1. Introduction

It is well known that, over long periods of time, as a nation becomes more affluent, average family size shrinks due to a reduction in rates of childbearing. This phenomenon has many ramifications for those interested in public policy. On the positive side, the environmental impact of the population is likely to be less adverse, and the need for educational and health care resources declines along with a shrinking population. On the negative side, the supply of future employees and particularly highly skilled employees is also likely to decline, leading many nations to rethink and restructure their policies around immigration, fiscal policies with regard to social safety nets for retirees, and their educational systems as well.

What is less well known and little studied is the related phenomenon of delayed childbearing. That is, the reductions in fertility just mentioned have occurred in conjunction with a more recent upward shift in the ages at which women bear children. We focus in this report on the relationship between work and fertility, with an emphasis on the phenomenon of delayed childbearing.

The reasons for fertility decline in general and the emergence of delayed childbearing in particular are not difficult to discern. On the demand side of the issue is the massive entry of women and mothers into the U.S. workforce in recent decades. As of 1950, only 33.1 percent of all women in the U.S. population worked for wages, a figure that climbed to 57.4 percent by 1999 (Council of Economic Advisors, 2000). In many professional careers there is an overlap between the traditional childbearing years and the period during which the professional must work long hours in order to achieve career success (Drago & Williams, 2000), leading to either delayed attempts to bear children or the foregoing of children altogether. On the supply side of delayed childbearing lies the recent development of fertility treatments that often permit women to bear children later than was feasible in the past. The widespread availability of reliable and low-cost contraception has facilitated delayed childbirth and the general decline in fertility.

The implications of delayed childbearing are more complex. On the one hand, recent medical advances provide many women with the opportunity to "sequence" (Blair-Loy, 1999; Garey, 1999), and achieve career success prior to the raising of children. For many career women in earlier times, this option was not available and so they were often forced to remain childless in order to stay on a career track. On the other hand, the risks associated with delayed childbearing are not, in our opinion, widely known. We document those risks below.

If women and men were aware of the risks surrounding attempts to delay childbearing, it is possible that many would seek to bear children at an earlier age. Public and corporate policy would then be critical if that option is to be viable. That is, policy supports will likely be needed to broaden the range of options currently available to individuals and families. Specifically, the career structures that are partly responsible for delayed childbearing require alterations. We discuss such policies in what follows.

The specifics of this report begin with an analysis of historical trends in fertility in the U.S. We then turn to the medical issues that emerge when delayed childbearing is attempted. Finally, we consider policy initiatives that can improve the options

available to families such that delayed childbearing is not viewed as a necessity to achieve career success.

2. Historical Trends in Fertility, 1900-1980

1900-1940

This section focuses on fertility trends starting at the beginning of the 20th century and continuing into today. From 1900-1940, there was a steady decline in fertility, a decline that was unrelated to women's education level or market work. During this time women working in and outside of the home had virtually identical fertility rates (Van Horn, 1988). Between 1900 and 1940, births decreased from 130 births for every 1000 women to 79.9 births (Van Horn, 1988). This sixty percent decrease was gradual but continued the trend of decreasing births that had begun in the 19th century. The declining birth rate into the early 20th century ran in contradiction to many factors that might have encouraged increasing fertility rates. There was an increase in marriage rates along with a decline in the age at first marriage. The average age at first marriage for women decreased from 22 to 21.5, while the comparable figure for men dropped from 26 to 24. Furthermore, only 75 percent of the population was married in 1900 but in 1940 the marriage rate was around 80 percent (Van Horn, 1988). However, 1936 also saw the lowest birthrate until 1978, 73.3 births per 1000 women (Van Horn, 1988), a finding discussed below.

Medical procedures and income improved over much of the period. These advantages help to explain the pregnancy and fertility rate decline. Women no longer needed multiple pregnancies to produce one or two living offspring. Childhood mortality rates decreased substantially due to improved medical conditions. In addition, Van Horn (1988) suggests that the rise of consumerism across many social groups placed fertility in direct competition with luxury consumer goods. That was not, however, the case in the decade of the 1930s.

The Great Depression of the 1930s

A widespread economic depression lasted almost the entire decade of the 1930s, and the United States fertility rate saw a significant decrease. As described by Van Horn (1988), 1936 saw the largest decrease in live births. At this time 25 percent of the population was unemployed, and unemployment was overwhelmingly concentrated among young workers, those of ideal childbearing age. The considerable doubt about the future kept people from marrying and parenting. Although there was a significant decrease in fertility levels, this was not the preference of the U.S. population. A 1937 Gallup poll found that families wished to have three to four children, but the reality was different. During this time few families had more than two children. Childlessness also increased with 17 percent of married women between the ages of 40 and 44 never having given birth to a child in1940 compared to only 10 percent of women in 1910. Young married people during the 1930s produced the smallest proportion of children in relation to all other groups in modern times.

1940-1960, The Baby Boom

The baby boom was a widespread phenomenon in the United States (Van Horn, 1988). All women of childbearing age participated regardless of race, religion and income level. In 1957, the fertility rate was 50 percent higher than in 1940, rising to 122.9 births for each 1000 women of childbearing age. Fertility rates across all social groups,

by religion, age, race, geographic location, and educational attainment were close to this national average. There was an increase in overall family size from the two to three children families of the 1920s and 1930s to three or four children families. Most women also began to space children closer together, less than two years apart, relative to the past. Fertility for mothers under age 29 increased the most during these years. There was also a significant rise in the number of older mothers (35-39) in comparison to earlier cohorts. Surprisingly, at this time the poor and the rich had the greatest number of children while middle-income mothers had the lowest birth rates.

This dramatic increase in births can be explained by several factors. Marriage rates increased throughout this time before reaching a pinnacle in 1946, resulting in a significant increase in birth rates starting in 1947. Heightened marriage rates during this time were the product of people waiting until the war was over to get married (Van Horn, 1988). People also tended to marry at earlier ages, a phenomenon that is typically associated with higher levels of fertility. Moreover, the marriage rate increased from 59 percent in 1950 to 65 percent in 1960 among people of childbearing age. Van Horn (1988) speculates that two different groups of mothers finished their families within this period, women born in the 1920s and those born after 1930. During the 1950s women born in the 1920s were finishing their families (third and fourth children) due to the war, and women born in the 1930s were having all of their children with shortly spaced intervals between pregnancies. A Gallup poll in 1960 caught the essence of the era: 43 percent of the U.S. population believed that four children was the perfect family size, 28 percent mentioned three children, and 18 percent favored two children, while no one thought that only children or remaining childless were ideal. Economics also played a part in the rise in fertility. Wartime earnings gave people extra money along with a minimum of consumerism following the war (a phenomenon linked to the memory of the Great Depression of the 1930s), and the U.S. Internal Revenue Service gave a significant tax break to parents for five consecutive years to promote fertility (Van Horn, 1988).

