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Prenatal Care in the United States, 1980–94

July 1996

U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
Public Health Service
Centers for Disease Control and Prevention
National Center for Health Statistics

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Hyattsville, Maryland
July 1996
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Abstract

Objectives. This report examines trends in timing of prenatal care in the United States from 1980 to 1994. Demographic characteristics examined include age, race, Hispanic origin, marital status, place of birth of mother, educational attainment of mother, and live-birth order. Social characteristics discussed include barriers to care and pregnancy wantedness.

Methods. The source of data for trends and demographic analyses is the certificate of live birth filed for each child born in the United States. Data for social characteristics are from the 1988 National Maternal and Infant Health Survey (NMIHS). Data from the NMIHS are based on 9,953 responses.

Results. Very few groups of women have yet to achieve the goal of 90 percent initiating prenatal care in the first trimester as set by *Healthy People 2000*. In 1994, 80 percent of all mothers initiated care in the first trimester. Cuban mothers were the only mothers to reach the objective of 90 percent with Japanese mothers close behind at 89 percent. Mothers with the lowest percent initiating early prenatal care were non-Hispanic black (68 percent), Puerto Rican (67 percent), and American Indian mothers (65 percent). Mothers who have problems getting prenatal care due to financial, scheduling, transportation, or other problems have lower rates of initiating early care. Mothers who wanted to be pregnant when they did were more inclined to initiate early care than mothers who did not want to become pregnant or whose pregnancies were mistimed.

Conclusions. Prenatal care use in the United States did not improve in the 1980's but has been improving since 1990. Variations in use by demographic characteristics persist. There are wide gaps between mothers with easier access to prenatal care and those who encounter barriers to care. Mothers who want to become pregnant also tend to seek help in understanding their pregnancy and its risks earlier than those who did not intend to get pregnant or cared to become pregnant at another time.

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Keywords: Prenatal care • Birth certificate • National Maternal and Infant Health Survey • Year 2000 Health Objectives

Prenatal Care in the United States, 1980–94

by Caroline T. Lewis, Bureau of Health Professions, Health Resources and Service Administration; T. J. Mathews, and Robert L. Heuser, Division of Vital Statistics

Introduction

Background

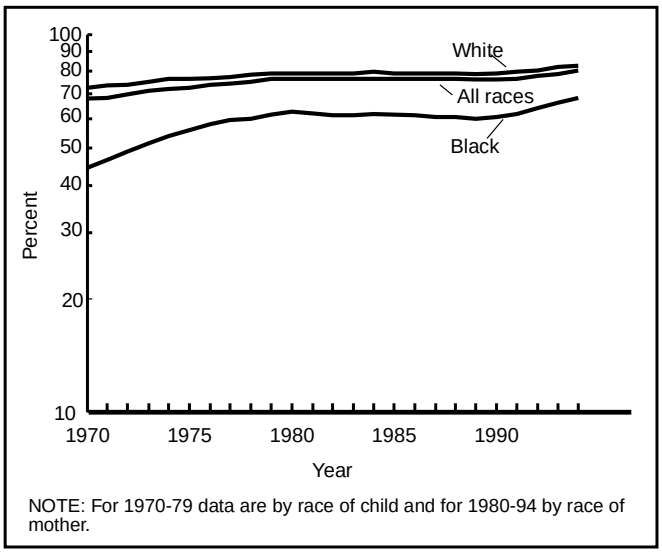
During the 1980's and early 1990's at least three out of every four infants in this country were born to women who began prenatal care in the first trimester. A minimum of 4 percent were born to women who began care as late as the third trimester or who received no care at all. Other studies have found that early prenatal care is associated with a decreased risk of low birthweight and preterm delivery (1,2), birth outcomes that are major predictors of infant morbidity and mortality (3,4,5). Improvement in the timing of prenatal care is considered so crucial to our Nation's health that it has been included in the Year 2000 Health Objectives for the Nation (6). Early care is critical to the health of the mother and child because it allows for early detection and treatment of existing medical and obstetric conditions. It also provides the opportunity for encouraging healthy behaviors and prevents disease by educating women early in their pregnancies about proper nutrition, adequate weight gain, safe sexual practices, dangers of smoking, alcohol, and drugs, environmental and occupational hazards, and other factors that might affect pregnancy outcome (7).

In this report national trends in the proportions of mothers receiving early care and late or no care between 1980 and 1994, as reported on live-birth certificates, are examined. Differential timing of prenatal care for various sociodemographic subgroups are reviewed. Data from the 1988 National Maternal and Infant Health Survey (NMIHS) show how some factors beyond those available on the birth certificate are related to initiation of prenatal care.

The proportion of mothers receiving early prenatal care remained at 76 percent from 1980 to 1991 and then increased each year thereafter to 80 percent in 1994 (figure 1 and table 1). A similar pattern is observed for white mothers, but for black mothers there was a decrease in early care usage in the 1980's and a notable increase in the 1990's. The proportion of mothers beginning care in the third trimester or receiving no care at all increased from 5.1 to 6.4 percent between 1980 and 1989 before declining to 4.4 percent in 1994.

