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## Understanding U.S. Fertility: Continuity and Change in the National Survey of Family Growth, 1988-1995

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About 50 studies based on the 1988 National Survey of Family Growth (NSFG) and a telephone reinterview conducted with the same women two years later provide continuing information about the fertility and health of American women. Among the findings of these studies are that black women have almost twice as many pregnancies as do white women (5.1 vs. 2.8), with nearly all of the difference being unintended pregnancies. Unwanted births increased between 1982 and 1988, particularly among less-educated, poor and minority women. This increase in the proportion of unwanted births may have prompted the increase in female sterilization among these groups. Concern with the AIDS epidemic led to increases in condom use between 1982 and 1990, especially among the partners of teenagers and college-educated women. Rates of teenage pregnancy were fairly stable during the period 1980-1988, as increases in the proportion of teenagers having intercourse were offset by increases in condom use. Rates of infertility did not change significantly in the 1980s, but because of delayed childbearing and the aging of the baby-boom cohort, the number of older childless women increased substantially. The 1995 NSFG was redesigned in a number of ways in order to answer a new generation of questions about fertility and women's health in the United States.

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Trends and differentials in fertility have profound effects on many aspects of American life, including population growth and the demand for schools, housing, medical care, jobs, Social Security and so on. It is important to study and predict fertility in a country the size of the United States, as even small changes in the national birthrate can have large effects on population growth. Recent Census Bureau projections, for example, show that a difference in the U.S. total fertility rates (TFR) of only 0.3 births per woman (about the same as the rise in the TFR from 1986 to 1990) would produce a population increase of 43 million in just 60 years.<sup>1</sup>

The vital registration system by itself cannot provide all of the information needed to understand fertility, family planning and reproductive health. In fact, the first national fertility survey—the 1955 Growth of American Families Study—was done in part because birth certificate data lacked the information needed to explain the lingering postwar baby boom.<sup>2</sup>

National fertility surveys have been conducted in the United States regularly since

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then. The first four—in 1955, 1960, 1965 and 1970—were carried out by private researchers.<sup>3</sup> To assure that these surveys would be continued and expanded as needed, the National Center for Health Statistics (NCHS) then began conducting fertility surveys under the name National Survey of Family Growth (NSFG). Cycle 1 of the NSFG was conducted in 1973, followed by Cycle 2 in 1976, Cycle 3 in 1982 and Cycle 4 in 1988. Women interviewed in person in 1988 were reinterviewed by telephone in 1990. The aims of the reinterview were to test the feasibility of reinterviewing a national sample, to update some of the cross-sectional data from the 1988 survey and to permit future longitudinal analysis. The data from the recently completed Cycle 5, which was fielded between January and October 1995, are expected to become available in late 1996 or early 1997.

The NSFG surveys have been fielded among women aged 15-44, the ages when most U.S. pregnancies occur. Only ever-married women were included in the first two cycles (in 1973 and 1976), but as of Cycle 3 (in 1982), all women, regardless of marital status, were eligible for the interview. The average sample size for the NSFG has been about 8,000 women; the interviews averaged about one hour and were conducted in person in the respondent's home.

The surveys supplement vital statistics data on factors that contribute to the nation's birthrate, including such intermediate fertility variables as marriage, divorce, sexual activity, contraceptive use, infertility and fetal loss.<sup>4</sup> The NSFG fertility data go beyond birth certificate data in three other important areas: data on expected future births; the wantedness status of pregnancies and births; and additional background characteristics that are not collected on birth certificates.

These national surveys have chronicled the spread of modern method use that produced the sharp decline in the U.S. TFR rate from 3.6 lifetime births per woman in 1955 to 1.8 by the early 1970s. The surveys showed the declines in pill and IUD use and the rise in sterilization as the TFR remained at 1.8 births per woman through the mid-1980s. The next NSFG will reveal the factors that led to the rise in the TFR to just over two births per woman through 1993. This TFR translates to roughly four million births annually. Future surveys should also shed light on the factors associated with the two million additional pregnancies that occur to American women each year.<sup>5</sup>

In this article, we summarize and interpret some of the most important findings of the 1988 NSFG and the 1990 reinterview\* by reviewing some 50 studies based on NSFG data. Most of the discussion uses as its conceptual framework the proximate determinants of fertility,<sup>6</sup> which are collected in the NSFG. These intermediate variables of fertility include intercourse variables (whether women have had intercourse), conception variables (whether intercourse resulted in conception) and gestation variables (whether conception resulted in a live birth). We also look at NSFG data on teenage pregnancy, the human immunodeficiency virus (HIV) and AIDS, and women's use of health services. This review then describes how the 1995 NSFG was redesigned to improve the quality of the data and to answer a new generation of questions about fertility and women's health.

