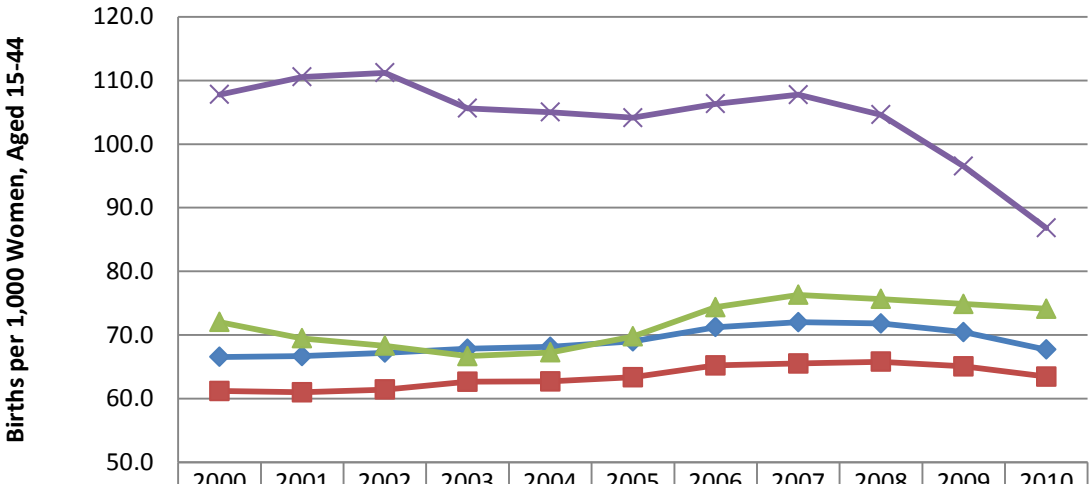
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All States	59.0	62.1	60.7	59.3	58.5	58.0	58.0	57.9	58.7	58.5	59.5	60.0	60.0	61.2	61.1	61.0	62.3	62.9	63.4	61.7	60.6
High Int	65.5	63.8	62.4	60.6	59.2	58.4	58.8	58.7	60.1	60.1	61.2	61.0	61.4	62.6	62.7	63.4	65.2	65.5	65.8	65.1	63.4
Med Int	60.9	59.9	58.8	57.2	56.6	56.0	55.8	55.6	56.0	56.0	57.2	58.7	58.4	59.3	58.7	58.0	58.7	59.5	60.5	57.8	57.0
Low Int	51.6	62.6	61.1	60.1	59.7	59.5	59.3	59.2	59.9	59.5	60.2	60.2	60.2	61.6	61.7	61.3	62.6	63.4	63.6	61.8	61.0

NHB GFR for All States by State Intention Category, 1990-2010



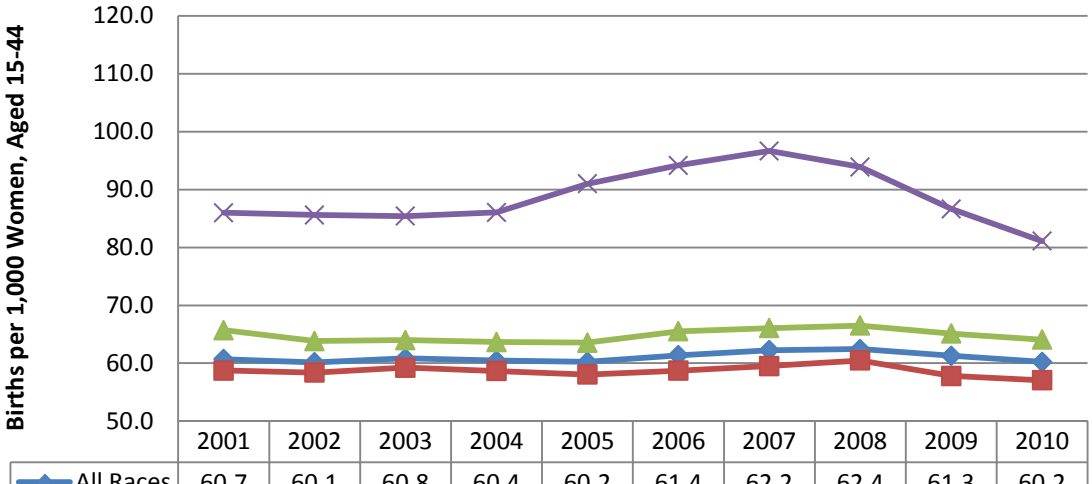
	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All States	84.2	86.6	85.2	82.5	79.2	73.0	71.0	70.4	71.4	69.9	71.2	69.1	67.3	67.1	66.9	67.0	69.4	70.3	70.1	68.5	66.4
High Int	86.8	83.7	83.2	79.8	74.4	69.1	67.2	66.6	67.7	68.4	72.0	69.5	68.3	66.7	67.2	69.8	74.4	76.3	75.7	74.9	74.1
Med Int	82.0	80.8	78.7	75.1	72.4	66.9	65.2	65.2	66.7	66.5	67.5	65.7	63.8	64.0	63.7	63.6	65.5	66.1	66.5	65.1	64.1
Low Int	86.4	93.8	93.0	91.4	87.6	80.7	78.5	77.1	77.6	74.2	75.3	73.0	71.3	70.9	70.7	70.6	73.1	74.2	73.3	71.3	67.5