Because increasing the proportion of women receiving early care is a major health priority for the Nation, it is important to identify the particular subgroups that are less likely to receive early care. Birth registration data show that timing of prenatal care varies by race, ethnicity, place of birth, age, live-birth order, educational attainment, and marital status of the mother. Mothers who are black, Hispanic, not born in the United States, young, unmarried, or who have had little schooling are more likely to delay initiating prenatal care to the second or third trimester or to receive no prenatal care.

Data from the 1988 NMIHS show that initiation of prenatal care also varies according to whether the mother encounters financial, transportation, child care, or other problems. Mothers who encounter these types of problems are more likely to delay care than are mothers who do not. The 1988 NMIHS also indicates that whether a woman wants to be pregnant influences when she begins care. Women who do not want to be pregnant are more likely to delay care.



NOTE: For 1970-79 data are by race of child and for 1980-94 by race of mother.

Figure 1. Percent of live births where mothers received early prenatal care by race: Reporting States, 1970–78 and United States 1979–94

This report was prepared in the Division of Vital Statistics (DVS). The authors gratefully acknowledge the assistance of John L. Kiely, Chief of the Infant and Child Health Studies Branch, Division of Health and Unit Analysis and Michael D. Kogan of the Followback Survey Branch, DVS, who reviewed the report and provided helpful comments; and Thomas Dunn of the Statistical Resources Branch, DVS, who provided content review. This report was edited by Thelma W. Sanders and typeset by Zung T. N. Le of the Publications Branch, Division of Data Services.

Because the quality or content of prenatal care given to pregnant women cannot be evaluated from the information on the birth certificate, the measure used in this report is the timing of the first prenatal visit. Timing of care is used as a proxy measure for adequacy of care because it indicates when care began and suggests the duration of that care.

In this report ''early care'' is defined as care initiated in the first trimester, ''delayed care'' refers to care begun in the second trimester, and ''late care'' refers to care started in the third trimester.

Sources of data

Data shown in tables 1–7 for 1994 are based on 100 percent of the birth certificates in all States and the District of Columbia except where otherwise noted. The data are provided to the National Center for Health Statistics through the Vital Statistics Cooperative Program (VSCP). In 1984 and earlier years, the VSCP included a varying number of States, which provided data on 100 percent of their birth certificates. Data for States not in the VSCP were based on a 50-percent sample of birth certificates filed in those States. Information on sampling procedures and sampling errors for 1984 and earlier years is provided in the annual report *Vital Statistics of the United States*, Volume I, Natality.

Data shown in tables 8–12 for 1988 are based on the NMIHS, which was conducted by the National Center for Health Statistics to examine factors concerning maternal health, pregnancy outcome, and infant health. Data from the NMIHS are based on 9,953 responses. The NMIHS was made nationally representative by the calculation of a sample weight for each record that accounts for the survey's sampling scheme and for survey nonresponse.

Demographic characteristics

Race of mother

The Public Health Service included among the year 2000 infant health objectives a goal that 90 percent of pregnant women in each racial and ethnic group receive prenatal care within the first trimester of pregnancy (6). In 1994 only Japanese mothers came close to achieving this goal with 89 percent receiving prenatal care in the first trimester (table 2). Other Asian and Pacific Islander subgroups had a range of 76 to 86 percent, compared with 65 and 68 percent for American Indian and black mothers and 83 percent for white mothers. In 1994 the proportion of women who delayed care until the third trimester or who received no care ranged from 2 to 5 percent for Asian and white mothers compared with 8 to 10 percent for black and American Indian mothers.

Hispanic origin of mother

Sixty-nine percent of Hispanic mothers began prenatal care in the first trimester of pregnancy in 1994, nearly the same level as that for non-Hispanic black mothers but substantially below that for non-Hispanic white mothers (87 percent) (table 3). Cuban mothers achieved the year 2000 infant health goal of 90 percent starting care in the first trimester while other Hispanic groups were much lower (67–72 percent).

Hispanic mothers are generally much more likely than non-Hispanic white mothers to get care late or to receive no care at all. However, Hispanic and non-Hispanic black mothers have similar proportions receiving late or no care. In 1994, 8 percent of Hispanic and non-Hispanic black mothers received late or no care compared with 3 percent of non-Hispanic white mothers. The proportions for specified Hispanic subgroups varied between 2 percent for Cuban mothers and 7–8 percent for Mexican, Puerto Rican, and Central and South American mothers.

Such differences among these Hispanic subgroups indicate that the problem with timing of care among Hispanic women is probably due to factors such as educational attainment and income. For example, in 1994, 85 percent of Cuban mothers completed high school compared with only 41 percent of Mexican mothers (8).

Place of birth of mother

Timing of care also varies by the place of birth of the mother. In 1994, 85 percent of white mothers born in the United States began care in the first trimester as compared with 71 percent of those born outside the United States (data not shown). This sizable differential is due to the large proportion of births to Mexican-born mothers among white mothers who were not born in the United States. In 1994, 54 percent of these births were to Mexican-born mothers and only 64 percent of the mothers born in Mexico began care in the first trimester of pregnancy. These differences in timing of prenatal care may be due, at least in part, to factors such as language barriers or lack of familiarity with available health care systems and social services (9).