1960-1980, When Work and Family Connect

The year 1960 signaled the beginning of the relationship between fertility and female labor force participation that we now see in the United States. Women's increased participation in paid market work had an inverse effect on fertility rates, with rates in the late 70s falling to levels not seen since the Great Depression (Van Horn, 1988). Between 1960 and 1980, the number of childless women at age 25 doubled (Rindfuss, Morgan & Swicegood, 1988). In 1980, over half of all households had one or two people whereas in 1955, this type of household was virtually non-existent (Van Horn, 1988). Following 1960, mothers returned to market work earlier following pregnancy and delayed having children in order to pursue paid labor. U.S. fertility rates also saw a significant decrease during this time due to heightened divorce rates and a later age of first marriage. There was also an increase between the average length of time married and the occurrence of first birth (Van Horn, 1988).

After 1960, family size fell such that a majority of the population had two children families. The babies of the baby boom, those born after 1945, rejected the norms of fertility and family that their parents had subscribed to. Employment rates among the young increased and some men joined the armed forces and then needed a period of readjustment following their discharge, a period which often lasted through their 20s (Van Horn, 1988). The most notable decrease in fertility among the young was for the

highly educated and the upper middle class. There was an increase in births by one-third between 1966 and 1976 to mothers that were age 30 and over, but the actual number of children born to this cohort was still small relative to those born to women under age 30 (Rindfuss et al, 1988). The continuation of and potential explanations for this trend will be discussed below.

In 1971, the U.S. total fertility rate (TFR) dropped below the "replacement" level. The replacement level is the rate at which a given generation can replace itself (NCHS, 2000). This phenomenon did not evenly affect all racial and ethnic groups. Since 1971, replacement level fertility rates have been achieved by Mexican, non-Hispanic black, and Puerto Rican women, whereas American Indian, Asian and Pacific Islander, Cuban and non-Hispanic white women exhibited fertility below the replacement level (NCHS, 2000).

A major part of the explanation for fertility decline can be found in the development and distribution of the birth control pill, a phenomenon which represented a medical advance, raised thorny religious and legal issues, and marked a separation between generations of women for whom the option was and was not available. In 1960, 10 percent of white men and women were found to have used this means of contraception in a nationwide study (Kiser, Grabill, & Campbell, 1968). There was a disparity among women using contraception according to educational attainment: of women with some college education, 88 percent reported they had used contraception, while only 78 percent of women with some high school reported using contraception (Kiser et al.). In June 1960, the birth control pill was legalized as a contraceptive, and the use of the pill increased rapidly. Data from the 1965 National Fertility Study found that 24.6 million married women under the age 45 were using the contraceptive pill (Kiser et al). The linkage between the pill and decreased fertility is not known for certain, but from 1957 to 1965, there was a 20 percent decrease in births (Kiser et al). In contrast to previous periods, there was now a strong linkage between education, race, and fertility decline: highly educated white women were delaying or in many cases avoiding childbearing altogether.

3. Recent Trends in Fertility

Due to the dramatic decline in fertility during the 1960s and 1970s, the "baby boomlet" which should have occurred as the baby boomers had their own children arrived with only a whimper. The low levels of fertility found during that time continued, and relatively little variation was seen in the overall trends in pregnancies and fertility rates during the 1980s and 1990s, although there was a small increase from 68.4 births per 1,000 women in 1980, to 68.9 in 1992 (NCHS, 1995).

During this time the only consistent rise in birth rates was among women in their mid thirties and above (NCHS, 1995). The baby boomers had in large part delayed childbirth, starting smaller families at a later age. In 1980 there were 19.8 live births per 1000 women age 34-39, a figure that climbed four-fold to 79.5 by 1991 (NCHS, 1995). The overall fertility rate then decreased throughout the 90s because the baby boomers had completed their families. In 1990, the fertility rate was 70.9 live births per 1000 women aged 15-44 years, but in 1998, the figure was 65.6, an 8 percent decrease in the overall fertility rate (NCHS, 2000).

Although there was a predictable decrease in fertility in the 1990s as the baby boomers aged, the phenomenon of delayed childbearing continued and expanded. Women in their mid to late thirties (35-39) generated an 18 percent increase in births from 1990 to 1998, with the figures rising from 31.7 to 37.4 live births per 1000 women over the period (NCHS, 2000). The fertility rate among this age group almost doubled since 1978, when the comparable figure was 19.0 live births per 1000 women (NCHS, 2000). The rate of births among mothers 40-44 increased by almost one-third from 1990 to 1998, rising from 5.5 to 7.3 births per 1000 women (NCHS, 2000). That trend began earlier; from 1981 to 1998, the fertility rate for this age cohort increased by 92 percent (NCHS, 2000).

Delayed childbearing brought with it a significant increase in multiple births. In the span of a single year, from 1997 to 1998, the number of twin deliveries rose six percent, and the number of triplet births increased by 13 percent (NCHS, 2000). The increase from 1980 to 1998 is much larger, with twin births rising by 62 percent and triplet and other higher order multiple births rising by 470 percent (NCHS, 2000). These increases took place in large part during the 1990s, with the twinning rate increasing about three percent each year and the triplet and other multiple births increasing by 13 percent each year. In 1998 one in every 36 births was a twin while one in every 500 births was a triplet + (NCHS, 2000).