Race-Specific GFRs for High Intention States, 2000-2010

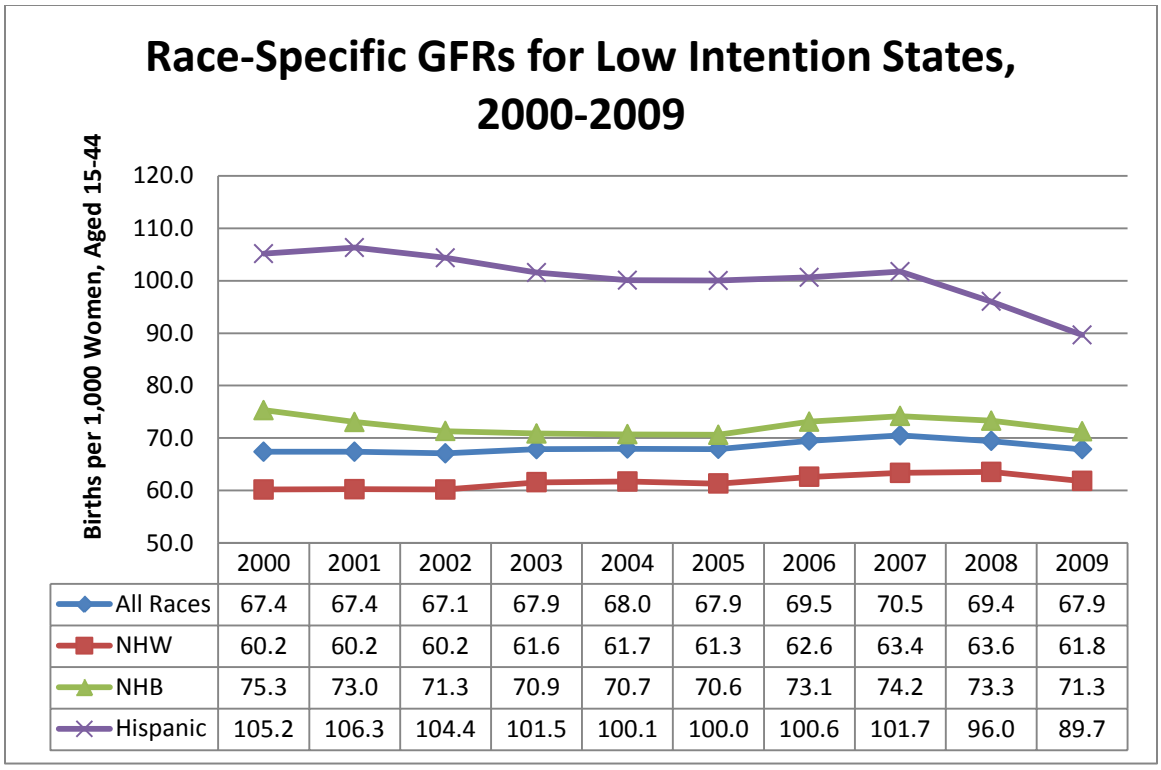


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	66.5	66.7	67.2	67.8	68.1	69.0	71.2	72.0	71.8	70.4	67.7
NHW	61.2	61.0	61.4	62.6	62.7	63.4	65.2	65.5	65.8	65.1	63.4
NHB	72.0	69.5	68.3	66.7	67.2	69.8	74.4	76.3	75.7	74.9	74.1
Hispanic	107.8	110.5	111.2	105.6	105.0	104.1	106.3	107.8	104.6	96.5	86.8

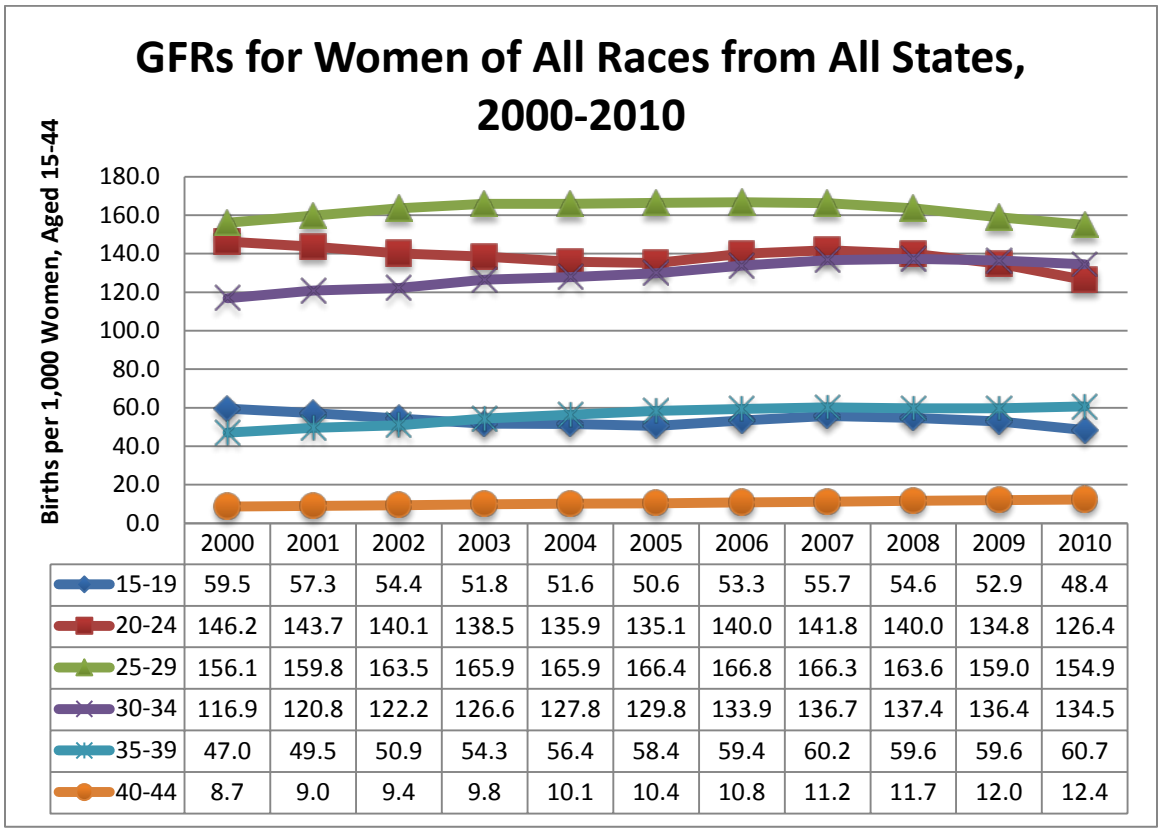
Race-Specific GFRs for Medium Intention States, 2001-2010