In contrast, the differential in receipt of early care between black mothers who were and were not born in the United States was not as great and the relationship was reversed. Sixty-eight percent of black mothers born in the United States received early care as compared with 72 percent of black mothers who were not born in the United States. This is consistent with other reports that black mothers born outside the United States are relatively better off than their U.S.-born counterparts in terms of income, years of schooling completed, health status, and lifestyle characteristics such as diet and alcohol and tobacco use (10) .

Age of mother

Figure 2 indicates that initiation of care also varies with age of mother. Generally, older mothers are more likely to start care in the first trimester. Teenage mothers are the least likely of any age group of women to get early prenatal care (table 4). In 1994, 50 percent of white mothers and 42 percent of black mothers aged 15 years and younger began prenatal care in the first trimester. For mothers under 35 years of age, the percent starting care in the first trimester increased successively with age for white and black mothers. White and black mothers 30–34 years of age were most likely to initiate care in the first trimester (90 percent and 76 percent) and proportions declined slightly for women in their late thirties and in their forties for both racial groups. Although patterns are the same for white and black mothers, for each age group black mothers consistently have a lower proportion of mothers initiating care in the first trimester.

Live-birth order

Table 5 indicates that timing of prenatal care is also associated with live-birth order. Women giving birth to a first or second order child were more likely to begin care in the

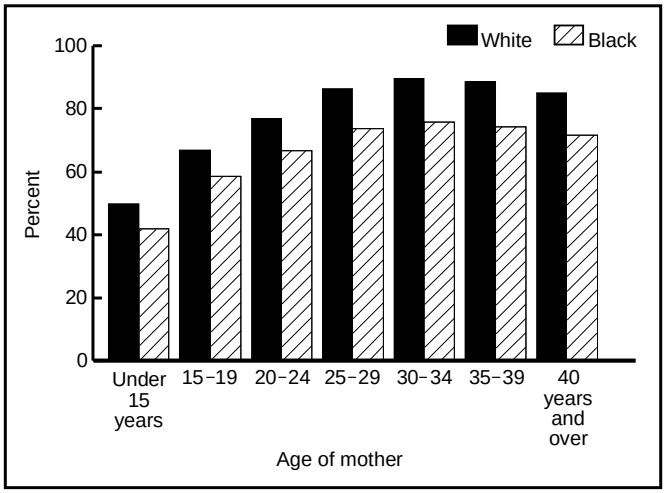


Figure 2. Percent of live births where mothers received early prenatal care, by age and race of mother: United States, 1994

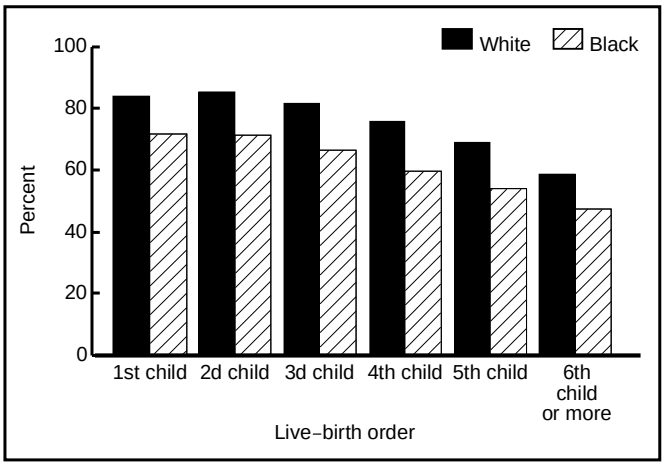


Figure 3. Percent of live births where mothers received early prenatal care, by live-birth order and race of mother: United States, 1994

first trimester than were women having a third or higher order birth (figure 3). After the second order birth, the proportion of mothers starting care in the first trimester declined. In 1994, 84 percent of white mothers having their first live birth received prenatal care in the first trimester while only 59 percent having a sixth or higher order birth got prenatal care in the first trimester. Seventy-two percent of black mothers having their first live birth began prenatal care in the first trimester compared with 47 percent bearing a sixth or higher order child. For each live-birth order, the proportion of black mothers initiating care early is substantially lower than that for the comparable group of white mothers.

Educational attainment of mother

Timing of prenatal care is associated with the years of schooling completed by the mother, a measure of socioeconomic status. The more years of schooling completed by the mother, the more likely she is to get early care. In 1994, 60 percent of mothers with 8 years of schooling or less began care in the first trimester compared with 94 percent of mothers with 16 years of schooling or more (table 6). The variation is even more striking when receipt of late or no care is examined (figure 4). In 1994, 11 percent of white mothers and 13 percent of black mothers who had 8 years of education or less received late or no care compared with 1 percent of white mothers and 2 percent of black mothers with 16 years of schooling or more.

Marital status of mother

Married women are much more likely to initiate early prenatal care than unmarried women (table 7). In 1994, 88 percent of married white mothers compared with 68 percent of unmarried white mothers began care in the first trimester. Among black mothers, 81 percent of married mothers compared with 63 percent of unmarried mothers began care in the first trimester. Unmarried mothers were more than three times as likely as married mothers to obtain late care or no care at all; large differences are seen for white and black mothers.