## **INTERCOURSE VARIABLES**

Intercourse variables measure exposure to the risk of pregnancy—the numbers and

proportions of women who have vaginal intercourse with men. The NSFG does not collect data on other types of intercourse or sexual activity, so it provides useful but incomplete measures of the risk of becoming infected with a sexually transmitted disease (STD), including exposure to HIV. As Americans begin having intercourse at younger ages and delay marriage and childbearing, preventing premarital pregnancy and avoiding infection with an STD become growing problems. To shed light on such issues as the rising incidence of nonmarital sexual activity and the increasing rates of out-of-wedlock pregnancy and childbearing among teenagers and adults, the Cycle 4 NSFG also collected data on the types of relationships (marital and cohabiting) among sexually experienced women.

## **COHABITATION AND MARRIAGE**

The changing economic reality in the 1970s and 1980s appears to have made it more difficult for many young Americans to marry and start families: As the large baby-boom cohort entered the labor force, wages for men stagnated, inflation remained high for several years and rapid technological change lengthened the period that young people needed to attend school to qualify for well-paying jobs. As a result, some Americans traded marriage for cohabitation, and many postponed marriage and childbearing to work.<sup>7</sup> Between 1964 and 1988, the mean age of women at first marriage increased from 21.4 to 24.6 years, while that for men increased from 24.0 to 26.5 years.<sup>8</sup> These pressures affected minority populations as well. Wilson has argued that black men's relatively high unemployment and low wages make it more difficult for them than for white men to marry and support a family.<sup>9</sup> In 1988, the mean age at first marriage among black women was 26 years, compared with 24 years among white women.

Cohabitation is now so common that it must be given emphasis in any study of family and fertility.<sup>10</sup> The 1988 NSFG asked women if they were currently "not married but living with a partner or boyfriend." About 5 % were currently cohabiting, but a far larger proportion—34% of all women of reproductive age—had ever lived with a male sexual partner without being married. Among women aged 25-34 in 1988, about 45% had ever cohabited, most often before their first marriage.<sup>11</sup> The proportions who had ever cohabited did not vary substantially by race or ethnicity.

There are large racial differences, however, in the proportions who never marry. As other surveys have also shown, the NSFG reveals strong differences in marriage patterns between black and white women: In 1988, 31% of black women 30-34 years of age had never been married, compared with only 13% of white women. If black women do marry, they are less likely than other women to stay married. In 1988, 62% of marriages among black women remained intact after 10 years, compared with 72% of the marriages among white women.<sup>12</sup> In addition, black women were half as likely to have remarried within three years after divorce as were white women (20% vs. 44%). Thus, black women spend substantially less of their reproductive lives in marriage than do white women. This shorter time spent within marriage undoubtedly explains in part the greater proportion of nonmarital and unwanted births among black women than among white women.<sup>13</sup>

## **NONMARITAL SEXUAL ACTIVITY**

Only 4% of births in the United States in 1940 were to unmarried women, compared with 11% in 1970 and 31% in 1993.<sup>14</sup> The increase in premarital sexual activity is one of the causes of this rise in nonmarital births. One study based on the 1988 NSFG, for example, showed that 52% of teenage women in the United States had had premarital intercourse in 1988, compared with 29% in 1970; this rise was considerably steeper among white teenagers (from 27% to 51%) than among black teenagers (from 46% to 59%).<sup>15</sup> On average, black teenagers are exposed to the risk of a premarital pregnancy for longer periods of time than are white and Hispanic teenagers, because they tend to begin having intercourse at a younger age and marry later.<sup>16</sup>

## CONCEPTION VARIABLES

Conception variables affect the probability that intercourse will result in pregnancy; the major variables in this group include the contraceptive methods couples choose, their contraceptive effectiveness, couples' impaired fecundity (or infertility) and women's breastfeeding behavior.

## CONTRACEPTIVE USE

Contraceptive use is one of the most important proximate determinants of fertility.<sup>17</sup> The NSFG data show a profile of contraceptive use over the life cycle.

- *Use at first intercourse.* Among American women who had intercourse for the first time in 1988-1990, more than half used a method at first intercourse, regardless of race or ethnicity.<sup>18</sup> By far, the most common method at first intercourse is the condom. The percentage of women protected by the condom at first intercourse doubled in the 1980s, from 28% in 1980-1982 to 55% in 1988-1990; the timing of this change shows that it is a response to concerns about HIV.

The likelihood of method use at first intercourse varies widely by demographic characteristics. According to one recent study that looked at all women who had premarital intercourse for the first time in the period 1965-1988,<sup>19</sup> Jewish women were most likely to have used a method at first intercourse (68%), while Hispanic women and white fundamentalist Protestant women were the least likely (32% and 39%, respectively). Further, contraceptive use at first intercourse was more common among women who waited until at least age 19, those whose mothers were college-educated and those who lived with both parents.

Measures of economic opportunity in the community were associated with a greater likelihood of contraceptive use at first intercourse. These findings suggest that if men and women perceive opportunities for themselves, they see premarital pregnancy as an obstacle to the achievement of their goals and practice contraception.