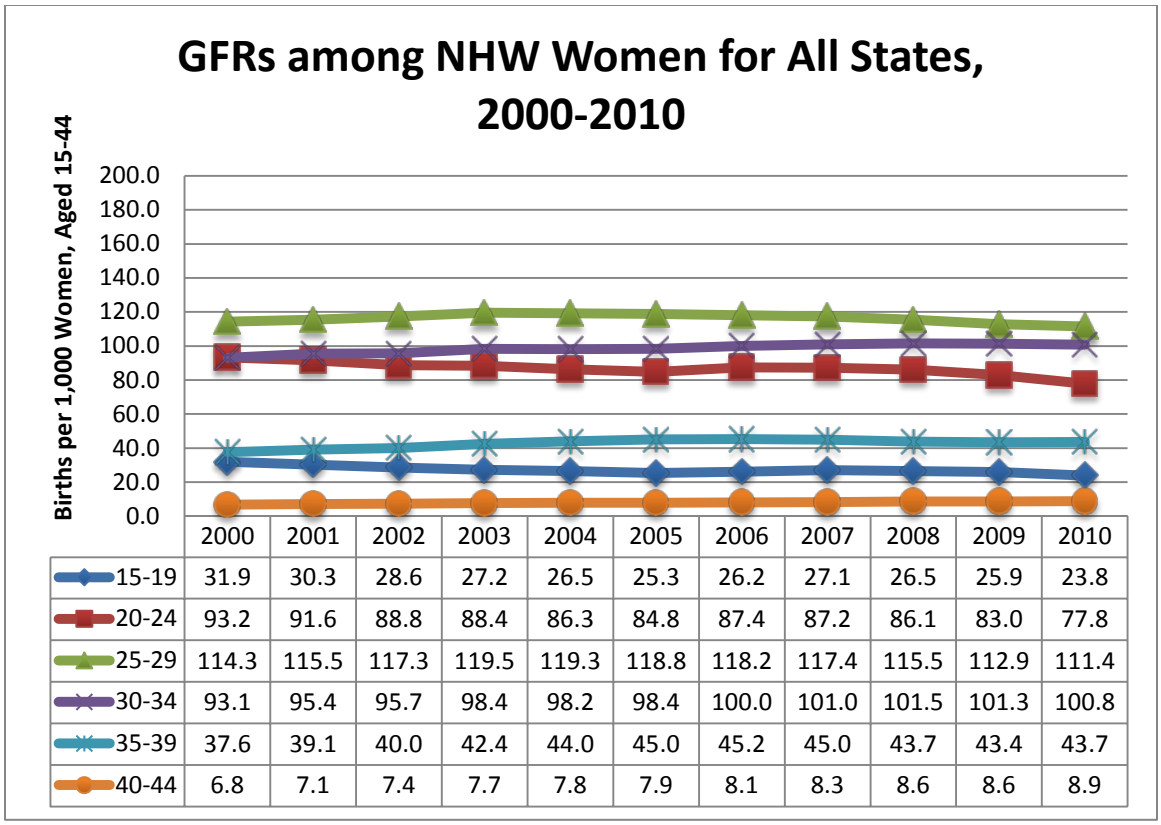
	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	60.7	60.1	60.8	60.4	60.2	61.4	62.2	62.4	61.3	60.2
NHW	58.7	58.4	59.3	58.7	58.0	58.7	59.5	60.5	57.8	57.0
NHB	65.7	63.8	64.0	63.7	63.6	65.5	66.1	66.5	65.1	64.1
Hispanic	86.0	85.6	85.4	86.0	91.0	94.2	96.6	93.9	86.6	81.1