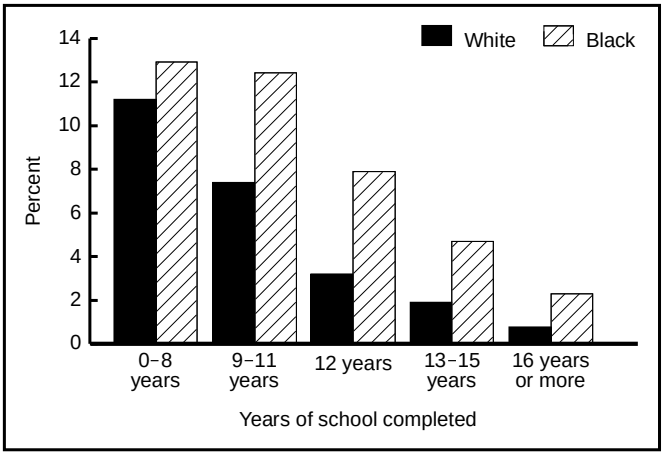


Figure 4. Percent of live births where mothers received late or no prenatal care, by educational attainment and race of mother: United States, 1994

Racial differences in the timing of care were greater for married mothers than for unmarried mothers.

Unmarried mothers are less likely to initiate early prenatal care and also have higher levels of low-birthweight babies. In 1994 an unmarried white mother was 50 percent more likely to bear a low-birthweight baby than a married white mother (8.1 compared with 5.4 percent). Among black mothers the risk was 32 percent higher for unmarried mothers compared with married mothers (14.3 compared with 10.8 percent). This higher risk of low birthweight translates into higher risk of infant mortality and morbidity for babies born to unmarried mothers.

Social characteristics

Barriers to care

Attitudinal surveys of women who receive inadequate prenatal care show that these women often do not want to be pregnant, have a low perceived value of prenatal care, or do not realize that they are pregnant until after the first trimester (11,12). These surveys also identify certain structural barriers to prenatal care including lack of health insurance coverage, transportation, and child care (12,13,14). The 1988 National Maternal and Infant Health Survey (NMIHS) conducted by the National Center for Health Statistics permits examination of such structural and attitudinal factors that affect the timing of prenatal care.

A sample of mothers who gave birth in 1988 was asked whether it was hard to get prenatal care during pregnancy because of problems with money or insurance; problems with appointments, work, or transportation; problems with health care providers; or any other problems. Fourteen percent of respondents reported problems with getting prenatal care. Table 8 shows that mothers reporting problems were more likely to initiate care late or to receive no care at all than were mothers who reported no problems in receiving care. In 1988, 66 percent of black mothers who did not report any problems getting prenatal care began prenatal care in the first trimester while only 49 percent of black mothers who did encounter problems initiated care in the first trimester. Although the levels are higher, the same pattern was observed for white mothers. Even among women reporting no problems with getting prenatal care, neither racial group reached the goal of 90 percent receiving early care.

Many studies have indicated that financial and insurance problems are the most significant barriers to prenatal care (15). Table 9 shows the percent distribution of births to mothers who encountered problems with receiving care by trimester prenatal care began and problem type. Only 54 percent of mothers with money or insurance problems began care in the first trimester. In comparison, a significantly higher proportion (66 percent) of mothers who encountered problems with health care providers began care in the first trimester. There was no significant difference in proportions of mothers receiving early care among mothers encountering financial problems (54 percent) and those encountering appointments, work, or transportation problems (61 percent). Mothers who encountered ''other'' problems were the least likely to initiate early care (42 percent). ''Other'' included not knowing that one was pregnant and not wanting others to know about the pregnancy.

In order to determine whether more educated mothers may be better equipped to overcome barriers to prenatal care, timing of prenatal care was examined in light of educational attainment for mothers who reported problems. As indicated in table 10, white mothers experiencing barriers to care with no more than a high school education were significantly less likely to receive early care (55 percent) than white mothers with 13 years of schooling or more (83 percent). The differences observed for black mothers were also significant (46 percent and 62 percent). This suggests that mothers who are more educated are better able to cope with these barriers to prenatal care than are their less-educated counterparts.

Wantedness status

As suggested earlier, timing of care is also associated with wantedness status. Table 11 uses information reported by the mother on whether she wanted to become pregnant with her last child at the time she did or earlier (''wanted at an earlier time or wanted at that time''), at a later time (''wanted some time in the future''), or not at all (''did not want''). A significantly higher proportion of white mothers who wanted to be pregnant at that time or earlier began prenatal care in the first trimester (88 percent) compared with white mothers who had a mistimed pregnancy (72 percent) or an unwanted pregnancy (69 percent). Black mothers wanting a birth at that time or earlier were also notably more likely to begin care early (75 percent) compared with those bearing a mistimed or unwanted baby (57 percent and 52 percent). There was no significant difference between mothers who had a mistimed pregnancy and those who had an unwanted pregnancy for black or white mothers.