- *Current use.* After having relied on the condom at first intercourse, young women typically switch to the pill. Among those practicing contraception in 1990, 61% of 18-19-year-olds and 55% of 20-24-year-olds were using the pill.<sup>20</sup> Female sterilization, however, is the leading method among 30-34-year-olds, because many American women have had all of the children they want by age 30. In 1990, among women who wanted no more children, about 70% relied on male or female sterilization.

Four major trends in current contraceptive use were apparent from 1982 through 1990.<sup>21</sup> First, reliance on female sterilization rose steadily, from 22% of users in 1982

to 30% in 1990. Female sterilization was already the leading method among women aged 30 and older in 1982, but increased sharply in the 1980s among other demographic groups, such as less-educated, low-income and minority women. By 1990, female sterilization was the leading method among less-educated, low-income and minority women of all ages.

Second, pill use remained high, especially among young women aged 15-29 and among college-educated white women. Third, IUD use virtually disappeared as the major distributors of the device withdrew it from the U.S. market: Reliance on the IUD dropped from 7% among users in 1982 to 1% in 1990. Finally, condom use more than doubled among never-married women, from 12% in 1982 to 30% in 1990, apparently in response to concerns about HIV infection. Diaphragm use dropped by an equivalent amount, and this shift from the diaphragm to the condom was especially pronounced among college-educated women.

If we combine male and female sterilization, 42 % of all users were protected by sterilization in 1990 (29.5% by female sterilization and 12.6% by vasectomy), while 29% relied on the pill and 18% on the condom. Why has sterilization, especially female sterilization, become so popular? First, the experience of an unintended pregnancy, whether it results in an unplanned birth or an abortion, is probably one reason why so many couples choose sterilization, with its minimal failure rate. Second, many women wish to avoid the side effects associated with reversible methods. (Such a concern may seem excessive, given the health data,<sup>22</sup> but is nonetheless genuine.)

Third, many couples have had all the children they want at a surprisingly young age and typically face 15 or more years in which they want to avoid any further pregnancies. The cumulative risk of an unwanted birth over a 15-year period may be quite high, since at ages 30-44 that risk is 10% in the first year alone.<sup>23</sup> Many couples who relied on the pill when they were younger may reject long-term continued use because of worries about side effects. Married or monogamous couples may also rule out barrier methods because they have relatively high failure rates and interrupt the spontaneity of intercourse. While the initial cost of sterilization is higher than that of other methods,<sup>24</sup> it is often covered by insurance. When averaged over many years, its long-term costs are relatively low. Thus, couples may view sterilization as providing permanent, coitus-independent protection from unwanted pregnancy at low cost and with no worry about side effects.

Among sterilized couples, male sterilization is less common than female sterilization. Reliance on male sterilization is particularly rare if the woman is black, Hispanic, less-educated or low-income. Several possible explanations have been offered for this consistent finding, including indifference or hostility to contraception among men in these groups,<sup>25</sup> their lack of access to health care and health insurance, and community-level variables such as limited economic opportunities and their adverse effects on employment, marital stability and access to health insurance.

## USE-EFFECTIVENESS

The basic measure of contraceptive effectiveness estimated from the NSFG is the first-year failure rate—the probability of pregnancy in the initial year of method use.

According to the 1988 survey, first-year failure rates were 7% for the pill, 16% for the

condom, 22% for the diaphragm, 30% for spermicides and 31% for periodic abstinence.<sup>26</sup> These rates, which reflect U.S. women's actual use, are obviously higher than failure rates for "perfect" use, and thus give patients and physicians a realistic estimate of the chances of success or failure with a given method. For example, the 7% failure rate for the pill indicates that compliance is far from perfect, especially with the now common lower-dose formulations that need to be taken consistently to be effective. The failure rate for the condom is 16% because fewer than half of users use one at each act of intercourse;<sup>27</sup> the same is probably true of other barrier and behavior-dependent methods.

The combined first-year failure rate in 1988 for all methods except sterilization was 14%. However, the failure rate among low-income women was double that among high-income women (21% versus 10%), and rates among black and Hispanic women were higher than those among white women. These findings suggest one explanation for why minority, low-income and less-educated women so often turn to sterilization.

## **IMPAIRED FECUNDITY AND INFERTILITY**

The two indicators of impaired fecundity used in the NSFG differ in two principal ways. First, infertility only measures a couple's difficulty in conceiving, while impaired fecundity covers both difficulty in conceiving and difficulty in carrying a pregnancy to term. Second, infertility is measured among married couples only, but impaired fecundity is assessed among both married couples and unmarried women.

Public concern with infertility has been intense and widespread. In the 1970s and 1980s, the popular media often reported an "epidemic" of infertility. However, NSFG estimates of infertility trends over time, which are based on detailed information on women's sexual, contraceptive and pregnancy experience, do not support these claims.<sup>28</sup>

Physicians define infertility as the inability to conceive after at least one year of unprotected intercourse. They use this definition to screen couples for infertility treatment; it is not a measure of sterility. In 1988, about 2.3 million married couples in which the woman was 15-44 years old were infertile, or about 8% of all married couples (roughly the same proportion as in 1982). Moreover, infertility among married couples has not significantly increased since 1965.