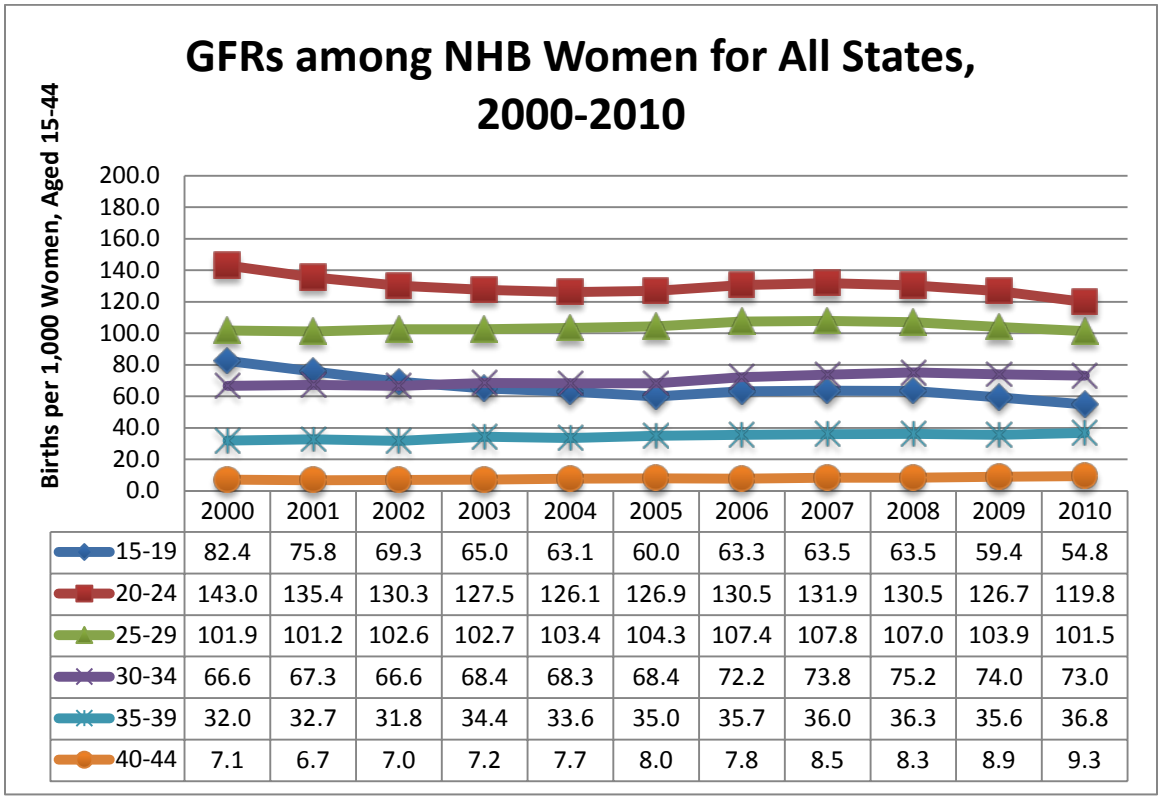
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
All Races	67.4	67.4	67.1	67.9	68.0	67.9	69.5	70.5	69.4	67.9
NHW	60.2	60.2	60.2	61.6	61.7	61.3	62.6	63.4	63.6	61.8
NHB	75.3	73.0	71.3	70.9	70.7	70.6	73.1	74.2	73.3	71.3
Hispanic	105.2	106.3	104.4	101.5	100.1	100.0	100.6	101.7	96.0	89.7



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
15-19	59.5	57.3	54.4	51.8	51.6	50.6	53.3	55.7	54.6	52.9	48.4
20-24	146.2	143.7	140.1	138.5	135.9	135.1	140.0	141.8	140.0	134.8	126.4
25-29	156.1	159.8	163.5	165.9	165.9	166.4	166.8	166.3	163.6	159.0	154.9
30-34	116.9	120.8	122.2	126.6	127.8	129.8	133.9	136.7	137.4	136.4	134.5
35-39	47.0	49.5	50.9	54.3	56.4	58.4	59.4	60.2	59.6	59.6	60.7
40-44	8.7	9.0	9.4	9.8	10.1	10.4	10.8	11.2	11.7	12.0	12.4

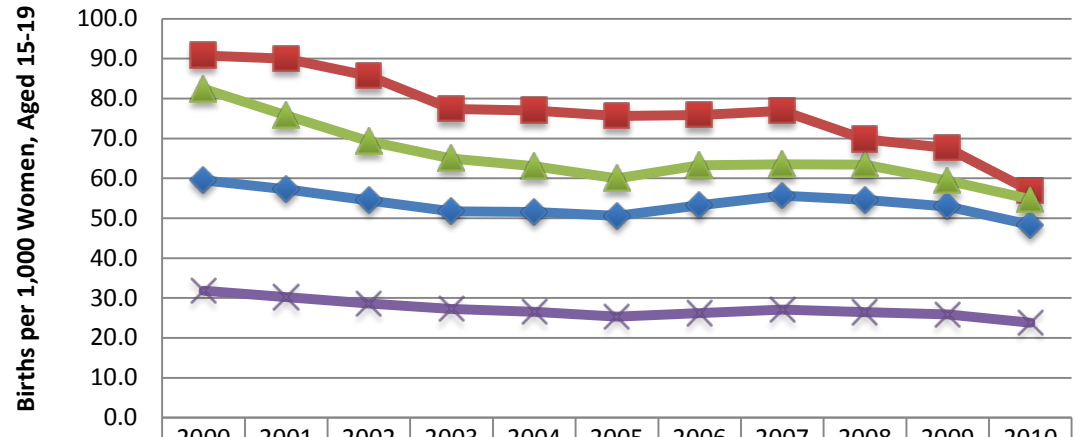


	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
15-19	31.9	30.3	28.6	27.2	26.5	25.3	26.2	27.1	26.5	25.9	23.8
20-24	93.2	91.6	88.8	88.4	86.3	84.8	87.4	87.2	86.1	83.0	77.8
25-29	114.3	115.5	117.3	119.5	119.3	118.8	118.2	117.4	115.5	112.9	111.4
30-34	93.1	95.4	95.7	98.4	98.2	98.4	100.0	101.0	101.5	101.3	100.8
35-39	37.6	39.1	40.0	42.4	44.0	45.0	45.2	45.0	43.7	43.4	43.7
40-44	6.8	7.1	7.4	7.7	7.8	7.9	8.1	8.3	8.6	8.6	8.9