A significantly higher proportion of married mothers who wanted to be pregnant at that time or earlier began care in the first trimester (90 percent) compared with married mothers who had a mistimed pregnancy (77 percent) or who had an unwanted pregnancy (73 percent). For unmarried mothers there were significant differences between all three categories of wantedness (table 12).

Summary

Mothers who are the least likely to obtain early prenatal care (that is, women who are black, Puerto Rican, American Indian, teenaged, poorly educated, unmarried, or who have problems with money, insurance, transportation, or child care) are also the ones whose infants have higher levels of poor outcomes. Early prenatal care is essential for these women at increased medical and social risk because it provides the opportunity for interventions and education necessary to prevent or reduce the risks. Prenatal care visits give the health care provider the opportunity to counsel expectant mothers on the benefits of proper nutrition, adequate weight gain, and breastfeeding as well as the negative effects of stress, anxiety, depression, extreme physical work and exercise, tobacco, alcohol, illicit drug use, and exposure to environmental hazards (7).

The steady improvements in timing of care achieved in the 1970's did not continue in the 1980's but improvements have occurred in the early 1990's. Black mothers, whose overall prenatal care usage comes much later than white mothers, experienced decreases in the proportions of mothers receiving early care in the 1980's and improvements in the 1990's. The proportion of mothers who initiated care in the first trimester is now at its highest point since 1969, the first year that prenatal care data were collected on the birth certificate. Continued improvements in the overall rate will depend primarily upon the progress in obtaining early care by the high-risk groups discussed in this report.

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List of detailed tables

Table 1. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to race of mother: United States, 1980–94

Race of mother and year	All births[1]	Trimester of pregnancy prenatal care began				
		Total	1st	2d	3d or no care	
					Total	3d	No care
All races[2]	Number	Percent distribution					
1994	3,952,767	100.0	80.2	15.4	4.4	3.0	1.4
1993	4,000,240	100.0	78.9	16.3	4.8	3.2	1.6
1992	4,065,014	100.0	77.7	17.1	5.2	3.5	1.7
1991	4,110,907	100.0	76.2	18.0	5.8	3.9	1.9
1990	4,158,212	100.0	75.8	18.1	6.1	4.1	2.0
1989	4,040,958	100.0	75.5	18.1	6.4	4.3	2.2
1988	3,909,510	100.0	75.9	18.0	6.1	4.2	1.9
1987	3,809,394	100.0	76.0	17.9	6.1	4.1	2.0
1986	3,756,547	100.0	75.9	18.1	6.0	4.1	1.9
1985	3,760,561	100.0	76.2	18.1	5.7	4.0	1.7
1984[3]	3,669,141	100.0	76.5	17.9	5.6	3.9	1.7
1983[3]	3,638,933	100.0	76.2	18.3	5.6	3.9	1.6
1982[3]	3,680,537	100.0	76.1	18.5	5.5	3.9	1.5
1981[3]	3,629,238	100.0	76.3	18.5	5.2	3.8	1.4
1980[3]	3,612,258	100.0	76.3	18.6	5.1	3.8	1.3
White							
1994	3,121,004	100.0	82.8	13.6	3.6	2.6	1.0
1993	3,149,833	100.0	81.8	14.3	3.9	2.8	1.2
1992	3,201,678	100.0	80.8	15.0	4.2	2.9	1.2
1991	3,241,273	100.0	79.5	15.9	4.7	3.3	1.4
1990	3,290,273	100.0	79.2	15.9	4.9	3.5	1.4
1989	3,192,355	100.0	78.9	15.9	5.2	3.6	1.6
1988	3,102,083	100.0	79.3	15.7	5.0	3.6	1.5
1987	3,043,828	100.0	79.3	15.7	5.0	3.5	1.5
1986	3,019,175	100.0	79.1	16.0	5.0	3.5	1.5
1985	3,037,913	100.0	79.3	15.9	4.8	3.4	1.3
1984[3]	2,967,100	100.0	79.6	15.8	4.7	3.3	1.3
1983[3]	2,946,468	100.0	79.3	16.1	4.6	3.3	1.3
1982[3]	2,984,817	100.0	79.2	16.3	4.5	3.3	1.2
1981[3]	2,947,679	100.0	79.3	16.4	4.3	3.2	1.1
1980[3]	2,936,351	100.0	79.2	16.5	4.3	3.3	1.0
Black							
1994	636,391	100.0	68.3	23.5	8.2	4.9	3.3
1993	658,875	100.0	66.0	25.0	9.0	5.2	3.8
1992	673,633	100.0	63.9	26.2	9.9	5.6	4.2
1991	682,602	100.0	61.9	27.4	10.7	6.1	4.6
1990	684,336	100.0	60.6	28.0	11.3	6.6	4.7
1989	673,124	100.0	60.0	28.1	11.9	6.8	5.1
1988	638,562	100.0	60.7	28.3	11.0	6.9	4.2
1987	611,173	100.0	60.8	28.0	11.2	6.8	4.4
1986	592,910	100.0	61.2	28.1	10.7	6.6	4.1
1985	581,824	100.0	61.5	28.4	10.2	6.7	3.4
1984[3]	568,138	100.0	61.9	28.4	9.7	6.4	3.3
1983[3]	562,624	100.0	61.2	29.0	9.8	6.5	3.3
1982[3]	568,506	100.0	61.1	29.2	9.7	6.5	3.2
1981[3]	564,955	100.0	62.1	28.7	9.2	6.3	2.9
1980[3]	568,080	100.0	62.4	28.7	8.9	6.1	2.8

[1]Includes births with trimester of pregnancy prenatal care began not stated.