Women are classified as having impaired fecundity if they report that it is impossible, difficult or dangerous for them to become pregnant or carry a baby to term. In 1988, about 4.9 million couples had impaired fecundity, compared with 4.5 million in 1982. This increase in absolute numbers resulted from the growth in population, since the proportion of women with impaired fecundity or whose partners had impaired fecundity was the same in both 1982 and 1988 (8.4%). In fact, the percentage with impaired fecundity did not change significantly over that period in any of 12 age and parity subgroups.<sup>29</sup>

Given that rates of infertility and impaired fecundity did not change, where did the widespread perception of an "epidemic" of infertility come from? First, the tendency to delay marriage and childbearing for economic reasons has increased the age at which women attempt conception,<sup>30</sup> and the incidence of impaired fecundity increases with age: In 1988, 4% of childless women aged 15-24 had impaired fecundity,



compared with 13% of those aged 25-34 and 21% of those aged 35-44.<sup>31</sup>

Second, an unprecedented number of women born in the baby-boom cohort were in their 30s and 40s in the 1980s and had delayed having a baby. The number of childless women aged 25 and older increased by 27% between 1982 and 1988, from 10.2 million to 12.9 million. Accordingly, the number of childless women aged 25 and older with impaired fecundity increased by 24%, from 1.3 million to 1.6 million.<sup>32</sup> To a clinician or to a reporter, a 24% increase in six years probably looks like an epidemic.

Third, the introduction of a variety of new fertility drugs and techniques received widespread news coverage and spurred public discussion about infertility. The greater range of techniques available also increased the number of visits per infertility patient and the number of physicians specializing in infertility;<sup>33</sup> the overall result was a rise in the number of medical visits for infertility and in the amount of money spent to treat infertility.

Two studies of 1988 NSFG data on infertility showed that impaired fecundity is not more prevalent in any one race or socioeconomic group, but those in higher socioeconomic groups use infertility services far more often than do those in other groups.<sup>34</sup> Thus, clinicians who treat infertility see a self-selected subset of all couples with infertility problems and the studies based on those populations suffer from the same selection bias.

The risk of impaired fecundity is doubled among women who have had pelvic inflammatory disease (PID), once age and other variables have been controlled for.<sup>35</sup> According to an analysis of NSFG data on PID, 11% of American women reported they had had PID at some time in their lives.<sup>36</sup> The factors that significantly predicted PID among all women, other than the woman's age, were being black, having had multiple lifetime sex partners and having been diagnosed with an STD. Among white women, being unmarried, having had intercourse for the first time at a young age and having practiced douching also independently predicted PID. While caution is always necessary when interpreting self-reported medical data, these findings are consistent with epidemiologic studies of physician-diagnosed PID among smaller samples.

In epidemiologic studies, douching has been associated with PID, ectopic pregnancy and cervical cancer.<sup>37</sup> Another analysis based on NSFG data confirmed douching as a risk factor for PID among white women; that study also found that 32% of white women and 67% of black women douched regularly, and women with less education and those who had first intercourse at an early age were more likely to have douched.<sup>38</sup>

## **BREASTFEEDING**

Although the demographic impact of breastfeeding is small compared with that of contraception and abortion, its well-established health benefits for the infant make it an important variable to monitor.<sup>39</sup> Unfortunately, the infants most likely to need the benefits of breastfeeding—those born to teenage mothers or to mothers with low incomes or less education—are least likely to get them.<sup>40</sup> Throughout the 1970s and 1980s, breastfeeding (and in particular long-term breastfeeding, which confers the greatest health benefits) was practiced primarily by college-educated white mothers. Breastfeeding increased sharply during the 1970s but not in the 1980s.

## GESTATION VARIABLES

In a framework based on the intermediate fertility variables, the gestation variables are pregnancy outcomes—whether a pregnancy results in fetal loss, a live birth or an induced abortion. The NSFG estimates of total fetal loss combine miscarriages (fetal deaths before 28 weeks' gestation) with the much less numerous stillbirths (deaths after 28 weeks' gestation). NSFG data show that when rates of fetal loss are expressed as fetal losses divided by live births plus fetal losses, about one in six pregnancies ends in a miscarriage or stillbirth. These estimates compare well with those from other survey data,<sup>41</sup> but are lower than estimates derived by using special methods of detection to uncover early miscarriages.<sup>42</sup>

NSFG data on fetal losses have been used in a series of reports that supply pregnancy rates by age and race for each year from 1976 to 1992. The birth data in these reports are from the national birth registration system, the data on fetal loss from the NSFG, and the abortion data from the U.S. Centers for Disease Control and Prevention and The Alan Guttmacher Institute. According to the most recent report, the annual number of pregnancies in the United States rose from 5.0 million in 1976 to 6.7 million in 1990, as the number of women of reproductive age increased by 20% (from 48.7 million women aged 15-44 in 1976 to 58.6 million in 1990).<sup>43</sup> In 1991 and 1992, the annual number of pregnancies declined slightly, to 6.5 million. In 1992, about 63% of pregnancies ended in a live birth, about 24% in an induced abortion and 14% in a fetal loss.

