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Health Aspects of Pregnancy and Childbirth: United States, 1982–88

August 1995

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
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Vital and Health Statistics

Health Aspects of Pregnancy and Childbirth: United States, 1982–88

Series 23:
Data From the National Survey of Family Growth
No. 18

Statistics collected in 1988 are presented on the timing of the first prenatal visit, the source of prenatal care, smoking and alcohol use during pregnancy, low birthweight, and how delivery was paid for. The data are shown by race and characteristics of the mother and the pregnancy. Trends between 1982 and 1988 are also presented.

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
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National Center for Health Statistics

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This report is dedicated to

Kathryn Ann London, Ph.D.
1956–1995

Dr. London set the highest of standards for herself;
for 7 years the National Survey of Family Growth reaped the benefits of that commitment to quality.
Her integrity, dedication, and expertise fostered an atmosphere of collegiality and learning in which it was a delight to work.
Kathy's generous spirit and unique perspectives are deeply missed.

Contents

Introduction . . . 1

Summary of principal findings . . . 3
- Timing of first prenatal visit . . . 3
- Source of most prenatal care . . . 3
- Cigarette smoking during pregnancy . . . 4
- Drinking during pregnancy . . . 4
- Low birthweight . . . 5
- Source of payment for delivery . . . 5

Source and limitations of the data . . . 10

Comparisons with other data . . . 11

Findings . . . 13
- Timing of the first prenatal visit . . . 13
- Source of most prenatal care . . . 15
- Cigarette smoking during pregnancy . . . 16
- Drinking during pregnancy . . . 18
- Smoking and drinking during pregnancy . . . 20
- Low birthweight . . . 20
- Source of payment for delivery . . . 22

References . . . 25

List of detailed tables . . . 28

Appendixes

I. Technical notes . . . 63
II. Definitions of terms . . . 68
III. Items on the 1988 National Survey of Family Growth questionnaire related to health aspects of pregnancy and childbirth . . . 71

Figures

1. Percent of mothers receiving prenatal care in the first trimester, by race of mother and marital status: United States, 1984–88 . . . 3
2. Percent of mothers receiving prenatal care in the first trimester, by marital status of mother and year of birth of child: United States . . . 5
3. Percent of mothers receiving prenatal care for a birth in 1984–88 and who received most prenatal care from a private physician, by race and poverty level income: United States . . . 5
4. Percent of women who reported any amount of cigarette smoking during their most recent pregnancy, by race and education: United States, 1988 . . . 5
5. Percent of ever-pregnant women who smoked during their most recent pregnancy, by education and year of pregnancy outcome: United States . . . 7
6. Percent of ever-pregnant women who drank once a month or more during their most recent pregnancy, by race and education: United States, 1988 . . . 7

7. Percent of most recent single live births to women 15–44 years of age that were low birthweight, by race and number of cigarettes smoked per day during pregnancy: United States, 1988 8
8. Percent of live births in 1984–88 that were paid for, in whole or part, from specified sources, by race of mother: United States 8
9. Percent distribution of most recent live births (1984–88) by source of payment for delivery and marital status: United States 9
10. Percent of deliveries paid in whole or in part by Medicaid, by age of mother and year of birth: United States 9

Text tables

A. Number of live births to women 15–44 years of age and percent having first prenatal visit within first trimester of pregnancy, by selected characteristics of the birth and mother: United States, 1979–82 and 1984–88 4
B. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent who reported any amount of cigarette smoking during pregnancy, by year pregnancy ended and selected characteristics of the pregnancy and mother: United States 6
C. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by whether they smoked cigarettes or drank alcohol during pregnancy, according to selected characteristics of the pregnancy and mother: United States, 1988 7
D. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent who reported drinking at all during pregnancy, by selected characteristics of the pregnancy and mother: United States, 1982 and 1988 8
E. Number of live birth deliveries to women 15–44 years of age and percent paid by private insurance or Medicaid, by selected characteristics of the birth and mother: United States, 1979–82 and 1984–88 9

Symbols

- - -	Data not available
. . .	Category not applicable
–	Quantity zero
0.0	Quantity more than zero but less than 0.05
Z	Quantity more than zero but less than 500 where the numbers are rounded to thousands
*	Figure does not meet standards of reliability or precision (see Technical notes)

Health Aspects of Pregnancy and Childbirth

by Anjani Chandra, Ph.D., Division of Vital Statistics

Introduction

During the 20th century, infant mortality rates in the United States have fallen dramatically, from 100 infant deaths per 1,000 live births in 1900, to 23 in 1960, to 9 in 1990 (1–3). In 1900, most infant deaths were due to infectious causes and occurred *after* the neonatal period. In recent years, however, neonatal deaths (those within the first 28 days of life) have accounted for the majority of infant deaths (4–5). Low birth weight is the key determinant of neonatal death. Although the survival of low birth weight babies has markedly improved in recent decades (6), the prevalence of low birth weight itself has not declined comparably with infant mortality rates (1,2,7). Given that the improved survival of low birth weight babies has chiefly been tied to expensive, recent developments in perinatal medicine, health care dollars would be saved and later complications would be prevented if fewer births were low birth weight (3,8).

Racial and ethnic group disparities persist in low birth weight and infant mortality, even as overall death rates move toward the Year 2000 national objective of 7 infant deaths per 1,000 live births (3,7,9). These disparities are largely attributable to continuing social and economic differentials in health status among subgroups of the population (8,10–13). The United States, though currently ranked 24th in infant mortality rate (14), is not alone among industrialized nations with regard to socioeconomic and racial-ethnic disparities. Despite their lower overall infant mortality rates, countries such as Sweden, Australia, France, and England also face large gaps in pregnancy outcomes and other health indices among groups of varying socioeconomic status (15–19).

The prevention of low birthweight will yield marked reductions in perinatal morbidity and mortality, as well as reductions in developmental deficits and health problems later in childhood (8,13,20,21). Although there may be debate over the specific mechanisms, there is general consensus that the most effective means of reducing rates of low birthweight, and thereby narrowing the racial and ethnic gaps in maternal and child health status in the United States, would include the following strategies: improving access to and quality of prenatal care; reducing prenatal smoking, drinking, and substance abuse; and narrowing disparities in nutritional status and other areas of health (3,8,13).

To monitor the Nation's progress toward these goals, reliable national data must be collected. The National Survey of Family Growth (NSFG), a periodic survey conducted by the National Center for Health Statistics, is designed to provide information on fertility, family planning, and aspects of maternal, child, and reproductive health that are closely related to childbearing. The NSFG offers several key health measures that are useful in assessing the risk of poor pregnancy outcomes among various groups in the United States. This report follows the precedent set by the first comprehensive presentation of NSFG data on health aspects of pregnancy and childbirth, which was based on the 1982 cycle (22). Health and pregnancy data from the 1988 NSFG are presented, with an emphasis on correlates of low birthweight.

The pregnancy-related health measures presented in this report include:

- The number of months women had been pregnant when they began receiving prenatal care for that pregnancy (tables 1–6).
- Whether women received their prenatal care for that pregnancy from a private doctor, a hospital clinic, or another kind of clinic (tables 7–12).
- Whether women smoked during their most recent pregnancy and, if so, how much they smoked (tables 13–18).
- Whether women drank alcoholic beverages during their most recent pregnancy and, if so, how often they drank (tables 19–20).
- The proportion of babies born at low birthweight (2,500 grams or less) (tables 21–22).
- Trends in the proportion of deliveries that were low birthweight (tables 23–24).
- How deliveries were paid for (sources of payment) (tables 25–32).

Data in these tables are presented for women of all races and separately for white (n = 5,354) and black (n = 2,771) women. Although some tables show results separately for Hispanic women, the sample size for Hispanic women in the NSFG sample (n = 641) was neither large enough to provide separate tables for this group, nor could Hispanic women be stratified by race. Data on Hispanic women are compared with data for non-Hispanic white and non-Hispanic black women.

Data are presented on prenatal care, low birthweight, and how delivery was paid for (tables 1–12 and 21–30). The unit of analysis is the pregnancy or birth. Women who had more than one pregnancy are included once for each pregnancy, and women who had never been pregnant are excluded. Although ''women'' is sometimes used in the text discussing these

tables, the reader should note that these tables refer to pregnancies or births.

In tables 13–20, data are presented on smoking and drinking during pregnancy. These data were only available for the most recent pregnancy or birth for each woman. Therefore, in these tables, women with multiple pregnancies are represented once. To show the trends in payment since the 1982 NSFG, tables 31–32 present data on the source of payment for delivery for the most recent birth occurring between 1984–88. Because the form of payment is likely to be similar for each of a woman's births, she is included only once to avoid overrepresentation of women with multiple births.

Although the NSFG is not the only source of national data on health aspects of pregnancy and childbirth, it offers a unique range of explanatory variables that permit a more complete description of trends in the fertility experience of American women. The data shown here, taken together with reports from other national data sources, are useful for evaluating the adequacy of medical care women receive during pregnancy, the sources they use to obtain and pay for prenatal care and obstetric services, certain health practices during pregnancy, and birth weight. A further strength of the NSFG is that it started collecting certain data, such as prenatal care and smoking during pregnancy, before these data were added to the birth certificate. Other variables, such as wantedness of pregnancies, income, and source of payment, are still not available from vital statistics. The NSFG remains the primary source of trend data related to pregnancy and childbirth throughout the 1960's–1980's.

Other aspects of reproductive health have been addressed in several previous NSFG reports, including infertility (23), contraception (24), unwanted childbearing (25), pelvic inflammatory disease (26), testing for sexually transmitted diseases (27), and other women's health screening (28).

Summary of principal findings

There are large differences by race and Hispanic origin in many of the health measures discussed in this report. Therefore, data are presented separately for pregnancies of white, black, and Hispanic women. Differences between Hispanic women, non-Hispanic white women, and non-Hispanic black women are often due to the lower income and educational levels of minority women, their limited access to health care and health insurance, the neighborhoods in which they live, and other factors (29,30). The causes of these differences merit intensive investigation, and one purpose of this report is to discuss some of the factors that explain differences in health outcomes among white, black, and Hispanic women.

A major finding is that marital status, education, income level, age at pregnancy outcome, and wantedness of the pregnancy *continue* to be important correlates of delayed prenatal care, health-risking behavior in pregnancy, and low birthweight. However, the impact of these variables on specific health measures is not uniform among racial and ethnic groups.

Timing of first prenatal visit

Nearly 98 percent of white and black women with pregnancies ending in a live birth received prenatal care before delivery. However, black women were less likely to receive early prenatal care than white women were, and the race gap in the 1988 NSFG was nearly identical to that observed in the 1982 NSFG (22). Figure 1 shows that 68 percent of white and 54 percent of black women (a difference of 14 percentage points) received early prenatal care. Among ever-married women, the difference between the two races was 10 percentage points, but among never-married women, black and white women were about equally likely to receive early prenatal care (4 percentage point difference).

For all women, regardless of race or Hispanic origin, prenatal care was more likely to be delayed beyond the first trimester if the mother was a teenager, had never married, had considered her pregnancy unwanted or mistimed at the time of conception, had never worked, had not finished high school, had a low income, or had received Medicaid for prenatal care or delivery costs (an indicator of very low income) (tables 1–6). Although these patterns of associations were fairly consistent within each race-ethnic group, the proportions receiving early care were generally lower for Hispanic and non-Hispanic black women than for non-Hispanic white women. No significant changes in patterns were found between the 1982 and 1988 NSFG (table A; see figure 2 for an example of the trend by marital status). This indicates that in 1988 there was still far to go in reaching the 1990 target level of 90 percent for early prenatal care among all race-ethnic groups.

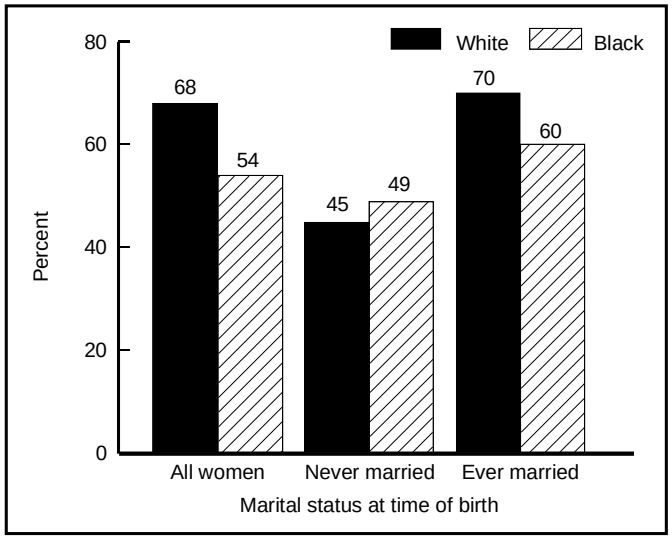

Figure 1. Percent of mothers receiving prenatal care in the first trimester, by race of mother and marital status: United States, 1984–88

Source of most prenatal care

White women were more than one and a half times as likely as black women to receive most of their prenatal care from a private physician (75 versus 46 percent) versus a hospital clinic or other clinic (figure 3). The proportions receiving private physician care increased steadily with income level for white and black women, but within each income group, the percent receiving private care was markedly lower for black women than for white women.

Among both black and white births, prenatal care from a private physician was less likely if the mother was a teenager, had never married, had her first visit after the first trimester, did not want her pregnancy at the time of conception, had never worked, or had received Medicaid for prenatal care or delivery costs (tables 7–12).

The question on source of prenatal care changed between the 1982 and 1988 surveys, preventing a direct examination of the trend. In 1982 women identified the site of their FIRST prenatal visit, while in 1988 they identified the site of MOST of their prenatal visits.

Table A. Number of live births to women 15–44 years of age and percent having prenatal visit within first trimester of pregnancy, by selected characteristics of the birth and mother: United States, 1979–1982 and 1984–1988

Characteristic	1979–1982		1984–1988	
	Number in thousands	Percent	Number in thousands	Percent
All live births[1]	14,372	67.9	16,220	65.4
Age at birth				
Less than 20 years	1,972	45.7	1,823	39.2
20–24 years	4,764	61.4	4,562	59.6
25–29 years	4,863	75.1	5,627	72.9
30–44 years	2,773	72.1	4,208	73.0
Marital status at time of birth				
Never married	2,471	43.8	2,695	45.9
Ever married	11,872	70.6	13,526	69.3
Wantedness status at conception				
Intended	9,127	72.6	9,711	71.9
Mistimed	3,823	56.0	4,487	55.9
Unwanted	1,422	49.6	1,987	55.1
Race and Hispanic origin				
Hispanic	1,704	65.1	2,115	52.6
Non-Hispanic white	10,248	71.5	11,025	70.3
Non-Hispanic black	2,020	55.3	2,287	52.7
Education (at interview)[2]				
Less than 12 years	2,416	58.0	2,557	49.1
12 years	4,948	69.2	5,287	66.5
13 years or more	5,036	79.2	6,554	78.1
Poverty level income (at interview)[2]				
149 percent or less	3,825	55.8	3,908	52.8
150–299 percent	4,159	74.9	4,331	67.6
300 percent or more	4,415	80.7	6,158	79.5
Medicaid recipient[3]				
No	12,269	69.2	14,256	67.7
Yes	2,059	45.9	1,964	48.7

NOTE: Data for 1979–82 come from Cycle III (1982) of the National Survey of Family Growth (NSFG) in 1982. Data for 1984–88 come from Cycle IV (1988) of the NSFG.

[1]Includes births with missing data on age at birth or wantedness status. Figures for 1979–82 also include births with missing data on education and income. Includes births to women of other races, not shown separately.

[2]Limited to women 20–44 years of age at time of birth.

[3]In the 1982 National Survey of Family Growth, women were asked explicitly if they were Medicaid recipients. In 1988, women were not asked explicitly, but could report Medicaid payment for prenatal care or delivery.

Cigarette smoking during pregnancy

About 27 percent of ever-pregnant women reported smoking during their most recent pregnancy, and black women were less likely to have smoked than white women (23 versus 29 percent). Figure 4 shows that among less educated women, pregnancy-related smoking was more common among white women than black women, but among women who continued beyond high school, the percents who smoked were equivalent for black and white women. Another important race difference was found in smoking according to age—white women smoked more when younger, particularly under age 20, while black women smoked more when older, particularly over age 30 (tables 14–15).

Smoking during pregnancy decreased steadily by year of pregnancy outcome, based on the 1982 and 1988 surveys. Yet several noteworthy patterns persist. Smoking remains primarily a practice of women who are under 25 years, have never married, are less educated, have lower incomes, and have delayed prenatal care until after the first trimester (tables B and C). Figure 5 shows how smoking rates have changed over time, by education level.

Drinking during pregnancy

Nearly 15 percent of ever-pregnant women, regardless of race, reported drinking once a month or more during their most recent pregnancy. However, a higher percent of black women (75 percent) abstained from drinking, as compared with 63 percent of white women (table 20). Hispanic women were also more likely to abstain than non-Hispanic white women.

Figure 6 shows how drinking rates varied by education level and race. Drinking in pregnancy *increased* with education among white women, but *decreased* at higher levels of education among black women.

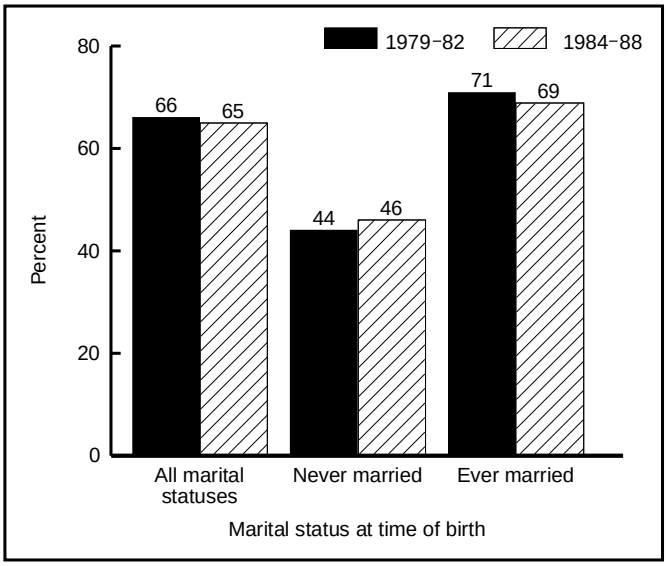

Figure 2. Percent of mothers receiving prenatal care in the first trimester, by marital status of mother and year of birth of child: United States

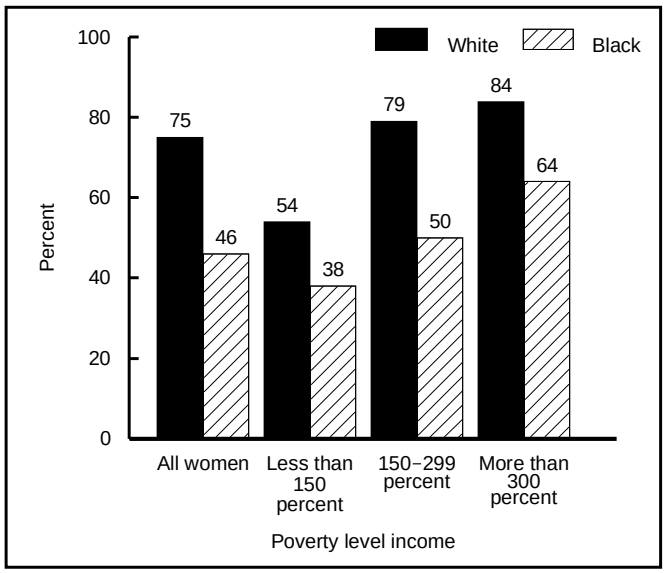

Figure 3. Percent of mothers receiving prenatal care for a birth in 1984–88 and who received most prenatal care from a private physician, by race and poverty level income: United States

When women of all races were grouped together, drinking during pregnancy was associated with numerous measures of socioeconomic status, including higher education, higher income, and higher status occupations (table 20). In general, significant declines in reported drinking during pregnancy were seen between the 1982 and 1988 NSFG (table D). The percent of non-Hispanic black women who reported drinking during pregnancy rose slightly between survey years, but this was not statistically significant at the 10 percent level.

Low birthweight

The overall rate of low birthweight was 7 percent, with black singleton births having more than twice (14 percent) the rate of low birthweight of white singleton births (6 percent).

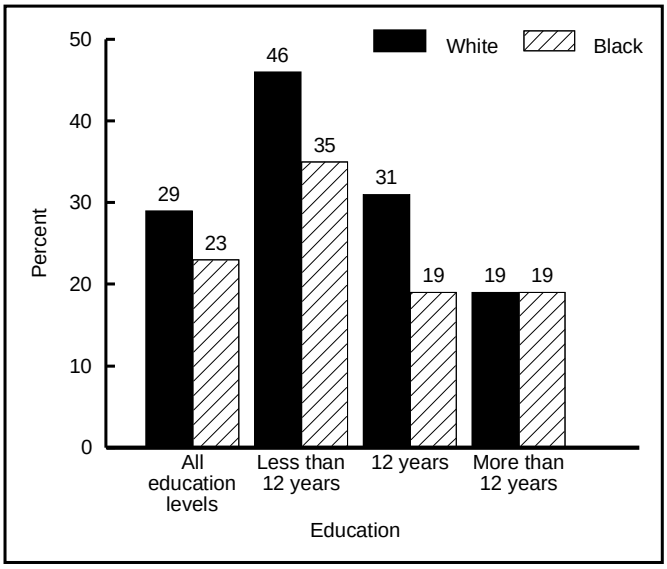

Figure 4. Percent of women who reported any amount of cigarette smoking during their most recent pregnancy, by race and education: United States, 1988

Among women of all races, low birthweight rates were lower for mothers who were older, were ever married, wanted their pregnancies, had more education, had higher-status jobs, or higher incomes (tables 21–22). While these patterns were generally similar for white and black births, within each category black births had consistently higher rates of low birthweight. The rate of low birthweight for Hispanic women was similar to that for non-Hispanic white women.

Figure 7 presents the proportions of births that were low birthweight according to race and amount of smoking during pregnancy. Both smoking and race were strongly associated with low birthweight. Smokers had much higher rates of low birthweight than nonsmokers. In all smoking categories (including "none"), the rates of low birthweight were more than twice as high for black births as for white births. The percent of low birthweight varied from under 4 percent for white nonsmokers to over 20 percent for black smokers.

Tables 23 and 24 show that low birthweight rates have declined markedly over time, from an overall rate of 16 percent for births in 1970 or earlier to an overall rate of 6 percent for births in 1985–88. Table 23 suggests an apparent widening of low birthweight rates between smokers and nonsmokers as overall low birthweight rates have fallen over time. Multivariate adjustment would be required to determine whether this is a real effect or a result of the changing characteristics of smokers in the later periods (for example, smokers may be less educated, younger, unmarried). Table 24 illustrates the persistent black-white race gap in low birthweight over time. Although the rate fell from 32 percent among black births in 1970 or earlier to 12 percent among black births in 1985–88, black low birthweight rates remain over twice those seen among white births.

Source of payment for delivery

There were dramatic differences in how deliveries were paid for, according to demographic and socioeconomic char-

Table B. Number of women 15–44 years of age whose most recent pregnancy ended in a live birth or spontaneous loss and percent who reported any amount of cigarette smoking during pregnancy, by year pregnancy ended and selected characteristics of the pregnancy and mother: United States

Characteristic	*1982 NSFG*[1]				*1988 NSFG*			
	1970 or earlier		*1971–1980*		*1981–1984*		*1985–1988*	
	Number in thousands	*Percent smoked*	*Number in thousands*	*Percent smoked*	*Number in thousands*	*Percent smoked*	*Number in thousands*	*Percent smoked*
All women[2]	6,673	34.7	18,197	32.0	7,960	25.9	11,661	23.4
Age at pregnancy outcome								
Less than 20 years	717	33.9	1,908	44.7	545	41.8	1,081	28.1
20–24 years	2,840	37.2	5,292	35.0	1,813	32.0	3,009	30.2
25–29 years	2,490	33.0	6,688	28.1	2,752	26.2	4,036	23.6
30–44 years	600	30.4	4,194	28.6	2,805	18.5	3,501	15.8
Marital status at pregnancy outcome								
Never married	323	40.2	2,296	43.0	991	38.1	2,066	32.0
Ever married	6,219	33.7	15,715	30.4	6,925	24.1	9,560	21.5
Pregnancy outcome								
Live birth	6,243	34.5	16,105	30.3	7,165	25.3	9,981	22.7
Spontaneous loss	407	36.6	1,978	45.7	752	31.1	1,645	27.6
Wantedness status at conception								
Intended	3,874	33.2	11,080	29.4	4,734	20.8	6,857	19.1
Mistimed	1,638	31.6	4,209	36.0	1,825	32.3	3,120	27.5
Unwanted	1,108	43.3	2,712	36.5	1,352	35.4	1,624	33.1
Race and Hispanic origin								
Hispanic	384	29.6	1,752	20.9	850	16.6	1,571	13.1
Non-Hispanic white	5,267	36.4	13,129	33.8	5,696	27.4	7,856	26.7
Non-Hispanic black	874	29.6	2,659	31.5	1,104	26.4	1,634	19.9
Education (at interview)[3]								
Less than 12 years	1,290	45.8	3,168	46.6	1,267	47.3	1,866	38.3
12 years	2,787	35.1	6,763	33.9	2,744	27.1	3,717	26.6
13 years or more	1,854	26.6	6,243	18.6	3,361	14.2	4,962	14.3
Poverty level income (at interview)[3]								
149 percent or less	1,043	32.8	3,905	39.2	1,801	38.9	2,799	32.3
150–299 percent	1,848	35.9	5,424	30.5	2,145	25.3	2,983	23.1
300 percent or more	3,039	34.7	6,845	25.5	3,425	16.9	4,764	17.2

NOTE: Data exclude current pregnancies and pregnancies ending in induced abortion because smoking during pregnancy was not asked.