[2]Includes races other than white and black.

[3]Based on 100 percent of births in selected States and on a 50-percent sample of births in all other States.

Table 2. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to specified race of mother: United States, 1994

Race of mother	All births[1]	Trimester of pregnancy prenatal care began			
		Total	1st	2d	3d or no care
	Number	Percent distribution			
All races	3,952,767	100.0	80.2	15.4	4.4
White	3,121,004	100.0	82.8	13.6	3.6
Black	636,391	100.0	68.3	23.5	8.2
American Indian[2]	37,740	100.0	65.2	25.0	9.8
Chinese	26,578	100.0	86.2	11.1	2.7
Japanese	9,230	100.0	89.2	8.9	1.9
Hawaiian	5,955	100.0	77.0	18.3	4.7
Filipino	30,495	100.0	81.3	15.1	3.6
Other Asian and Pacific Islander	85,374	100.0	76.2	19.0	4.8

[1]Includes births with trimester of pregnancy prenatal care began not stated.
[2]Includes births to Aleuts and Eskimos.

Table 3. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to Hispanic origin of mother and by race of mother for mothers of non-Hispanic origin: United States, 1994

Origin of mother	All births[1]	Trimester of pregnancy prenatal care began			
		Total	1st	2d	3d or no care
	Number	Percent distribution			
All origins[2]	3,952,767	100.0	80.2	15.4	4.4
Hispanic	665,026	100.0	68.9	23.5	7.6
Mexican	454,536	100.0	67.3	24.4	8.3
Puerto Rican	57,240	100.0	71.7	21.8	6.5
Cuban	11,889	100.0	90.1	8.3	1.6
Central and South American	93,485	100.0	71.2	22.3	6.5
Other and unknown Hispanic	47,876	100.0	72.1	21.7	6.2
Non-Hispanic[3]	3,287,741	100.0	82.5	13.8	3.7
White	2,474,162	100.0	86.5	11.0	2.5
Black	624,303	100.0	68.3	23.5	8.2

[1]Includes births with trimester of pregnancy prenatal care began not stated.
[2]Includes Hispanic origin not stated.
[3]Includes races other than white and black.

Table 4. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to age and race of mother: United States, 1994

Age and race of mother	All births[1]	Total	Trimester of pregnancy prenatal care began		
			1st	2d	3d or no care
	Number	Percent distribution			
All races[2]	3,952,767	100.0	80.2	15.4	4.4
Under 15 years	12,901	100.0	45.7	38.4	15.9
15–19 years	505,488	100.0	64.3	27.7	8.0
15 years	30,742	100.0	54.8	34.1	11.1
16 years	63,125	100.0	59.3	31.2	9.5
17 years	101,302	100.0	63.3	28.4	8.3
18 years	137,547	100.0	65.4	27.0	7.6
19 years	172,772	100.0	67.6	25.4	7.0
20–24 years	1,001,418	100.0	74.6	19.8	5.6
25–29 years	1,088,845	100.0	84.5	12.1	3.4
30–34 years	906,498	100.0	87.7	9.6	2.7
35–39 years	371,608	100.0	86.8	10.3	2.9
40 years and over	66,009	100.0	83.0	12.9	4.0
White	3,121,004	100.0	82.8	13.6	3.6
Under 15 years	5,978	100.0	49.9	34.9	15.2
15–19 years	348,081	100.0	66.9	25.9	7.2
15 years	17,443	100.0	58.3	31.2	10.4
16 years	40,198	100.0	62.1	29.0	9.0
17 years	68,747	100.0	65.6	26.8	7.6
18 years	96,605	100.0	67.7	25.5	6.8
19 years	125,088	100.0	69.7	24.1	6.2
20–24 years	764,085	100.0	76.9	18.3	4.9
25–29 years	889,581	100.0	86.5	10.8	2.8
30–34 years	754,871	100.0	89.6	8.4	2.1
35–39 years	305,291	100.0	88.7	9.0	2.3
40 years and over	53,117	100.0	85.1	11.5	3.4
Black	636,391	100.0	68.3	23.5	8.2
Under 15 years	6,465	100.0	42.1	41.7	16.1
15–19 years	140,968	100.0	58.7	31.5	9.8
15 years	12,297	100.0	50.1	37.9	12.0
16 years	20,853	100.0	54.6	35.0	10.4
17 years	29,413	100.0	58.8	31.5	9.7
18 years	36,489	100.0	59.8	30.5	9.6
19 years	41,916	100.0	62.3	28.7	9.0
20–24 years	197,841	100.0	66.8	24.9	8.3
25–29 years	142,355	100.0	73.8	18.9	7.3
30–34 years	99,155	100.0	75.9	17.1	7.0
35–39 years	42,029	100.0	74.5	18.3	7.3
40 years and over	7,578	100.0	71.8	19.9	8.3

[1]Includes births with trimester of pregnancy prenatal care began not stated.