The overall total pregnancy rate (the sum of age-specific pregnancy rates) in 1991 was 3.3 lifetime pregnancies per woman—2.1 births, 0.8 abortions and 0.4 fetal losses. White women averaged 2.8 pregnancies, including 1.8 live births, 0.6 abortions and 0.4 fetal losses per woman. Among black women, the rate was 5.1 pregnancies per woman, broken down into 2.6 births, 1.9 abortions and 0.6 fetal losses. Hispanic women averaged 4.7 pregnancies per woman—3.0 births, 1.0 abortions and 0.7 fetal losses.

## OTHER FERTILITY-RELATED VARIABLES

### FERTILITY EXPECTATIONS

National fertility surveys have always collected data on women's birth expectations in order to project future birthrates. A recent study compared NSFG data and data from the Census Bureau's Current Population Surveys (CPS) in an effort to understand the conditions under which birth expectations provide useful information for predicting future birthrates.<sup>44</sup> The report is valuable for two reasons. First, it is the most extensive presentation of NSFG data on birth expectations in two decades. Second, the report shows that the CPS and the NSFG get significantly different estimates of birth expectations because many women are uncertain about how many births they expect and the two surveys handle this uncertainty differently. Researchers need to resolve the problem of how to project the birthrates of women who are uncertain about their birth expectations.\*

According to the report, in 1982 American women aged 15-44 expected to have 2.38 births, while in 1988 they expected 2.22 births. Both of these estimates are



significantly higher than the actual TFRs for the corresponding years (1.83 births in 1982 and 1.93 births in 1988). The report points out that these higher levels of expected fertility relative to actual fertility suggest that many women who are delaying childbearing plan to compensate for this delay later on. In fact, the TFR increased to more than two births per woman in 1989 and 1990, in part because birthrates among women in their 30s and 40s rose sharply. Thus, women's expectations of future childbearing may have anticipated the rise in birthrates since the early 1980s.

## UNINTENDED FERTILITY

Since 1965, national fertility surveys have ascertained whether pregnancies were intended or unintended.\* A recent study by the U.S. Institute of Medicine found that about 57% of pregnancies in the United States are unintended.<sup>45</sup> Several industrialized nations have succeeded in reducing the proportion of pregnancies that are unintended to 30%; if the United States were to achieve this goal, the report notes, there would be about 200,000 fewer unwanted births and about 800,000 fewer abortions each year.

The report stresses that unintended pregnancy is the common thread in teenage pregnancy, nonmarital childbearing and abortion; all of these problems would be less severe if unintended pregnancy were reduced. Another study has shown that preventing unintended pregnancy saves a great deal of money: Since each pregnancy, on average, costs about \$3,800 in a managed-care setting,<sup>46</sup> the 3.5 million unintended pregnancies that occur each year cost about \$13 billion annually in medical costs alone.<sup>47</sup>

Although overall rates of unintended childbearing decreased greatly in the 1970s, the proportion of births that were unwanted increased among less-educated, poor and minority women in the 1980s, with the greatest increases occurring among poor and less-educated black women.<sup>48</sup> The Institute of Medicine report notes that this trend reflects both an overall increase in the proportion of unintended pregnancies and a decline in the percentage of unintended pregnancies that were resolved by abortion.<sup>49</sup>

About 40% of U.S. births result from unintended pregnancy. Teenagers, poor women, black women, less-educated women and unmarried women are more likely than others to report that a birth was unwanted or mistimed. For example, about 73% of births to teenagers result from unintended pregnancy, compared with 46% among women aged 20-24 and 32% among women aged 25-29.<sup>50</sup> The determinants of unwanted births, a subset of unintended births, have not changed in the last two decades: Net of all other factors, low education, low income, older age and black race all increase the probability of an unwanted birth. This was true in 1973, and was still true in 1988.<sup>51</sup>

## RELIGIOUS DIFFERENTIALS IN FERTILITY

Another important correlate of fertility not measured on birth certificates is religious affiliation. In the 1955 and 1960 surveys, religious affiliation was associated with large differences in fertility and its intermediate variables.<sup>52</sup> Among white women, Catholics had a much higher birthrate than Protestants, and this difference persisted until the late 1960s. By the 1980s, however, this pattern had ended. Total fertility rates among non-Hispanic whites were now lower for Catholics than for Protestants (1.64 lifetime births per woman versus 1.91 per woman).<sup>53</sup>

Catholic women tend to have fewer children than Protestant women, primarily because they marry later and less frequently than do Protestants. However, fertility remains high among Hispanics, regardless of their religion, and among Mormons. Conversely, fertility rates are lowest among Jewish women and those with no religion. Women with a wide gap between their TFR and the total number of births they expect to have—for example, Catholics, Jews and those with no religious affiliation—may end up having fewer children than they expect to have.