[1]NSFG is National Survey of Family Growth.

[2]Totals based on 1982 National Survey of Family Growth include women with missing data on age at outcome, birthweight, wantedness status, education, or income; totals based on 1988 NSFG include women with missing data on wantedness status. Total also includes women of other races, not shown separately.

[3]Limited to women 20–44 years of age at time of pregnancy outcome.

acteristics of the mother. The strongest correlates of private insurance payment for delivery costs were being ever-married, older, and white (tables 25–30). Insurance payment was also more prevalent among women who had higher levels of education, higher-status jobs (or any job at all), or higher income.

Figure 8 illustrates how payment for deliveries between 1984 and 1988 varied by race. Only 40 percent of black births were paid for, partly or totally, by private insurance, compared with 71 percent of white births. (Note that these forms of payment are not mutually exclusive categories.) Black births were nearly 5 times as likely to be paid for by Medicaid as white births (33 versus 7 percent).

Figure 9 shows the percent distribution (mutually exclusive categories summing to 100 percent) of most recent live births (occurring in 1984–88) by source of payment and marital status. Insurance, alone or in conjunction with out-of-pocket funds, covered 76 percent of deliveries for ever-married women, while covering only 25 percent of deliveries for never-married women. Among never-married women, the predominant sources of payment were Medicaid (34 percent) and other government programs (23 percent) (table 31).

Figure 10 depicts the percent of deliveries paid for by Medicaid in 1979–82 and in 1984–88, by age of the mother. None of the changes in payment by Medicaid or private insurance, or by maternal and birth characteristics, were significant between the two survey years (table E). Medicaid continued to be a major source of payment for delivery among teenagers, but not among women 25 and older.

Table C. Number of women 15–44 years of age whose most recent pregnancy ended in a live birth or spontaneous loss and percent distribution by whether they smoked cigarettes or drank alcohol during pregnancy, according to selected characteristics of the pregnancy and mother: United States, 1988

Characteristic	Number in thousands	Smoking and drinking during most recent pregnancy[1]					
		Total	Neither smoked nor drank	Subtotal	Smoked only	Drank only	Both smoked and drank
		Percent distribution					
All women[2]	32,465	100.0	51.1	48.9	15.4	21.3	12.1
Age at pregnancy outcome							
Less than 20 years	2,966	100.0	57.6	42.4	20.5	10.2	11.7
20–24 years	9,718	100.0	49.6	50.4	18.4	17.0	15.0
25–29 years	11,657	100.0	49.7	50.3	14.8	23.0	12.5
30–44 years	8,123	100.0	52.7	47.3	10.8	28.2	8.3
Marital status at pregnancy outcome							
Never married	4,468	100.0	52.5	47.5	19.1	13.8	14.6
Ever married	27,997	100.0	50.9	49.1	14.8	22.5	11.7
Wantedness status at conception							
Intended	19,437	100.0	53.4	46.6	13.5	22.2	10.8
Mistimed	8,011	100.0	48.1	51.9	17.0	20.9	14.0
Unwanted	4,960	100.0	47.4	52.6	20.3	18.3	14.1
Year of pregnancy outcome							
1985–1988	11,661	100.0	55.2	44.8	14.1	21.4	9.3
1981–1984	7,960	100.0	52.2	47.8	15.6	21.9	10.4
1980 or earlier	12,844	100.0	46.8	53.2	16.5	20.9	15.8
Race and Hispanic origin							
Hispanic	3,402	100.0	68.6	31.4	7.0	17.7	6.7
Non-Hispanic white	23,419	100.0	45.9	54.1	17.5	23.6	13.0
Non-Hispanic black	4,545	100.0	62.6	37.4	12.1	13.9	11.4
Non-Hispanic other	1,098	100.0	62.1	37.9	11.3	14.2	12.4
Education (at interview)[3]							
Less than 12 years	5,203	100.0	46.0	54.0	28.0	10.9	15.1
12 years	11,612	100.0	52.2	47.8	16.1	18.8	13.0
13 years or more	12,547	100.0	50.8	49.2	8.3	30.7	10.2

[1]Data exclude current pregnancies and pregnancies ending in induced abortion because smoking and drinking during pregnancy were not asked.
[2]Includes women with missing data on smoking and drinking during pregnancy or wantedness status.
[3]Limited to women 20–44 years of age at time of pregnancy outcome.

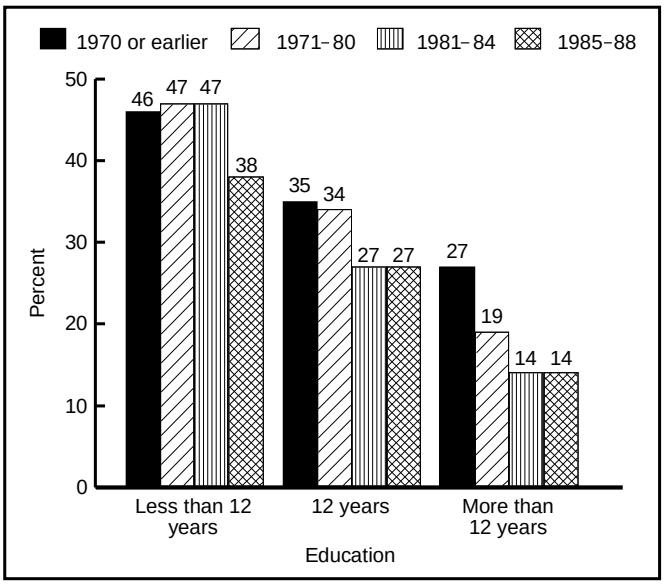

Figure 5. Percent of ever-pregnant women who smoked during their most recent pregnancy, by education and year of pregnancy outcome: United States

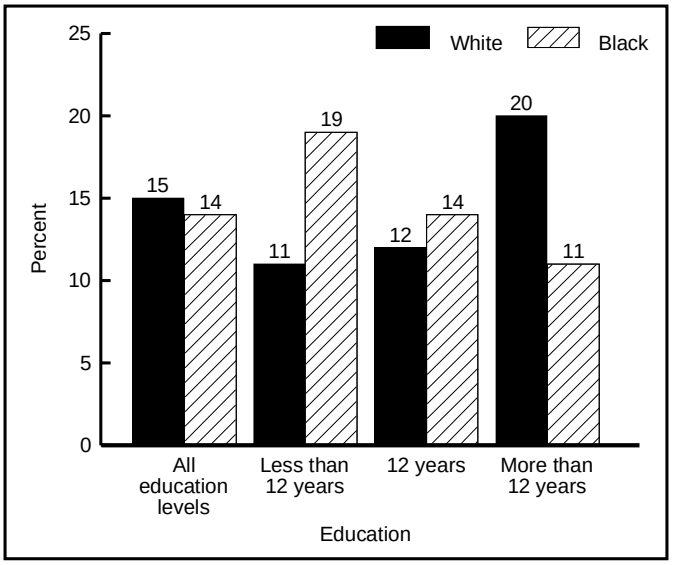

Figure 6. Percent of ever-pregnant women who drank once a month or more during their most recent pregnancy, by race and education: United States, 1988

Table D. Number of women 15–44 years of age whose most recent pregnancy ended in a live birth or spontaneous loss and percent who reported drinking at all during pregnancy, by selected characteristics of the pregnancy and mother: United States, 1982 and 1988

Characteristic	1982 NSFG[1]		1988 NSFG	
	Number in thousands	Percent who drank	Number in thousands	Percent who drank
All women[2]	32,465	45.4	32,465	33.5
Age at pregnancy outcome				
Less than 20 years	3,609	31.2	2,966	22.1
20–24 years	10,615	40.5	9,718	32.0
25–29 years	11,814	52.3	11,657	35.4
30–44 years	6,424	48.6	8,123	36.6
Marital status at pregnancy outcome				
Never married	3,895	37.5	4,468	28.4
Ever married	28,353	46.5	27,997	34.3
Race and Hispanic origin				
Hispanic	3,017	30.5	3,402	24.4
Non-Hispanic white	23,859	50.1	23,419	36.7
Non-Hispanic black	4,626	17.0	4,545	25.3
Education (at interview)[3]				
Less than 12 years	5,660	33.3	5,212	25.9
12 years	12,274	46.4	11,624	31.8
13 years or more	10,919	55.1	12,560	40.8
Poverty level income (at interview)[3]				
149 percent or less	6,938	35.1	6,655	27.5
150–299 percent	9,404	46.2	8,164	30.5
300 percent or more	12,512	54.5	14,577	40.2

NOTE: Data exclude current pregnancies and pregnancies ending in induced abortion because drinking during pregnancy was not asked.

[1]NSFG is National Survey of Family Growth.

[2]Includes women with missing data on age at pregnancy outcome, marital status at outcome, race and ethnicity, education, or income. Includes women of other races, not shown separately.

[3]Limited to women 20–44 years of age at time of pregnancy outcome.

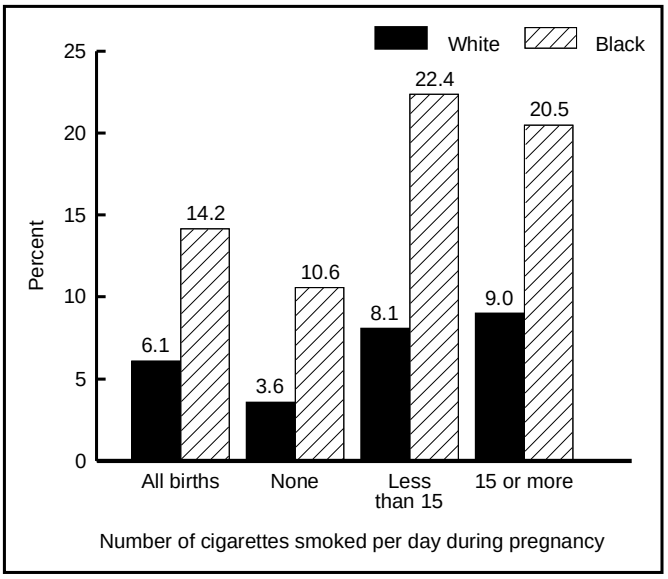

Figure 7. Percent of most recent single live births to women 15–44 years of age that were low birthweight, by race and number of cigarettes smoked per day during pregnancy: United States, 1988

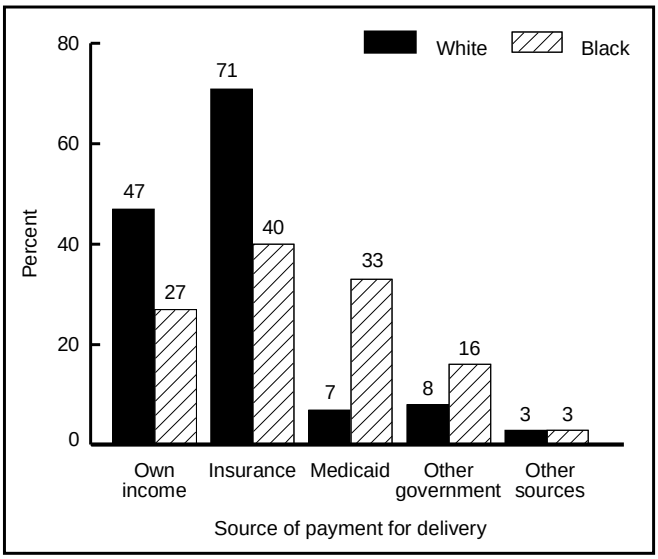

Figure 8. Percent of live births in 1984–88 that were paid for, in whole or part, from specified sources, by race of mother: United States

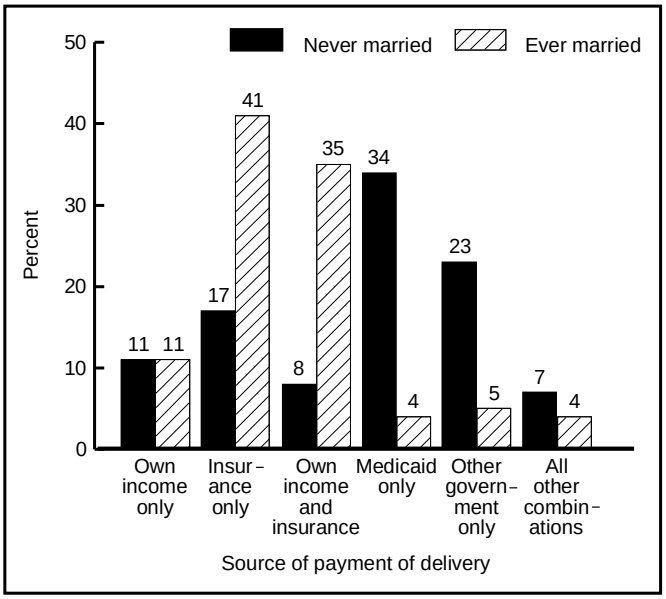

Figure 9. Percent distribution of most recent live births (1984–88) by source of payment for delivery and marital status: United States

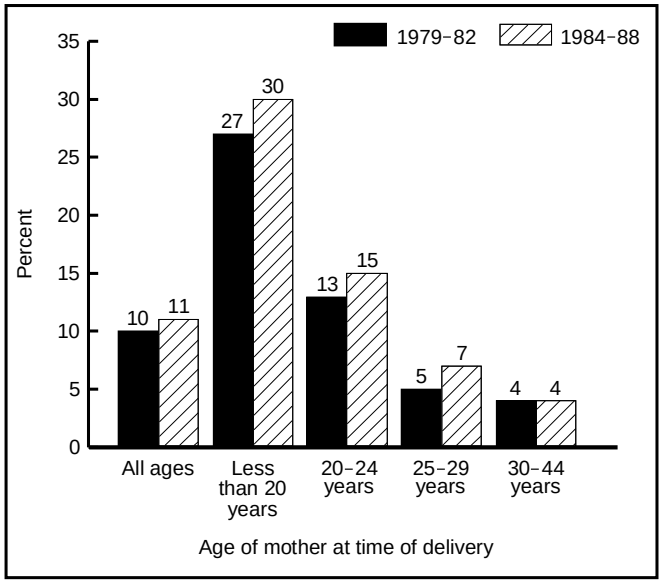

Figure 10. Percent of deliveries paid in whole or in part by Medicaid, by age of mother and year of birth: United States

Table E. Number of live birth deliveries to women 15–44 years of age and percent paid by private insurance or Medicaid, by selected characteristics of the birth and mother: United States, 1979–82 and 1984–88

Characteristic	*1979–1982*			*1984–88*		
	Number in thousands	*Private insurance*	*Medicaid*	*Number in thousands*	*Private insurance*	*Medicaid*
All live births[1]	14,372	62.4	10.3	16,220	65.7	11.0
Age at birth						
Under 20 years	1,972	27.1	26.7	1,823	30.1	29.9
20–24 years	4,764	55.6	13.4	4,562	53.0	15.4
25–29 years	4,863	74.2	4.6	5,627	75.4	6.8
30–44 years	2,773	78.5	3.5	4,208	82.2	3.7
Marital status at time of birth						
Never married	2,471	18.1	39.2	2,695	23.0	38.0
Ever married	11,872	71.6	4.3	13,526	74.2	5.7
Race and Hispanic origin						
Hispanic	1,704	41.8	19.6	2,115	41.4	20.6
Non-Hispanic white	10,248	70.8	5.0	11,025	75.2	5.0
Non-Hispanic black	2,020	36.8	30.1	2,287	39.9	32.6

NOTE: Data for 1979–82 are from Cycle III (1982) of the National Survey of Family Growth (NSFG). Data for 1984–88 are from Cycle IV (1988) of the NSFG.

[1]Includes deliveries with missing data on payment, age at birth, marital status at birth, or race and ethnicity. Totals also include births to women of other races, not shown separately.

Source and limitations of the data

Cycle IV (1988) of the National Survey of Family Growth (NSFG) was based on personal interviews with a multistage area probability sample of 8,450 women 15–44 years of age in the civilian noninstitutionalized population of the United States. In 1988, women from Alaska and Hawaii were included for the first time in the NSFG. Cycle III in 1982 was the first cycle in which women were interviewed regardless of marital status. The 8,450 women interviewed for the 1988 NSFG were located from households in which someone had already been interviewed for another NCHS survey, the National Health Interview Survey (NHIS), between October 1985 and March 1987. Black women were sampled at higher rates than other women to increase the reliability of statistics for this group.

Between January and August of 1988, trained female interviewers conducted in-person interviews with 5,354 white women, 2,771 black women, and 325 women of other races. The interview, which lasted an average of 70 minutes, focused on the woman's pregnancies, if any; her use of contraception; her ability to bear children (fecundity and infertility); her use of medical services for family planning, infertility, and prenatal care; her marriage and cohabitation history, if any; and a wide range of demographic and economic characteristics.

Characteristics such as race, Hispanic origin, parity, education, and geographic region refer to the woman at the time she was interviewed. Terms such as ''black births'' refer to births to black women, regardless of the race of the father. Similarly, women living in families with incomes below 150 percent of poverty level are referred to as ''low-income'' women, and women living in families with incomes of greater than or equal to 300 percent of poverty level are referred to as ''high-income'' women.

The statistics cited are estimates for the national population from which the sample was drawn. Because the estimates are based on a sample, they are subject to sampling variability. The estimates may be affected by nonsampling errors that may have been introduced during interviewing, data processing, and analysis, although stringent quality control measures were used at each stage to minimize errors as much as possible. Further discussion of the NSFG survey design and sampling variability is in the appendixes, as well as in a detailed report (31) on design, estimation, and inference in the 1988 survey.

In this report, the term ''similar'' means that any observed difference between two estimates being compared is not statistically significant at the 10-percent level. Terms such as ''greater,'' ''less,'' ''larger,'' ''smaller,'' ''more likely,'' and ''less likely'' indicate that the observed differences are statistically significant at the 5-percent level using a two-tailed *z*-test (normal deviate test). Statements that are qualified in some way (for example, ''the data suggest'') indicate that the observed difference is significant at the 10-percent level, but not at the 5-percent level.

The following sections in this report include comparisons with other data and detailed descriptions of survey findings on timing of first prenatal care visit, source of most prenatal care, smoking and alcohol use during pregnancy, low birthweight, and sources of payment for delivery of live births. Appendix I contains technical notes on how the NSFG was designed and conducted, appendix II consists of definitions of the variables used in this report, and appendix III includes the survey questions on the topics covered in this report.

Although the 1982 and 1988 NSFG Cycles offer a wide range of explanatory variables that can clarify the health aspects of pregnancy and childbirth in the United States, there are many factors that could not be included because of limits on the length and cost of the interview. For example, basic sociodemographic and employment information about women's *current* husbands or cohabiting partners were collected, but such information about the father of pregnancies described in this report may not be included. A woman's relationship with her baby's father has been associated with the receipt of timely and adequate prenatal care (32), and other paternal characteristics such as education, race, and smoking (that is, passive exposure to maternal or paternal cigarette smoke) have been linked to rates of low birthweight, sudden infant death syndrome, and preterm delivery (33–35). Furthermore, it is recognized that there are complex relationships among many of the variables used in these tabulations. Multivariate analyses of these data would be worthwhile, but they are beyond the scope of this report.

Comparisons with other data

The data in this report are from the 1988 National Survey of Family Growth. Comparisons of NSFG pregnancy and childbirth data can be made with vital registration data. In addition to basic sociodemographic characteristics of the baby's parents, the U.S. Standard Certificate of Live Birth includes information on birthweight, timing of initial prenatal visit, and number of prenatal visits. Beginning in 1983, the National Center for Health Statistics has produced the annual Linked Birth and Infant Death Files that permit analyses of infant mortality and low birthweight using the data from birth and death certificates. The latest available file is for the 1988 birth cohort (36).

The 1989 revision of the birth certificate added several new items, including smoking and drinking during pregnancy and pregnancy-related morbidity, which will be useful in monitoring risk factors for difficult pregnancies and poor pregnancy outcomes (37,38). Meanwhile, the 1988 and earlier NSFG Cycles remain one of the few sources of reliable national trend data on the source of prenatal care, the sources of payment for prenatal care and delivery, and smoking and alcohol use in pregnancy.

Other sources

In recent years, several national and State-level surveys have emerged that offer data comparable to the NSFG on pregnancy and childbirth. The 1988 National Maternal and Infant Health Survey (NMIHS) contains information on women who had 9,953 live births, 5,332 infant deaths, and 3,309 fetal deaths. Data were collected from the women themselves, the hospitals where births and infant deaths occurred, and the medical providers of prenatal care (39). The NMIHS is more clinically oriented than the NSFG and focuses primarily on the specific pregnancy and birth sampled. In contrast, the NSFG is primarily a demographic survey and includes data on the entire fertility history of individual women.

A recently begun initiative in monitoring health aspects of pregnancy and childbirth is the Pregnancy Risk Assessment Monitoring System (PRAMS), an ongoing, population-based surveillance system designed to supplement vital records data and to generate State-specific data for planning and evaluating maternal and child health programs (40). Using self-administered questionnaires, partly tailored to individual States, PRAMS collects information similar to the NSFG on prenatal care, birthweight, smoking and drinking in pregnancy, and socioeconomic characteristics. In 1987, PRAMS was operational in five States plus the District of Columbia; as of early 1993, PRAMS is under way in 22 States plus the District of Columbia.

Low birthweight

Data on birthweight are published each year from the U.S. birth registration system, by such characteristics as race, age, marital status, and education of the mother; birth order; and month of the pregnancy in which prenatal care began. It is important to recognize that birth registration data are based on complete counts of all births and refer only to births in a particular calendar year. The NSFG data used for this report are based on a sample of births that occurred over several calendar years up to 1988. In addition, the tabulations of low birthweight—2,500 grams (5 pounds 8 ounces) or less—in this report are limited to single live births because twins, triplets, and other multiple births are more likely to be low birthweight than single births. One purpose of this report is to present birthweight data that may further clarify the observed racial and ethnic group disparities. Another distinction between the NSFG data and birth registration data is that the NSFG sample size is not large enough to study births with very low birthweight (less than 1,500 grams).

The following table shows a sample comparison of the 1988 NSFG with 1985 and 1988 data on registered births (41,42), the percent of single live births that were low birthweight, by race:

Race	*NSFG (± 2 standard errors)*	*Registered births 1985*	*Registered births 1988*
All races	7.4(± 0.8)	6.7	6.9
White	6.1(± 0.4)	5.6	5.6
Black	14.2(± 2.4)	12.4	13.0

The numbers in parentheses after the NSFG figures show two standard errors around the NSFG estimate of the low-birthweight rate. (The standard errors for registered birth data are essentially zero when rounded to one decimal place.) In each case, though they are consistently higher, the NSFG estimates do not differ significantly from the birth registration data; that is, the registered birth figures fall within the range of two standard errors. Thus, the NSFG estimates of low birthweight based on mother's reports, often several years after the birth, are comparable to those in the birth registration system, which are obtained primarily from hospitals at the time of delivery.

Timing of first prenatal visit

In the 1988 NSFG, women who had a live birth between 1984 and 1988 were asked: ''During this pregnancy, did you ever visit a doctor or clinic for prenatal care?'' If the mother responded ''yes,'' she was asked: ''How many months pregnant were you when you first visited a doctor or clinic for prenatal care?''

Prenatal care was defined for the respondent as *not* including visits simply for pregnancy tests; that is, she was not to count a visit during which she only learned she was pregnant as prenatal care. On the U.S. birth certificate, the mother or the doctor provides information about the ''month of pregnancy prenatal care began'' (first, second, etc.). In the 1988 NMIHS, women were asked: ''How many weeks pregnant were you when you went for your first prenatal visit?'' Prenatal care was defined as including visits that may have only consisted of pregnancy tests. Information was obtained by maternal self-report as well as provider reports.

Differences in the wording of these questions among the data sources, as well as differences in methods of data collection, time reference of the questions, definitions of prenatal care, and sampling error, account for much of the variation among the data sources with respect to timing of initial prenatal visit. In general, a smaller proportion of women in the 1988 NSFG than in the vital registration data or the 1988 NMIHS reported beginning care in the first trimester. Vital records indicate that the overall proportion receiving early care has been stable at 76 percent since 1979, and the proportion receiving no care or beginning care in the third trimester has remained at 6 percent since 1983 (41).

The disparity in timing of first prenatal care was more striking between the NSFG and the NMIHS, probably due to the different definitions of prenatal care. The NSFG estimates that about 65 percent of births in 1984–88 received prenatal care in the first trimester (table 1). The NMIHS showed that over 80 percent of pregnant women in their 1988 sample began care in the first trimester (43). The NSFG white-black differential was 68 percent versus 54 percent (figure 1), compared with 85 percent versus 64 percent in the NMIHS (43). The higher levels of early care seen in the NMIHS may be due to that survey's inclusion of pregnancy tests in its definition of prenatal care.

These differences are important because they give different impressions of the progress that has been made toward the national public health goal of having at least 90 percent of all subgroups of pregnant women receive prenatal care within the first trimester. Many researchers have stressed the importance of further methodologic research and standardization of measurement (44–46). For example, cognitive work on how best to ask questions on prenatal care would be worthwhile because ''prenatal care'' may be a complex concept or a technical term that women interpret differently. It should be noted that despite the significant variations in estimates of early prenatal care, the patterns of associations with pregnancy and maternal characteristics are remarkably similar across all data sources. This lends greater confidence in the NSFG findings, particularly for those variables not contained in vital records or other survey data.