[2]Includes races other than white and black.

Table 5. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to live-birth order and race of mother: United States, 1994

Live-birth order and race of mother	All births[1]	Trimester of pregnancy prenatal care began			
		Total	1st	2d	3d or no care
	Number	Percent distribution			
All races[2,3]	3,952,767	100.0	80.2	15.4	4.4
First child	1,618,811	100.0	82.0	14.5	3.5
Second child	1,266,056	100.0	83.1	13.4	3.5
Third child	631,571	100.0	78.6	16.5	4.9
Fourth child	245,636	100.0	71.8	20.8	7.4
Fifth child	93,043	100.0	64.5	24.7	10.7
Sixth child and more	74,861	100.0	54.7	29.1	16.2
White[3]	3,121,004	100.0	82.8	13.6	3.6
First child	1,290,315	100.0	84.0	12.9	3.1
Second child	1,022,360	100.0	85.3	11.9	2.9
Third child	496,852	100.0	81.4	14.7	3.9
Fourth child	182,812	100.0	75.5	18.7	5.8
Fifth child	64,042	100.0	68.8	22.7	8.4
Sixth child and more	47,148	100.0	58.7	27.8	13.5
Black[3]	636,391	100.0	68.3	23.5	8.2
First child	245,196	100.0	71.8	22.5	5.7
Second child	182,499	100.0	71.3	21.8	6.9
Third child	107,572	100.0	66.5	24.5	9.1
Fourth child	51,665	100.0	59.8	27.3	12.9
Fifth child	23,832	100.0	53.9	29.2	16.9
Sixth child and more	21,345	100.0	47.3	29.8	22.9

[1]Includes births with trimester of pregnancy prenatal care began not stated.
[2]Includes races other than white and black.
[3]Includes births with live-birth order not stated.

Table 6. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to educational attainment and race of mother: United States, 1994

Years of school completed by mother and race of mother	All births[1]	Trimester of pregnancy prenatal care began			
		Total	1st	2d	3d or no care
	Number	Percent distribution			
All races[2,3]	3,952,767	100.0	80.2	15.4	4.4
0–8 years	247,285	100.0	60.1	28.8	11.1
9–11 years	644,894	100.0	65.0	26.2	8.7
12 years	1,364,436	100.0	79.4	16.4	4.2
13–15 years	845,172	100.0	86.6	11.0	2.4
16 or more years	793,827	100.0	93.8	5.2	1.0
White[3]	3,121,004	100.0	82.8	13.6	3.6
0–8 years	209,550	100.0	60.8	28.0	11.2
9–11 years	460,295	100.0	67.9	24.7	7.4
12 years	1,052,684	100.0	82.4	14.4	3.2
13–15 years	673,546	100.0	88.7	9.4	1.9
16 or more years	685,328	100.0	94.7	4.6	0.8
Black[3]	636,391	100.0	68.3	23.5	8.2
0–8 years	22,741	100.0	52.7	34.4	12.9
9–11 years	160,197	100.0	57.1	30.5	12.4
12 years	253,759	100.0	68.2	23.8	7.9
13–15 years	132,460	100.0	77.4	17.9	4.7
16 or more years	54,312	100.0	87.4	10.4	2.3

[1]Includes births with trimester of pregnancy prenatal care began not stated.
[2]Includes races other than white and black.
[3]Includes births with educational attainment of mother not stated.

Table 7. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to marital status and race of mother: United States, 1980 and 1994

Marital status and race of mother and year	All births[1]	Trimester of pregnancy prenatal care began				
		Total	1st	2d	3d or no care	
					Total	3d	No care
All races[2]	Number	Percent distribution					
All births:							
1994	3,952,767	100.0	80.2	15.4	4.4	3.0	1.4
1980[3]	3,612,258	100.0	76.3	18.6	5.1	3.8	1.3
Births to married women:							
1994	2,663,175	100.0	87.0	10.7	2.4	1.8	0.6
1980[3]	2,946,511	100.0	81.3	15.2	3.5	2.7	0.8
Births to unmarried women:							
1994	1,289,592	100.0	66.1	25.2	8.6	5.6	3.0
1980[3]	665,747	100.0	53.8	33.7	12.5	8.7	3.8
White							
All births:							
1994	3,121,004	100.0	82.8	13.6	3.6	2.6	1.0
1980[3]	2,936,351	100.0	79.2	16.5	4.3	3.3	1.0
Births to married women:							
1994	2,326,743	100.0	87.7	10.1	2.2	1.7	0.5
1980[3]	2,599,440	100.0	82.5	14.4	3.1	2.5	0.6
Births to unmarried women:							
1994	794,261	100.0	68.2	24.1	7.7	5.3	2.4
1980[3]	328,984	100.0	53.2	33.5	13.3	9.4	3.9
Black							
All births:							
1994	636,391	100.0	68.3	23.5	8.2	4.9	3.3
1980[3]	568,080	100.0	62.4	28.7	8.9	6.1	2.8
Births to married women:							
1994	188,076	100.0	81.2	15.0	3.7	2.6	1.2
1980[3]	248,450	100.0	72.2	22.1	5.7	4.2	1.5
Births to unmarried women:							
1994	448,315	100.0	62.8	27.1	10.1	5.9	4.2
1980[3]	318,799	100.0	54.7	33.9	11.4	7.6	3.7

[1]Includes births with trimester of pregnancy prenatal care began not stated.