The rise in multiple births was almost exclusively associated with white women over the age of 30. The NCHS (2000) compared twinning rates between 1980-2 and 1996-8 for women ages 40-44 and found that the increase was 77 percent, and by more than 1,000 percent for the cohort of women ages 45-49, with more twins being born to this age cohort in 1997 than for the entire decade of the 1980s. The triplet and above rate between these yearly groupings rose 461 percent for women in their thirties and increased almost 15 fold for women in their forties (from 28.1 to 411.9 per 100,000 births) (NCHS, 2000). In 1998, one in six births to women 45-49 was a multiple birth, while one in every three births was a multiple for women ages 50-54 (NCHS, 2000). White women have seen the highest increase in triplet and multiple births with a 14 percent rise from 1997 to 1998, a figure that is three times greater than those for black and Hispanic women (NCHS, 2000). From 1980-97, twin birth rates among white women increased by 48 percent in comparison to a 25 percent increase among black women (NCHS, 1999). Comparing the periods 1989-91 and 1995-97, twinning among among white women increased sevenfold, and white mothers were responsible for 85 percent of twin births within the age cohort during the 1995-97 period (NCHS, 1999).

It may be tempting to trace the increase in multiple births to fertility treatments. That assessment is mainly correct. However, it is not the entire story because any delay in childbearing will increase the rate of multiple births. According to a recent study, around 80 percent of triplet or above births are due to fertility treatments, with the remaining 20 percent due to natural multiple births, often in connection with delayed childbearing and without fertility treatments (NCHS, 2000).

The linkage between race, employment, education and delayed childbearing is not well-documented, but the pattern seems fairly clear. As discussed above, delayed childbearing is mainly associated with white women, and is far less prevalent among minority women. Recent research also establishes a link to educational attainment. From 1969 to 1994, mean maternal age at first birth increased from 21.3 to 24.4,

almost three years, but highly educated women experienced the most drastic change (Heck, Schoendorf, Ventura, & Kiely, 1994). Between 1969 and 1994, among women with 12 years of education or more, median maternal age rose by 18 months. The most notable change in maternal age, however, was among women with 13-15 years of education, where the median age at first birth increased by three years (Heck et al, 1994). Looking at women with 16 or more years of education, median age at first birth rose by 3.8 years to 29.5 between 1969 and 1994 (Heck et al, 1994). In 1994, 45.5 percent of all first births among women with 16+ years of education occurred at age 30 or older; more than four times the rate found in 1969 (Heck et al, 1994).

Education alone can exert an effect on patterns of delayed childbearing. Those who stay in school for longer periods of time might delay children until schooling is completed. However, it seems unlikely that delaying attempted childbirth until after the age of 30 is attributable to efforts to complete schooling alone. Instead, we suspect that there is a strong connection to employment and particularly occupations with career ladders. The association between education and employment for women is well documented. For example, in 1990, for women of ages 25 or over, there was a monotonic relationship between educational attainment and employment, with only 31 percent of women who did not complete high school in the labor force, a figure that rises to 78.2 percent for women with five or more years of education beyond high school (Spain & Bianci, 1996). More directly, Spain and Bianci (1996), report for a 1992 sample of women in the U.S. ages 18-34, that employed women plan smaller families than women out of the labor force (2.0 compared to 2.4 children), and they are far more likely to plan childlessness over the entire life course (10.5 percent compared to 6.0 percent).

It is critical to recall that this linkage between employment and fertility is of relatively recent origin. When the baby boomers were being born in the 1940s and 1950s, no such pattern existed. Nowhere is it written in stone that the relationship must continue to hold indefinitely.

4. Are Infertility and Delayed Childbearing Problems?

For the U.S. as a society, the fertility decline and rise of delayed childbearing pose three problems. The most obvious problem is a rise in health care expenditures to cover fertility treatments resulting from attempts to delay childbearing. We document those costs for individual treatments below, although no nationwide estimate currently exists for total treatment costs. The second problem is the potential decline in the availability of young, skilled employees. Given the linkage between the educational attainment of parents and their children, this problem could exert significant effects on future productivity increases. The third problem is that the ratio of young employees contributing to social safety net programs for the burgeoning population of the elderly has declined and is likely to continue to do so.

If society views declining fertility and delayed childbearing as a problem, we must nonetheless look to the constraints and opportunities confronting individuals in order to seek solutions. A number of factors are in play here. The first, as mentioned earlier, is the widespread availability of low-cost and effective contraception, in tandem with expensive but also widely available infertility treatments. These developments facilitated both delayed childbearing and declining fertility. The

second factor, alluded to earlier, is the rise in consumerism and, relatedly, increasing income levels (Schor, 1998). The arithematic of consumerism as it applies to fertility is straightforward. Each child added to a family decreases the per person financial resources available to existing family members, so any increase in consumerism should lead to fertility decline. The third factor lies in conflict between career aspirations and childbearing (Williams, 1999), a phenomenon that may be related to both fertility decline and delayed childbearing. The fourth factor concerns ignorance of the actual costs and consequences of attempts to delay childbearing. Although that ignorance has not been documented, the response to an earlier piece on delayed childbearing directed at highly educated women (Varner, 2000), suggested to us that ignorance is widespread.

We do not know the precise mix of these factors that is responsible for fertility decline and delayed childbearing. We only know that some mix is likely involved. In what follows, we first provide information on the costs and consequences of attempts to delay childbirth. We believe that families would be in a better position to make decisions regarding children if such information were widely available. The next and longer section of the report concerns public and private sector policies in relation to fertility and delayed childbearing. We focus on these areas because both are amenable to relatively obvious policy manipulation. We do not address consumerism or the availability of contraception and infertility treatments further.

5. Medical and Economic Issues Related to Delayed Childbearing

We consider three sets of medical issues related to delayed childbearing below: risks to the mother, risks to the child, and infertility treatments. The latter are not strictly associated with delayed childbearing, although the risk of infertility rises with the age of the prospective mother, leading us to cover the issue here.

Maternal Risks

There are various maternal risks associated with childbearing. However, as the prospective mother's age increases, there is a dramatic increase in the likelihood of childbearing complications. First, the probability of carrying a child to term is significantly reduced after the age of 35. Cohen & Sauer (1998) found for a sample of pregnant women who received no infertility treatments that spontaneous abortion rates rose from 10 percent in the 30-34 year old age group to almost 30 percent in the 35-39 year old age group. According to Cohen and Sauer, even after fetal heart monitoring, miscarriage rates were still significantly higher in women 35 years and older. Blood pressure, type II diabetes and hypertension rates increase as women get older, each of which can lead to further complications in pregnancy. Preeclampsia is a severe condition that is identified with hypertension, high blood pressure during pregnancy, and can lead to convulsions, harming the mother as well as the child. Gilbert, Nesbitt, & Danielson (1999) found that women age forty or over have a higher chance of assisted childbirth: forceps, cesarean, and vacuum deliveries occur at a rate of 61 percent whereas younger women only have a 35 percent risk of needing operative assistance. According to Scholz, Haas, & Petru (1999), in women over age 40, induction of labor was higher than for controls. Maternal morbidity due to childbirth also increases with maternal age over 35 (van Katwijk & Peeters, 1998). An older maternal age at first birth has also been linked to an increased risk of breast cancer (Kelsey & Horn-Ross, 1993).