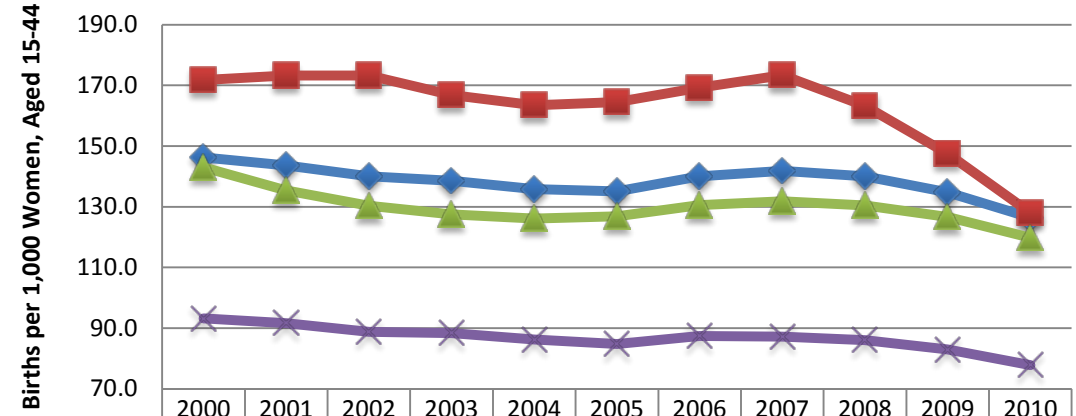
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
15-19	82.4	75.8	69.3	65.0	63.1	60.0	63.3	63.5	63.5	59.4	54.8
20-24	143.0	135.4	130.3	127.5	126.1	126.9	130.5	131.9	130.5	126.7	119.8
25-29	101.9	101.2	102.6	102.7	103.4	104.3	107.4	107.8	107.0	103.9	101.5
30-34	66.6	67.3	66.6	68.4	68.3	68.4	72.2	73.8	75.2	74.0	73.0
35-39	32.0	32.7	31.8	34.4	33.6	35.0	35.7	36.0	36.3	35.6	36.8
40-44	7.1	6.7	7.0	7.2	7.7	8.0	7.8	8.5	8.3	8.9	9.3

GFRs among 15-19 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



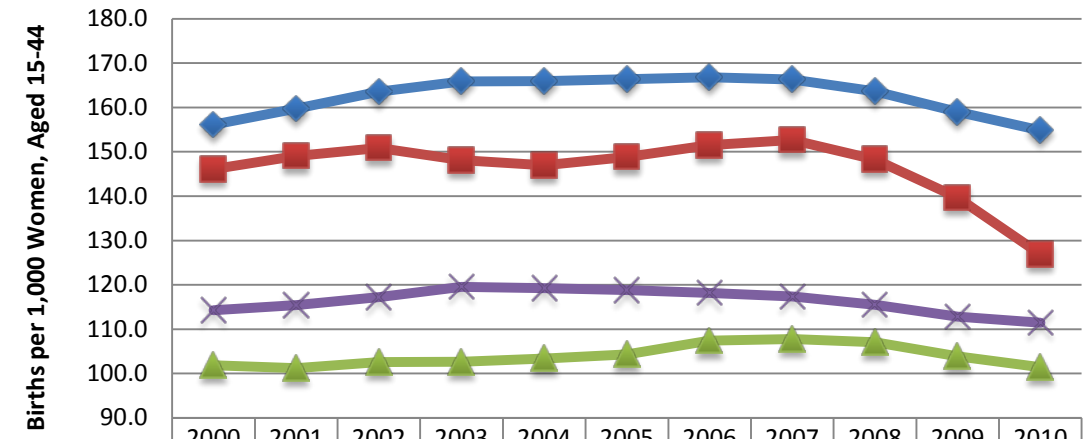
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	59.5	57.3	54.4	51.8	51.6	50.6	53.3	55.7	54.6	52.9	48.4
Hispanic	90.8	90.0	85.7	77.4	77.0	75.6	75.9	76.9	69.8	67.6	56.9
NHB	82.4	75.8	69.3	65.0	63.1	60.0	63.3	63.5	63.5	59.4	54.8
NHW	31.9	30.3	28.6	27.2	26.5	25.3	26.2	27.1	26.5	25.9	23.8

GFRs among 20-24 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



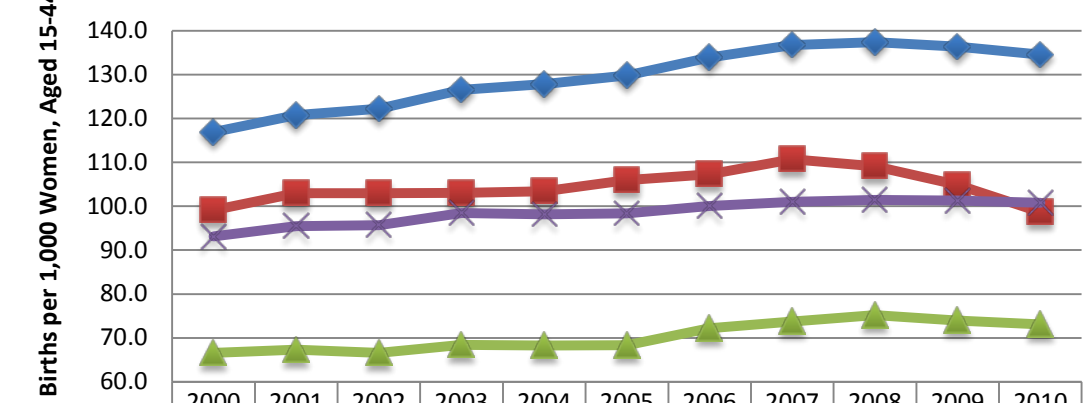
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	146.2	143.7	140.1	138.5	135.9	135.1	140.0	141.8	140.0	134.8	126.4
Hispanic	171.8	173.2	173.3	166.8	163.5	164.5	169.3	173.3	163.2	147.6	128.0
NHB	143.0	135.4	130.3	127.5	126.1	126.9	130.5	131.9	130.5	126.7	119.8
NHW	93.2	91.6	88.8	88.4	86.3	84.8	87.4	87.2	86.1	83.0	77.8