Other pregnancy-related variables

The NSFG and NMIHS data yield comparable findings for the source of most prenatal care and payment for prenatal care and delivery. For example, in the NMIHS, about 70 percent of pregnant women received most of their care from private providers, the same percent seen with NSFG data (table 7). The percents receiving private care by race were also similar between the surveys. Similar proportions in both surveys reported paying for prenatal care and delivery with private insurance and with Medicaid.

Both surveys contained questions about smoking and drinking in pregnancy, but they were asked in somewhat different ways. The NMIHS asked women if they smoked or drank *in the year* before delivery, a recall period that includes months during which they were not pregnant. As a result, the NMIHS figures may overestimate the prevalence of these behaviors during the pregnancy.

The NSFG asked women if they smoked or drank *during* their most recently completed pregnancy (if ending in spontaneous loss or live birth), a wording that may have resulted in an underestimate of smoking and drinking among women who did not learn they were pregnant until well into the pregnancy. Despite this difference, the NMIHS figure for smoking was 32 percent, quite close to the NSFG figure of 27 percent (table 13). The NMIHS figure for drinking was 50 percent, versus 33 percent in the NSFG (table 19), probably because the NMIHS referred to a 12-month period that predated the start of the pregnancy, while the NSFG only asked about drinking during the pregnancy.

Findings

Timing of first prenatal visit

Early, regular, and appropriate prenatal care has been linked to reduced rates of pregnancy complications, of preterm delivery, of low birthweight, and of perinatal illness or death (13,20,47). The benefits gained in maternal and infant health are particularly striking for women at higher risk for poor outcomes (8,20,48–50). In addition to health benefits, studies have illustrated considerable potential for health care cost savings. For example, in a cost-benefit analysis of prenatal care among Medicaid recipients in Missouri, a savings of $1.49 in newborn and postpartum costs was found to result from each extra $1 spent on prenatal care (51).

Despite considerable debate about how best to evaluate prenatal care (for example, the impact of specific styles or components of prenatal care) (8,20,44,46), there is general consensus in the literature that quality prenatal care programs are vital for providing necessary medical care and advice that will prevent serious complications for both mother and baby. In addition, prenatal care programs have the potential to improve the general health status of some pregnant women, for whom prenatal care may be the only source of medical attention. Early and comprehensive prenatal care thus offers a woman several critical benefits (8,13):

- Counseling on stopping the use of cigarettes, alcohol, and other drugs; on nutrition; and on other lifestyle factors that affect her and her baby's health.
- Identifying and managing maternal medical conditions such as diabetes and high blood pressure.
- Assessing risk for problems such as preterm delivery, low birthweight, premature rupture of membranes, and other pregnancy complications.

Although the importance of content and timing of subsequent visits is well recognized (44,52–54), the timing of the initial prenatal visit is widely used as a convenient indicator of the adequacy of care. Increasing to at least 90 percent the proportion of all pregnant women who begin prenatal care within the first trimester is an objective of the national ''Healthy People 2000'' initiative (55). Tables 1–6 present 1988 NSFG data on prenatal care initiation among American women in the mid 1980's (1984–88). These tables show that all groups of pregnant women fell short of this national health goal. The tables also show the wide disparities that exist according to race, Hispanic origin, marital status, age, and other factors in the rate at which groups are achieving the goal.

Some women, for a variety of reasons, may not recognize that they are pregnant while they are in their first trimester. Often, these are women at higher risk of adverse pregnancy outcomes, and they may only learn of their pregnancy when they miscarry or have other difficulties. Other women may experience pregnancy loss within the first trimester and never have the opportunity to receive prenatal care. To circumvent these and other limitations, the 1988 NSFG restricted its prenatal care questions to women whose pregnancies ended in live birth between January 1984 and the interview in 1988.

Characteristics of the birth

Table 1 shows that the timing of the initial prenatal visit varied according to selected characteristics of the birth for all women regardless of race. Younger women, particularly those under age 25 years at delivery, were much less likely to begin prenatal care within the first trimester. Only 39 percent of teenaged mothers and 60 percent of mothers 20–24 years began prenatal care in the first 3 months, compared with 73 percent of mothers 25–44 years old. As seen with births occurring in 1979–82 (22), teenaged mothers were three times as likely as mothers 25–29 years old to delay prenatal care beyond 5 months or to receive no care at all. Many reports have documented this association in birth registration data (37,41), as well as in survey data in which confounding variables were controlled by multivariate analysis (18,56). First and second order births were more likely than third or higher-order births to receive early prenatal care, a finding consistent with reports based on vital statistics and survey data (18,41,42). No difference was found in timing of first prenatal care by mode of delivery.

Only 46 percent of never-married women received early prenatal care, far less than the 70 percent of ever-married women. Many studies have found similar disparities by marital status, largely attributable to the fact that single mothers are disproportionately younger, less educated, and have lower incomes than married mothers (8,20,56). About 72 percent of pregnancies that were intended at the time of conception received early prenatal care, compared with approximately 55 percent of mistimed or unwanted pregnancies. These findings are consistent with 1980 National Natality Survey results.

Those data showed that among births to married white women, planning status of pregnancy (a measure of wantedness) was associated with timing of first prenatal care (57).

Tables 2 and 3 reveal large black-white differences in the timing of first prenatal care. About 68 percent of white births received care within the first trimester, versus 54 percent of black births. The black-white difference in receiving first trimester care is relatively small for teenagers and women 20–24 years old, but increases to a 16-point difference (60 versus 76 percent) for women aged 30–44 years. A similar pattern of prenatal care timing is seen by birth order among black and white births, but the rates of early care are consistently lower among black births than among white births. As when all births were examined together, mode of delivery and birthweight were not related to prenatal care initiation for black or white births.

Less than 50 percent of never-married women, black or white, received early prenatal care (figure 1). Among ever-married women, white mothers were more likely to receive first trimester care than black women were, but the difference for ever-married women was largely made up in the third and fourth months of pregnancy, suggesting that delayed recognition of pregnancy may be responsible for some of the delay in prenatal care. The pattern by wantedness status suggested that intended (or ''wanted then'') births, regardless of mother's race, were more likely to receive first trimester care.

Characteristics of the mother

The timing of first prenatal care for all live births in 1984–88, according to selected maternal characteristics determined at the time of interview, is shown in table 4. (Note that for all tables presenting maternal characteristics in this report, some characteristics (other than race) may have changed between the child's birth and the date of interview.) About 53 percent of Hispanic women and non-Hispanic black women began prenatal care in the first trimester, significantly less than the 70 percent of non-Hispanic white women who began care early. Among women who delayed care beyond 5 months or received no care at all, the gap between Hispanic and non-Hispanic white women narrowed from 17 to 12 percentage points, while the gap between non-Hispanic black and white women was narrowed more significantly from 17 to 8 percentage points.

Prenatal care in the first trimester (that is, early care) was markedly associated with several measures of socioeconomic status. Women with higher levels of education, professional or managerial jobs, and higher levels of income were more likely to receive early prenatal care. (Note that for education, occupation, and income, these and subsequent tables show data only for women 20–44 years old at time of birth. Teenagers are likely to still be in high school. They are also more likely to be unemployed or have lower status jobs, and to have low incomes or not know their total family income.) Relative to women who had never worked, women in all occupational groups showed significantly higher proportions with early prenatal care (table 4). Only 49 percent of women who received Medicaid payments for prenatal care or delivery received early care, versus 68 percent among non-Medicaid recipients (table 4). Women who lived in suburban areas were more likely to have early care than women in central cities of metropolitan areas or nonmetropolitan areas.

Tables 5 and 6 present variations by race in prenatal care timing according to these same maternal characteristics. The proportions receiving early care were similar for white and black women with less than a high school education or with any amount of college. However, white high school graduates were about 30 percent more likely to receive early care than black high school graduates (68 versus 53 percent). In every job category, white women were more likely to get early care than black women, but differences were only statistically significant for those in higher status jobs. About 61 percent of births to nonmetropolitan white women and only 44 percent of births to nonmetropolitan black women received early care.

Although early prenatal care rates were similar among low income women and among Medicaid recipients, white nonrecipients of Medicaid were almost 25 percent more likely than black nonrecipients of Medicaid to begin prenatal care in the first 3 months of pregnancy. However, it should be noted that the women who did not receive Medicaid are a large and extremely heterogeneous group with regard to socioeconomic status.

Trends: Cycles III–IV

Table A gives the proportion of live births receiving prenatal care within the first trimester, according to selected birth and maternal characteristics and survey year. Figure 2 shows the percent of mothers receiving early prenatal care in 1979–82 versus 1984–88, by marital status. None of the changes in rates of early care shown in table A or figure 2 were significant between the 1982 and 1988 surveys. This suggests that little progress was made toward the 1990 target level of 90 percent in the early and mid 1980's. However, effort toward achieving this target level has continued in the Healthy People 2000 objectives (55).

Summary

Similar levels and patterns of early prenatal care were found between the 1982 and 1988 surveys. The likelihood of receiving delayed care (that is, after the first trimester) remains significantly higher for the following groups of women:

- never married
- teenaged
- Hispanic and non-Hispanic black
- having unwanted or mistimed birth
- never worked
- low income (less than 150 percent of poverty level)
- Medicaid recipient
- education less than high school

The percent receiving early care among all mothers taken together (65 percent) still falls far short of the 90 percent objective specified in the nation's 1990 and Healthy People 2000 programs. This, along with the wide disparities among

subgroups of mothers, indicates that further efforts are needed to extend early prenatal care to all pregnant women.

Source of most prenatal care

Although many studies of prenatal care have been published in recent years, few have presented findings on the source of care for pregnant women, and almost none are based on nationally representative samples of women. In 1982 and 1988, the NSFG asked women to identify their source of prenatal care. Unfortunately, trends over time cannot be examined because the question changed. In 1982, women were asked where they had their FIRST prenatal visit, but in 1988 they were asked the site of MOST of their prenatal visits. To the extent that these measures are comparable (that is, the extent to which women stay with the same provider throughout their pregnancy), the 1982 and 1988 NSFG data indicate that some important changes occurred in the proportion of care that was from private physicians.

As for other data sources, birth registration data include timing of first prenatal care, but do not contain information on providers. Compared with the NSFG, the National Maternal and Infant Health Survey (NMIHS) data on timing and source of prenatal care have suggested similar patterns, if not levels, of early prenatal care and care provided by private physicians (43). Pregnancy Risk Assessment Monitoring System (PRAMS) data from four States in 1988–89 indicated associations between maternal sociodemographic characteristics and source of prenatal care that were similar to those revealed in national estimates from the 1988 NSFG (58,59). Women with higher incomes, better education, and higher-status jobs were more likely to have private medical insurance to cover their prenatal care. Insurance status was also found to be the key determinant of source of prenatal care in a North Carolina-based study in which uninsured women and Medicaid recipients relied primarily on public clinics (60).

Private physician care is generally associated with better pregnancy outcomes, but this is largely due to the fact that women who use private doctors are often in better health before their pregnancy begins (8). However, the literature does not firmly indicate that low-income women, generally with higher risk profiles, do better with private physician care than they would with clinic (public-sector) care. Many researchers have suggested that low-income women receiving prenatal care from public health department clinics and other government-subsidized facilities show better pregnancy outcomes than low-income women receiving care from private physicians. Therefore, they have argued for expanding public clinics and Medicaid eligibility to cover more women in poverty (60–63). Researchers have also argued for boosting (or to refrain from further restricting) comprehensive prenatal services in public health care facilities because many of the barriers to early and adequate prenatal care are related to clinic features such as long waiting times, less continuity of care, and difficult transportation and child care arrangements (8,20,44,59). Despite the increased numbers of counties offering routine maternity and related services between 1975 and 1984, 40 percent of U.S. counties did not offer prenatal care in health department operated or funded sites in 1984 (63).

Tables 7–12 present NSFG data on source of prenatal care for women whose live births occurred between 1984 and 1988. These tables also show the near-universal proportions of women who received any prenatal care at all.

Receipt of prenatal care

Less than 2 percent of women who had live births between 1984 and 1988 went without any prenatal care, regardless of race or any of the birth and maternal characteristics shown in tables 7–12. None of the differences in use of any prenatal care was significant at the 5 percent level. Furthermore, these rates represent no substantial change from the rates of prenatal care receipt among pregnancies ending in live birth between 1979 and 1982, as measured in the 1982 NSFG.

Characteristics of the birth

Table 7 indicates that 69 percent of all births receiving prenatal care had most of their visits with a private physician, while the remainder were primarily cared for at hospital clinics or other clinics. The proportions managed primarily by private physicians increased markedly with maternal age, from 42 percent among teenaged births, to over 75 percent after age 25 years. The data suggest that babies born by cesarean section were more likely than babies born vaginally to have received private care. This is consistent with reports that women with private health insurance have higher rates of cesarean delivery than women who use other means to pay for their deliveries (64).

Marital status, wantedness status, and timing of first prenatal visit were all closely linked with source of most prenatal care. Private physician care was more likely among women who were ever-married (74 percent versus 46 percent), who had intended pregnancies rather than mistimed or unwanted pregnancies (74 percent versus 64 percent and 58 percent), and who had their first prenatal visit within the first trimester (73 percent versus 58 percent).

‘‘Hospital clinics’’ and ‘‘other clinics’’ include public health department clinics and other government subsidized facilities. Greater use of these clinics for prenatal care was seen among teenaged mothers and women who were having nonsecond order births, had never married, were having unintended pregnancies, or who delayed prenatal care beyond the first trimester.

Tables 8 and 9 present race-specific data on the source of most prenatal care. White births were 60 percent more likely than black births to have received most prenatal care from a private doctor (75 percent versus 46 percent). Thus, a majority of black women relied on clinics for their prenatal care. Within each category of birth characteristics presented in these tables, white births were substantially more likely to have received private care than black births, and the patterns of associations were similar. There was a 20 percentage point difference in the rates of private prenatal care between black (38 percent) and white (58 percent) never-married women. Among births that were intended at the time of conception, nearly 80 percent of

white births, compared with 50 percent of black births, received private prenatal care. These findings reinforce the known disparities in social and economic conditions surrounding black and white childbearing (8,13,20).

Characteristics of the mother

The percent distribution of the source of most prenatal care for all births according to selected maternal characteristics is shown in table 10. Births to minority women were much less likely than those to non-Hispanic white women to receive prenatal care primarily from private physicians. About 78 percent of white births, 53 percent of Hispanic births, and only 45 percent of black births received private care. Reliance on clinics for prenatal care was comparable among births to Hispanic and non-Hispanic black women, and more likely than it was among births to non-Hispanic white women.

Private prenatal care was strongly linked with several measures of socioeconomic status. Overall, the rate of clinic use for prenatal care was 31 percent. Greater clinic reliance was found among women who had less than a high school education (50 percent), who had never worked (64 percent), who had low income (47 percent), and who had received Medicaid payments for prenatal care or delivery (72 percent). Women who lived in central cities of metropolitan areas were substantially more likely to use clinics (44 percent) than those who lived in suburban or nonmetropolitan areas (27 percent).

Race-specific data for source of most prenatal care among black and white births according to maternal characteristics are shown in figure 3 and tables 11 and 12. As with the tables presenting pregnancy and birth characteristics, the patterns of associations were generally comparable between white and black births. However, the extent of private prenatal care was markedly greater among white births in nearly every category of the maternal variables. For example, among births to higher-educated women, private doctors were used for prenatal care for 84 percent of white births, compared with only 59 percent of black births. A 17 percentage point difference (53 versus 36) was seen between white and black births among women who never worked.

A somewhat different pattern in metropolitan residence was suggested. For white births, lowest receipt of private prenatal care was observed among women who lived in central cities of metropolitan areas (65 percent). In contrast, for black births, lower but similar rates of private care were found among women living in either central cities or nonmetropolitan areas (43–45 percent).

Summary

Use of clinics for most prenatal care was more common among the following groups of pregnant women:

- never married
- teenaged
- Hispanic and non-Hispanic black
- having an unwanted birth
- delaying first prenatal visit beyond first trimester
- low income (less than 150 percent of poverty level)
- Medicaid recipient
- never worked
- education less than high school

Given that most women who receive delayed prenatal care received their care at public clinics, greater outreach by clinics and better tailoring of services might increase the proportions receiving early care. For example, health planners and providers could consider increasing the number of facilities and staff, boosting clinic hours, and providing assistance with transportation and child care (8,13).

Cigarette smoking during pregnancy

Smoking cigarettes during pregnancy has been shown to increase the risk of numerous adverse pregnancy outcomes, including low birthweight, preterm delivery, miscarriage, ectopic (tubal) pregnancy, premature rupture of membranes, infant death (for example, sudden infant death syndrome), low Apgar scores, and early childhood illness (for example, respiratory illnesses, asthma) (15,35,65–69). Risk of poor outcomes increases with the amount smoked, but any amount of smoking increases risk relative to not smoking at all. Among studies that considered passive exposure to cigarette smoke, exposure in utero remained a significant risk factor for poor outcomes, independent of other variables (32).

The biological mechanisms for the effect of smoking on pregnancy loss, preterm delivery, and birthweight are known. In addition, similar patterns of associations have been found between smoking and low birthweight in countries with a wide range of smoking prevalence (70). Biological plausibility and generalizability of association are two key criteria for establishing causation (71), and these criteria appear to be met with smoking.

Epidemiologic studies have established that smoking is strongly associated with low birthweight that ensues from intrauterine growth retardation (IUGR), also known as ‘‘term low birthweight’’ and ‘‘small for gestational age’’ (SGA) (72,73). The association with smoking is less strong for low birthweight that results from preterm delivery, for which the key predictors include older maternal age and prior preterm delivery (15,74). Several components of cigarette smoke, such as nicotine, have been demonstrated to reduce fetal growth, leading to IUGR low birthweight, and to induce placental insufficiency, leading to preterm delivery (69,75).

The causal role of maternal cigarette smoking is more difficult to establish for child health after birth because of the many family, socioeconomic, and environmental factors that can confound the observed associations. However, some studies have suggested that smoking has adverse health and developmental effects on young children (15,76,77).

Smoking among American women has generally been declining in recent years, but these declines have been slower or nonexistent among groups of women already at greater risk of poor health outcomes (for example, teenaged white women, poor women of all races) (78–80). Data from the 1987 Oklahoma Pregnancy Risk Assessment Monitoring System (PRAMS) indicated that women receiving publicly funded

prenatal care (that is, care from a health department or paid by Medicaid) were much more likely than other pregnant women to smoke heavily before pregnancy and to continue smoking during pregnancy (58).

Several reports have documented that women who smoke, and particularly those who smoke during pregnancy, are more likely to have other sociodemographic and behavioral attributes that place them at higher risk for poor pregnancy outcomes (16,56–58,65,79,81,82). However, smoking generally remains an independent risk factor after adjustment for these other characteristics. For example, smoking was found to reduce birthweight by 150–300 grams (69) and to double the risk of low birthweight, independent of other risk factors (81). It has been estimated that elimination of smoking during pregnancy would prevent 18 percent of low birthweight among singleton white births and 35 percent among singleton black births (83).

The NSFG data in tables 13–18 show patterns of smoking during pregnancy according to selected pregnancy and maternal characteristics. Women who had ever been pregnant and who reported smoking at all in the 12 months prior to the outcome of their most recent pregnancy, were asked:

''On the average, how many cigarettes did you smoke per day before you found out you were pregnant?'' The answer categories were:

- about one a day or less
- just a few (2–4)
- about half a pack (5–14)
- about a pack (15–24)
- about 1 1/2 packs (25–34)
- about 2 packs (35–44)
- more than 2 packs (45 and more)
- none

Women who reported smoking about half a pack (5–14 cigarettes) or less per day are shown in tables 13–18 as having smoked fewer than 15 per day and are referred to in the text as light smokers. Women who reported smoking about a pack (15–24) or more per day are shown as having smoked 15 or more per day and are referred to as heavy smokers in the text. Women whose most recent completed pregnancy ended with induced abortion are excluded from these tables.

Characteristics of the pregnancy

Overall, 28 percent of women reported smoking during their most recent pregnancy, 17 percent were light smokers and 11 percent were heavy smokers (table 13). The race-specific tables (tables 14 and 15) indicated that white women were more likely to have smoked during pregnancy than black women were (29 versus 24 percent), and all of this difference was in heavy smoking (12 percent of white versus only 6 percent of black women).

Table 13 shows that for women of all races, smoking during pregnancy generally diminishes with age, from 32 percent among teenaged women to 19 percent among women 30 years or older. However, tables 14 and 15 disclosed an important race disparity in pregnancy-related smoking patterns by age. No consistent relationship with age was seen among black women, but the smoking rates for white women fell sharply with age, from 39 percent among teenagers to 19 percent among older white women. These race differentials in overall and age-related rates of smoking during pregnancy are consistent with reports based on other surveys (43,56,79,80).

White and black women whose last pregnancy was third or higher order were equally likely (30 percent) to report smoking during the pregnancy. At each pregnancy order (gravidity), black women had lower levels of heavy smoking than white women did (for example, 4 percent versus 11 percent for primigravida).

Recency of the pregnancy was found to be related to the overall and race-specific smoking rates. In addition to the data in tables 13–15, table B shows that smoking during pregnancy fell substantially from 35 percent among pregnancies ending in 1970 or earlier to less than 25 percent among pregnancies ending 1985–88. Because the data in table B come from Cycles III and IV, it is possible that there was a ''cycle effect'' on smoking rates. This possibility was ruled out by checking the smoking rates for pregnancies ending in 1971–80 in each survey sample. The rates of smoking during pregnancy were similar (30–32 percent) in both Cycles III and IV. The data in table B suggest that public health messages urging smoking cessation in pregnancy are having an impact. Also, the levels of pregnancy-related smoking found in the NSFG are within the range of other national estimates (80). The reduction in smoking was more significant among white (34 to 25 percent) (table 14) than among black women (25 to 20 percent) (table 15). Despite these reductions over time, table B indicates that non-Hispanic white women continue to have higher reported rates of smoking during pregnancy than non-Hispanic black or Hispanic women.

Other pregnancy factors associated with higher smoking rates among women, all races taken together (table 13), were never-married status (34 versus 26 percent) and unwanted status (34 percent versus 24 percent among intended pregnancies). The data suggested that smoking was more likely among pregnancies ending in spontaneous loss than live birth (5 percentage point difference), and those receiving delayed or no prenatal care than those with first trimester care (5 percentage point difference). Tables 14 and 15 indicated that race-specific patterns of smoking were similar, but that the associations with smoking rates among black women were not statistically significant for marital status, wantedness status, live birth versus spontaneous loss, and timing of first prenatal visit.

Characteristics of the mother

Tables 16–18 present pregnancy-related smoking rates for the most recently completed pregnancy by characteristics of the mother. Hispanic women were less likely to have smoked during pregnancy than non-Hispanic white or black women (14 percent versus 30 and 23 percent, respectively). As found in other reports (43,56,58,79), smoking in pregnancy was related to many of the factors associated with smoking among women in general—lesser education, lower-status jobs, and lower income levels.

Table 16 shows large differences in smoking during pregnancy by education, and smaller but significant differences by occupation and income level. Women with less than a high school education were more than twice as likely to have smoked during pregnancy than women with greater than a high school education (43 versus 18 percent). Professional women were less likely to have smoked (19 percent) than women in other occupations (26–37 percent). Low-income women were more likely to have smoked (34 percent) than higher-income women (about 25 percent).

Heavy smoking during the most recent pregnancy was more likely among non-Hispanic white women (14 percent), less educated women (13–18 percent), those in lower-status (that is, lesser paying) jobs (14–17 percent), and those with low and middle incomes (less than 300 percent of poverty level) (12 percent). Only 6 percent of women with more than a high school education smoked heavily, as compared with 18 percent of women with less than a high school education. The gap was even wider for white women taken separately (6 versus 21 percent, table 17).

Tables 17 and 18 indicate similar patterns of associations with maternal variables for white and black women; however, the levels of smoking—especially heavy smoking—are generally lower for black women in every category. Smoking rates dropped sharply as education increased among white women, but among black women, the only significant reduction was found between women who did not complete high school and women who did (figure 4). A similar pattern occurred with income level. For white women, there were significant declines with each level of increasing income, while for black women, the only significant decline in smoking rates was seen between the lowest and middle income groups.

Trends: Cycles III–IV

Table B and figure 5 present the trends in smoking during pregnancy for pregnancies ending in 1970 or before, 1971–80, 1981–84, and 1985–88, by selected characteristics of the pregnancy and the mother. Overall, the rates of smoking fell markedly from 35 percent among pregnancies ending in 1970 or earlier to 23 percent in those ending in 1985–88. Over time, smoking in pregnancy has decreased in most subgroups of women. However, several patterns persist. Smoking in pregnancy remains primarily a practice of women who are younger (less than 25 years old), never married, having an unwanted pregnancy, less educated, and lower income. With the exception of pregnancies in 1970 or earlier, Hispanic women had lower smoking rates than women of other race/origins.

Overall age-specific smoking rates fell steadily throughout the 1970's and 1980's with one notable exception. Teenagers showed a considerable increase in smoking during pregnancy in the 1970's, from 34 to 45 percent. The age gap in smoking widened substantially in the 1970's and early 1980's (16 and 23 percentage point differences, respectively), but it narrowed to a 12 percentage point difference among pregnancies ending in 1985–88.

Summary

NSFG data indicate that, overall, women are getting the message about the harmful effects of smoking; smoking rates during pregnancy have fallen steadily throughout the past two decades. Yet, smoking in pregnancy continues to be a common practice among the following groups of women:

- never married
- age less than 25 years
- having an unwanted or mistimed birth
- delaying first prenatal visit beyond first trimester
- non-Hispanic white (especially heavy smoking)
- low income (less than 150 percent of poverty level)
- never worked or working in lower-status jobs
- education less than high school

The persistence of pregnancy-related smoking among groups of women who may already be at greater risk of poor health and pregnancy outcomes suggests that health education and smoking cessation programs should be targeted to these at-risk groups.