Fetal Risks

There are several fetal risks associated with advanced maternal age. In a study of 379 mature prospective mothers, age 35 years and older, in comparison to a control group of 379 prospective mothers, age 20 to 30, there were five stillbirths in the mature age group and none in the younger age group (Barton, Bergauer, Jacques, Coleman, Stanziano, & Sibai, 1997). Furthermore, there is a significant difference in unexplained fetal death in pregnant women over the age of 35. According to Fretts & Usher (1997), one in 440 fetal deaths were unexplained in women 35 and older, whereas, one in 1000 fetal deaths were unexplained in women younger than 35.

Chromosomal abnormalities in the fetus also increase with maternal age. In a recent study, in the age group 35 and younger, 63.6 percent (7 of 11) had normal fetal chromosome makeup; in the elder maternal age group, 35 and older, only 22 percent (9 of 41) had a normal fetal genetic makeup (Schmidt-Sarosi, 1998). The most prevalent chromosomal anomalies are trisomy 21 (Down's Syndrome), trisomy 18 (Edward's Syndrome), and trisomy 13 (Patau's syndrome). Each of these symptoms occurs due to an extra chromosome in the cell during embryonic development. Down's syndrome is the most frequent in occurrence. The rate of having a child with Down's syndrome in a mother at age 25 is 1:2000, a figure that rises to1:200 at age 35, and climbs to 1:40 for mothers over the age of 40 (Magalini & Magalini 1995). Down's syndrome affects both sexes and all races equally; the children are mentally retarded with an IQ ranging from 20-60. The survival rate in Down's syndrome is the highest in the first month of life, at 92 percent, at a year the figure falls to 80 percent, and at age five, 76 percent of Down's syndrome patients have survived. The typical life span for someone with Down's syndrome is in the 30's and 40s (Magalini & Magalini, (1995). Heart conditions usually decrease the chances of a full life span in Down's syndrome patients.

Edward's syndrome is the second most common chromosomal disorder. Edward's syndrome most frequently occurs in female babies and is associated with a poor prognosis. Average survival in male patients is 58.5 days and for females 282 days. Edward's babies are usually born post term and do not have normal feeding and sleeping patterns. Edward's patients suffer from severe mental retardation, and have several physical defects (Berkow, Beers, & Fletcher, 1997).

The third chromosomal disorder is trisomy 13, Patau's syndrome. Most cases of Patau's syndrome end in miscarriage, but those that do carry to term have a severe prognosis. Seventy percent of Patau's babies die within the first three months due to cardiac and other complications (Magalini & Magalini 1995). Only about 20 percent of Patau's patients survive a single year, and all have severe mental retardation (Berkow, Beers, & Fletcher 1997).

Infertility treatments

After a woman's mid 20s there is a decline in fertility, with dramatic changes during a woman's 30s and 40s (Schmidt-Sarosi, 1998). Women over the age of 40 account for only one percent of all live natural births, a rate that falls to 0.01 percent for women over the age of 47 (Nesbitt, Bythell & Redfern 1999). These differences in childbearing are, in turn, linked to an increasing probability of infertility as a women ages. Griffin & Panak (1998) found that women under the age of 40 using in vitro fertilization and gamete

intrafallopian transfer had a 20 percent success rate, whereas women over 40 had only an eight percent success rate. A study by Schmidt-Sarosi (1998) looking at all assisted reproductive technologies found that women younger than 35 had a 25.3 percent live birth rate, women 35-39 had a 18.2 percent live birth rate, and only an eight percent success rate was found in women 40 and older.

There are several different assisted reproductive technologies (ART) available to promote pregnancy. This report considers in vitro fertilization (IVF), gamete intrafallopian transfer (GIFT), zygote intrafallopian transfer (ZIFT), and cryopreserved egg transfers. These procedures are considered because they are reasonably common. A study by the National Center for Chronic Disease Prevention and Health Promotion (NCCDPHP) on assisted reproductive technology success rates in fertility clinics throughout the United States (1997) found that IVF was the most popular form of ART, employed by 93 percent of those receiving fertility treatments. GIFT was used by four percent of women, ZIFT by two percent, and a combination of these were applied to one percent of patients. In vitro fertilization is performed in a lab setting; partners' sperm and egg are joined. The expectation is that the egg and sperm will fertilize within the dish. Usually along with IVF, drugs are taken to increase the number of eggs available from the ovaries to harvest. According to Well-Connected Report: Infertility In Women, (1998) "in order to harvest eggs a laparoscopy is performed, by either inserting an instrument through an incision at the navel or a probe inserted into the vagina guided by ultrasound. The physician then uses a needle to drain the liquid from the follicles and retrieves several eggs." After this procedure the sperm and egg are combined and upon fertilization the embryo is placed back in the uterus. This procedure is typically done with multiple fertilized embryos. Typically embryos that are not used are cryopreserved for later transfers.

Gamete intrafallopian transfer (GIFT) and zygote intrafallopian transfer (ZIFT) are extensions of IVF. With both of these procedures a prospective mother must have a least one functioning fallopian tube. GIFT eggs are harvested in the same fashion as IVF, however they are mixed with the sperm and immediately injected back into the fallopian tubes. The procedure for ZIFT combines both IVF and GIFT. The eggs are harvested and fertilized in a lab and then implanted into the fallopian tubes.