GFRs among 25-29 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



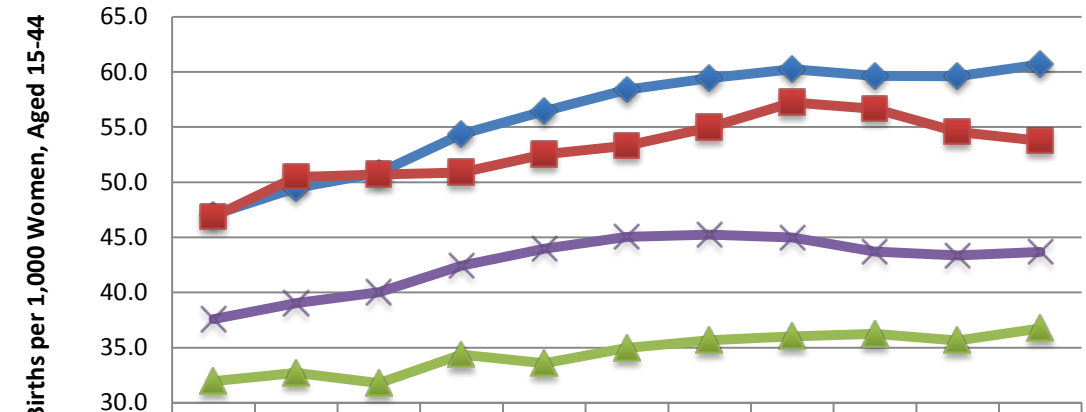
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	156.1	159.8	163.5	165.9	165.9	166.4	166.8	166.3	163.6	159.0	154.9
Hispanic	146.1	149.1	150.9	148.2	147.0	148.8	151.5	152.7	148.2	139.7	126.9
NHB	101.9	101.2	102.6	102.7	103.4	104.3	107.4	107.8	107.0	103.9	101.5
NHW	114.3	115.5	117.3	119.5	119.3	118.8	118.2	117.4	115.5	112.9	111.4

GFRs among 30-34 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



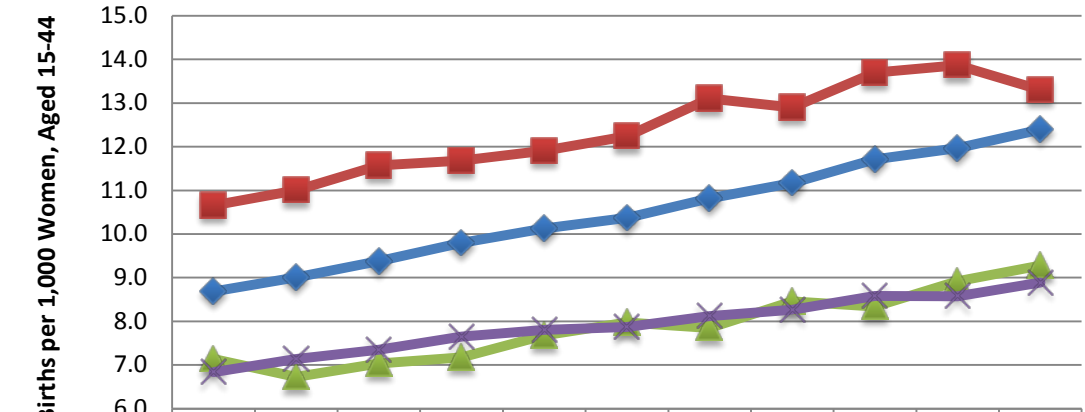
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	116.9	120.8	122.2	126.6	127.8	129.8	133.9	136.7	137.4	136.4	134.5
Hispanic	99.1	103.0	102.9	103.1	103.4	106.0	107.3	110.7	109.1	104.9	98.7
NHB	66.6	67.3	66.6	68.4	68.3	68.4	72.2	73.8	75.2	74.0	73.0
NHW	93.1	95.4	95.7	98.4	98.2	98.4	100.0	101.0	101.5	101.3	100.8

GFRs among 35-39 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	47.0	49.5	50.9	54.3	56.4	58.4	59.4	60.2	59.6	59.6	60.7
Hispanic	46.9	50.5	50.7	50.9	52.5	53.3	55.0	57.2	56.7	54.6	53.7
NHB	32.0	32.7	31.8	34.4	33.6	35.0	35.7	36.0	36.3	35.6	36.8
NHW	37.6	39.1	40.0	42.4	44.0	45.0	45.2	45.0	43.7	43.4	43.7

GFRs among 40-44 Year Olds, by Race and Hispanic Origin for All States, 2000-2010