Drinking during pregnancy

Heavy alcohol consumption during pregnancy increases the risks for spontaneous pregnancy loss, particularly stillbirth. Children of heavy drinkers have higher rates of birth defects, low birthweight, pre- and postnatal growth retardation, mental retardation, learning disorders, hyperkinetic disorders, and perinatal mortality (13,84–87). Babies of alcoholic mothers are often born with fetal alcohol syndrome, which involves several of these conditions (84).

Unlike smoking during pregnancy, for which adverse effects have been documented for any degree of exposure, there has been considerable debate regarding the critical threshold of alcohol consumption that leads to poor outcomes. Numerous papers have suggested that other variables and reporting errors in the amount of alcohol consumed may prevent clear interpretation of the effects of alcohol use in pregnancy (86–89). Heavy consumption is generally defined as greater than 140–150 grams of absolute alcohol per week (about 5 ounces), but elevated risk of pregnancy loss and low birthweight have been found at more moderate levels of consumption (87,90,91). Some have suggested that underreporting of alcohol consumption may result in a greater likelihood of mistakenly inferring negative effects of lower levels of alcohol consumption (88). Further research is needed on the following questions, among others:

- How much alcohol consumption will adversely affect a baby?
- What are the effects of various drinking patterns (for example, the effects of ''binge drinking'' versus ''social drinking'')?
- What are the effects of different types of alcohol (beer, wine, liquor)?
- What are the effects of the timing of fetal exposure to alcohol?

- What other variables must be controlled to accurately measure alcohol's effects (84,89)?

Although numerous issues remain unresolved about alcohol in pregnancy, the American Medical Association has concluded that until a safe amount of consumption can be firmly established, pregnant women should not drink alcohol (84). Similarly, in July 1981, the U.S. Surgeon General advised physicians that ''each patient should be told about the risk of alcohol consumption during pregnancy and advised not to drink alcoholic beverages'' (92). More recently, warning labels were mandated for alcoholic beverage packaging.

Tables 19 and 20 present 1988 NSFG data on drinking during the most recently completed pregnancy ending in spontaneous loss or live birth. Women who had ever been pregnant were asked: ''On the average, how often did you drink alcoholic beverages after you found out you were pregnant?'' The answer categories were:

- every day
- a few days a week
- once a week
- once a month
- less than once a month
- never

In the 1982 NSFG report, tables were presented with the following categories of drinking frequency: ''none,'' ''less than once a week,'' and ''once a week or more often.'' The 1988 data indicated a marked reduction in reports of drinking more frequently than once a week, so tables 19 and 20 use the following categories: ''none,'' ''less than once a month,'' ''once a month,'' and ''more than once a month.'' For comparison across survey years, ''more than once a month'' in tables 19 and 20 is equivalent to the ''once a week or more often'' used in the 1982 report (22). ''Regular'' or ''monthly'' drinkers refer to women who drank once a month or more.

Table C shows the percent of women who drank alcohol in any amount during their most recent pregnancy ending in live birth or spontaneous loss. The overall percent fell from 45 percent in the 1982 NSFG to 34 percent in the 1988 NSFG. Generally, the levels of reported drinking in pregnancy fell between the two surveys, but the patterns of association with maternal age, marital status, race/origin, education, and income remained similar. Drinking during pregnancy was more common among women who were older, ever married, non-Hispanic white, more educated, and higher-income. The tendency for these women to have good pregnancy outcomes despite their alcohol consumption may reflect their generally good health status and access to health care. However, it may also indicate that low levels of consumption are not necessarily harmful.

Characteristics of the pregnancy

Overall, 34 percent of pregnant women reported drinking in their most recently completed pregnancy, and 15 percent drank once a month or more (table 19). Drinking was somewhat less common in recent pregnancies (31 percent in 1985–88) than in less recent pregnancies (37 percent before 1980) (table 19). These figures, along with table C, suggest that public health messages about abstinence during pregnancy may be having an impact.

As found in other studies (79), table 19 shows that women who drank during pregnancy were more likely to be older: 22 percent of teenage women drank while pregnant versus 37 percent of women 30 years or older. However, unlike other studies that found lower parity among pregnant drinkers, pregnant drinkers in the NSFG were more likely to be multiparous than primiparous. Other, perhaps paradoxical, findings suggested by the data were that drinkers were more likely to be ever married than never married and that no associations were disclosed with pregnancy loss, unwanted status, or delayed initiation of prenatal care.

Black and white women showed similar drinking patterns (not shown) by age, pregnancy order, year of pregnancy outcome, and marital status, although the levels of drinking are lower among black women in all categories of these variables.

Characteristics of the mother

Non-Hispanic white women were more likely to have consumed alcohol in their most recently completed pregnancy than either Hispanic or non-Hispanic black women (table 20). No difference was evident among monthly drinkers, which implies that the higher amount of drinking among non-Hispanic white women occurred chiefly in the ''less than once a month'' category. About 21 percent of white women reported drinking less than monthly, versus 11 percent of black women and 13 percent of Hispanic women. This race/origin disparity is consistent with findings from the 1982 NSFG and other surveys (22,43,56). There was a striking pattern of an increased proportion of women drinking less than once a month with higher education: 12 percent of women with less than a high school education, compared with 23 percent of women who had some college, drank less than once a month during pregnancy. Women in professional or managerial jobs were twice as likely to have consumed alcohol as women who had never worked (42 versus 20 percent). Women in other job categories were intermediate in their proportions who drank during pregnancy. Higher-income women were also more likely to drink than lower-income women (40 versus about 30 percent). All of these findings are consistent with the association disclosed in numerous studies of drinking with higher social status (82).

Measured by area of residence, the greatest proportion of abstainers from alcohol was found among women living in nonmetropolitan areas.

White and black drinking patterns (not shown) were similar by maternal characteristics. One notable exception was drinking patterns by educational level (figure 6). Overall, 15 percent of women, regardless of race, drank once a month or more during pregnancy. Among white women, there was an increase in drinking (once a month or more) with higher education, from 11 to 20 percent. Among black women, however, the data indicated a reverse pattern: 19 percent of

less-educated black women drank once a month or more compared with 11 percent of black women with some college education.

Summary

NSFG data from 1982 and 1988 suggest that reported drinking during pregnancy has declined, but the decline is not statistically significant at the 5-percent level. Drinking during pregnancy, particularly light drinking, remains a practice of the following groups of women:

- older
- non-Hispanic white, more educated
- non-Hispanic black, less educated
- higher income
- higher status jobs

Though requiring multivariate analysis for confirmation, the NSFG data suggested that these women's overall good health, access to health care, and nutrition may well overwhelm any potentially adverse effects of light alcohol consumption. Conversely, it may be that light consumption is not harmful or is only harmful when other factors associated with poor pregnancy and health outcomes are present. These data showed that among black women, drinking during pregnancy is more common among those with less education, lower incomes, and lower-status or no jobs. Women in these socioeconomic groups are already at significant risk for poor health outcomes.

Smoking and drinking during pregnancy

Table D shows the percent distribution of smoking and drinking during the most recent pregnancy that ended in live birth or spontaneous loss. About 51 percent of ever-pregnant women abstained from both smoking and drinking during pregnancy, 15 percent smoked only, 21 percent drank only, and 12 percent both smoked and drank. No clear age pattern could be detected for total abstinence, probably because the patterns for smoking and drinking went in opposite directions. Younger women tended to smoke and older women tended to drink. Among women who reported both smoking and drinking, there was a modest decline after age 30.

Women with pregnancies ending more recently, particularly after 1980, were less likely to smoke or drink during pregnancy. This suggests that public health messages are having an impact on pregnant women and prenatal care providers.

Non-Hispanic white women were significantly more likely than Hispanic or non-Hispanic black women to smoke and/or drink during pregnancy (54 versus 31 and 37 percent). Education was strongly correlated with drinking during pregnancy, but showed a strong inverse correlation with smoking. Table D indicates that women who smoke during pregnancy may not be the same women who drink during pregnancy, so health education efforts should not be targeted similarly.

Low birthweight

Low birthweight is defined as 2,500 grams (5 1/2 pounds) or less (13). Babies born at low birthweight are significantly more likely to die than normal weight babies during the first 28 days of life. They account for two-thirds of neonatal deaths in the United States (8,13). After the neonatal period, low-birthweight babies are twice as likely to be rehospitalized during their first year and five times more likely to die between 28 days and 1 year. They are at increased risk for neurodevelopmental handicaps (for example, cerebral palsy, seizure disorders), birth defects, childhood illnesses, learning disorders, and social functioning and behavioral problems (13,20,93,94). The risk of adverse consequences increases substantially for very-low-birthweight babies, those born at less than 1,500 grams. However, for this report, tabulations are presented only for low-birthweight babies due to the small numbers of very-low-birthweight births in the NSFG. Several reports based on vital registration data can provide further information on the risks associated with more severe low birthweight (1,2,4,5,37,41).

Two major etiologic classes of low birthweight have been identified: (a) term low birthweight, or ''small for gestational age'' low birthweight, due to intrauterine growth retardation (IUGR), and (b) preterm low birthweight results from premature delivery (earlier than 37 weeks gestation). In general, preterm low birthweight is associated with higher perinatal mortality, but those babies who survive the perinatal period tend to catch up to the weight and developmental milestones of their normal birthweight counterparts. Meanwhile, IUGR low-birthweight babies have lower infant mortality rates than preterm low-birthweight babies, but they are more likely to be sick and rehospitalized in their first year of life and do not catch up to normal birthweight babies (13,74).

Many of the same factors have been associated with term (IUGR) and preterm low birthweight: younger and older maternal age, prenatal stress, prior history of low-birthweight births or pregnancy losses, lower pre-pregnancy weight, lack of early and adequate prenatal care, unmarried status, black race, lower levels of education and income, lower status jobs, and smoking and drinking during pregnancy (73,95,96). Smoking has been particularly linked with IUGR low birthweight (72).

Because many of these factors can be readily identified before delivery, they can be used for screening and risk assessment. Smoking and drinking during pregnancy, as well as timing and adequacy of prenatal care, are the most amenable to preventive measures (8,13,20). Prevention of low-birthweight births, and its adverse consequences, has immense potential for reducing medical expenditures at personal (family) and governmental levels. In 1988, the Office of Technology Assessment estimated that for every immature birth (low birthweight or preterm) prevented by improved prenatal care, the U.S. health care system would save between $14,000–$30,000 (20). Given medical cost inflation since 1988, these figures are likely to be substantially higher now. Also, given that a large proportion of low-birthweight infants are born to poor or young mothers, many of whom do not have private

health insurance, the costs of low-birthweight care are often passed on to the public (8).

In addition to the considerable research on the impact of socioeconomic confounding on low-birthweight rates, some researchers have suggested that part of the persisting racial gap is due to differing birthweight distributions (97,98). Other researchers have focused on the apparent fact that smaller black babies are more likely to survive than white babies of the same weight (that is, a birthweight-specific advantage for black babies) (6,99). In a study of smoking and the risk for sudden infant death syndrome (SIDS) among different racial and ethnic groups, one report concluded that using the same definition of low birthweight may explain the weaker association between smoking and SIDS for black babies and the lack of association among Asian and Hispanic babies (100). Many questions remain unanswered, including the persistence of a nearly twofold race gap in *birthweight-specific* mortality, even after using race-specific birthweight distributions. It may be that any biological advantage of black babies (both low and normal weight) is outweighed by social and economic disadvantage, as well as by differentials in behavioral risk factors.

Tables 21–24 present 1988 NSFG data on low birthweight among all single live births. The tabulations in this report were restricted to single live births because multiple births are far more likely than single births to be low birthweight (101).

Characteristics of the birth

Table 21 shows that the overall rate of low birthweight among single live births was 7 percent. The black rate of 14 percent was more than twice the white rate of 6 percent. These figures are consistent with birth certificate data for single live births in 1988 (41).

The rates for all races reflect the disproportionate contribution of white births to the denominator (all single live births) and black low birthweight births to the numerator, so the discussion of tables 21 and 22 will focus on the race-specific rates. The ‘‘all races’’ rates are presented because they include births to women of other races.

The rates for low birthweight among black births were generally higher, typically about double, the rates among white births in all categories of the birth characteristics shown (table 21). About 15 percent of black births to teenagers were low birthweight, compared with 8 percent of white births to teenagers. The sex differential in low birthweight suggested in the overall group was more marked among black births—nearly 18 percent of black female births were low birthweight versus 11 percent of black male births. While white low-birthweight rates declined from 7 percent to 5 percent by more recent year of birth, the black low birthweight rate fell from 15 percent to 12 percent.

No significant difference in the percent low birthweight was seen by marital status among black or white births separately. However, when all races were considered together, births to never-married women were more likely than those to ever-married women to be low birthweight (11 versus 7 percent). This difference reflects, in part, the fact that a greater proportion of black births than white births occur among never-married mothers, and black births are significantly more likely to be low birthweight. Along with race, many other factors contribute to differentials in low-birthweight rate by marital status. In one of the few multivariate analyses (to date) of birth registration data, the Missouri State Health Department has used 1991 data to produce odds ratios for low birthweight, adjusting for selected risk factors on the birth certificate. Births to unmarried women were 19 to 42 percent more likely to be low birthweight than births to married women, after controlling for race, age, education, parity, Medicaid status, maternal weight, history of premature delivery, history of infant/child death, pregnancy weight gain, smoking during pregnancy, birth spacing, and initiation of prenatal care (102). It should be noted that the NSFG did not code precise marital status at the time of delivery; a certain unknown fraction (and unknowable) fraction of ‘‘ever-married’’ births were to women who were not *currently* married. A further note of caution about interpreting these findings is that the Missouri analysis was limited to those risk factors available on the birth certificate. These do not comprise a complete roster of variables to account for the indirect effect of marital status on pregnancy outcome.

With regard to wantedness status, a greater proportion of black births than white births were mistimed or unwanted at the time of conception. This was linked to significantly higher rates of low birthweight among black births and total (all races) births. White births that were unwanted or mistimed were no more likely to be low birthweight than white births that were intended. The lack of bivariate association between birthweight and prenatal care initiation may be related to the absence of more precise measures of prenatal care adequacy in the NSFG, such as timing and content of subsequent visits.

A somewhat different racial pattern in low birthweight rates was seen with *source* of prenatal care. Highest low birthweight rates were found among white women who attended hospital clinics, while for black women, the data suggested higher low birthweight rates among those attending either hospital or other clinics. This racial difference may be caused by a higher proportion of black mothers than white mothers relying on nonhospital (that is, other) clinics for prenatal care. White mothers using hospital clinics rather than private doctors for prenatal care may have been referred there because such clinics are often targeted at women who are at medically higher risk for poor outcomes, such as low birthweight. However, black mothers receiving prenatal care from clinics are, in general, more likely to be in groups at higher risk for low birthweight, both for medical and nonmedical reasons. For example, their access to and use of health services may be limited by their lower, on average, levels of income or education.

Low-birthweight rates rose with increased amounts of cigarette smoking during pregnancy for white and black women (4–9 percent and 11–21 percent, respectively) (figure 7). The rates of low birthweight were significantly higher for black mothers in each smoking category.

Characteristics of the mother

Table 22 shows that non-Hispanic black births were more than twice as likely to be low-birthweight (14 percent) as births to Hispanic and non-Hispanic white women (6 percent) and other race women (7 percent).

The race-specific low-birthweight rates in table 22 indicate similar patterns between white and black births, but much higher rates of low birthweight among black births. As seen with several of the birth characteristics, the approximately twofold disparity in low-birthweight rates was maintained across all categories of maternal variables. Sample sizes were too small for the differences to be statistically significant among black births, but higher low-birthweight rates in both race groups were found for women who were less educated, had lower status jobs or never worked, or had lower incomes. Birth registration data support the association between low-birthweight and lower educational attainment, but income and occupation data cannot be compared because they are unavailable from vital statistics (37).

Trends: Cycles III–IV

Tables 23 and 24 illustrate trends in low-birthweight among single live births based on the 1982 and 1988 NSFG. Low birthweight rates have fallen substantially over time, reflecting medical and public health advances: 16 percent among single live births in 1970 or earlier, to 6 percent among births in 1985–88. (The possibility of a ''cycle effect'' on low-birthweight rates in tables 23 and 24 was eliminated by checking the low-birthweight rates for single live births in 1971–80 in each survey sample. The rates of low birthweight were similar (7–9 percent) in both Cycles III and IV.) During the earlier years, an association between smoking and low-birthweight rates was not detectable. However, as low-birthweight rates fell, particularly for births in 1985–88, the rates were significantly higher among women who smoked during pregnancy (about 11 percent) than among nonsmokers (4 percent) (table 23).

Summary

Although low-birthweight rates have fallen over time, tables 23 and 24 show that higher rates continue to be found among mothers who are:

- teenaged
- having a higher order birth
- never married
- having an unwanted birth
- black
- less educated
- lower income
- residents of central metropolitan areas

Source of payment for delivery

Several reports, including those based on the 1984 National Health Interview Survey (103), have documented that white persons aged 18–44 years are more likely to have private medical insurance than black persons aged 18–44 years. Because health insurance is predominantly a benefit of employment, this disparity in insurance coverage is primarily linked with racial differentials in work status (that is, whether and how employed), which in turn are associated with differentials in education and other socioeconomic factors. Proportions covered by private medical insurance rise with education and income level. The NSFG is one of the few nationally representative sources of data on payment for delivery costs and the only national survey that collected this data throughout the 1970's and 1980's. Tables 25–32, which present NSFG data on payment for delivery, permit an examination of these associations among childbearing women in the United States. Tables 25–30 give the percents who used any of the specified sources to pay for live birth deliveries between 1984 and 1988. The percents sum to more than 100 percent because women could report more than one form of payment. Tables 31–32 show the percent distribution, summing to 100 percent, by source of payment for most recent delivery (1984–88).

Characteristics of the birth

Among all live births occurring in 1984–88, 44 percent of the deliveries were paid for by the woman, her family, or friends (that is, out of pocket); 66 percent by private medical insurance; 11 percent by Medicaid; and 9 percent by other government sources (table 25). The racial disparities (tables 26–27) were striking. Private insurance was used for 71 percent of white deliveries versus 40 percent of black deliveries. Medicaid paid for 7 percent of white deliveries, compared with 33 percent of black deliveries. Because insurance generally pays for part but not all medical expenses and because white women were more likely to have private insurance coverage, it is not surprising that white women were more likely (47 percent) than black women (27 percent) to use out-of-pocket funds to pay for part of the delivery costs. In general, for this reason, out-of-pocket payment patterns mirrored those of private insurance.

Reliance on private insurance was greatest among women who were older, who had deliveries by cesarean section, who were ever married, who intended their pregnancies at the time of conception, whose prenatal care began in the first trimester, and whose prenatal care came mostly from private physicians. The associations with age and marital status were particularly striking.

Insurance paid, all or in part, for 30 percent of teenagers' deliveries versus 82 percent of deliveries to women 30 years or older. About 74 percent of deliveries to ever-married women had insurance coverage, compared with 23 percent to never-married women. About 73 percent of those with first trimester prenatal care used private insurance to pay for the birth, compared with only 47 percent of those with late or no prenatal care. Women who received most of their prenatal care from private physicians were more likely (78 percent) to use insurance for delivery costs than women who used clinics (34–42 percent). The data suggested that insurance coverage was more likely for normal weight babies than for low-birthweight babies. This is probably due to low-birthweight

being more prevalent among black babies, whose deliveries were likely to be paid for in ways other than private insurance.

Conversely, Medicaid and other government payment was more likely for deliveries to women who were younger, who were never married, whose pregnancies were mistimed or unwanted at conception, whose first prenatal visit was delayed or never occurred, or whose prenatal care came mainly from clinic providers (table 25, figure 10). Medicaid covered 30 percent of teenage deliveries, 38 percent of never-married deliveries, 21 percent of unwanted deliveries, 18 percent of deliveries to women who received delayed or no prenatal care, and 24–30 percent of deliveries to women who attended clinics for most of their prenatal care.

Tables 27 and 28 and figure 8 disclose some important racial differentials in source of payment for delivery. Medicaid and other government sources were the leading payment source (44 and 21 percent, respectively) among births to black teenagers, while out-of-pocket and private insurance were primary sources for white teenagers (43 and 37 percent, respectively). The leading payment sources for white low-birthweight deliveries were private insurance (62 percent) and out-of-pocket funds (41 percent), but the leading sources for black low-birthweight deliveries were insurance (38 percent) or Medicaid (35 percent). Never-married white women were fairly evenly distributed across the forms of payment for delivery, but the leading payment sources for never-married black women were Medicaid (46 percent) and other government sources (22 percent).

Characteristics of the mother

Tables 28–30 show percents of all deliveries paid for by specified sources according to characteristics of the mother at time of interview. Hispanic and non-Hispanic black deliveries were 4–6 times more likely than non-Hispanic white deliveries to have been paid for by Medicaid, and twice as likely to be paid for by other government sources. Conversely, reliance on insurance was markedly greater among non-Hispanic white women than among the other two groups (table 28). Insurance payment was tied closely with measures of socioeconomic status, increasing with higher education, higher status jobs, higher income, and suburban residence. Deliveries to high-income women were over three times as likely to be paid for by private insurance as deliveries to low-income women (89 versus 31 percent) (table 28). A similar pattern for educational status was found. Over 90 percent of women in professional or managerial jobs had their deliveries paid for by insurance as compared with 58 percent of women in service, farm, craft, or operative jobs and 32 percent of women who never worked. The data suggested that Medicaid covered a greater percent of deliveries in central cities of metropolitan areas.

As with the birth characteristics, source of delivery payment according to maternal characteristics revealed substantial racial disparities. Insurance coverage showed similar patterns of association with higher education, higher status jobs, higher income, and suburban residence.

However, the level of use of insurance was dramatically lower among black than among white women. Even among college-educated women, 85 percent of white women and only 68 percent of black women used private insurance for their delivery costs—a difference of nearly 20 percentage points. This finding gives further evidence of continuing socioeconomic disparities between black and white college-educated women (95). Insurance paid for deliveries of only 56 percent of white women living in central cities of metropolitan areas, 76 percent of white women living in suburban areas, and 69 percent of white women living in nonmetropolitan areas; the parallel percents for black women were 36, 50, and 33.

Percent distribution by source of payment

Tables 31 and 32 show the percent distribution by source of payment for most recent deliveries between 1984 and 1988. The categories were own income only (''self, family, or friends''), insurance only, own income and insurance only, Medicaid only, other government sources only, and all other combinations of sources. The tables were restricted to the most recent delivery to avoid over-representation of high-parity women, who are more likely to have their births closer together and to be of lower socioeconomic status (that is, use Medicaid or other government sources).

One purpose of this categorization was to distinguish between women who relied solely on out-of-pocket funds and those who use out-of-pocket funds to supplement insurance coverage. It was expected that the two groups would show marked socioeconomic differences, and the data supported this hypothesis. Sole reliance on out-of-pocket funds generally mirrored the patterns of payment by Medicaid or other government sources. Women using Medicaid, other government sources, or only their own funds were more likely to be younger (less than 25 years old), never married (figure 9), to be having a first birth or a third-or-higher order birth, to be having an unwanted or mistimed birth, to have delayed or have no prenatal care for this birth, or to have obtained most prenatal care from clinic providers. Maternal characteristics associated with these forms of payment included less education, having never worked or working in lower status jobs, and lower income.

The exceptions to the similarity of associations between solely out-of-pocket payers and Medicaid/government payers were with birthweight, marital status, race/origin, and metropolitan residence. Women who had low-birthweight babies were somewhat less likely to use solely out-of-pocket funds and more likely to use Medicaid or government funds, compared with women who had normal birthweight babies. No difference by marital status (11 percent for both ever- and never-married women) was seen for women relying solely on out-of-pocket funds. Conversely, 34 percent of never-married women used Medicaid only and 23 percent relied on other government sources compared with 4 and 5 percent, respectively, among ever-married women (figure 9). Medicaid or government fund usage was most likely for non-Hispanic black or Hispanic women, and for women living in central metropolitan areas. There was no clear pattern in use of solely out-of-pocket funds by race/origin or metropolitan residence.

Reliance on private medical insurance, either alone or in conjunction with out-of-pocket funds, was associated with older age, normal birthweight, ever-married status, intended births, early prenatal care, receipt of prenatal care from private physicians, higher education, higher status jobs, higher income, and residence in suburban or nonmetropolitan areas. These data on source of payment for delivery document one of the consequences of the socioeconomic disparities in insurance status illustrated in other NCHS reports (104).

Summary

The use of private insurance and Medicaid for delivery costs did not change significantly between the 1982 and 1988 NSFG (table E). The strongest correlates of private insurance use continue to be older age, ever-married status, employment (especially in higher paying jobs), and white race. Racial differentials in insurance use persist even among women of equal educational and occupational status. Medicaid, other government funds, and out-of-pocket funds remain the leading sources of payment for births to teenagers and never-married women.