## SELECTED POLICY ISSUES

Studies based on data from the 1988 NSFG and the 1990 reinterview shed light on several important public policy issues, including teenage pregnancy, adoption, STD and HIV prevention, and the use of family planning and other medical services by women of reproductive age.

## ADOLESCENT PREGNANCY

The U.S. teenage pregnancy rate, which is higher than that of many other industrialized nations,<sup>54</sup> is a policy and health concern because of its association with adverse social, economic and health outcomes for women and children. For example, teenage mothers are more likely than adult mothers to receive inadequate prenatal care, to gain too little weight during pregnancy, to have labor and delivery complications (including low birth weight, preterm birth and newborn anemia), to drop out of high school, to have decreased earning potential and to live in poverty.<sup>55</sup> Although many of these associations seem to stem from the already disadvantaged status of women who become adolescent mothers, substantial evidence suggests that childbearing at an early age compounds the risk of adverse outcomes for these women and their children.

About 11% of teenage women became pregnant annually during the 1980s. These rates remained relatively stable during the period 1982-1988 because two important trends balanced each other out: Although the proportion of teenagers who had ever had intercourse increased (from 47% in 1982 to 53% in 1988), condom use among teenagers also increased, which prevented pregnancy rates from rising accordingly.<sup>56</sup> The overall increase in the past decades in the number and proportion of unwed teenage mothers is a complex phenomenon, but its demographic causes include the declining proportion of teenagers who marry, the decline of the shotgun marriage and decreases in birthrates to married women, as well as increases in the birthrates among unmarried teenagers.<sup>57</sup> More than 85% of births to never-married teenagers are unintended.<sup>58</sup>

For never-married teenagers, the first-year contraceptive failure rate is 16%, the same as that for all never-married women.<sup>59</sup> The predominant method among teenagers is the pill, which suggests that use-effectiveness could be increased by improving the consistency with which teenagers take the pill.

## ADOPTION

Carrying a pregnancy to term and placing the child for adoption is an alternative to abortion for some women with an unwanted pregnancy, and adopting a child is an alternative for couples for whom infertility treatment is unsuccessful or too costly.

The NSFG is one of the only available sources of nationally representative information on adoption and the only source of national data on relinquishment of babies for adoption among women of reproductive age. Data from the survey have shown that the percentage of ever-married women aged 15-44 who ever adopted a child remained quite stable, at about 2% during the 1970s and 1980s.<sup>60</sup>

Adoption of an unrelated child is most common among childless women, women with fecundity impairments, white women and those with higher levels of income and education. Adoptions of related children, however, follow a different pattern: Black families and families with low incomes and low levels of education are more likely than others to adopt a relative. Most studies of adoption focus only on unrelated adoption, leaving out an important part of the overall picture.

Relinquishment of children for adoption declined dramatically over time among white women, from 19% of nonmarital births in 1965-1972 to 3% of nonmarital births in 1982-1988.<sup>61</sup> Among black women, the rate of relinquishment did not change and has always been low (under 2% of nonmarital births). The drop among white women initially reflected the increases in abortion rates after the legalization of abortion in 1973. In subsequent years, however, the continuing decline in the proportion of women who placed their children for adoption most likely reflected the diminishing stigma of unwed parenthood.

The difficulties that infertile couples face in adopting a child have attracted much attention in recent years. Data from the 1988 NSFG, which for the first time included measures of the adoption-seeking process, confirmed the popular impression that there were more couples seeking adoption than there were babies to adopt: In 1988, there were an estimated 3.3 adoption seekers for every actual adoption.<sup>62</sup> At the same time, however, only a minority of couples with fecundity impairments (11-24%) had taken any step to adopt a child.

## **USE OF FAMILY PLANNING SERVICES**

The most effective methods of contraception—i.e., the pill, sterilization, the implant and injectables—must be obtained from a doctor or other health care provider, so contraceptive use is closely tied to use of the health care system. However, the American health care system is changing, which makes it critical for researchers and providers alike to understand where and how women obtain contraception and why some women cannot or do not obtain a method when they need one.

Family planning visits give women the chance to be screened for cancer, hypertension and STDs, including infection with HIV.<sup>63</sup> In 1982 and 1988, about 20 million women (35% of the 58 million women aged 15-44) used family planning services in a 12-month period. This percentage fluctuated by age, rising from 30% among 15-19-year-olds to 59% among 20-24-year-olds and then declining, from 53% among 25-29-year-olds to 35% among 30-34-year-olds, 17% among 35-39-year-olds and 6% among 40-44-year-olds.<sup>64</sup> This pattern is associated with the age pattern of contraceptive use.

Over 90% of women who use family planning services obtain cancer and hypertension screening each year; in contrast, among those who do not use such services, large differentials exist in health screening measures by socioeconomic status and disease risk.<sup>65</sup> Pill use in particular requires regular visits and is typically accompanied by

routine health screening.