ART procedures can be costly and time consuming. The estimated cost for IVF is $8,000, GIFT costs an estimated $8,000, ZIFT raises this figure to $10,000, and it costs an average of $2,000 for cryopreserved egg transfer cycles (Griffin & Panak 1998). Griffin and Panak estimated costs per delivery in Massachusetts from the 1993 IVF registry data; there were 2,942 initiated cycles and only 386 deliveries utilizing IVF, and the cost per delivery was estimated to be $69,448. From GIFT administrations, there were 564 cycles and 114 live births, cost per delivery was $49,469, and embryo cryopreservation was attempted 591 times with a rate of 74 live births at a cost of, $15,500 per birth. There were no successful births utilizing ZIFT (Griffin & Panak, 1998). The NCCDPHP's study of ART success rates (1997) also found that infertility treatments were effective for only a small percentage of women that tried, below are tables adapted from this study:

Table 1 **Maternal Age**

Embryos From Nondonor Eggs	<35	35-37	38-40	40+
Number of cycles	24,581	12,733	10,997	6,691
Pregnancies per 100 cycles	35.7	31.3	22.8	13.2
Live births per 100 cycles	30.7	25.5	17.1	7.6
Live births per 100 transfers	35.9	31.4	22.5	10.9
Average number embryos transferred	3.7	3.8	3.9	4.0

Table 2 **Maternal Age**

Frozen Embryos From Nondonor Eggs	<35	35-37	38-40	40+
Number of transfers	4,862	2,144	1,385	774
Live births per 100 transfers	21.3	18.6	14.5	10.0
Average number embryos transferred	3.5	3.4	3.5	3.6

Finally, a major cost of infertility treatment comes in the form of psychological stress affecting the prospective parents. Assisted reproductive technologies are not only invasive to the body but also to the mind and emotional well being of individuals. There is stress for the individuals due to time and money and the strain that seemingly endless attempts to achieve childbirth place on personal relationships. Even if pregnancy does occur, there is still fear about carrying the pregnancy to term, which can lead to feeling unattached because of fear of loss. ART is not a cure for infertility and even though there is success in relatively rare instances, there is no guarantee for the future. If pregnancy is achieved there can be extreme emotional highs. However, if pregnancy is not achieved then depression, guilt and anxiety might ensue. Strains from ART can exacerbate any previous emotional imbalance or strains in a person's life or relationships. It is important to consider the full array of emotional and physical stress before deciding upon ART.

Summary

Even a cursory glance at the information provided above would be disturbing for young people considering any delay in childbearing. It is not our purpose to scare people into earlier childbearing with this information, but rather to help individuals make informed decisions. More disturbing to us is that among the many reasons why women and men may avoid facing these facts is the possibility that the choice of children at a younger age is inconsistent with the current structure of careers. To the extent this argument is true, both public and private policies require rethinking and restructuring. We return to this issue after a discussion of public policies around fertility in the U.S.

6. Public Policy and Fertility in the United States

Anyone suggesting that the U.S. has a coherent policy around issues of fertility would be overstating the case. No such coherence exists. Instead we have seen a piecemeal response to major issues as they emerge. Those issues concern family planning, a process or movement that has centered around the availability of contraception, the legalization of abortion through the 1973 Roe versus Wade decision of the U.S. Supreme Court, and various government programs that affect the fertility of poor women in the U.S. and abroad. Family planning has been and remains extremely controversial because it touches on issues of religion, rights, education and economics. For example, even within the Bush White House, the president and his wife are split in their attitudes toward abortion (Strope, 2001).

Family Planning

"Between now and the end of the century...many of the forces tending toward a reduction of family size are likely to continue in effect. On the other hand, we have yet to see a nation approaching a stationary population that did not launch strong measures to stimulate childbearing. I expect that efforts to increase births will be one of the major preoccupations of those concerned with social legislation in the Western world." (Notestein 1950).

This prediction from a half century ago turned out to be incorrect. Fertility decline in the U.S. indeed resulted in the society falling below the replacement rate, yet relatively few policies to promote fertility have appeared in the United States (Demeny, 1988). Instead, and perhaps surprisingly, most legislation and initiatives have been designed to prevent unwanted births and limit fertility. In the United States this is called family planning.

Family planning clinics are sparse throughout the United States. Henshaw and Torres (1994) found that:

- "2,614 agencies provide family planning services in 5,400 clinics."
- "Health departments operate 52 percent of the clinic sites; Planned Parenthood affiliates, 15 percent; hospitals, 6 percent; and other agencies, largely community and migrant health centers; 27 percent."
- "Planned Parenthood clinics serve on average three times the number of clients as the next largest provider."

Family planning centers are largely funded by the government, under the auspices of the federal Title X program, which helps about 75 percent of the clinics (Kotch, 1997). According to Kotch, around 50 percent of all family planning clinics receive 20 percent or more of their funding from Title X. There was been an increase in women utilizing public subsidized family planning service clinics from 6.1 million in 1981 to 7.1 million in 1988 (Alan Gutmacher Institute (AGI), 1995).

Government funding for family planning comes in two forms, Title X and Medicaid. Medicaid provides low-income individuals with health care; federal and state governments subsidize Medicaid. Medicaid offers the largest amount of monetary public support to individuals, and in 1994 Medicaid spent $332 million on contraceptives (AGI, 1995). Medicaid forbids co-payments and deductibles for family planning services (AGI, 1995). Title X is an additional source of funding for family planning services among low income and teenage women (AGI, 1999). The federal government in 1960, under the Nixon administration, instituted the program to reduce unwanted pregnancies. Unwanted pregnancies among women that fell under the

poverty line occurred twice as often as was true of wealthier women (AGI, 1999). Title X not only provided provisions for contraceptives but also for breast and pelvic exams, sexually transmitted disease testing and treatment, and pap smears (AGI, 1999). Funding for Title X decreased by 61 percent from 1980 to 1998 (AGI, 1999), leaving millions of women without the means necessary to make effective decisions about reproductive health care. Former President Clinton requested a 15 percent increase in funding to support Title X for the 2001 fiscal year (Planned Parenthood, 2000). The request cited the fact that clinics funded by Title X prevented an estimated 1,331,100 pregnancies and prevented 632,300 abortions per year (Planned Parenthood, 2000).

Until 1993, the "gag rule" under Title X existed. The gag rule, implemented in 1988 under the Reagan administration, was a policy that forbade health care professionals to disseminate any information or referrals regarding terminations of pregnancies even if requested by the patient (AGI, 2000). Instead, health care professionals were required to give information regarding prenatal care and delivery (AGI, 2000). Furthermore, the gag rule required financial and physical separation between abortion activities and Title X appropriated activities (AGI, 2000). Former President Clinton reversed this policy by an executive order on his third day in office.