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List of detailed tables

1. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988 30
2. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988 31
3. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988 32
4. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988 33
5. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988 34
6. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988 35
7. Number of pregnancies ending in live birth in January 1984 or later to women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the birth: United States, 1988 36
8. Number of pregnancies ending in live birth in January 1984 or later to white women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the birth: United States, 1988 37
9. Number of pregnancies ending in live birth in January 1984 or later to black women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of prenatal care for most visits, according to selected characteristics of the birth: United States, 1988 38
10. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988 39
11. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988 40
12. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988 41
13. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988 42
14. Number of white women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988 43
15. Number of black women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988 44
16. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988 45
17. Number of white women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988 46
18. Number of black women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988 47
19. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average frequency of alcoholic beverage consumption during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988 48
20. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average frequency of alcoholic

beverage consumption during the pregnancy, according to selected characteristics of the mother: United States, 1988 49
21. Number of single live births to women 15–44 years of age and percent low birthweight, by race and selected characteristics of the birth: United States, 1988 50
22. Number of single live births to women 15–44 years of age and percent low birthweight, by race and selected characteristics of the mother: United States, 1988 51
23. Number of single live births to women 15–44 years of age and percent low birthweight, according to year of birth and selected characteristics of the birth: United States . 52
24. Number of single live births to women 15–44 years of age and percent low birthweight, by year of birth and selected characteristics of the mother: United States 53
25. Number of live birth deliveries in January 1984 or later to women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988 54
26. Number of live birth deliveries in January 1984 or later to white women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988 55
27. Number of live birth deliveries in January 1984 or later to black women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988 56
28. Number of live birth deliveries in January 1984 or later to women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988 57
29. Number of live birth deliveries in January 1984 or later to white women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988 58
30. Number of live birth deliveries in January 1984 or later to black women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988 59
31. Number of women 15–44 years of age who had a live birth in January 1984 or later and percent distribution by source of payment for most recent delivery, according to selected characteristics of the birth: United States, 1988 60
32. Number of women 15–44 years of age who had a live birth in January 1984 or later and percent distribution by source of payment for most recent delivery, according to selected characteristics of the mother: United States, 1988 61

Table 1. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth[1]	16,220	100.0	65.4	19.3	15.3
Mother's age at time of birth					
Under 20 years	1,823	100.0	39.2	30.4	30.5
20–24 years	4,562	100.0	59.6	22.7	17.7
25–29 years	5,627	100.0	72.9	17.1	10.0
30–44 years	4,208	100.0	73.0	13.8	13.2
Birth order					
First	4,881	100.0	66.5	19.7	13.8
Second	4,856	100.0	69.5	17.9	12.7
Third or higher	6,482	100.0	61.5	20.1	18.4
Mode of delivery					
Cesarean section	3,789	100.0	66.3	19.7	14.0
Vaginal	12,379	100.0	65.2	19.0	15.8
Mother's marital status at time of birth					
Never married	2,695	100.0	45.9	23.9	30.3
Ever married	13,526	100.0	69.3	18.4	12.3
Wantedness status at conception					
Intended	9,711	100.0	71.9	16.3	11.8
Mistimed	4,487	100.0	55.9	25.4	18.7
Unwanted	1,987	100.0	55.1	20.3	24.7

[1]Includes births with missing data on first prenatal care visit, mode of delivery, or wantedness status.

Table 2. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth[1]	12,821	100.0	67.9	18.1	14.0
Mother's age at time of birth					
Under 20 years	1,144	100.0	41.7	32.1	26.2
20–24 years	3,476	100.0	60.0	21.9	18.1
25–29 years	4,726	100.0	74.0	16.0	9.9
30–44 years	3,474	100.0	76.0	12.6	11.4
Birth order					
First	3,815	100.0	69.3	18.0	12.7
Second	3,899	100.0	72.5	17.4	10.0
Third or higher	5,107	100.0	63.2	18.7	18.0
Mode of delivery					
Cesarean section	2,965	100.0	68.0	19.4	12.6
Vaginal	9,809	100.0	68.0	17.6	14.5
Mother's marital status at time of birth					
Never married	1,220	100.0	45.4	19.5	35.1
Ever married	11,601	100.0	70.2	18.0	11.8
Wantedness status at conception					
Intended	8,056	100.0	73.8	15.4	10.8
Mistimed	3,546	100.0	57.4	24.9	17.7
Unwanted	1,193	100.0	59.0	16.7	24.3

[1]Includes births with missing data on first prenatal care visit, mode of delivery, or wantedness status.

Table 3. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth[1]	2,374	100.0	53.6	26.1	20.3
Mother's age at time of birth					
Under 20 years	576	100.0	36.7	27.8	35.4
20–24 years	777	100.0	54.7	27.5	17.8
25–29 years	587	100.0	63.6	25.3	11.2
30–44 years	434	100.0	60.4	22.2	17.4
Birth order					
First	719	100.0	51.8	28.8	19.3
Second	641	100.0	56.2	21.8	22.1
Third or higher	1,014	100.0	53.2	26.8	20.0
Mode of delivery					
Cesarean section	555	100.0	56.4	26.3	17.3
Vaginal	1,814	100.0	52.7	25.9	21.3
Mother's marital status at time of birth					
Never married	1,323	100.0	48.6	26.5	24.9
Ever married	1,051	100.0	59.9	25.5	14.6
Wantedness status at conception					
Intended	961	100.0	58.9	24.7	16.4
Mistimed	729	100.0	51.1	28.3	20.6
Unwanted	674	100.0	48.5	26.0	25.5

[1]Includes births with missing data on mode of delivery or wantedness status.

Table 4. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth[1]	16,220	100.0	65.4	19.3	15.3
Race and Hispanic origin					
Hispanic	2,115	100.0	52.6	23.1	24.3
Non-Hispanic white	11,025	100.0	70.3	17.4	12.2
Non-Hispanic black	2,287	100.0	52.7	26.5	20.8
Non-Hispanic other	794	100.0	67.3	14.5	18.2
Education (at interview)[2]					
Less than 12 years	2,557	100.0	49.1	20.7	30.2
12 years	5,287	100.0	66.5	22.4	11.1
13 years or more	6,554	100.0	78.1	13.2	8.7
Most recent occupation[2]					
Professional or managerial	2,928	100.0	79.4	14.5	6.1
Sales or clerical	5,921	100.0	70.8	17.5	11.7
Service	2,495	100.0	63.4	18.8	17.8
Farm, craft, or operative	1,539	100.0	67.2	20.0	12.8
Never worked	1,515	100.0	50.2	22.4	27.4
Poverty level income (at interview)[2]					
149 percent or less	3,908	100.0	52.8	22.8	24.4
150–299 percent	4,331	100.0	67.6	21.4	11.0
300 percent or more	6,158	100.0	79.5	12.4	8.1
Medicaid for prenatal care or delivery					
No	14,256	100.0	67.7	18.2	14.1
Yes	1,964	100.0	48.7	27.6	23.7
Residence (at interview)					
Metropolitan/central city	3,764	100.0	61.2	20.4	18.4
Metropolitan/suburban	8,630	100.0	70.1	16.6	13.4
Nonmetropolitan	3,827	100.0	58.9	24.4	16.7

[1]Includes births with missing data on first prenatal care visit.
[2]Limited to women 20–44 years at time of birth.

Table 5. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth[1]	12,821	100.0	67.9	18.1	14.0
Education (at interview)[2]					
Less than 12 years	1,877	100.0	49.1	19.2	31.6
12 years	4,277	100.0	68.2	21.5	10.3
13 years or more	5,514	100.0	79.4	12.3	8.4
Most recent occupation[2]					
Professional or managerial	2,620	100.0	80.5	13.4	6.1
Sales or clerical	4,845	100.0	71.8	16.9	11.2
Service	2,010	100.0	64.6	16.2	19.1
Farm, craft, or operative	1,152	100.0	66.8	21.7	11.5
Never worked	1,040	100.0	53.7	20.0	26.3
Poverty level income (at interview)[2]					
149 percent or less	2,649	100.0	52.8	20.1	27.2
150–299 percent	3,643	100.0	68.6	21.3	10.1
300 percent or more	5,375	100.0	80.4	12.1	7.5
Medicaid for prenatal care or delivery					
No	11,804	100.0	69.4	17.3	13.3
Yes	1,018	100.0	50.0	27.7	22.2
Residence (at interview)					
Metropolitan/central city	2,244	100.0	67.4	17.7	15.0
Metropolitan/suburban	7,271	100.0	71.3	15.8	12.9
Nonmetropolitan	3,307	100.0	60.7	23.5	15.9

[1]Includes births with missing data on first prenatal care visit.
[2]Limited to women 20–44 years at time of birth.

Table 6. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age and percent distribution by months pregnant when prenatal care began, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Total*	*Months pregnant when prenatal care began*		
			Less than 3 months	*3–4 months*	*5 months or more or no care*
		Percent distribution			
All pregnancies ending in a live birth	2,374	100.0	53.6	26.1	20.3
Education (at interview)[1]					
Less than 12 years	429	100.0	47.6	26.2	26.2
12 years	714	100.0	53.2	31.2	15.6
13 years or more	655	100.0	72.8	18.8	8.4
Most recent occupation[1]					
Professional or managerial	182	100.0	65.7	29.0	*5.3
Sales or clerical	693	100.0	61.4	24.3	14.3
Service	356	100.0	60.2	26.3	13.5
Farm, craft, or operative	273	100.0	62.0	21.2	16.8
Never worked	294	100.0	45.0	29.1	26.0
Poverty level income (at interview)[1]					
149 percent or less	1,005	100.0	54.1	27.5	18.4
150–299 percent	367	100.0	58.7	29.8	11.5
300 percent or more	426	100.0	70.7	17.0	12.3
Medicaid for prenatal care or delivery					
No	1,536	100.0	56.4	25.5	18.2
Yes	838	100.0	48.5	27.2	24.3
Residence (at interview)					
Metropolitan/central city	1,237	100.0	51.9	25.8	22.3
Metropolitan/suburban	742	100.0	61.5	24.0	14.5
Nonmetropolitan	395	100.0	44.0	30.9	25.2

[1]Limited to women 20–44 years at time of birth.

Table 7. Number of pregnancies ending in live birth in January 1984 or later to women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth[1]	16,220	98.7	100.0	69.1	10.6	20.3
Mother's age at time of birth						
Under 20 years	1,823	99.1	100.0	41.9	18.7	39.4
20–24 years	4,562	97.8	100.0	64.8	12.8	22.4
25–29 years	5,627	99.5	100.0	75.6	7.8	16.6
30–44 years	4,208	98.6	100.0	76.9	8.4	14.8
Birth order						
First	4,881	99.4	100.0	66.8	10.8	22.3
Second	4,856	98.7	100.0	74.5	8.3	17.1
Third or higher	6,482	98.3	100.0	66.8	12.1	21.1
Mode of delivery						
Cesarean section	3,789	99.3	100.0	73.6	10.2	16.2
Vaginal	12,379	98.5	100.0	67.7	10.7	21.5
Mother's marital status at time of birth						
Never married	2,695	97.9	100.0	46.3	23.2	30.4
Ever married	13,526	98.9	100.0	73.7	8.1	18.3
Wantedness status at conception						
Intended	9,711	99.0	100.0	73.7	8.8	17.5
Mistimed	4,487	98.4	100.0	64.1	12.2	23.7
Unwanted	1,987	98.0	100.0	58.1	15.9	26.0
Timing of first prenatal visit						
Within first trimester	11,919	100.0	100.0	73.0	8.9	18.2
After first trimester or never	4,292	95.2	100.0	57.8	15.6	26.6

[1]Includes births with missing data on prenatal care, mode of delivery, or wantedness status.

Table 8. Number of pregnancies ending in live birth in January 1984 or later to white women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth[1]	12,821	99.0	100.0	74.9	7.8	17.3
Mother's age at time of birth						
Under 20 years	1,144	100.0	100.0	44.3	15.3	40.4
20–24 years	3,476	97.8	100.0	71.2	9.8	19.0
25–29 years	4,726	99.4	100.0	80.5	5.5	14.0
30–44 years	3,474	99.2	100.0	80.8	6.4	12.7
Birth order						
First	3,815	99.5	100.0	72.4	7.6	19.9
Second	3,899	99.3	100.0	80.7	6.1	13.2
Third or higher	5,107	98.4	100.0	72.2	9.2	18.6
Mode of delivery						
Cesarean section	2,965	99.8	100.0	77.7	8.0	14.3
Vaginal	9,809	98.8	100.0	74.0	7.7	18.2
Mother's marital status at time of birth						
Never married	1,220	98.1	100.0	57.6	16.3	26.1
Ever married	11,601	99.1	100.0	76.7	6.9	16.4
Wantedness status at conception						
Intended	8,056	99.4	100.0	77.9	6.8	15.4
Mistimed	3,546	98.1	100.0	69.6	9.7	20.7
Unwanted	1,193	98.6	100.0	70.3	9.4	20.4
Timing of first prenatal visit						
Within first trimester	9,692	100.0	100.0	78.1	6.4	15.5
After first trimester or never	3,120	95.9	100.0	64.5	12.2	23.3

[1]Includes births with missing data on prenatal care, mode of delivery, or wantedness status.

Table 9. Number of pregnancies ending in live birth in January 1984 or later to black women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of prenatal care for most visits, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth[1]	2,374	97.9	100.0	45.5	23.6	30.9
Mother's age at time of birth						
Under 20 years	576	97.0	100.0	36.5	23.4	40.1
20–24 years	777	96.6	100.0	47.1	26.2	26.8
25–29 years	587	99.4	100.0	46.9	21.0	32.2
30–44 years	434	99.5	100.0	53.1	22.9	24.0
Birth order						
First	719	98.5	100.0	43.6	24.6	31.8
Second	641	97.4	100.0	50.8	18.4	30.8
Third or higher	1,014	97.8	100.0	43.5	26.3	30.2
Mode of delivery						
Cesarean section	555	96.3	100.0	54.5	21.9	23.6
Vaginal	1,814	98.4	100.0	42.9	24.0	33.1
Mother's marital status at time of birth						
Never married	1,323	97.4	100.0	38.3	27.9	33.8
Ever married	1,051	98.6	100.0	54.7	18.1	27.2
Wantedness status at conception						
Intended	961	97.8	100.0	50.4	23.3	26.2
Mistimed	729	99.5	100.0	46.1	22.5	31.4
Unwanted	674	96.4	100.0	37.6	25.1	37.3
Timing of first prenatal visit						
Within first trimester	1,537	100.0	100.0	47.7	23.7	28.6
After first trimester or never	837	94.1	100.0	41.2	23.5	35.3

[1]Includes births with missing data on source of prenatal care, mode of delivery, or wantedness status.

Table 10. Number of pregnancies ending in a live birth in January 1984 or later to women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth	16,220	98.7	100.0	69.1	10.6	20.3
Race and ethnicity						
Hispanic	2,115	96.5	100.0	53.3	15.1	31.5
Non-Hispanic white	11,025	99.5	100.0	77.9	7.0	15.1
Non-Hispanic black	2,287	97.8	100.0	45.3	23.4	31.3
Non-Hispanic other	794	96.3	100.0	55.3	*12.4	*32.3
Education (at interview)[1]						
Less than 12 years	2,557	94.9	100.0	50.4	17.4	32.2
12 years	5,287	99.3	100.0	73.4	9.5	17.1
13 years or more	6,554	99.7	100.0	80.1	6.6	13.2
Most recent occupation[1]						
Professional or managerial	2,928	100.0	100.0	83.9	*3.8	12.3
Sales or clerical	5,921	98.9	100.0	77.3	8.2	14.5
Service	2,495	99.2	100.0	67.7	9.2	23.1
Farm, craft, or operative	1,539	98.9	100.0	65.3	13.3	21.3
Never worked	1,515	93.9	100.0	46.1	23.4	30.4
Poverty level income (at interview)[1]						
149 percent or less	3,908	95.9	100.0	53.1	17.3	29.6
150–299 percent	4,331	99.3	100.0	76.4	8.3	15.3
300 percent or more	6,158	100.0	100.0	81.7	5.7	12.6
Medicaid for prenatal care or delivery						
No	14,256	98.7	100.0	74.6	8.3	17.1
Yes	1,964	98.7	100.0	29.8	26.9	43.3
Residence (at interview)						
Metropolitan/central city	3,764	98.9	100.0	55.9	18.8	25.3
Metropolitan/suburban	8,630	99.1	100.0	73.2	7.9	18.8
Nonmetropolitan	3,827	97.6	100.0	72.9	8.4	18.7

[1]Limited to women 20–44 years at time of birth.

Table 11. Number of pregnancies ending in a live birth in January 1984 or later to white women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth	12,821	99.0	100.0	74.9	7.8	17.3
Education (at interview)[1]						
Less than 12 years	1,877	95.1	100.0	56.0	13.3	30.7
12 years	4,277	99.7	100.0	79.5	7.4	13.1
13 years or more	5,514	99.6	100.0	83.7	4.8	11.5
Most recent occupation[1]						
Professional or managerial	2,620	100.0	100.0	84.9	*3.3	11.9
Sales or clerical	4,845	99.3	100.0	81.8	6.4	11.9
Service	2,010	99.2	100.0	74.8	6.8	18.4
Farm, craft, or operative	1,152	98.8	100.0	72.4	11.8	15.8
Never worked	1,040	93.8	100.0	52.5	*15.5	32.0
Poverty level income (at interview)[1]						
149 percent or less	2,649	95.9	100.0	60.5	12.7	26.9
150–299 percent	3,642	99.4	100.0	80.9	7.0	12.1
300 percent or more	5,375	100.0	100.0	84.1	4.4	11.5
Medicaid for prenatal care or delivery						
No	11,804	99.0	100.0	78.5	6.8	14.8
Yes	1,018	99.0	100.0	33.7	19.4	46.9
Residence (at interview)						
Metropolitan/central city	2,244	100.0	100.0	64.9	11.9	23.2
Metropolitan/suburban	7,271	99.3	100.0	77.0	6.6	16.3
Nonmetropolitan	3,307	97.6	100.0	77.0	7.4	15.6

[1]Limited to women 20–44 years at time of birth.

Table 12. Number of pregnancies ending in a live birth in January 1984 or later to black women 15–44 years of age, percent receiving prenatal care, and percent distribution of pregnancies receiving care by source of care for most prenatal visits, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Percent receiving prenatal care*	*Total*	*Source of most prenatal care*		
				Private doctor	*Hospital clinic*	*Other clinic*
			Percent distribution			
All pregnancies ending in a live birth	2,374	97.9	100.0	45.5	23.6	30.9
Education (at interview)[1]						
Less than 12 years	429	97.5	100.0	29.7	33.1	37.2
12 years	714	97.0	100.0	50.0	21.0	29.0
13 years or more	655	100.0	100.0	58.8	20.4	20.8
Most recent occupation[1]						
Professional or managerial	182	100.0	100.0	63.4	*14.5	22.1
Sales or clerical	693	96.9	100.0	57.4	22.9	19.7
Service	356	99.3	100.0	37.2	23.9	39.0
Farm, craft, or operative	273	99.3	100.0	44.6	22.7	32.7
Never worked	294	97.9	100.0	35.8	31.6	32.6
Poverty level income (at interview)[1]						
149 percent or less	1,005	96.8	100.0	39.7	27.5	32.8
150–299 percent	367	100.0	100.0	51.4	20.4	28.2
300 percent or more	426	100.0	100.0	66.2	17.5	16.3
Medicaid for prenatal care or delivery						
No	1,536	97.8	100.0	55.3	17.7	27.0
Yes	838	98.2	100.0	27.9	34.3	37.8
Residence (at interview)						
Metropolitan/central city	1,237	97.3	100.0	42.5	27.2	30.3
Metropolitan/suburban	742	99.6	100.0	51.0	23.4	25.7
Nonmetropolitan	395	96.5	100.0	44.5	*12.7	42.8

[1]Limited to women 20–44 years at time of birth.

Table 13. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988

Characteristic of the pregnancy	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	32,465	100.0	72.5	16.5	11.0
Mother's age at pregnancy outcome					
Under 20 years	2,966	100.0	67.8	18.3	13.9
20–24 years	9,718	100.0	66.7	19.6	13.8
25–29 years	11,657	100.0	72.7	16.7	10.6
30–44 years	8,123	100.0	80.9	11.8	7.3
Pregnancy order					
First	7,660	100.0	74.3	16.6	9.1
Second	10,812	100.0	75.3	15.0	9.6
Third or higher	13,992	100.0	69.3	17.5	13.2
Year of pregnancy outcome					
1985–1988	11,661	100.0	76.6	15.7	7.6
1981–1984	7,960	100.0	74.1	14.3	11.6
1980 or earlier	12,844	100.0	67.8	18.5	13.7
Mother's marital status at pregnancy outcome					
Never married	4,468	100.0	66.3	24.3	9.4
Ever married	27,997	100.0	73.5	15.2	11.3
Wantedness status at conception					
Intended	19,437	100.0	75.7	15.0	9.4
Mistimed	8,011	100.0	69.0	19.2	11.8
Unwanted	4,960	100.0	65.7	18.1	16.1
Pregnancy outcome					
Live birth	28,955	100.0	73.0	15.9	11.1
Spontaneous pregnancy loss	3,510	100.0	68.4	20.9	10.7
Timing of first prenatal visit[2]					
Within first trimester	9,230	100.0	77.3	14.1	8.6
After first trimester or never	3,100	100.0	72.6	17.4	10.0

[1]Includes women with missing data on smoking during pregnancy, wantedness status, or first prenatal care visit.

[2]Prenatal care items only pertain to live births in or after January 1984.

Table 14. Number of white women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988

Characteristic of the pregnancy	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	26,195	100.0	71.3	16.3	12.4
Mother's age at pregnancy outcome					
Under 20 years	1,985	100.0	60.8	20.1	19.1
20–24 years	7,642	100.0	65.5	18.8	15.7
25–29 years	9,899	100.0	71.5	16.7	11.8
30–44 years	6,669	100.0	80.9	11.7	7.4
Pregnancy order					
First	5,978	100.0	72.0	17.3	10.7
Second	8,922	100.0	73.9	15.0	11.1
Third or higher	11,295	100.0	68.9	16.8	14.3
Year of pregnancy outcome					
1985–1988	9,203	100.0	75.2	16.1	8.7
1981–1984	6,401	100.0	73.8	13.2	13.0
1980 or earlier	10,590	100.0	66.4	18.3	15.2
Mother's marital status at pregnancy outcome					
Never married	2,131	100.0	58.5	26.4	15.0
Ever married	24,064	100.0	72.4	15.4	12.2
Wantedness status at conception					
Intended	16,395	100.0	74.9	14.9	10.2
Mistimed	6,352	100.0	66.9	19.2	13.9
Unwanted	3,407	100.0	62.2	17.9	19.8
Pregnancy outcome					
Live birth	23,411	100.0	71.7	15.8	12.5
Spontaneous pregnancy loss	2,784	100.0	67.9	20.8	11.3
Timing of first prenatal visit[2]					
Within first trimester	7,509	100.0	76.4	14.2	9.4
After first trimester or never	2,242	100.0	68.6	18.8	12.7

[1]Includes women with missing data on smoking during pregnancy, wantedness status, and first prenatal care visit.

[2]Prenatal care items only pertain to live births in or after January 1984.

Table 15. Number of black women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988

Characteristic of the pregnancy	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	4,734	100.0	76.6	17.8	5.6
Mother's age at pregnancy outcome					
Under 20 years	859	100.0	82.7	13.3	*3.9
20–24 years	1,651	100.0	71.8	22.4	5.8
25–29 years	1,342	100.0	78.1	17.3	4.6
30–44 years	881	100.0	77.3	14.1	8.6
Pregnancy order					
First	1,286	100.0	82.4	13.5	4.0
Second	1,376	100.0	82.4	15.0	*2.6
Third or higher	2,072	100.0	69.2	22.2	8.6
Year of pregnancy outcome					
1985–1988	1,710	100.0	79.9	15.1	5.0
1981–1984	1,169	100.0	74.4	20.8	4.8
1980 or earlier	1,855	100.0	75.0	18.3	6.7
Mother's marital status at pregnancy outcome					
Never married	2,091	100.0	75.0	20.5	4.5
Ever married	2,642	100.0	77.9	15.6	6.5
Wantedness status at conception					
Intended	2,048	100.0	78.5	16.6	4.9
Mistimed	1,340	100.0	79.2	16.5	4.3
Unwanted	1,330	100.0	71.0	21.0	8.0
Pregnancy outcome					
Live birth	4,204	100.0	76.8	17.8	5.4
Spontaneous pregnancy loss	530	100.0	75.1	17.5	*7.4
Timing of first prenatal visit[2]					
Within first trimester	1,217	100.0	78.9	16.6	4.5
After first trimester or never	600	100.0	82.6	13.1	*4.3

[1]Includes women with missing data on smoking during pregnancy, wantedness status, or first prenatal care visit.

[2]Prenatal care items only pertain to live births in or after January 1984.

Table 16. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	32,465	100.0	72.5	16.5	11.0
Race and ethnicity					
Hispanic	3,402	100.0	86.3	12.5	*1.2
Non-Hispanic white	23,419	100.0	69.5	16.8	13.7
Non-Hispanic black	4,545	100.0	76.6	17.5	5.9
Non-Hispanic other	1,098	100.0	76.3	17.2	*6.5
Education (at interview)[2]					
Less than 12 years	5,231	100.0	57.0	25.0	18.0
12 years	11,663	100.0	70.9	16.2	12.8
13 years or more	12,604	100.0	81.5	12.7	5.8
Most recent occupation[2]					
Professional or managerial	6,597	100.0	81.2	11.2	7.6
Sales or clerical	11,955	100.0	74.0	15.7	10.3
Service	5,371	100.0	66.3	20.0	13.7
Farm, craft, or operative	3,737	100.0	63.9	19.8	16.3
Never worked	1,839	100.0	74.6	20.3	5.1
Poverty level income (at interview)[2]					
149 percent or less	6,681	100.0	66.1	21.5	12.4
150–299 percent	8,201	100.0	74.1	14.9	11.1
300 percent or more	14,616	100.0	75.5	14.7	9.8
Residence (at interview)					
Metropolitan/central city	7,096	100.0	72.2	18.3	9.5
Metropolitan/suburban	17,229	100.0	73.4	15.8	10.8
Nonmetropolitan	8,140	100.0	70.8	16.3	12.9

[1]Includes women with missing data on smoking during pregnancy.