Title X of the Public Health Service Act was passed to provide birth control and other medical services for all women who need but cannot afford them. Of the women who obtained family planning services in 1988, 18% used a Title X clinic at their most recent visit, 18% attended another type of clinic and 64% went to a private doctor or a health maintenance organization.<sup>66</sup> While Title X clinics provide services to all women, they are a major source of family planning for teenagers, black women and low-income women, since at least one-third of their most recent visits for family planning were at a Title X clinic.

## **MATERNAL AND CHILD HEALTH**

A majority of infant deaths in the United States occur in the first 28 days of life, and these neonatal deaths are typically related to conditions that develop during pregnancy. A recent analysis of NSFG data found that race, marital status, education, income, age at pregnancy outcome and wantedness of the pregnancy continue to be correlated with delayed prenatal care, smoking and drinking during pregnancy, and low birth weight.<sup>67</sup> For example, infant mortality rates are twice as high among black babies as among white babies, in part because black women continue to be less likely than white women to receive prompt prenatal care; the magnitude of this difference did not decrease in the 1980s. Black and other minority women more often relied on public sources for most of their prenatal care. Private insurance paid for about 68% of the most recent deliveries to women in 1984-1988; 11% were paid for with the woman's own money, 9% by Medicaid, 7% by other government programs and 5% by other sources. About one-third of teenage, black and never-married mothers relied on Medicaid for payment for their most recent delivery in 1982 and 1988.

Smoking during pregnancy declined in the 1980s, but did not disappear: Twenty-three percent of pregnant women smoked during their pregnancy in 1985 ;1988, compared with 32% in 1971-1980. White women were more likely to smoke during pregnancy than were black or Hispanic women. Alcohol use during pregnancy also declined between 1982 and 1988, from 45% to 34%. Among the 34% who drank during pregnancy, nearly 25% drank once a month or less, while just over 8% did so more than once a month.

## **HIV AND STD PREVENTION**

Information on the prevalence of behaviors that increase the risk of HIV infection is essential for predicting the course of the AIDS epidemic, targeting public health efforts to discourage risky behaviors and evaluating the success of such programs nationwide. While the 1988 NSFG and 1990 reinterview measured only certain aspects of HIV risk behavior, the inclusion of such questions in a national survey was an important step in showing that respondents were willing and able to answer them.

One study that analyzed these NSFG data on risk behavior concluded that "further data collection on the topic is vitally important and appears to be feasible."<sup>68</sup> According to this analysis, about 4.2 million women aged 15-44 (8% of those who have ever had intercourse) have had more than 10 male sexual partners in their lifetime. The proportions of women with more than 10 partners were similar by income and race.

During the past two decades, behavior that raises the risk of STD infection increased among teenagers, with the proportion who had more than one sexual partner increasing from 12% in 1971 to 32% in 1988. Studies based on NSFG data have also shown that among unmarried women, those who had first intercourse before age 15 and those with no religious affiliation were the most likely to have had more than one recent male partner.<sup>69</sup>

Data from the 1990 reinterview show that less than half of all condom use in 1990 was consistent use; that is, most condom users do not use a condom at each act of intercourse.<sup>70</sup> Consistent condom use for disease prevention was most common among college-educated unmarried women: About 19% of the partners of such women used condoms consistently to prevent STDs in 1990, compared with just 3% of the partners of high school dropouts. Clearly, public health messages about condom use for STD and HIV prevention are not being heeded equally by all segments of the population. The same study also showed that among unmarried women who had recent multiple partners, only 40% succeeded in having their partners use condoms at all acts of intercourse.

About 35% of women aged 15-44 had been tested for HIV at some time, according to the 1990 reinterview. Only about 16% of these tests, however, were obtained at visits specifically for an HIV test. The remainder took place when the woman donated blood (55% of tests), or at a periodic medical examination or at other medical visits (17%). The proportions of women who had been tested were as high as 54% among unmarried women who had ever had an STD, 47% among those who had had six or more partners and 43% among those who had had PID.<sup>71</sup>

A study of the 1988 data found that 26% of women aged 15-44 had been tested for an STD in that year.<sup>72</sup> The probability of having been tested was higher among blacks than among whites (47% vs. 23%); one reason for this disparity is the higher rates of gonorrhea among black women than among white women.<sup>73</sup> According to the 1988 NSFG data, women who had made a family planning visit in the last 12 months (especially to a clinic) were more likely than others to have been screened for STDs.<sup>74</sup> This finding suggests that some clinics serving high-risk populations now find it cost-effective to screen most of their clients regardless of their individual characteristics.

## **THE CYCLE 5 REDESIGN**

For many years, the data collected by the NSFG from representative cross-sections of women of childbearing age have provided useful information on the status of women's reproductive experience and health. In planning for Cycle 5, however, it became clear that the survey needed to be enhanced in important ways to continue to meet the needs of policymakers, health planners and researchers.