During the final days of the Clinton administration there was a reappearance of the gag rule but in a different form. The "Mexico City gag rule" is a policy that "seeks to disqualify foreign non-governmental organizations (NGOs) from eligibility for U.S. family planning assistance if they facility or lobby on abortion (Cohen, 2000). The Mexico City gag rule became a federal law as a rider written into the 2000 foreign aid appropriations bill (Cohen 2000). President Clinton waived the restrictions imposed by the gag rule and, as a result, $12.5 million was transferred from the family planning programs of Title X and only $15 million can be used to subsidize NGOs that participate in this "offending" manner (Cohen, 2000).

The year 2000 saw several congressional actions on reproductive health care.

- The United States Supreme Court ruled that state legislation banning "partial-birth" abortions (a late-term procedure) are unconstitutional (AGI, 2000).
- The Food and Drug Administration (FDA) gave approval to mifepristone, the so-called 'abortion pill,' to be used as a nonsurgical form of early pregnancy termination (AGI, 2000).
- Funding was increased by more than $50 million to overseas family planning services under the U.S. Agency for International Development's (USAID) family planning services (AGI, 2000). The Mexico City gag rule was repealed, although the gag rule still applies during 2001 for those organizations funded under the previous year's appropriations (AGI, 2000).
- Another bill that passed the U.S. Senate prohibited the use of federal funds for school-based health centers to distribute emergency contraceptives. The fate of this bill is undecided until Congress acts on the appropriations bill for the Department of Health and Human Services in 2001 (AGI, 2000). The Bush administration's budget was submitted last week, so it will be some time before a decision on this matter occurs.
- Another provision that affects the Title X family planning clinics was that under the Adoption Awareness Act (H.R. 3301), passed in October of 2000,

health care professionals are to be "trained to provide adoption information and referrals to pregnant women on an equal basis with all other courses of action included in nondirective counseling to pregnant women" (AGI, 2000). The importance lying in this wording is that professionals in federally funded clinics can provide information on *all* their legal and medical options (AGI, 2000).

As argued earlier, these activities do not suggest a coherent policy approach. However, one major piece of legislation does embody a philosophy around fertility and delayed childbearing, and we turn to that next.

The Family & Medical Leave Act

The first piece of legislation to be passed by the Clinton administration was the Family and Medical Leave Act of 1993 (FMLA). This act guarantees employees that have been working for the employer for at least one year or 1,250 hours during the 12 months proceeding the time off, up to 12 weeks of *unpaid* leave per year for a birth, adoption, or care of sick children, spouses, or parents, and either the same or an comparable job upon return. The FMLA applies to employers with 50 or more employees within a 75 mile radius. Employers must also provide health benefits during the time off allotted by the FMLA. Employers can make employees first use other types of leave, such as vacation, if so employees must be compensated as they regularly would. Employers can also restrict employees that are spouses to one 12 week period of leave. Employers may also exclude the highest paid 10 percent of workers from FMLA coverage. Employers may also request medical confirmation of an illness, which the U.S. Department of Labor has defined as at least one night stay in the hospital (Bennett-Alexander & Hartman, 2001). In other words, the scope of the FMLA is extremely limited. However, in its attempt to provide leave for new parents, it is consistent with the philosophy that employees should also have the choice to become parents if they wish.

In 1997, President Clinton unsuccessfully lobbied Congress to extend the FMLA to cover 24 hours of unpaid leave each year for employees to meet certain family obligations (Bennett-Alexander & Hartman, 2001). On February 12, 2000, that same President tried a different approach and introduced a $20 million plan that would provide parents with economic incentives to use the FMLA; again Congress declined.

How effective has the FMLA been as currently structured? Research conducted by the Commission on the Family and Medical Leave Act by the U.S. Department of Labor found in two nationally representative samples that the FMLA covered 66.1 percent of the entire U.S. labor force, but only about 50 percent of employees met the time requirement. The Commission found that the FMLA had led to 69.3 percent of covered worksites creating policies that allow fathers to take care of infants. The FMLA commission also found a great disparity among those employers that were and were not subject to the FMLA. Among employers not subject to the provisions of the FMLA, only 32.3 percent offered parental leave, and only 41.7 percent offered leave to care for a seriously ill child, parent or spouse. Among businesses covered by the provisions of the FMLA, the vast majority (86.4 percent-95.8 percent) reported that the introduction of this policy had virtually no effect on overall performance, which could be attributable to the fact that the median amount of leave taken was only ten days. Since the passage of the FMLA, over 20 million employees have taken leave,

with employees 35-49 being the largest group of leave takers. Employees with children, hourly employees, employees with incomes from $20,000-$30,000 are also more likely than employees with higher incomes to use the policy.

As a further sign of the absence of any coherent governmental policies around issues of fertility and delayed childbearing, to the best of our knowledge there currently exist no estimates of the effects of the FMLA on either phenomenon. However, the direction of the effects seems reasonably straightforward. Any legislation guaranteeing that job loss will not follow childbirth and ensuing leave should function to increase fertility rates as the constraints on employees who wish to raise children are loosened. The effect of the FMLA on delayed childbearing is contradictory. On the one hand, to the extent the FMLA permits childbearing at a younger age, rates of delayed childbearing might fall. On the other hand, the FMLA enhances the opportunities for delayed childbearing because job loss will not ensue regardless of parental age. We cannot know which influence is larger, but suspect it is the latter. If this is true, then the FMLA is encouraging a general increase in fertility across all relevant age groups.

By extension, any expansion of the FMLA would also increase rates of fertility. Paid leave provisions or any expansion of the definition of the population covered by the provisions of the FMLA would have such an effect. However, given all of the discussion in this section, it seems unlikely that legislative changes in the FMLA will hinge on its effects on fertility. Instead, such changes will probably turn on issues of economics, politics and rights (see http://www.nationalpartnership.org).

7. Private Sector Policies affecting Fertility

In this section we first outline the norm of the "ideal worker," and its relationship to fertility. We then turn to work/family policies in the private sector.

The Ideal Worker Norm

The inverse relationship between educational attainment and fertility may be closely linked to the "ideal worker" norm (Williams, 1999). In general, the ideal worker is someone who enters a profession immediately upon receiving the relevant academic credential, works his or her way up the career ladder by putting in long hours without interruptions beyond short vacations, and continues in this fashion until retirement age. The ideal worker can contribute financially to the family, but cannot make substantial time commitments to children or other family members without endangering his or her career. Pay and promotion systems, practices, and rules around working time, absence, vacations, and retirement systems, and the beliefs of those from previous generations who have succeeded as ideal workers and currently manage our organizations, are all built upon the presumption that only ideal workers should be hired, retained, and rewarded.