[2]Limited to women 20–44 years at time of pregnancy outcome.

Table 17. Number of white women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	26,195	100.0	71.3	16.3	12.4
Education (at interview)[2]					
Less than 12 years	3,933	100.0	54.8	24.4	20.8
12 years	9,736	100.0	69.6	16.3	14.1
13 years or more	10,542	100.0	81.1	12.6	6.4
Most recent occupation[2]					
Professional or managerial	5,861	100.0	80.0	11.7	8.3
Sales or clerical	10,055	100.0	73.1	15.9	11.0
Service	4,138	100.0	64.4	19.8	15.8
Farm, craft, or operative	2,899	100.0	62.5	18.2	19.3
Never worked	1,257	100.0	76.0	19.5	*4.5
Poverty level income (at interview)[2]					
149 percent or less	4,491	100.0	64.6	20.4	14.9
150–299 percent	6,910	100.0	72.6	15.3	12.0
300 percent or more	12,809	100.0	74.6	14.8	10.6
Residence (at interview)					
Metropolitan/central city	4,453	100.0	71.0	17.7	11.3
Metropolitan/suburban	14,659	100.0	72.2	15.9	12.0
Nonmetropolitan	7,083	100.0	69.8	16.3	13.9

[1]Includes women with missing data on smoking during pregnancy.
[2]Limited to women 20–44 years at time of pregnancy outcome.

Table 18. Number of black women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average number of cigarettes smoked per day during the pregnancy, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of women in thousands*	*Total*	*Average number of cigarettes smoked per day during pregnancy*		
			None	*Fewer than 15*	*15 or more*
		Percent distribution			
All women[1]	4,735	100.0	76.6	17.8	5.6
Education (at interview)[2]					
Less than 12 years	900	100.0	60.5	29.4	10.1
12 years	1,564	100.0	78.9	15.8	5.3
13 years or more	1,410	100.0	80.7	15.2	4.2
Most recent occupation[2]					
Professional or managerial	504	100.0	86.1	10.4	*3.5
Sales or clerical	1,398	100.0	78.1	16.1	5.8
Service	965	100.0	73.3	20.4	6.3
Farm, craft, or operative	635	100.0	70.0	24.6	5.5
Never worked	372	100.0	64.0	25.8	*10.2
Poverty level income (at interview)[2]					
149 percent or less	1,763	100.0	67.7	24.9	7.4
150–299 percent	925	100.0	82.1	14.0	4.0
300 percent or more	1,186	100.0	81.2	13.3	5.5
Residence (at interview)					
Metropolitan/central city	2,255	100.0	73.5	19.7	6.7
Metropolitan/suburban	1,605	100.0	78.0	16.7	5.4
Nonmetropolitan	874	100.0	82.0	14.7	*3.3

[1]Includes women with missing data on smoking during pregnancy.
[2]Limited to women 20–44 years at pregnancy outcome.

Table 19. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average frequency of alcoholic beverage consumption during the pregnancy, according to selected characteristics of the pregnancy: United States, 1988

Characteristic of the pregnancy	*Number of women in thousands*	*Total*	*Average frequency of alcoholic beverage consumption during pregnancy*				
			None	*Subtotal*	*Less than once a month*	*Once a month*	*More than once/month*
		Percent distribution					
All women[1]	32,465	100.0	66.5	33.5	18.8	6.3	8.4
Mother's age at pregnancy outcome							
Under 20 years	2,966	100.0	77.9	22.1	11.3	4.9	5.9
20–24 years	9,718	100.0	68.0	32.0	18.2	6.3	7.5
25–29 years	11,657	100.0	64.6	35.4	19.8	6.3	9.3
30–44 years	8,123	100.0	63.4	36.6	20.8	6.7	9.1
Pregnancy order							
First	7,660	100.0	70.2	29.8	17.4	5.7	6.7
Second	10,812	100.0	66.8	33.2	18.9	6.1	8.2
Third or higher	13,992	100.0	64.3	35.7	19.5	6.7	9.4
Year of pregnancy outcome							
1985–1988	11,661	100.0	69.3	30.7	18.4	5.3	7.0
1981–1984	7,960	100.0	67.6	32.4	18.4	5.6	8.4
1980 or earlier	12,844	100.0	63.3	36.7	19.5	7.6	9.6
Mother's marital status at pregnancy outcome							
Never married	4,468	100.0	71.6	28.4	11.1	6.3	10.9
Ever married	27,997	100.0	65.7	34.3	20.0	6.3	8.0
Wantedness status at conception							
Intended	19,437	100.0	66.9	33.1	19.4	6.1	7.5
Mistimed	8,011	100.0	65.1	34.9	18.3	6.6	9.9
Unwanted	4,960	100.0	67.5	32.5	16.9	6.2	9.4
Pregnancy outcome							
Live birth	28,955	100.0	66.5	33.5	19.6	6.4	7.5
Spontaneous pregnancy loss	3,510	100.0	66.8	33.2	12.4	5.0	15.8
Timing of first prenatal visit[2]							
Within first trimester	9,230	100.0	68.8	31.2	20.1	5.6	5.6
After first trimester or never	3,100	100.0	70.6	29.4	18.0	5.1	6.2

[1]Includes women with missing data on drinking during pregnancy, wantedness status, or first prenatal care visit.
[2]Prenatal care items only pertain to live births in or after January 1984.

Table 20. Number of women 15–44 years of age whose most recent pregnancy ended in live birth or spontaneous loss and percent distribution by average frequency of alcoholic beverage consumption during the pregnancy, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of women in thousands*	*Total*	*Average frequency of alcoholic beverage consumption during pregnancy*				
			Never	*Subtotal*	*Less than once a month*	*Once a month*	*More than once/month*
		Percent distribution					
All women[1]	32,465	100.0	66.5	33.5	18.8	6.3	8.4
Race and ethnicity							
Hispanic	3,402	100.0	75.6	24.4	13.4	5.6	5.5
Non-Hispanic white	23,419	100.0	63.3	36.7	21.3	6.5	8.8
Non-Hispanic black	4,545	100.0	74.7	25.3	11.0	5.4	8.9
Non-Hispanic other	1,098	100.0	73.4	26.6	*14.1	*6.0	*6.5
Education (at interview)[2]							
Less than 12 years	5,212	100.0	74.1	25.9	12.3	4.3	9.3
12 years	11,624	100.0	68.2	31.8	19.5	5.9	6.4
13 years or more	12,560	100.0	59.2	40.8	22.7	7.8	10.4
Most recent occupation[2]							
Professional or managerial	6,597	100.0	57.9	42.1	23.5	7.9	10.8
Sales or clerical	11,955	100.0	63.9	36.1	20.9	6.6	8.5
Service	5,371	100.0	69.2	30.8	18.4	4.3	8.0
Farm, craft, or operative	3,737	100.0	70.8	29.2	13.7	7.8	7.7
Never worked	1,839	100.0	79.6	20.4	12.0	*3.2	5.2
Poverty level income (at interview)[2]							
149 percent or less	6,655	100.0	72.5	27.5	13.9	4.4	9.1
150–299 percent	8,164	100.0	69.5	30.5	17.7	6.1	6.7
300 percent or more	14,577	100.0	59.8	40.2	23.2	7.5	9.5
Residence (at interview)							
Metropolitan/central city	7,096	100.0	65.7	34.3	16.1	6.8	11.3
Metropolitan/suburban	17,229	100.0	64.4	35.6	21.0	6.3	8.3
Nonmetropolitan	8,140	100.0	71.8	28.2	16.5	5.7	6.0

[1]Includes women with missing data on drinking during pregnancy.
[2]Limited to women 20–44 years at time of pregnancy outcome.

Table 21. Number of single live births to women 15–44 years of age and percent low birthweight, by race and selected characteristics of the birth: United States, 1988

Characteristic of the birth	All races[1]		White		Black	
	Number of births in thousands	Percent low birth-weight	Number of births in thousands	Percent low birth-weight	Number of births in thousands	Percent low birth-weight
All single live births[2]	69,472	7.4	55,437	6.1	10,670	14.2
Mother's age at birth						
Less than 20 years	13,839	10.3	9,395	8.3	3,846	15.3
20–24 years	26,644	7.6	21,581	6.2	3,923	14.4
25–44 years	28,990	5.8	24,461	5.1	2,901	12.4
Birth order						
First	27,420	7.7	21,879	6.5	4,184	13.8
Second	21,090	6.5	17,125	5.3	2,944	12.8
Third or higher	20,962	7.9	16,432	6.3	3,543	15.9
Mode of delivery						
Cesarean section	9,813	7.6	7,737	6.1	1,436	15.9
Vaginal	59,471	7.4	47,581	6.1	9,168	13.9
Sex of baby						
Male	36,179	6.7	28,869	5.9	5,482	10.9
Female	33,234	8.1	26,515	6.1	5,183	17.7
Year of birth						
1985–1988	11,950	6.2	9,417	5.3	1,806	12.4
1981–1984	15,245	5.8	12,168	4.3	2,127	13.3
1980 or earlier	42,277	8.3	33,852	6.9	6,737	14.9
Mother's marital status at time of birth						
Never married	10,073	10.8	4,272	6.1	5,292	14.3
Ever married	59,399	6.8	51,165	6.1	5,379	14.1
Wantedness status at conception						
Intended	41,642	6.5	35,358	5.8	4,123	12.7
Mistimed	20,233	8.5	15,595	6.8	3,766	15.0
Unwanted	7,502	9.2	4,418	5.4	2,752	15.1
Timing of first prenatal visit[3]						
Within first trimester	11,740	6.2	9,552	4.3	1,511	13.4
Later or never had prenatal care	4,278	7.1	3,115	5.6	829	12.3
Site of most prenatal care[3]						
Private doctor	10,794	5.0	9,283	4.3	1,033	11.0
Hospital clinic	1,655	9.6	970	*8.1	531	13.5
Other clinic	3,196	6.9	2,169	4.9	700	14.2
Payment for prenatal care[3,4]						
Self, family, or friends	7,326	4.6	6,285	4.1	664	*10.0
Private insurance	10,108	4.5	8,605	3.9	881	11.1
Medicaid/other government	3,061	10.7	1,756	8.6	1,102	14.1
All other methods	437	*7.9	359	*6.9	51	*8.6
Smoking during pregnancy (if most recent)						
Did not smoke	20,871	4.7	16,599	3.6	3,172	10.6
Fewer than 15 cigarettes per day	4,550	10.6	3,645	8.1	728	22.4
15 or more cigarettes per day	3,169	9.7	2,894	9.0	225	20.5

[1]Includes white, black, and other races; other races not shown separately.
[2]Includes births with missing data on delivery, sex, wantedness status, prenatal care, or smoking during pregnancy.
[3]Limited to births occurring in January 1984 or later.
[4]Women could choose all applicable methods of payment, so numbers may exceed total births.

Table 22. Number of single live births to women 15–44 years of age and percent low birthweight, by race and selected characteristics of the mother: United States, 1988

Characteristic of the mother	*All races*[1]		*White*		*Black*	
	Number of births in thousands	*Percent low birth-weight*	*Number of births in thousands*	*Percent low birth-weight*	*Number of births in thousands*	*Percent low birth-weight*
All single live births	69,472	7.4	55,437	6.1	10,670	14.2
Race and ethnicity						
Hispanic	8,075	6.5	- - -	- - -	- - -	- - -
Non-Hispanic white	48,726	6.2	- - -	- - -	- - -	- - -
Non-Hispanic black	10,266	14.2	- - -	- - -	- - -	- - -
Non-Hispanic other	2,405	*6.6	- - -	- - -	- - -	- - -
Education (at interview)[2]						
Less than 12 years	10,588	9.8	7,958	8.0	1,894	17.0
12 years	22,162	6.9	18,701	5.9	2,755	13.7
13 years or more	23,429	5.9	19,820	5.2	2,270	12.0
Most recent occupation[2]						
Professional or managerial	11,806	4.6	10,544	4.2	862	10.6
Sales or clerical	22,854	6.4	19,413	5.8	2,378	11.9
Service	10,765	8.4	8,370	6.7	1,802	15.4
Farm, craft, or operative	7,148	9.3	5,639	7.8	1,123	16.5
Never worked	3,607	10.5	2,512	8.6	755	17.7
Poverty level income (at interview)[2]						
149 percent or less	13,874	9.8	9,599	7.2	3,497	17.2
150–299 percent	16,659	5.9	14,223	5.4	1,632	11.1
300 percent or more	25,647	6.3	22,657	5.8	1,790	10.5
Residence (at interview)						
Metropolitan/central city	14,793	9.3	8,885	7.1	5,039	13.7
Metropolitan/suburban	36,458	6.6	30,948	5.6	3,501	14.2
Nonmetropolitan	18,222	7.4	15,604	6.5	2,130	15.3

[1]Includes white, black, and other races; other races not shown separately.

[2]Limited to women 20–44 years of age at time of birth.

Table 23. Number of single live births to women 15–44 years of age and percent low birthweight, according to year of birth and selected characteristics of the birth: United States

Characteristic of the birth	*1982 NSFG*[1]				*1988 NSFG*[1]			
	1970 or before		*1971–1980*		*1981–1984*		*1985–1988*	
	Number in thousands	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*
All single live births[2]	29,652	16.2	33,132	9.2	15,245	5.8	11,950	6.2
Mother's age at time of birth								
Under 20 years	8,208	18.0	5,700	12.1	1,833	9.1	1,270	8.7
20–24 years	14,841	15.6	11,909	8.4	4,627	5.7	3,321	6.5
25–29 years	5,769	15.8	10,458	7.5	4,916	5.0	4,170	5.4
30–44 years	829	13.7	5,064	11.3	3,869	5.3	3,189	6.0
Birth order								
First	12,632	13.7	12,188	8.4	5,032	6.7	3,559	3.0
Second	8,337	14.4	9,854	7.4	4,575	5.2	3,581	5.0
Third or higher	8,683	21.7	11,089	11.6	5,638	5.4	4,810	7.1
Mother's marital status at time of birth								
Never married	2,630	31.7	4,563	16.1	2,152	8.9	2,031	10.2
Ever married	26,626	14.6	28,453	8.0	13,094	5.3	9,919	5.4
Wantedness status at conception								
Intended	16,628	13.2	20,963	7.8	9,573	4.7	7,134	6.1
Mistimed	9,672	16.7	8,674	9.6	3,911	7.2	3,236	5.3
Unwanted	3,279	29.7	3,396	16.0	1,749	8.8	1,551	8.7
Smoking during pregnancy (if most recent)								
Did not smoke	19,361	15.5	23,408	7.4	11,016	5.4	9,010	4.4
Less than 15 cigarettes a day	4,813	17.7	4,669	13.2	2,087	7.8	1,780	11.6
More than 15 cigarettes a day	5,346	17.3	4,915	13.8	1,589	6.4	947	10.6

[1]NSFG is National Survey of Family Growth.

[2]Totals based on 1982 NSFG include births with missing data on birthweight, age at delivery, marital status, wantedness, or smoking. Totals based on 1988 NSFG include births with missing data on wantedness or smoking.

Table 24. Number of single live births to women 15–44 years of age and percent low birthweight, by year of birth and selected characteristics of the mother: United States

Characteristic of the mother	*1982 NSFG*[1]				*1988 NSFG*[1]			
	1970 or before		*1971–1980*		*1981–1984*		*1985–1988*	
	Number in thousands	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*	*Number in thousands*	*Percent low birth-weight*
All single live births[2]	29,652	16.2	33,132	9.2	15,245	5.8	11,950	6.2
Race and ethnicity								
Hispanic	2,571	27.6	3,732	15.5	1,777	6.7	1,598	5.4
Non-Hispanic white	21,570	11.6	23,589	6.4	10,699	4.2	8,066	5.3
Non-Hispanic black	4,809	31.9	4,896	18.8	2,049	13.0	1,736	12.4
Education (at interview)[3]								
Less than 12 years	4,904	29.1	5,112	15.7	2,234	8.7	2,008	8.4
12 years	9,820	9.7	11,326	8.1	4,912	5.3	3,828	6.1
13 years or more	6,644	14.4	10,993	5.8	6,266	4.2	4,843	4.8
Poverty level income (at interview)[3]								
149 percent or less	4,537	18.9	7,413	12.2	3,566	6.9	2,978	9.1
150–299 percent	7,432	13.5	9,106	8.5	4,139	5.0	3,178	3.8
300 percent or more	9,469	15.6	10,913	6.2	5,707	4.6	4,523	5.4
Residence (at interview)								
Metropolitan/central city	8,279	21.9	9,330	13.6	3,283	6.9	2,861	7.8
Metropolitan/suburban	14,318	12.5	16,253	7.0	8,038	5.0	6,385	6.0
Nonmetropolitan	7,055	17.2	7,549	8.6	3,924	6.5	2,703	5.0

[1]NSFG is National Survey of Family Growth.

[2]Totals based on 1982 NSFG include births with missing data on race/ethnicity, education, income, or metropolitan residence.

[3]Limited to women 20–44 years of age at time of birth.

Table 25. Number of live birth deliveries in January 1984 or later to women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988

Characteristic of the birth	Number of births in thousands	Source of payment for delivery: Self, family, or friends	Private medical insurance	Medicaid	Other government	All other
		Percent[1]				
All live births[2]	16,220	44.0	65.7	11.0	9.3	2.5
Mother's age at pregnancy outcome						
Under 20 years	1,823	36.6	30.1	29.9	19.4	*2.3
20–24 years	4,562	42.0	53.0	15.4	12.4	3.8
25–29 years	5,627	44.5	75.4	6.8	7.2	*1.9
30–44 years	4,208	48.7	82.2	3.7	4.3	2.0
Pregnancy order						
First	4,881	41.8	64.1	11.0	11.2	2.8
Second	4,856	48.1	72.9	10.1	6.2	1.6
Third or higher	6,482	42.5	61.5	13.3	10.1	2.9
Mode of delivery						
Cesarean section	3,789	47.8	73.7	10.1	8.4	*1.6
Vaginal	12,379	42.8	63.3	11.4	9.6	2.8
Birthweight						
Normal (2,500 grams or more)	15,188	44.7	66.7	10.8	8.4	2.4
Low (less than 2,500 grams)	1,032	33.9	53.5	14.6	22.5	*4.0
Mother's marital status at pregnancy outcome						
Never married	2,695	21.2	23.0	38.0	26.0	3.2
Ever married	13,526	48.5	74.2	5.7	5.9	2.4
Wantedness status at conception						
Intended	9,711	47.4	74.1	6.8	6.7	2.5
Mistimed	4,487	40.6	56.6	15.7	11.5	2.8
Unwanted	1,987	34.5	45.1	21.2	17.1	*2.0
Timing of first prenatal visit						
Within first trimester	10,958	44.8	72.6	8.4	7.4	2.1
After first trimester or never	5,613	41.6	46.6	18.2	14.4	3.5
Site of most prenatal care						
Private doctor	10,946	51.6	78.1	4.6	5.7	1.4
Hospital clinic	1,675	29.3	34.1	27.9	17.1	7.5
Other clinic	3,216	24.4	42.3	24.4	17.5	3.6

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.

[2]Includes births with missing data on source of payment, mode of delivery, wantedness, first prenatal care visit, or site of most prenatal care.

Table 26. Number of live birth deliveries in January 1984 or later to white women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988

Characteristic of the birth	Number of births in thousands	Source of payment for delivery: Self, family, or friends	Private medical insurance	Medicaid	Other government	All other
		Percent[1]				
All live births[2]	12,821	47.4	70.5	7.1	8.1	2.5
Mother's age at pregnancy outcome						
Under 20 years	1,144	43.0	37.1	*24.3	17.1	*2.2
20–24 years	3,476	47.6	55.2	11.0	12.1	4.1
25–29 years	4,726	46.2	79.3	*3.4	6.7	*1.8
30–44 years	3,474	50.3	84.7	*2.5	*2.9	*1.9
Pregnancy order						
First	3,815	44.5	70.2	6.2	10.1	2.7
Second	3,899	52.2	77.5	5.1	4.5	*1.5
Third or higher	5,107	45.9	65.3	9.3	9.3	3.1
Mode of delivery						
Cesarean section	2,965	50.2	78.6	*6.2	7.8	*1.6
Vaginal	9,809	46.6	68.0	7.4	8.2	2.8
Birthweight						
Normal (2,500 grams or more)	12,164	47.8	70.9	7.1	7.2	2.4
Low (less than 2,500 grams)	657	40.7	61.8	*5.8	23.4	*4.7
Mother's marital status at pregnancy outcome						
Never married	1,220	26.9	26.6	30.3	29.2	*4.3
Ever married	11,601	49.6	75.1	4.6	5.8	2.3
Wantedness status at conception						
Intended	8,056	49.9	76.9	4.3	6.1	2.4
Mistimed	3,546	43.9	61.3	11.9	9.7	*2.9
Unwanted	1,193	41.2	54.3	*11.2	16.5	*1.7
Timing of first prenatal visit						
Within first trimester	8,695	47.5	77.0	5.1	6.5	2.1
After first trimester or never	4,117	47.1	50.4	13.2	12.9	*3.7
Site of most prenatal care						
Private doctor	9,410	52.2	80.2	3.0	5.2	1.5
Hospital clinic	978	38.5	39.4	17.9	16.2	*9.6
Other clinic	2,179	28.8	44.4	20.2	16.9	*3.6

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.

[2]Includes births with missing data on source of payment, mode of delivery, wantedness, first prenatal care visit, or site of most prenatal care.

Table 27. Number of live birth deliveries in January 1984 or later to black women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the birth: United States, 1988

Characteristic of the birth	Number of births in thousands	Source of payment for delivery: Self, family, or friends	Private medical insurance	Medicaid	Other government	All other
		Percent[1]				
All live births[2]	2,374	26.6	40.1	32.8	15.6	2.6
Mother's age at pregnancy outcome						
Under 20 years	576	24.3	17.4	43.5	21.2	*2.0
20–24 years	777	26.0	35.4	36.4	15.2	*3.2
25–29 years	587	25.6	54.1	29.3	10.4	*2.5
30–44 years	434	32.0	60.3	16.6	15.7	*2.2
Pregnancy order						
First	719	26.6	35.5	35.3	16.0	*3.1
Second	641	29.0	43.5	29.7	13.9	*2.7
Third or higher	1,014	25.0	41.1	33.0	16.3	*2.1
Mode of delivery						
Cesarean section	555	32.6	46.4	29.0	11.7	*2.0
Vaginal	1,814	24.7	38.2	34.0	16.7	2.7
Birthweight						
Normal (2,500 grams or more)	2,054	27.5	40.4	32.4	15.4	2.7
Low (less than 2,500 grams)	320	20.8	37.6	35.1	*17.1	*1.6
Mother's marital status at pregnancy outcome						
Never married	1,323	17.7	19.2	46.4	21.8	*2.1
Ever married	1,051	37.7	66.2	15.7	7.8	*3.1
Wantedness status at conception						
Intended	961	29.2	52.2	26.7	12.1	*2.6
Mistimed	729	28.0	35.3	33.7	18.1	*2.2
Unwanted	674	21.3	28.0	40.3	18.0	*2.9
Timing of first prenatal visit						
Within first trimester	1,272	29.5	43.9	30.6	14.3	2.5
After first trimester or never	1,102	21.3	32.9	36.8	17.9	*2.7
Site of most prenatal care						
Private doctor	1,046	43.5	57.7	20.2	8.9	*0.6
Hospital clinic	542	12.2	25.5	47.0	16.0	*4.4
Other clinic	709	13.2	26.2	40.9	24.9	*3.6

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.

[2]Includes births with missing data on source of payment, mode of delivery, wantedness, first prenatal care visit, or site of most prenatal care.

Table 28. Number of live birth deliveries in January 1984 or later to women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of births in thousands*	*Source of payment for delivery*				
		Self, family, or friends	*Private medical insurance*	*Medicaid*	*Other government*	*All other*
		Percent[1]				
All live births[2]	16,220	44.0	65.7	11.0	9.3	2.5
Race and ethnicity						
Hispanic	2,115	47.1	41.4	20.6	12.8	*0.9
Non-Hispanic white	11,025	47.0	75.2	5.0	7.4	2.7
Non-Hispanic black	2,287	26.8	39.9	32.6	15.8	2.5
Non-Hispanic other	794	42.8	73.0	*6.7	*6.5	*3.5
Education (at interview)[3]						
Less than 12 years	2,556	41.7	32.3	21.0	21.5	*3.1
12 years	5,287	44.5	72.4	8.5	7.3	2.7
13 years or more	6,554	46.5	83.3	3.9	3.3	2.2
Most recent occupation[3]						
Professional or managerial	2,928	44.9	90.8	*1.3	*1.5	*1.2
Technical, sales, or administrative	5,921	48.5	78.3	4.3	5.2	2.2
Service	2,495	44.1	58.0	12.9	12.4	*3.6
Farm, craft, or operative	1,539	33.2	58.2	15.3	14.6	*3.8
Never worked	1,515	44.3	31.8	26.1	17.4	*3.4
Poverty level income (at interview)[3]						
149 percent or less	3,908	38.5	31.2	24.4	21.7	4.6
150–299 percent	4,331	48.6	78.9	4.7	3.8	*2.3
300 percent or more	6,158	46.4	88.8	*1.5	2.3	1.4
Residence (at interview)						
Metropolitan/central city	3,764	32.7	50.0	21.0	15.4	2.4
Metropolitan/suburban	8,630	46.7	73.1	6.5	6.9	2.2
Nonmetropolitan	3,827	48.9	64.4	11.6	8.7	3.3

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.
[2]Includes births with missing data on source of payment.
[3]Limited to women 20–44 years of age at time of birth.