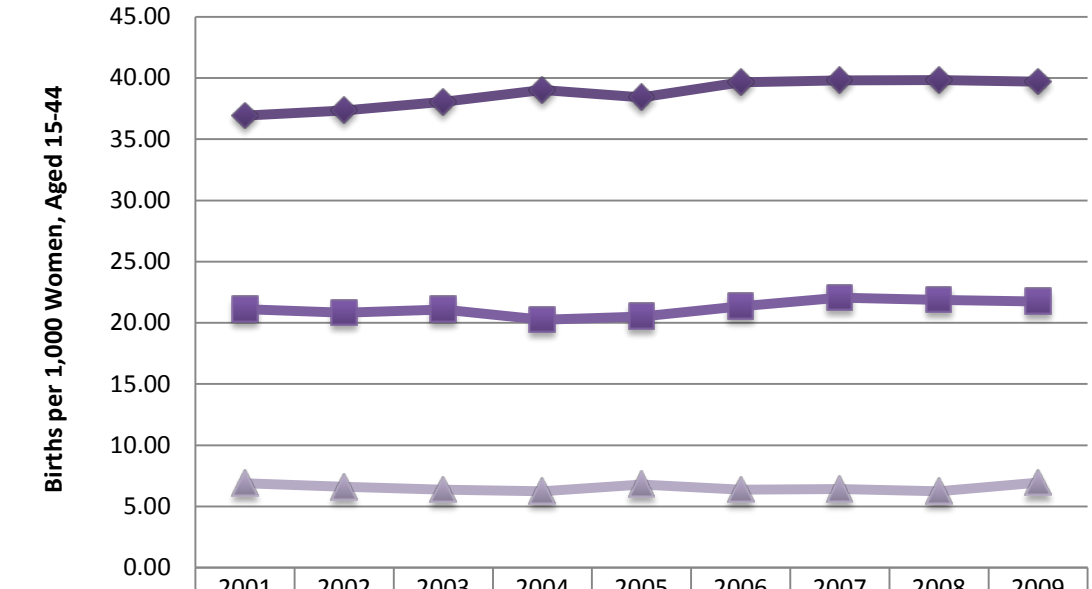
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
All Races	8.7	9.0	9.4	9.8	10.1	10.4	10.8	11.2	11.7	12.0	12.4
Hispanic	10.7	11.0	11.6	11.7	11.9	12.2	13.1	12.9	13.7	13.9	13.3
NHB	7.1	6.7	7.0	7.2	7.7	8.0	7.8	8.5	8.3	8.9	9.3
NHW	6.8	7.1	7.4	7.7	7.8	7.9	8.1	8.3	8.6	8.6	8.9