Although the ideal worker norm developed in settings where only men were measured against this standard (Whyte, 1956), women have since entered positions where they too are expected to serve as ideal workers (Bailyn, 1993; Fletcher, 1999; Hochschild, 1997;Williams, 1999). Williams concludes that this system results in "discrimination" against career women because they may experience career failure as a result of being

more likely to take on substantial time commitments to family during the years when the ideal worker is typically climbing the career ladder.

For the Faculty and Families project, we extended this concept of "discrimination" by developing the notion of "discrimination avoidance" strategies (see http://lsir.la.psu.edu/workfam/faculty&families.htm). Suppose that there is in fact discrimination against caregiving that afflicts professionals. If employees are aware of this behavior, then they might respond strategically, avoiding commitments to family entirely or attempting to hide or minimize the intrusion of family responsibilities on work. Such individuals can be viewed as engaging in discrimination avoidance strategies. Employees who successfully apply such strategies will then appear as ideal workers, and enjoy career success.

If we accept this logic, then we would also predict that women will be more likely to employ discrimination avoidance strategies relative to men. Women who have children are likely to devote more time to that child relative to men who are also fathers. Therefore, the need to hide or minimize such commitments will be greater among women. Further, if women tend to experience gender discrimination regardless of parental status, there may be more reason to minimize actual and perceived commitments that would make the employee appear to be less than an ideal worker.

The implications of these arguments for fertility are clear. Women seeking career success will tend to exhibit low rates of fertility in general, and may delay attempted childbirth as well.

The importance of these arguments is two-fold.

- *Low rates of fertility for professional women are due to constraints imposed by the ideal worker norm and related career structures, and are not primarily a matter of choice.* That is, many professional women may wish to bear children or more children and at a younger age, but believe correctly that career success requires the minimization of commitments to family.
- *The constraints of the ideal worker norm affect men as well as women.* If our understanding of the ideal worker norm is correct, then men or women who take on commitments to children or other dependents are likely to encounter career failure.

The hopeful message provided here is that policies to promote fertility by weakening the constraints of the ideal worker norm would be welcomed by many professionals, both male and female. If individuals were provided a path to simultaneous success with their careers and their families, many would take that path.

Work/Family Policies in the Private Sector

During the first half of the twentieth century, almost all private sector benefit packages were modeled around the male breadwinner model of the family (Glass and Fujimoto, 1995). This model of the family posited that the man would serve as an ideal worker, the woman would work in the home raising children, and corporations would provide financial and health benefits to support this model of the family.

Because benefits policies were built upon the presumption that a mother would be available in the home, the policies fell increasingly short as women and particularly mothers entered the workforce. The modal family type shifted to the dual-earner couple, and there was a major expansion in the number of single parent families. For these families, no one is at home to provide care for dependents. As a result, employees increasingly needed not financial supports but instead the time and flexibility to meet commitments to family while employed.

Employers responded by providing work/family benefits. These policies can be located within three categories: leave benefits, dependent services, and work scheduling adjustments. Leave benefits can include disability, sick leave, vacation and time-off to care for a child/other dependent, and maternity/paternity leave. Dependent benefits range from child and elder care referral services, subsidies, on-site or near-site child care, elder day care, and long-term life insurance. Work scheduling adjustments can be seen in telecommuting, job sharing, compressed work weeks, reduced hours and the option of part time work.

The most widely available work-life policies available in organizations today are elder care and child care referral services, parental leave, and flex time. Barnett (1999) found that in a study of the ten family-responsive corporations, as chosen by their employees, that ten had elder care services, nine had job sharing, flex time and unpaid leave beyond that required by the FMLA, but only three had onsite or near site child care subsidies allowances or vouchers, even though child care affected more employees than any other work-life situation. From the 1992 Survey of American Establishments, Osterman (1995) found that of the 875 establishments observed, two percent offered onsite child care, 4.6 percent offered employer subsidized child care, 4.1 percent child care subsidies, 10.7 percent donations to child care centers to open spaces for employee's children, 13.6 percent offered child care referral services and 40.2 percent offered flexible scheduling.

Even though corporations expanded work-family benefits in recent years, utilization of policies falls far short of expectations (Hochschild, 1997). Family policies are underused because of fears, whether realistic or not, of career reprisal. Judiesch and Lyness (1999) found employees in a U.S. corporation who took family and medical leaves suffered promotional penalties as well as smaller wage increases in subsequent years. For these employees, fears of reprisal were entirely justified. A Women's Bar Association of Massachusetts study documented this problem in vivid terms. It found that while over 90 percent of the leading firms in the area allowed associates and partners to work part-time, less than four percent have chosen to do so and among those who do, turnover is higher and about one third report their careers have suffered for having taken up this option (Women's Bar Association of Massachusetts, 2000). .

Although the relevant evidence is far from conclusive, other studies are consistent with the possibility that the ideal worker norm provides part of the explanation for career penalties. For example, Thompson, Beauvais and Lyness (1999) found that corporate culture around work and family played a significant role in explaining whether employees used work-family policies. The fact that some organizations but not others are able to provide a favorable culture suggests that we are indeed dealing with norms.

The developments detailed in this section suggest that low rates of fertility and attempts to delay childbearing among highly educated women in the U.S. are less a matter of choice then of the current structure of careers. If this is so, then efforts to restructure careers offer a promising avenue for altering patterns of fertility and delayed childbearing.

8. Conclusions

This report considered long term trends in fertility and its relationship to employment in the United States. The overall pattern is one where fertility has declined as women's and mother's employment has risen. That decline is particularly severe for highly educated, employed women. This same group is disproportionately receiving fertility treatments, suggesting that they are often delaying any attempt to bear child in order to achieve career success.

The context for these developments is one where advances in medical technology have outpaced the ability of our institutions to deal with the consequences in a constructive fashion. Two medical advances are particularly relevant, the development of readily available and inexpensive birth control, and more recent advances in widespread but expensive fertility treatments.

We suspect, but cannot prove, that a majority of women who delay childbirth do so without full knowledge of the risks involved. Those risks, to the mother, to the potential child, and in terms of the low success rates associated with expensive fertility treatments, were detailed above.