Table 29. Number of live birth deliveries in January 1984 or later to white women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of births in thousands*	*Source of payment for delivery*				
		Self, family, or friends	*Private medical insurance*	*Medicaid*	*Other government*	*All other*
		Percent[1]				
All live births[2]	12,821	47.4	70.5	7.1	8.1	2.5
Education (at interview)[3]						
Less than 12 years	1,877	47.1	33.2	15.5	21.8	*3.6
12 years	4,277	49.0	76.6	4.5	6.8	*2.7
13 years or more	5,523	47.2	85.2	*2.6	2.5	*2.0
Most recent occupation[3]						
Professional or managerial	2,629	45.1	90.9	*0.7	*1.5	*1.0
Technical, sales, or administrative	4,845	52.0	80.1	*1.9	4.8	2.4
Service	2,010	46.6	63.3	8.8	10.5	*3.9
Farm, craft, or operative	1,152	35.3	59.8	*13.3	15.4	*2.9
Never worked	1,040	51.7	36.5	*18.0	16.8	*3.9
Poverty level income (at interview)[3]						
149 percent or less	2,649	44.3	33.1	17.3	22.9	5.7
150–299 percent	3,643	51.4	80.0	3.5	*3.2	*2.4
300 percent or more	5,384	47.2	89.4	0.8	2.2	*1.1
Residence (at interview)						
Metropolitan/central city	2,244	38.9	55.9	13.0	15.3	*2.3
Metropolitan/suburban	7,271	47.8	75.7	4.9	6.1	2.1
Nonmetropolitan	3,307	52.2	68.7	*7.8	7.5	3.4

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.
[2]Includes births with missing data on source of payment.
[3]Limited to women 20–44 years of age at time of birth.

Table 30. Number of live birth deliveries in January 1984 or later to black women 15–44 years of age and percent of delivery costs paid from specified sources, by selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number of births in thousands*	*Source of payment for delivery*				
		Self, family, or friends	*Private medical insurance*	*Medicaid*	*Other government*	*All other*
		Percent[1]				
All live births[2]	2,374	26.6	40.1	32.8	15.6	*2.6
Education (at interview)[3]						
Less than 12 years	429	12.1	18.6	47.5	26.0	*2.7
12 years	714	31.3	45.9	30.9	11.7	*1.6
13 years or more	655	32.8	67.7	15.9	8.0	*4.1
Most recent occupation[3]						
Professional or managerial	182	29.0	84.5	*11.0	*0.5	*4.3
Technical, sales, or administrative	693	30.7	59.5	22.0	8.9	*1.5
Service	356	32.3	37.3	29.5	21.6	*1.0
Farm, craft, or operative	273	28.6	49.1	24.6	*14.1	*6.4
Never worked	294	*11.0	*7.1	62.0	23.5	*3.6
Poverty level income (at interview)[3]						
149 percent or less	1,005	21.9	25.4	43.4	21.0	*2.4
150–299 percent	367	36.3	68.1	15.9	*6.2	2.1
300 percent or more	426	32.3	82.0	*7.7	*3.1	4.0
Residence (at interview)						
Metropolitan/central city	1,237	22.5	36.3	35.8	17.0	*1.8
Metropolitan/suburban	742	31.2	49.9	25.1	13.7	*3.9
Nonmetropolitan	395	30.7	33.3	37.8	*14.8	*2.4

[1]The sum of the percents exceeds 100 because some women reported more than one source of payment for delivery.
[2]Includes births with missing data on source of payment.
[3]Limited to women 20–44 years of age at time of birth.

Table 31. Number of women 15–44 years of age who had a live birth in January 1984 or later and percent distribution by source of payment for most recent delivery, according to selected characteristics of the birth: United States, 1988

Characteristic of the birth	*Number in thousands*	*Total*	*Own income only*	*Insurance only*	*Own income and insurance*	*Medicaid*	*Other government*	*All other*
		Percent distribution						
All women[1]	12,340	100.0	11.4	36.9	31.1	8.7	7.4	4.6
Mother's age at time of birth								
Under 20 years	1,099	100.0	18.1	15.9	*16.9	27.9	18.6	*2.6
20–24 years	3,102	100.0	14.0	30.2	23.3	13.3	10.8	8.3
25–29 years	4,519	100.0	9.9	41.4	34.1	5.3	5.5	3.8
30–44 years	3,620	100.0	8.8	43.7	38.3	3.0	3.3	3.0
Mode of delivery								
Cesarean section	2,943	100.0	7.4	36.8	38.5	7.5	6.0	3.7
Vaginal	9,349	100.0	12.6	36.9	28.8	9.0	7.8	4.9
Birthweight								
Normal (2,500 grams or more)	11,590	100.0	11.7	37.6	31.4	8.4	6.7	4.3
Low (less than 2,500 grams)	750	100.0	*6.5	27.3	27.1	13.0	16.9	*9.2
Mother's marital status at time of birth								
Never married	1,898	100.0	11.0	17.0	7.5	34.0	23.3	7.2
Ever married	10,442	100.0	11.4	40.6	35.4	4.1	4.5	4.1
Wantedness status at conception								
Intended	7,463	100.0	9.6	39.2	36.5	5.8	5.2	3.6
Mistimed	3,232	100.0	13.2	35.1	24.4	10.7	9.7	6.9
Unwanted	1,616	100.0	16.1	30.3	19.1	17.6	12.6	*4.4

[1]Includes births with missing data on payment for delivery, mode of delivery, or wantedness.

Table 32. Number of women 15–44 years of age who had a live birth in January 1984 or later and percent distribution by source of payment for most recent delivery, according to selected characteristics of the mother: United States, 1988

Characteristic of the mother	*Number in thousands*	*Total*	*Own income only*	*Insurance only*	*Own income and insurance*	*Medicaid*	*Other government*	*All other*
		Percent distribution						
All women[1]	12,340	100.0	11.4	36.9	31.1	8.7	7.4	4.6
Race and ethnicity								
Hispanic	1,539	100.0	24.5	23.6	21.1	16.2	11.5	*3.2
Non-Hispanic white	8,498	100.0	9.3	41.4	35.7	3.3	5.4	4.9
Non-Hispanic black	1,748	100.0	9.7	25.5	15.9	30.2	14.7	4.0
Non-Hispanic other	554	100.0	*11.3	41.4	36.2	*2.3	*3.5	*5.4
Education (at interview)[2]								
Less than 12 years	1,903	100.0	20.4	17.5	16.6	18.7	19.0	7.9
12 years	4,126	100.0	9.7	41.4	31.9	6.2	5.4	5.4
More than 12 years	5,079	100.0	7.9	45.2	38.9	2.8	2.2	3.1
Most recent occupation[2]								
Professional or managerial	2,333	100.0	5.3	50.4	40.5	1.0	0.5	2.3
Sales or clerical	4,615	100.0	9.9	42.9	36.1	3.3	3.6	4.2
Service	1,828	100.0	15.0	31.3	27.9	9.3	9.3	7.2
Farm, craft, or operative	1,211	100.0	7.6	38.8	21.8	10.7	13.4	7.7
Never worked	1,121	100.0	21.4	12.2	19.9	24.7	16.5	5.4
Poverty level income (at interview)[2]								
149 percent or less	2,902	100.0	18.8	16.3	14.9	21.0	18.9	10.2
150–299 percent	3,258	100.0	11.1	43.7	35.8	2.9	2.2	4.3
300 percent of higher	4,948	100.0	5.7	49.3	40.6	1.0	1.5	2.0
Residence (at interview)								
Metropolitan/central city	2,779	100.0	10.9	32.9	20.0	17.7	14.8	3.7
Metropolitan/suburban	6,671	100.0	10.7	41.2	34.4	4.9	4.5	4.3
Nonmetropolitan	2,890	100.0	13.3	30.9	34.2	8.6	7.0	6.0

[1]Includes births with missing data on payment for delivery.
[2]Limited to women 20–44 years of age at time of delivery.

Appendixes

Contents

I. Technical notes . . . 63
- Background . . . 63
- Statistical design . . . 63
- Measurement process . . . 64
- Data reduction and quality control . . . 64
- Reliability of estimates . . . 64
- Testing differences . . . 65
- Nonsampling error . . . 66

II. Definitions of terms . . . 68
- Dependent variables . . . 68
- Characteristics of pregnancies . . . 69
- Demographic terms . . . 70

III. Items on the 1988 National Survey of Family Growth questionnaire related to health aspects of pregnancy and childbirth . . . 71

Appendix tables

I. Estimates of parameters A and B for relative standard error curves for the 1988 NSFG . . . 65

II. Approximate relative standard errors and standard errors for estimated number of total or other-than-black women: 1988 NSFG . . . 65

III. Approximate relative standard errors and standard errors for estimated number of black women: 1988 NSFG . . . 65

IV. Approximate standard errors for estimated percents expressed in percentage points for numbers of total or other-than-black women: 1988 NSFG . . . 65

V. Approximate standard errors for estimated percents expressed in percentage points for pregnancies to all or other-than-black women: 1988 NSFG . . . 66

VI. Approximate standard errors for estimated percents expressed in percentage points for pregnancies to black women: 1988 NSFG . . . 66

Appendix I
Technical notes

Background

This report is one of a series based on the National Survey of Family Growth (NSFG), conducted by the National Center for Health Statistics (NCHS). The NSFG was designed to provide data on fertility, contraception, infertility, and other aspects of maternal and infant health that are closely related to childbearing.

The NSFG is a periodic survey based on personal interviews with a nationwide sample of women. The NSFG has been conducted four times—in 1973, 1976, 1982, and 1988. The present report is based primarily on the 1988 NSFG (called Cycle IV), with some reference to trends since the 1982 survey (Cycle III). Interviewing for Cycles III and IV was conducted under contract by Westat, Inc., in 1982 and 1988. A detailed description of the methods and procedures used for Cycles III and IV are in two other publications (31,105).

For Cycle IV, personal (face-to-face) interviews were conducted between January and August, 1988, with a national sample of 8,450 women who were 15–44 years of age as of March 15, 1988, in the civilian, noninstitutionalized population of the United States. (In 1988, Alaska and Hawaii were included in the sample for the first time.) In 1982, interviews were conducted with 7,969 women 15–44 years of age from the civilian noninstitutionalized population of the conterminous United States. In 1982, women were interviewed regardless of marital status for the first time.

In 1988 (Cycle IV), interviews were conducted with 8,450 women, including 2,771 black women, 5,354 white women, and 325 women of other races. The interviews were conducted by trained female interviewers in respondents' homes and lasted an average of 70 minutes. The interview focused on the woman's pregnancy history; her past and current use of contraceptives; her physical ability to bear children (including surgical sterilization and infertility); expectations for having children in the future; use of medical services for birth control; infertility; prenatal care; and a wide range of social, economic, and demographic characteristics.

Statistical design

The NSFG is based on a multistage area probability sample. Black households were sampled at higher rates than other households so that reliable estimates of statistics could be presented separately for black women. In addition, the sample was designed to provide reliable estimates for each of the four major geographic regions of the United States. The sample was not large enough to produce estimates for individual states, counties, or other local areas.

The 8,450 women interviewed for the 1988 NSFG were drawn from households in which someone had already been interviewed for another NCHS survey, the National Health Interview Survey (NHIS), between October 1985 and March 1987. The NHIS is a continuous survey of the civilian noninstitutionalized population of the United States in which data are collected for each household member on disabilities, health conditions, doctor visits, hospitalizations, and other health-related topics.

NCHS provided computer files of households that participated in the NHIS, along with information on addresses and household composition. Households were included if a member had been interviewed between October of 1985 and March of 1987, inclusively. The NSFG sample of households was selected from 156 of the 198 primary sampling units (PSU's) in the NHIS design. (A PSU is a county or group of contiguous counties. The sampled PSU's were located in nearly every State and included all of the largest metropolitan areas in the United States, as determined by the 1980 Census.) In comparison, Cycle III was confined to 79 PSU's. The increased dispersion of the sample resulted in smaller sampling errors in 1988 than in 1982.

The first step was to select households; the second was to select women from those households. No more than one woman was selected per household. Within each selected household, all eligible women had an equal probability of selection for the NSFG.

Interviewers were trained to trace the woman to her new address if she had moved since her household's participation in the NHIS. After locating a sampled woman, the interviewer conducted a brief ''screener'' interview to ascertain that she was eligible for the NSFG.

The NSFG is designed to provide national estimates of the number of women with particular characteristics—for example, the number using oral contraceptives or the number who are infertile. To make such estimates, each sample case (woman) must be assigned a ''sampling weight''—a multiplier that is the number of women in the population she represents. In the 1988 NSFG, the final weights ranged from 197 to 54,997 and averaged about 6,852. They were derived by using the following four basic steps:

- Inflation by the reciprocal of the probability of selection—The probability of selection is the product of the probabilities of selection of the PSU, segment, household, and sample person within the household. This weight is called the baseweight, or W_0. For example, if the probability of selection is 1 in 5,000, then W_0 is 5,000.
- Trimming—About 100 cases in the 1988 NSFG had extremely large baseweights (largest W_0 was greater than 50,000). In previous Cycles, these large weights were left alone, but they could have large effects on estimates, particularly among smaller categories of variables. To reduce this problem, these large baseweights in Cycle IV were trimmed to a maximum value of 8,000 for black women (about 4 times the average W_0 for black women) and 19,000 for women who were not black (about 3 times their average W_0). The trimmed weight is called W_1. Trimming reduced the total weighted numbers to less than the 57.9 million U.S. women who were known to be 15–44 years of age in 1988. These W_1 weights underwent up to two more iterations of trimming to yield the reduced, trimmed weights (W_3).
- Nonresponse adjustment—For Cycle IV, 51 nonresponse adjustment cells were identified, based on extensive analysis of response rates using variables available from the NHIS (106). The trimmed weights were adjusted for nonresponse using the cell-specific ratio of the weighted sum of all cases to the weighted sum of all completed cases (''ratio-adjusted''). For example, if the weight (W_3) for a particular case was 5,000, and that case is in a nonresponse adjustment cell with a response rate of 80 percent, then the nonresponse adjusted weight for that case would be 5,000/0.80, or 6,250. These new weights were called ''nonresponse adjusted weights'' (W_4).
- Post-stratification by marital status, age, parity, and race—The weights were then ratio-adjusted within each of a 72-cell matrix of categories of age (15–17, 17–19, 20–24, 25–29, 30–34, 35–39, and 40–44) by race (black versus other-than-black), marital status (ever married versus never married), or parity (0, 1, 2, 3, 4+). The control totals for each of these 72 cells were obtained from the June 1988 Current Population Survey (CPS), conducted by the U.S. Bureau of the Census.

The effect of this ratio adjustment process made the sample more closely representative of the civilian noninstitutionalized population of women 15–44 years of age in the United States. The final ''post-stratification'' yielded weights (W_5) that reduced the sample variances of the estimates for most statistics.

Estimates of weighted numbers shown in the tables of this report were rounded to the nearest thousand. Aggregate weights and percents may not add to the total because of this rounding.

Measurement process

Field operations for Cycle IV were carried out by Westat, Inc., under contract with NCHS. These operations included interviewing several hundred women in a practice survey, called a ''pretest''; selecting the sample; interviewing women in the main survey; and performing specified quality control checks on the completed questionnaires. Interviewers, all of whom were female, were trained for one week before field work. The first five interviews completed by each interviewer were reviewed. After a high level of quality was achieved by an interviewer, this review was reduced to a sample of questionnaires, unless an unacceptable level of error was found. A 10-percent sample of respondents was recontacted by telephone to verify that the interview had taken place and that certain key items had been accurately recorded.

A portion of the questionnaire used for this report is reproduced in appendix III. Two forms of the questionnaire were used, one for women 15–24 years of age and one for women 25–44. The questionnaire for women 15–24 years old included additional items that referred to early experiences that women over 25 could not be expected to remember accurately.

Data reduction and quality control

The responses of each woman to the interview questions were coded into predetermined numerical codes and keyed onto computer tapes. The first few questionnaires coded by each coder were checked completely. After an acceptable level of quality was reached, verification of coding was performed on a systematic sample of each coder's questionnaires. The data were edited by computer to identify inconsistencies between responses as well as code numbers not allowed in the coding scheme. These errors were corrected.

Missing data on most of the variables used in this report were imputed to provide consistent national estimates. (However, to speed release of the public use computer tape, not all variables on the computer tape were imputed.)

Reliability of estimates

Because the statistics presented in this report are based on a sample, they may differ somewhat from the figures that would have been obtained if a complete census been taken using the same questionnaires, instructions, interviewing personnel, and field procedures. This potential difference between sample results and a complete count is referred to as a sampling error.

Sampling error is measured by a statistic called the standard error of estimate. The chances are about 68 in 100 that an estimate from the sample will differ from a complete count by less than the standard error. The chances are about 95 in 100 that the difference between the sample estimate and a complete count will be less than twice the standard error. The relative standard error (RSE), or coefficient of variation, of an estimate is obtained by dividing the standard error of the estimate by the estimate itself and is expressed as a percent of the estimate. Percents that have a relative standard error of more than 30 percent are considered unreliable.

Estimation of standard errors

Because of the complex multistage design of the NSFG sample, conventional formulas for calculating sampling errors are inapplicable. Therefore, standard errors were estimated empirically by using a technique known as balanced half-sample replication. This technique produces highly reliable, unbiased estimates of sampling errors. Its application to the NSFG has been described elsewhere (31).

Because it would be prohibitively expensive and cumbersome to estimate and publish a standard error for each percent or other statistic by this technique, standard errors were computed for selected statistics and population subgroups that were chosen to represent a wide variety of demographic characteristics and a wide variation in the size of the estimates themselves. Curves were then fitted to the relative standard error estimates (ratio of the standard error to the estimate itself) for numbers of women according to the model

$$\mathrm{RSE}\ (N') = (A + B/N')^{1/2}$$

where N' is the number of women and A and B are the parameters whose estimates determine the shape of the curve. Separate curves were fitted for women of all races combined, for races other than black, and for black women, because a different sampling rate was used for black women. Selected estimates of A and B are shown in table I.

Table I. Estimates of parameters A and B for relative standard error curves for the 1988 NSFG

Parameter set	*Characteristic*	*Estimated parameters*	
		A	*B*
I	Number of pregnancies for total of other-than-black women	–0.000047	13,216
II	Number of pregnancies for black women	0.000961	3,307
III	Number of total of other-than-black women	–0.00018	10,738
IV	Number of black women	–0.000626	5,181

To calculate the estimated standard error or relative standard error of an aggregate or percent, the appropriate estimates of A and B are used in the equations:

$$\mathrm{RSE}_{N'} = (A + B/N')^{1/2}$$

$$\mathrm{SE}_{N'} = (A + B/N')^{1/2}\ (N')$$

$$\mathrm{RSE}_{P'} = [[(B/P')(100 - P')]/X')]^{1/2}$$

$$\mathrm{SE}_{P'} = ([(BP')(100 - P')]/X'))^{1/2}$$

where

N' = number of pregnancies,

P' = percent,

X' = number of pregnancies in denominator of percent,

SE = standard error, and

RSE = relative standard error.

Tables II, III, IV, V, and VI show some illustrative standard errors of aggregates and percents for women from Cycle IV of the NSFG. Similar figures for Cycle III are found in the earlier report (22).

Table II. Approximate relative standard errors and standard errors for estimated number of total or other-than-black women: 1988 NSFG

Size of estimate	*Relative standard error (in percent)*	*Standard error*
100,000	32.0	32,000
250,000	20.4	51,000
500,000	14.4	72,000
1,000,000	10.2	102,000
5,000,000	4.4	221,000
10,000,000	3.0	298,000
20,000,000	1.9	377,000
30,000,000	1.3	400,000
50,000,000	0.6	294,000
58,000,000	0.2	131,000

Table III. Approximate relative standard errors and standard errors for estimated number of black women: 1988 NSFG

Size of estimate	*Relative standard error (in percent)*	*Standard error*
100,000	22.0	22,000
250,000	14.0	35,000
500,000	9.8	49,000
1,000,000	6.7	67,000
5,000,000	2.0	101,000
7,500,000	0.8	60,000

Table IV. Approximate standard errors for estimated percents expressed in percentage points for numbers of total or other-than-black women: 1988 NSFG

Base of percent	*Estimated percent*						
	2 or 98	*5 or 95*	*10 or 90*	*20 or 80*	*30 or 70*	*40 or 60*	*50*
	Standard error in percentage points						
100,000	4.6	7.1	9.8	13.1	15.0	16.1	16.4
500,000	2.1	3.2	4.4	5.9	6.7	7.2	7.3
1,000,000	1.5	2.3	3.1	4.1	4.7	5.1	5.2
5,000,000	0.6	1.0	1.4	1.9	2.1	2.3	2.3
10,000,000	0.5	0.7	1.0	1.3	1.5	1.6	1.6
30,000,000	0.3	0.4	0.6	0.8	0.9	0.9	0.9
50,000,000	0.2	0.3	0.4	0.6	0.7	0.7	0.7
58,000,000	0.2	0.3	0.4	0.5	0.6	0.7	0.7

Testing differences

The standard error of a difference between two comparative statistics, such as the proportion of white women using the pill compared with the proportion of black women using the pill, is approximately the square root of the sum of the squares of the standard errors of the statistics considered separately, or calculated by this formula: If

$$d = P'_1 - P'_2$$

then

$$S_d = \sqrt{[(P'_1)^2(\mathrm{RSE}_{p'1})^2 + (P'_2)^2(\mathrm{RSE}_{p'2})^2]}$$

where P'_1 is the estimated percent for one group and P'_2 is the estimated percent for the other group, and $\mathrm{RSE}_{p'1}$ and $\mathrm{RSE}_{p'2}$

Table V. Approximate standard errors for estimated percents expressed in percentage points for pregnancies to all or other-than-black women: 1988 NSFG

Base of percent	Estimated percent						
	2 or 98	*5 or 95*	*10 or 90*	*20 or 80*	*30 or 70*	*40 or 60*	*50*
	Standard error in percentage points						
100,000	5.1	7.9	10.9	14.5	16.7	17.8	18.2
250,000	3.2	5.0	6.9	9.2	10.5	11.3	11.5
500,000	2.3	3.5	4.9	6.5	7.5	8.0	8.1
1,000,000	1.6	2.5	3.4	4.6	5.3	5.6	5.7
5,000,000	0.7	1.1	1.5	2.1	2.4	2.5	2.6
10,000,000	0.5	0.8	1.1	1.5	1.7	1.8	1.8
20,000,000	0.4	0.6	0.8	1.0	1.2	1.3	1.3
30,000,000	0.3	0.5	0.6	0.8	1.0	1.0	1.0
50,000,000	0.2	0.4	0.5	0.7	0.7	0.8	0.8
75,000,000	0.2	0.3	0.4	0.5	0.6	0.7	0.7
100,000,000	0.2	0.3	0.3	0.5	0.5	0.6	0.6

Table VI. Approximate standard errors for estimated percents expressed in percentage points for pregnancies to black women: 1988 NSFG

Base of percent	Estimated percent						
	2 or 98	*5 or 95*	*10 or 90*	*20 or 80*	*30 or 70*	*40 or 60*	*50*
	Standard error in percentage points						
100,000	2.9	4.6	6.3	8.4	9.6	10.3	10.5
250,000	1.9	2.9	4.0	5.3	6.1	6.5	6.6
500,000	1.3	2.0	2.8	3.8	4.3	4.6	4.7
1,000,000	0.9	1.4	2.0	2.7	3.0	3.3	3.3
5,000,000	0.4	0.6	0.9	1.2	1.4	1.5	1.5
10,000,000	0.3	0.5	0.6	0.8	1.0	1.0	1.0
25,000,000	0.2	0.4	0.5	0.7	0.8	0.8	0.9

are the relative standard errors of P'_1 and P'_2. This formula represents the actual standard error accurately for the difference between separate and uncorrelated characteristics, although it is only an approximation in most other cases.

A difference among comparable proportions or other statistics from two or more subgroups is considered statistically significant when a difference of that size or larger would be expected by chance in fewer than 5 percent of repeated samples of the same size and type, if no true difference existed in the populations sampled (also known as Type I error or alpha level). Such a difference would be statistically significant at the 0.05 level. By this criterion, if the observed difference or a larger one could be expected by chance in more than 5 percent of repeated samples, then one cannot be sufficiently confident to conclude that a real difference exists between the populations. When an observed difference is large enough to be statistically significant, the true difference in the population is estimated to lie between the observed difference plus or minus two standard errors of that difference in 95 of 100 samples.

Although the 5-percent criterion is conventionally applied, it is arbitrary. Depending on the purpose of the particular comparison, a different level of significance may be more useful. For greater confidence, one would test for significance at the 0.01 (1-percent) level. However, if one can accept a 10-percent chance of concluding that a difference exists when there actually is none in the population, a test of significance at the 10-percent level would be appropriate.