First, we were urged to expand the explanatory measures included in the survey. In previous cycles, the wide scope of fertility-related topics covered by the survey and the one-hour time limit on the interview restricted the characteristics of women's current and past lives that could be measured. This hampered the ability of researchers to test hypotheses about the causes and consequences of fertility and fertility-related behavior. For example, one study conducted with 1988 NSFG data found a relationship between premarital intercourse and the risk of divorce.<sup>75</sup> Two

key explanations for this finding require measures of family background and attitudes and values on marriage and childbearing, and these were quite limited in the 1988 survey. Another study based on Cycle 4 could not test explanations for the finding that teenage mothers are more likely to have daughters who are teenage mothers, because the survey had too few measures of respondents' background.<sup>76</sup>

The 1995 NSFG features several improvements that address these and other gaps. First, Cycle 5 was redesigned to include detailed event histories—a cohabitation history, a work history, an education history and a history of parents and grandparents with whom the respondent lived during childhood.<sup>77</sup> These event histories make it possible to link NSFG data on fertility, contraception and other proximate determinants to other elements of the life course.

In addition, improved history data on marriage, divorce and sexual partnerships have been added, as have questions on attitudes toward marriage and childbearing. These data will provide an important resource for studying how the formation, circumstances and stability of relationships influence the risk of pregnancy and non-marital birth and STD infection.

These additions, however, made the survey substantially longer and more burdensome. In 1993, the NSFG pretest showed that \$20 incentives helped increase response rates and control costs, despite the questionnaire's increased length.<sup>78</sup>

A second improvement was to strengthen the measurement of certain fertility-related variables. Whereas previous surveys have consistently documented much higher rates of unintended pregnancy in the United States than in many other industrialized countries, the reasons for this situation have been left unanswered. Enhanced measures in Cycle 5 of the consistency of contraceptive use, of the characteristics of sexual partners and of women's attitudes about their pregnancies should give us fresh insights on this question.<sup>79</sup> Similarly, the expanded data on family planning and infertility services and other measures of health care use should yield better information on how well the health care system addresses Americans' needs.

Third, to improve the quality and timeliness of the data, the NSFG shifted from paper-and-pencil interviewing to computer-assisted personal interviewing, in which the interviewer uses a laptop computer to ask questions and record answers. Computer-assisted interviewing reduces interviewer error and lessens the time needed for coding and editing after the interviews are completed.

Fourth, the most recent cycle incorporated new methods to improve the reporting of abortion and other sensitive topics. Abortion reporting has always been incomplete in the NSFG, as it is in nearly all fertility surveys.<sup>80</sup> In the Cycle 5 pretest, women responded on a personal computer to a self-administered questionnaire delivered over headphones. The pretest results suggested that this new technique, called audio computer-assisted self-interviewing, helped to improve the reporting of abortion compared with traditional face-to-face interviewing (as did the \$20 incentive). The 1995 NSFG was one of the first large national studies to use audio computer-assisted self-interviewing.<sup>81</sup>

Data collection occurred from January through October 1995. Over the next year, the Cycle 5 data will be edited and coded; constructed variables (such as current



contraceptive use, fecundity status and infertility status) will be programmed, tested and imputed; weights for each case will be computed to account both for nonresponse and for the different sampling rates for white, black and Hispanic women; sampling errors will be estimated (as errors in a complex sample differ from those in a simple random sample of the same size<sup>82</sup>); and a user's guide to the data file will be prepared. When these processing steps are complete, data from the survey will be released for public use,\* probably in early 1997. If accomplished, this will represent a substantially faster turnaround time than with previous cycles, despite the fact that the Cycle 5 data file is longer and more complex than any previous NSFG.

Just as the Cycle 5 survey was enriched to address current research and policy questions, future cycles will also change to meet new data needs as they arise. Some of the challenges for Cycle 6 and beyond may be improving information on men's roles in marriage, fertility and parenting; seeking new ways to characterize relevant aspects of the social, cultural and economic context; and measuring how changes in public policy and health care will affect the reproductive behavior and health of American couples.

Future surveys will also need to continue to provide time-series data on critical aspects of fertility and reproductive health. No one study can answer all questions related to fertility. Nevertheless, by striking a careful balance between continuity and change, this historic series of studies will continue to contribute to understanding fertility and reproductive health in the United States.

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Human Development (NICHD), Bethesda, Md. The National Surveys of Family Growth (NSFG) are jointly planned and funded by NCHS, NICHD and the Office of Population Affairs, all of the U.S. Department of Health and Human Services. The NSFG has been made possible by the cooperative efforts of many dedicated people. The authors acknowledge the contributions of their colleagues, past and current, with gratitude. The opinions expressed in this article are those of the authors, and do not necessarily reflect those of any of the funding agencies. \*For example, women aged 18-34 who were interviewed in the NSFG expected 12% more births than similar women interviewed in the CPS. The report suggests several possible explanations for this difference, but pe