In addition to medical advances, we have the context of governmental policies that are generally incoherent and piecemeal. The one governmental policy intended to provide employees with time for their families, the Family and Medical Leave Act, has helped, but its limited coverage and lack of financial provisions make it a weak mechanism for confronting a serious problem.

The private sector has responded to these developments in two ways. First, employers have been admitting women to the ranks of "ideal workers" who strive tirelessly to achieve career success, but at the expense of time with their families. Second, employers have implemented family-responsive policies in an attempt to accommodate the increasing number of employees with caregiving responsibilities.

Low utilization rates for family-responsive policies are, we believe, in large part due to the pervasive nature of the ideal worker norm. Young professionals, whether they be doctors, lawyers, accountants, academics, managers or engineers, receive many subtle and not-so-subtle messages to the effect that long hours of work and uninterrupted employment until one is established are required for career success. In such settings, delayed attempts to bear and raise children, or the avoidance of childrearing entirely, are a logical and reasonable response on the part of employees.

Any public policy response to these issues must first confront the question of whether an increase in fertility rates and decrease in delayed childbirth is desirable to the society. In terms of the health care costs involved, the future supply of skilled employees, and the availability of young employees to support an aging population,

such policies may make sense, although increased immigration offers an alternative approach.

However, it is not obvious that population increases *per se* are desirable, as noted by proponents of reproductive rights for women (e.g., Folbre, 1994, 260-261). Instead, it seems reasonable to strive for the sort of balance that can only emerge if a system that effectively denies fertility rights to professional women can be changed.

If this position is taken, we have argued that the next step is to think about the conditions under which individuals would choose to increase fertility and reduce delayed childbearing. Several policy responses might be considered in this regard. First, Fukuyama (2000) has argued that women should abandon employment and return to the home. If related policies were pursued, it seems likely that an increase in fertility, and a reduction in delayed childbearing, would follow. The two key problems with this strategy are that it a) assumes that women could return to the home, an option that as of 1994 would have eliminated 44 percent of the entire U.S. labor force (Spain & Bianchi, 1996), and b) would necessarily involve a reduction rather an increase in the choices available to career women. Fukuyama's solution is therefore neither practical nor fair.

A second policy option is to inform individuals of the costs and consequences involved in attempts to delay childbearing. Although we have no desire to scare people, delaying any attempt to raise a family without such knowledge is akin to driving an automobile without knowledge of the risks involved. People who are aware of the risks involved in driving behave in a more careful manner, and childbearing certainly warrants no lesser provision of knowledge.

A third policy option involves changing and challenging the ideal worker norm such that employees, be they men or women, can take on commitments to children and simultaneously achieve career success. As discussed earlier, a major concern of academics who research work and family policies is that the ideal worker norm has created circumstances where individuals believe that they cannot utilize existing private sector policies designed to increase time with family.

Yet there are signs of hope. The U.S. continues to discuss expansion of the coverage and financial provisions of the FMLA. *Working Mother* magazine, a publication that ranks the top 100 family-responsive organizations in the U.S. each year, now requires that applicants provide information on the utilization of work/family policies. Some trade unions have made work/family benefits and practices a high priority, leading to, e.g., the Family Service and Learning Centers jointly sponsored by the Ford Automobile Company and the United Automobile Workers (see www.familycenteronline.org). And corporations have continued to expand their work/family policies and benefits (Bond, Galinsky, & Swanberg, 1998).

Further, as Moen (2001) notes, the price to employers for becoming family-responsive is relatively low. On the one hand, the number of employees who are parents of young children at any given time tends to be low. On the other hand, looking over the entire span of a typical career, the fraction of time during which the employee is likely to be responsible for young children is typically short. Relatedly, Albelda and Manuel

(2000) show that an expansion of the FMLA to provide paid leave for new parents through governmental funding would also be of relatively low cost.

If these work/family policies and practices can be expanded, and if employees feel free to use the policies, the decline in fertility would be slowed if not reversed, and delayed childbearing would become an option instead of a necessity for many families.

References

The Alan Guttmacher Institute. (1996). The impact of publicly funded family planning, New York, NY: AGI.

The Alan Guttmacher Institute. (2000). U.S. policy can reduce cost barriers to contraception. New York, NY: AGI.

Albelda, R., & Manuel, T. (2000). Filling the work and family gap: Paid parental leave in Massachusetts. Boston, MA: Labor Resource Center, University of Massachusetts.

Bailyn, L. (1993). Breaking the mold: Women, men, and time in the new corporate world. New York, NY: Free Press.

Barnett, R. (1999). A new work-life model for the twenty-first century. Annals of the American Academy of Political and Social Science, 562, 143-158.

Barton, J., Bergauer, N., Jacques, D., Coleman, S., Stanziano, G., & Sibai, B. (1997). Does advanced maternal age affect pregnancy outcome in women with mild hypertension remote from term? American Journal of Obstetrics & Gynecology, 176(6), 1236-1240.

Bennett-Alexander, D. & Hartman, L. (2001). Employment Law for Business (3rd ed.). Boston: Irwin-McGraw Hill.

Berkow, R., Beers, M., & Fletcher, A. (Eds.). (1997). The Merck manual of medical information (Home edition). Whitehouse Station, New Jersey: Merck Research Laboratories.

Blair-Loy, M. (1999). Career patterns of executive women in finance: An optimal matching analysis. American Journal of Sociology, *104*, 1346-1397.

Bond, J.T., Galinsky, E., & Swanberg, J.E. (1998). The 1997 National Study of the Changing Workforce. New York, NY: The Families & Work Institute.

Cohen, M., & Sauer, M. (1998). Fertility in perimenopausal women. Clinical Obstetrics and Gynecology, 41,(4), 951-957.

Cohen, S. (2000a). Global gag rule threatens international family planning programs. The Guttmacher Report on Public Policy, February.

Cohen, S. (2000b). Congress in 2000: Actions to date on major reproductive health issues. The Guttmacher Report on Public Policy, 3(6), 1-4.

Council of Economic Advisors (2000). Economic Report of the President, 2000. Washington, D.C.: U.S. Government Printing Office.

Demeny, P. (1997). Replacement-level fertility: The implausible endpoint of the demographic transition. In G. W. Jones, R. M. Douglas, J. C. Caldwell & R. M