In this report, terms such as ‘‘similar’’ and ‘‘no difference’’ mean that any observed difference between two estimates being compared is not statistically significant. Terms relating to difference (for example, ‘‘greater,’’ ‘‘less,’’ ‘‘larger,’’ and ‘‘smaller’’) indicate that the observed differences are statistically significant at the 5-percent alpha level. Statements about differences that are qualified (by phrases such as ‘‘the data suggest’’ and ‘‘some evidence’’) indicate that the difference is significant at the 10-percent alpha level but not at the 5-percent level. Individual *t*-tests, with a critical value of 1.96 (0.05 alpha level), were used to test all comparisons. This strategy, although it highlights major findings, does not take into account hypothesis testing issues associated with multiple comparisons, where a statistic is potentially compared for more than two domains. Lack of comment regarding the difference between any two statistics does not mean the difference was tested and found to be not significant.

When a substantial observed difference is found not to be statistically significant, one should not conclude that no difference exists. It means that such a difference cannot be established with 95-percent confidence from this sample. This is especially important for estimates based on smaller subgroups of women, such as Hispanic women or teenagers. Furthermore, lack of comment about any two statistics does not mean that the difference was tested and found not to be significant.

The number of replicates in the balanced half-sample replication design minus one (99 in Cycle IV) can reasonably be used as an estimate of the number of degrees of freedom. A two-tailed *t*-test with 99 degrees of freedom is equivalent to a two-tailed normal deviate *z*-test. For example, in the years up to and including 1988, 14.2 percent of the 10,670,000 births to black women and 6.1 percent of the 55,437,000 births to white women were low birthweight. To test this racial difference at the 0.05 level of significance, compute

$$z = \frac{14.2 - 6.1}{\sqrt{[(14.2)^2\ \mathrm{RSE}^2_{(14.2)} + (6.1)^2\ \mathrm{RSE}^{2(6.1)}]}}$$

Relative standard errors are computed using the appropriate values for *B* from table I:

$$\mathrm{RSE}_{14.2} = [([3{,}307/(14.2)][100–14.2])/10{,}670{,}000]^{1/2} = 0.043$$

$$\mathrm{RSE}_{6.1} = [([13{,}216/(6.1)][100–6.1])/55{,}437{,}000]^{1/2} = \mathit{0.061}$$

thus

$$z = 11.34$$

The two-tailed 0.95 critical value (1–α) for a *z* statistic is 1.96. Therefore, the difference is significant at the 5-percent level.

Nonsampling error

Although sampling errors affect the reliability (that is, precision, repeatability) of survey estimates, nonsampling

error may introduce bias (that is, inaccuracy). The results of any survey are subject to at least four types of nonsampling error: interview nonresponse; nonresponse to individual questions or items within the interview; inconsistency of responses to questions; and error of recording, coding, and keying by survey personnel.

To minimize nonsampling error, stringent quality control procedures were introduced at every stage of the survey. This includes a check on completeness of the household listing; extensive training and practice of interviewers; editing of questionnaires by the interviewers' supervisors; short verification interviews with a subsample of respondents; verification of coding and editing; independent coding of a sample of questionnaires by NCHS; keypunch verification; and an extensive computer ''cleaning'' to check for inconsistent responses, missing data, and invalid codes. A detailed description of some of these procedures follows; others were discussed above.

Interview nonresponse

Interview nonresponse means that no part of an interview was obtained. This is conventionally measured by response rates. Nonresponse to the NHIS was 4 percent, for a response rate of 96 percent. Among this 96 percent, 82.5 percent of eligible women responded to the NSFG, for a compound response rate of 79 percent. Nonresponse varied by certain characteristics of the woman, but the wealth of information in the NHIS allowed adjustments to be made for nonresponse. This nonresponse, and the procedures used to adjust for it, are described elsewhere (28,105,106).

Item nonresponse

Item nonresponse may have occurred when a respondent refused to answer a question, when she did not know the answer to a question, when the question was erroneously skipped or the answer was not recorded by the interviewer, or when the answer could not be coded. The rate of nonresponse to individual questions was very low in Cycle IV, as it was in Cycle III. Some examples of item nonresponse from among a total of 8,450 respondents are as follows: religion, 25 cases; occupation, 17 cases. The items with the most nonresponse were family income (from which poverty-level income was derived), with 893 cases, and age (date) of first intercourse, with 458 missing cases. In the 1988 NSFG, 201 items were forced to be complete; missing data for these variables were imputed. Of these 201 items, 173 imputed items with imputation flags exist on the public-use tape. For 116 of these 173 items, less than 1 percent of the cases required imputation; for 39, 1–5 percent; for 13, 5–10 percent; and for only 5, 10–11 percent. For those few items for which the proportion of cases imputed was high, this fact is noted in the appropriate section of the definitions. This report only used NSFG variables with imputed missing data.

As with all survey data, responses to the NSFG were subject to deliberate misreporting by the respondent. Such misreporting cannot be detected directly, but it can be detected indirectly by the extensive computer ''cleaning'' and editing procedures used in the NSFG.

Appendix II
Definitions of terms

Dependent variables

Timing of first prenatal visit—For pregnancies ending in a live birth in 1984–88, women in the 1988 NSFG were asked: ‘‘During this pregnancy, did you ever visit a doctor or clinic for prenatal care?’’ Women were instructed not to include visits consisting only of a pregnancy test. Women who answered ‘‘yes’’ were then asked: ‘‘How many weeks or months had you been pregnant when you first visited a doctor, midwife, or clinic for prenatal care?’’ Women who answered that they were less than a month, 1 month, or 2 months pregnant are classified as beginning prenatal care in the first trimester, or at ‘‘less than 3 months.’’ The other categories are ‘‘3 or 4 months pregnant’’ and ‘‘5 months (pregnant) or more or no care.’’

Several reports have examined the proportion of births receiving first trimester prenatal care across different data sources. The three national data sources commonly compared are: birth certificates (42,45,107), the 1980 National Natality Survey (NNS) (108), and the National Survey of Family Growth (NSFG) (45). Because the questions are worded and administered differently in these three sources, the proportions reporting first-trimester care differ (45). However, in one recent study the largest differences are seen in the first 1 or 2 months of pregnancy, which suggests that (a) the stage at which pregnancies are recognized varies among sources of data; (b) data sources other than the NSFG may be counting pregnancy tests as first prenatal visits; and (c) mothers report, but physicians may sometimes be unaware of, early visits to other providers of prenatal care (45).

Source of most prenatal care—Women who reported that they visited a doctor, midwife, or clinic for prenatal care (for pregnancies ending in 1984–88) were asked: ‘‘To which of the places on the card did you go for most of your prenatal care visits?’’ Women were then shown a card listing the following types of medical facilities and asked to choose one category that best described the place.

A.	Community health center clinic	01
B.	Public health department clinic	02
C.	Family planning clinic	03
D.	Hospital clinic	04
E.	Private doctor	05
F.	Private group practice, co-op, or private clinic	06
G.	HMO or other prepaid group practice	07
H.	Other (specify)	08

In this report, women who answered E, F, or G were classified as receiving care from a ‘‘private doctor;’’ women who answered D, as using a ‘‘hospital clinic;’’ and those who answered A, B, C, or H, as using ‘‘other clinic.’’ Sample sizes are not large enough to allow separate analyses of use of the different types of clinics.

Cigarette smoking during pregnancy—Women in the NSFG who had ever been pregnant and who reported smoking at all during the 12 months before their most recent pregnancy ended were asked: ‘‘On the average, how many cigarettes did you smoke *per day after* you found out that you were pregnant?’’ The responses were coded in the following categories:

About one a day or less	1
Just a few (2–4)	2
About half a pack (5–14)	3
About a pack (15–24)	4
About 1½ packs (25–34)	5
About 2 packs (35–44)	6
More than 2 packs (45 or more)	7
Didn’t smoke during (last) pregnancy	96

In this report, women in categories 1, 2, and 3 were classified as having smoked fewer than 15 cigarettes per day. Those in categories 4, 5, 6, and 7 were classified as having smoked 15 or more per day. Women in category 96, as well as women who reported no smoking in the 12 months before the pregnancy ended, were labeled as ‘‘did not smoke at all.’’

Women who were currently pregnant were excluded from the statistics on smoking and drinking during the most recent pregnancy, as were women whose most recent pregnancies ended in induced abortion. In contrast, in a previous report (109), currently pregnant women were included in the tables showing smoking and drinking during pregnancy, but excluded from the statistics by age at pregnancy outcome. In this report, they were excluded entirely so the totals would be more consistent throughout the tables and so that the data would refer only to completed pregnancies. Induced abortions were excluded in order to permit meaningful analysis of factors such as wantedness and timing of prenatal care, which would be particularly sensitive for women who terminated their pregnancies. Furthermore, because of this sensitivity, these questions were not asked for pregnancies ending in induced abortion.

Alcohol consumption during pregnancy—Women in the NSFG who had ever been pregnant were also asked: ‘‘During

your (last) pregnancy, how often did you usually drink alcoholic beverages, that is, beer, wine, or liquor?'' The response categories were:

Every day	1
Nearly every day	2
3 or 4 days a week	3
1 or 2 days a week	4
3 or 4 days a month	5
About once a month	6
Less than once a month	7
Not at all	96

In this report, women in category 96 were classified as ''did not drink at all,'' women in category 7 were classifed as drinking ''less than once a month,'' women in category 6 as drinking ''once a month,'' and those in categories 1–5 as drinking ''more than once a month.''

Low birthweight—A ''low birthweight'' baby is one who weighs 2,500 grams (5 pounds 8 ounces) or less at birth. Statistics on birthweight in this report are shown only for single live births because multiple births often have lower birthweights. For all births in the NSFG, women were asked: ''How much did [child's name] weigh at birth?''

Women who could not remember were then asked: ''Did [child's name] weigh more than 5 pounds, 9 ounces or less?''

As noted in the text, births in this report occurred during a period of several years up to and including 1988 and are based on a sample. However, births in the vital statistics system occurred during a specified calendar year and are based on birth certificates. (In most states, statistics on birthweight were based on all birth certificates. In selected states, data on birthweight were based on a 50-percent sample of birth certificates.)

Source of payment for delivery—Women who had had one or more live births were asked the following question for each live birth in 1984–88: ''This card lists some of the ways in which medical bills can be paid. When [child's name] was born, in which of these ways was the bill paid?'' The woman was then handed a card containing the following categories:

Your (or your husband's/partner's) own income	1
Parents, other relatives, boyfriend or his family	2
Insurance (which you carry or is carried for you)	3
No charge—paid by Medicaid	4
Government assistance other than Medicaid (State or local)	5
Some other way (specify)	6

Women could choose as many responses as applied. Therefore the percents given in tables 27–32 add up to more than 100 percent. Responses to categories 1 and 2 were combined to form the category ''self, family, or friends;'' category 3 is labeled ''private medical insurance'' in tables 27–32; category 4, ''Medicaid;'' category 5, ''other government;'' and category 6, ''all other.''

For tables 31–32, a source of payment variable was created with mutually exclusive categories that add up to 100 percent. The categories are ''self, family, or friends only,'' ''private insurance only,'' ''self, family, friends, and insurance only,'' ''Medicaid only,'' ''other government only,'' and ''all other combinations of payment.''

Characteristics of pregnancies

Age at birth or pregnancy outcome—Each woman was asked the month, day, and year each pregnancy ended. Her date of birth was subtracted from the date of the pregnancy outcome to compute her age in completed years when the child was born or the pregnancy otherwise ended.

Birth order or pregnancy order—Births are classified by birth order. Where the birth order is ''first,'' the birth was the woman's first birth; where it is ''second,'' the birth was the woman's second birth. Similarly, where the pregnancy order is ''first,'' it was the woman's first pregnancy; where it is ''second,'' it was the woman's second pregnancy.

Mode of delivery—For each pregnancy, women were asked to identify the way or ways in which the pregnancy ended, using the following categories:

Miscarriage	1
Stillbirth	2
Abortion	3
Birth by cesarian section	4
Birth by vaginal delivery	5

Mode of delivery was classified as ''cesarian section'' if the woman responded with 4 and as ''vaginal delivery'' if she answered with 5.

Marital status at birth or pregnancy outcome—If the date of the baby's birth was before the date of the woman's first legal marriage, the woman was classified as ''never married at birth;'' if the date of the baby's birth was after the date of her first legal marriage, she was classified as ''ever married at birth.'' The same procedure was used for other pregnancy outcomes.

Wantedness status at conception—The specific terms ''intended,'' ''mistimed,'' and ''unwanted'' used in this report refer to the woman's attitude toward her pregnancy at the time she became pregnant.

The series of questions from which the variables were derived to classify pregnancies as intended, mistimed, or unwanted at conception in the 1988 NSFG were:

- ''At the time you became pregnant with [baby's name], did you yourself, actually want to have a(nother) baby at *some* time?''
- ''It is sometimes difficult to recall these things but, just before that pregnancy began, would you say that you probably wanted a(nother) baby at *some* time?''
- ''Did you become pregnant sooner than you wanted, later than you wanted, or at about the right time?''

Pregnancies were classified as:

- *Intended* if the woman reported becoming pregnant at about the right time or later than she wanted, or if she did not care when she became pregnant;
- *Mistimed* if she wanted a baby eventually, but not as soon as the pregnancy occurred (for example, if she became

pregnant at age 19 but had wanted to wait until she was 22); and

- *Unwanted* if she never wanted that pregnancy (for example, if she wanted only one child, already had one, and became pregnant again).

It is important to emphasize that an ''unwanted pregnancy'' does not necessarily mean an ''unwanted child.'' Many children who were not wanted at conception become cherished members of their families.

Demographic characteristics of women

Race—Women were asked to identify which of the following groups best described their racial background:

- Alaskan native or American Indian
- Asian or Pacific Islander
- Black
- White

Race was also recorded based on interviewer observation, but for this report, race was based on respondent's self-report and classified as black, white, or other.

Hispanic origin—A respondent was classified as being of Hispanic origin if she reported that her only or principal national origin was Puerto Rican, Cuban, Mexican American, Central or South American, or other Spanish. In selected tables presenting maternal characteristics, race and Hispanic origin were used to classify women as Hispanic, non-Hispanic white, non-Hispanic black, or non-Hispanic other. The numbers of Hispanic women in the survey were too small to be subdivided by other characteristics and yield reliable national estimates.

Education—Education was classified according to the highest grade or year of regular school or college completed. Tables in this report present each woman's educational level at the time of interview, which may not be the same as at the time of her pregnancies. The categories used are ''less than 12 years,'' ''12 years'' (high school), and ''13 years or more.'' Because teenage women are likely to fall into the first category due solely to their age, many tables in this report show education level only for women aged 20–44 years at pregnancy outcome.

Most recent occupation—Women who were working at the date of interview were asked: ''What is your occupation? That is, what is your job called?'' ''What are your most important activities or duties?'' ''What kind of business or industry do you work for? That is, what do they make or do?''

Women who had worked in the past but were not currently working were asked: ''What was your last occupation? That is, what was your job called?'' ''What were your most recent activities or duties?'' ''What kind of business or industry did you work for? That is, what did they make or do?''

The answers to these questions were recorded verbatim and used by specially trained occupation coders to find the most appropriate standard job title in the 1980 U.S. Census classification. Where more than one occupation was given, the primary or first-mentioned occupation was coded. Occupations were coded using the 3-digit codes used by the U.S. Bureau of the Census. However, for this report they have been grouped into the following major categories:

- Professional or managerial occupation
- Technical, sales, or clerical occupation
- Service occupation
- Farmwork, craft, or operative occupation
- Never worked

As with the education variable, many tables in this report show job status only for women aged 20–44 years at pregnancy outcome because teenage women may still be in school, thus more likely to be classified as ''never worked.''

Poverty level income—The poverty index ratio was calculated by dividing the total family income by the weighted average threshold income of families whose head of household was under 65 years of age, based on the 1987 poverty levels defined by the U.S. Census Bureau and shown in *Current Population Reports* (110). This definition of poverty status takes into account the sex of the family head and the number of persons in the family. Total family income includes income from all sources for all members of the respondent's family. For example, for a family of four in 1987, the poverty level was $11,611. So, if a family of four had an income of $30,000, their poverty level income would be 30,000/11,611, or 258 percent. This respondent would be classified in the second of three categories used for this report: ''149 percent or less,'' ''150–299 percent,'' or ''300 percent or more.''

As with education level and job status variables, many tables in this report show poverty level income only for women aged 20–44 years at pregnancy outcome. Teenage women living on their own are more likely to be poor. If they are living with parents, they are more likely to respond with ''don't know'' to the total family income question.

For a substantial number of respondents (893 or 11 percent), total family income was not ascertained. These missing values were imputed using a known value of another similar, randomly selected respondent. Because of this high level of missing data, small differences by poverty level income should be interpreted with caution.

Medicaid status—In Cycle III, NSFG respondents were asked, ''Are you yourself now covered by Medicaid [State name for Medicaid], or do you have a card that looks like this?'' The respondent was then shown a Medicaid card for her State. Cycle IV of the NSFG did not include this direct question. For this report, women who received Medicaid payments for prenatal care or for delivery costs were classified as ''Medicaid recipients.'' There is potential for misclassification with this approach, but the comparability of NSFG data on Medicaid coverage with other national data sources strengthens its plausibility.

Place of residence—The U.S. Office of Management and Budget defines metropolitan statistical areas (MSA's). Places of residence in the 1988 NSFG were classified into three categories, based on 1980 Census population counts: central cities of metropolitan areas, suburban parts of metropolitan areas, and nonmetropolitan areas. Women in the first two categories are often referred to in this report as ''metropolitan'' residents, while those in the last category are referred to as ''nonmetropolitan area'' residents. Nonmetropolitan areas may include both rural and urban places of residence.

Appendix III
Items on the 1988 National Survey of Family Growth questionnaire related to health aspects of pregnancy and childbirth

ALL PREGNANCIES

06R

		FIRST PREGNANCY	SECOND PREGNANCY
B-11.	Thinking about your (1st/2nd/etc.) pregnancy, in which of the ways shown on Card 5 did the pregnancy end? (CIRCLE CODE HERE AND ON B & P RECORD.)		
HAND CARD 5	A. Miscarriage	A. 1 (B-14)	A. 1 (B-14)
	B. Stillbirth.	B. 2 (B-14)	B. 2 (B-14)
	C. Abortion.	C. 3 (B-14)	C. 3 (B-14)
	D. Birth by Cesarean section	D. 4 (B-12)	D. 4 (B-12)
	E. Birth by normal (vaginal) delivery.	E. 5 (B-12)	E. 5 (B-12)
	IF MULTIPLE OUTCOME, CIRCLE FIRST OUTCOME ABOVE AND ENTER LETTER FOR OTHER OUTCOME(S) ON LINE	_____	_____
B-12.	Was the baby a boy or a girl?		
	Boy	 1	 1
	Girl.	 2	 2
	Twins, both boys.	 3	 3
	Twins, both girls	 4	 4
	Twins, one boy, one girl.	 5	 5
B-13.	What did you name (her/him/them)? (ENTER HERE AND ON B & P RECORD.)	_____ NAME _____ NAME	_____ NAME _____ NAME
B-14.	On what date (was [CHILD] born/did that pregnancy end)? (ENTER HERE AND ON B & P RECORD.)	____|____|____ MO DAY YR	____|____|____ MO DAY YR
B-15.	How many weeks or months had you been pregnant when that pregnancy ended?	_____ (BOX 7) WEEKS _____ (BOX 7) MONTHS DK. 98 (B-16)	_____ (BOX 7) WEEKS _____ (BOX 7) MONTHS DK. 98 (B-16)
B-16.	Was it . . .		
	Less than 3 months, ...	 1	 1
	3-6 months, or.	 2	 2
	More than 6 months?	 3	 3
BOX 7.	R'S PREGNANCY ENDED BEFORE JANUARY 1984. . .	. . . . . 1 (BOX 8, PAGE 12)	. . . . . 1 (BOX 8, PAGE 12)
	R'S PREGNANCY ENDED JANUARY 1984 OR LATER, AND ENDED IN:		
	• LIVE BIRTH.	. . . . . 2 (B-17)	. . . . . 2 (B-17)
	• MISCARRIAGE, STILLBIRTH, OR ABORTION. . .	. . . . . 3 (B-28, PAGE 12)	. . . . . 3 (B-28, PAGE 12)

PREGNANCIES ENDING JANUARY 1984 OR LATER

		FIRST PREGNANCY	SECOND PREGNANCY
B-17.	For this pregnancy, did you have a pregnancy test done at a doctor's office or clinic?		
	Yes	1 (B-18)	1 (B-18)
	No	2 (B-20)	2 (B-20)
B-18.	How many weeks or months had you been pregnant when you had the pregnancy test done?	_____ OR _____ (WEEKS) (MONTHS) Don't know. . . 98 (B-20)	_____ OR _____ (WEEKS) (MONTHS) Don't know. . . 98 (B-20)
B-19.	How long after you had the pregnancy test done did you visit a doctor, midwife or clinic for prenatal care, if ever?	_____ DAYS WEEKS MONTHS (B-22) No prenatal care. . . . . 96 (B-28) Don't know. . . 98 (B-21)	_____ DAYS WEEKS MONTHS (B-22) No prenatal care. . . . . 96 (B-28) Don't know. . . 98 (B-21)
B-20.	(Not counting the pregnancy test), during this pregnancy, did you ever visit a doctor, midwife or clinic for prenatal care?		
	Yes	1 (B-21)	1 (B-21)
	No	2 (B-28)	2 (B-28)
B-21.	How many weeks or months had you been pregnant when you first visited a doctor, midwife or clinic for prenatal care?	_____ OR _____ (WEEKS) (MONTHS)	_____ OR _____ (WEEKS) (MONTHS)
B-22.	How many times did you visit a doctor, midwife or clinic for prenatal care?	_____ NUMBER OF VISITS	_____ NUMBER OF VISITS
B-23.	To which of the places on Card 6 did you go for most of your prenatal care visits?		
HAND CARD 6	A. Community health center clinic	01	01
	B. Public health department clinic	02	02
	C. Family planning clinic	03	03
	D. Hospital clinic	04	04
	E. Private doctor	05	05
	F. Private group practice, co-op, or private clinic	06	06
	G. HMO or other prepaid group practice	07	07
	H. Other (SPECIFY)	08	08
		_____	_____
B-24.	How many different places did you go to for prenatal care?	_____ NUMBER OF PLACES	_____ NUMBER OF PLACES
B-25.	Card 7 lists some of the ways in which medical bills can be paid. When you made a visit to a doctor or clinic for prenatal care, in which of these ways was the bill paid? (CIRCLE ALL THAT APPLY AND PROBE: What other ways?)		
HAND CARD 7	A. Your (or your husband's/partner's) own income	01	01
	B. Parents, other relatives, boyfriend or his family	02	02
	C. Insurance (which you carry or is carried for you)	03	03
	D. No charge -- paid by Medicaid	04	04
	E. Government assistance other than Medicaid (state or local)	05	05
	F. Some other way (SPECIFY)	06	06
		_____	_____

07R

LIVE BIRTHS

	Pregnancy No. |__|__| FIRST BIRTH	Pregnancy No. |__|__| SECOND BIRTH
CHILD's NAME	_____	_____
B-31. How much did (CHILD) weigh at birth?	_____|_____ (BOX 10) LBS. OZ. DK. 9898 (B-32)	_____|_____ (BOX 10) LBS. OZ. DK. 9898 (B-32)
B-32. Did (s/he) weigh more than 5 1/2 pounds, or less than 5 1/2 pounds?		
More than 5 1/2 pounds.	 1	 1
Less than 5 1/2 pounds.	 2	 2
BOX 10. WAS CHILD BORN . . .		
BEFORE JANUARY 1984	. . . . . 1 (BOX 11, PAGE 16)	. . . . . 1 (BOX 11, PAGE 16)
JANUARY 1984 OR LATER	. . . . . 2 (B-33)	. . . . . 2 (B-33)
B-33. Card 7 lists some of the ways in which medical bills can be paid. When (CHILD) was born, in which of these ways was the bill paid? (CIRCLE ALL THAT APPLY AND PROBE: What other ways?)		
HAND CARD 7		
A. Your (or your husband's/ partner's) own income	 01	 01
B. Parents, other relatives, boyfriend or his family	 02	 02
C. Insurance (which you carry or is carried for you)	 03	 03
D. No charge -- paid by Medicaid . . .	 04	 04
E. Government assistance other than Medicaid (state or local). . .	 05	 05
F. Some other way (SPECIFY).	 06	 06
	_____	_____

E-64. How long had you been living there when you got pregnant?

_____ YEARS AND/OR _____ MONTHS 114-116

E-65. Did you smoke cigarettes at all during the 12 months before the end of your (last) pregnancy?

Yes. 1 (E-66)
No 2 (E-68) 117

E-66. Please look at Card 28. On the average, how many cigarettes did you smoke per day before you found out that you were pregnant?

HAND CARD 28

A. About one a day or less. 01
B. Just a few (2-4) 02
C. About half a pack (5-14) 03
D. About a pack (15-24) 04
E. About 1 1/2 packs (25-34). 05
F. About 2 packs (35-44). 06
G. More than 2 packs (45+). 07 118-119

E-67. Again, looking at Card 28, on the average, how many cigarettes did you smoke per day after you found out that you were pregnant?

HAND CARD 28

A. About one a day or less. 01
B. Just a few (2-4) 02
C. About half a pack (5-14) 03
D. About a pack (15-24) 04
E. About 1 1/2 packs (25-34). 05
F. About 2 packs (35-44). 06
G. More than 2 packs (45+). 07
H. None 96 120-121

E-68. Please look at Card 29. During your (last) pregnancy, how often did you usually drink alcoholic beverages, that is, beer, wine, or liquor?

HAND CARD 29

A. Every day. 01
B. Nearly every day 02
C. 3 or 4 days a week 03
D. 1 or 2 days a week 04
E. 3 or 4 days a month. 05
F. About once a month 06
G. Less than once a month 07
H. Not at all 96 122-123

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