APPENDIX III

Pregnancy Intention & GFR Plots

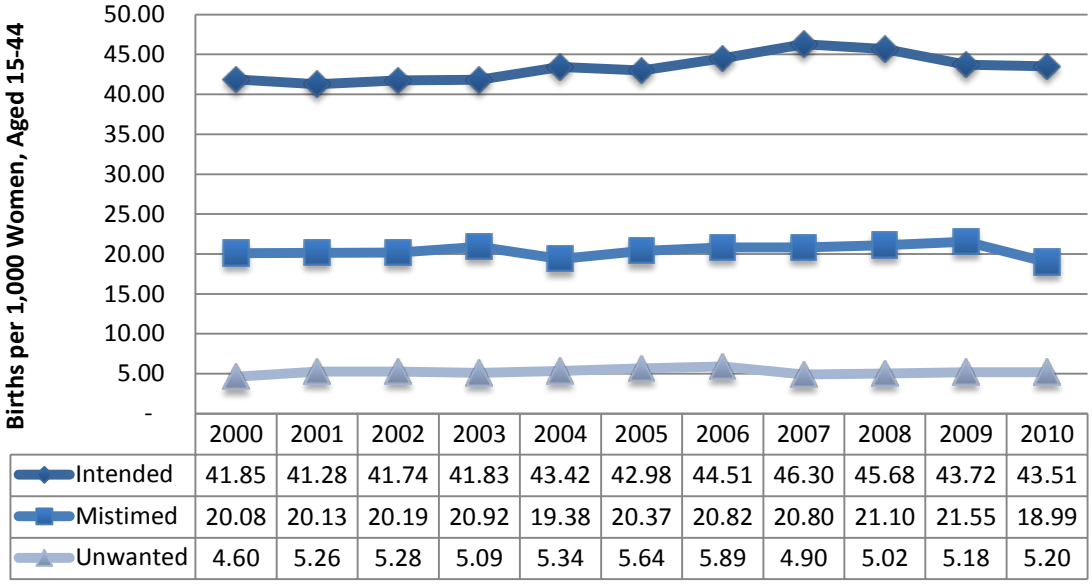
Pregnancy Intention-Specific GFRs

Intention-Specific GFRs for All States, 2001-2009

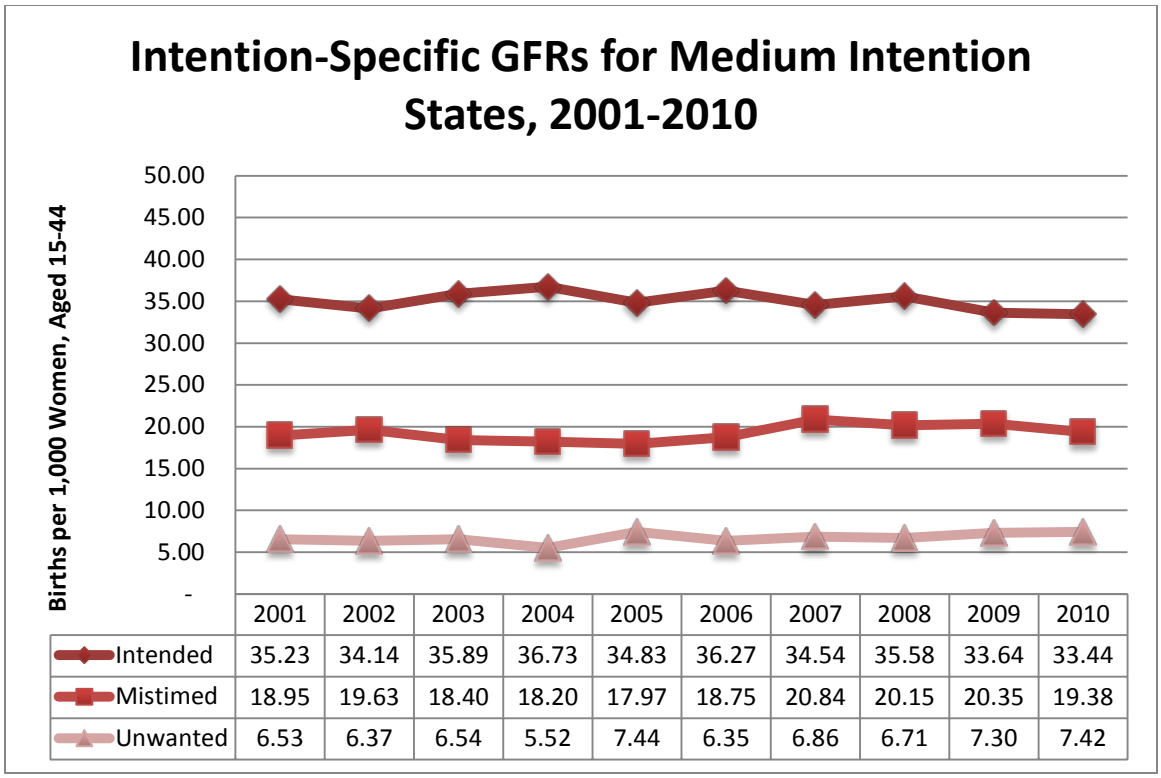


	2001	2002	2003	2004	2005	2006	2007	2008	2009
Intended	36.92	37.36	38.06	39.03	38.41	39.66	39.81	39.84	39.71
Mistimed	21.12	20.84	21.10	20.25	20.52	21.35	22.05	21.86	21.73
Unwanted	6.90	6.62	6.36	6.25	6.78	6.36	6.43	6.24	6.95

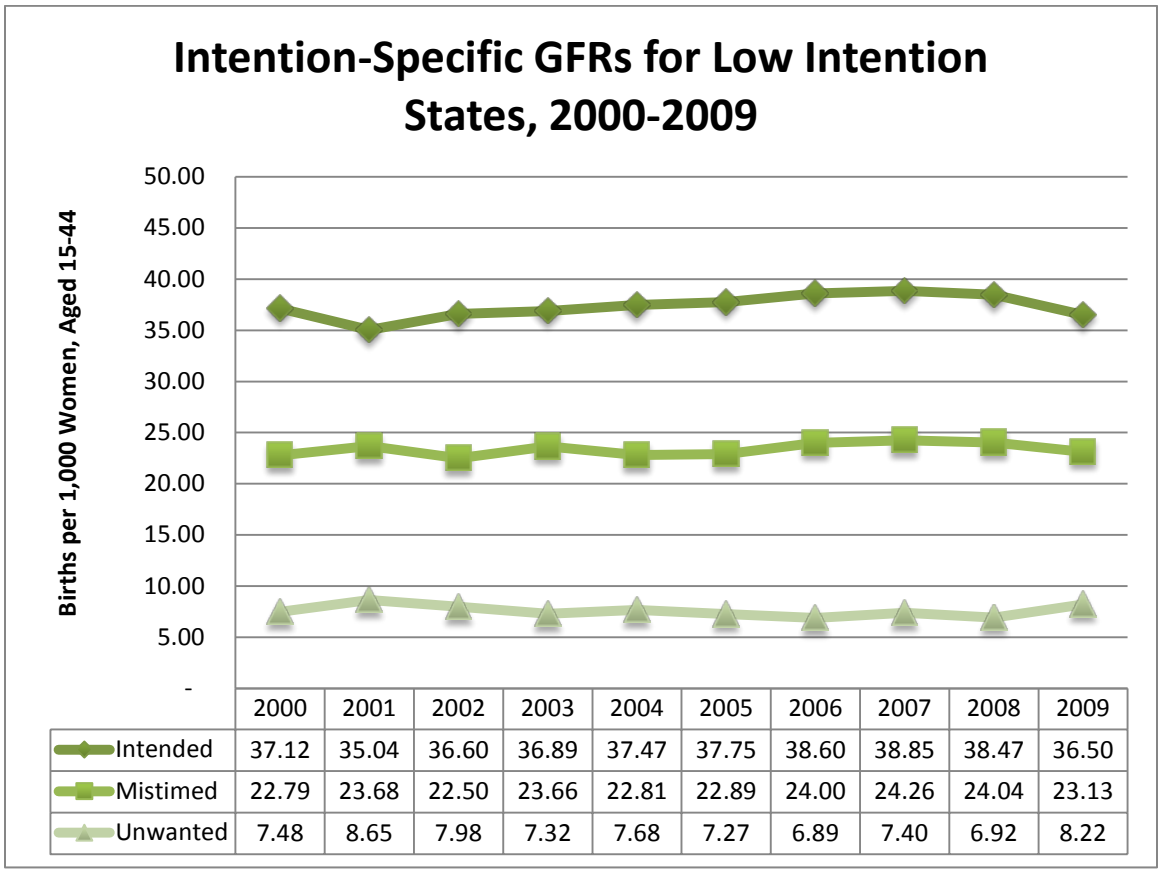
Intention-Specific GFRs for High Intention States, 2000-2010



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Intended	41.85	41.28	41.74	41.83	43.42	42.98	44.51	46.30	45.68	43.72	43.51
Mistimed	20.08	20.13	20.19	20.92	19.38	20.37	20.82	20.80	21.10	21.55	18.99
Unwanted	4.60	5.26	5.28	5.09	5.34	5.64	5.89	4.90	5.02	5.18	5.20



	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Intended	35.23	34.14	35.89	36.73	34.83	36.27	34.54	35.58	33.64	33.44
Mistimed	18.95	19.63	18.40	18.20	17.97	18.75	20.84	20.15	20.35	19.38
Unwanted	6.53	6.37	6.54	5.52	7.44	6.35	6.86	6.71	7.30	7.42



	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Intended	37.12	35.04	36.60	36.89	37.47	37.75	38.60	38.85	38.47	36.50
Mistimed	22.79	23.68	22.50	23.66	22.81	22.89	24.00	24.26	24.04	23.13
Unwanted	7.48	8.65	7.98	7.32	7.68	7.27	6.89	7.40	6.92	8.22