[2]Includes races other than white and black.

[3]Based on 100 percent of births in selected States and on a 50-percent sample of births in all other States.

Table 8. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to problem status with receiving prenatal care and race of child: United States, 1988 National Maternal and Infant Health Survey

Problem status and race of child	All births in thousands	Total	Trimester of pregnancy prenatal care began		
			1st	2d	3d or no care
	Number	Percent and standard error			
All races[1]	3,899	100.0	78.3 (0.5)	16.6 (0.5)	5.1 (0.3)
Problems	539	100.0	59.2 (1.8)	26.6 (1.7)	14.3 (1.2)
No problems	3,360	100.0	81.5 (0.5)	15.0 (0.5)	3.6 (0.3)
White	3,033	100.0	81.6 (0.6)	14.3 (0.6)	4.1 (0.3)
Problems	404	100.0	61.9 (2.3)	26.1 (2.1)	11.9 (1.6)
No problems	2,629	100.0	84.7 (0.7)	12.5 (0.6)	2.8 (0.3)
Black	667	100.0	62.7 (0.7)	27.5 (0.7)	9.8 (0.4)
Problems	113	100.0	48.9 (1.8)	27.3 (1.6)	23.9 (1.5)
No problems	555	100.0	65.5 (0.8)	27.6 (0.7)	6.9 (0.4)

[1]Includes races other than white and black.

Table 9. Number of live births to mothers who reported a problem receiving prenatal care and percent of distribution by trimester of pregnancy prenatal care began, according to type of problem and race of child: United States, 1988 National Maternal and Infant Health Survey

Problem type and race of child	All births in thousands	Total	Trimester of pregnancy prenatal care began		
			1st	2d	3d or no care
	Number	Percent and standard error			
All races[1]	539	100.0	59.2 (1.8)	26.6 (1.7)	14.3 (1.2)
Money or insurance	259	100.0	53.8 (2.8)	29.0 (2.5)	17.2 (2.1)
Appointments, work, or transportation	229	100.0	60.7 (2.8)	29.2 (2.6)	10.1 (1.5)
Health care providers	166	100.0	65.7 (3.3)	24.4 (3.0)	9.9 (1.9)
Other	89	100.0	41.5 (4.3)	34.0 (4.3)	24.5 (3.6)
White	404	100.0	61.9 (2.3)	26.1 (2.1)	11.9 (1.6)
Money or insurance	206	100.0	55.3 (3.3)	28.9 (3.1)	15.9 (2.5)
Appointments, work, or transportation	161	100.0	64.2 (3.6)	29.5 (3.4)	*
Health care providers	132	100.0	68.1 (3.9)	23.3 (3.5)	*
Other	60	100.0	45.1 (6.0)	35.5 (6.0)	*
Black	113	100.0	48.9 (1.8)	27.3 (1.6)	23.9 (1.5)
Money or insurance	43	100.0	46.9 (2.9)	28.4 (2.6)	24.7 (2.5)
Appointments, work, or transportation	53	100.0	50.3 (2.8)	28.8 (2.5)	20.9 (2.2)
Health care providers	27	100.0	56.4 (3.7)	24.9 (3.3)	18.7 (2.9)
Other	26	100.0	32.6 (3.5)	29.2 (3.4)	38.3 (3.6)

*Does not meet standards of precision and reliability; less than 30 sample cases.

[1]Includes races other than white and black.

Table 10. Number and percent distribution of live births to mothers who reported a problem receiving prenatal care by trimester of pregnancy prenatal care began, according to educational attainment of mother and race of child: United States, 1988 National Maternal and Infant Health Survey

Years of school completed by mother and race of child	*All births in thousands*	*Total*	*Trimester of pregnancy prenatal care began*		
			1st	*2d*	*3d or no care*
	Number	Percent and standard error			
All races[1]	539	100.0	59.2 (1.8)	26.6 (1.7)	14.3 (1.2)
0–12 years	406	100.0	52.5 (2.2)	30.4 (2.0)	17.1 (1.5)
13 years or more	133	100.0	79.3 (3.0)	15.1 (2.7)	5.6 (1.7)
White	404	100.0	61.9 (2.3)	26.1 (2.1)	11.9 (1.6)
0–12 years	299	100.0	54.5 (2.8)	30.7 (2.6)	14.8 (2.0)
13 years or more	105	100.0	82.9 (3.5)	*	*
Black	113	100.0	48.9 (1.8)	27.3 (1.6)	23.9 (1.5)
0–12 years	93	100.0	46.0 (2.0)	27.7 (1.8)	26.3 (1.8)
13 years or more	19	100.0	62.4 (4.2)	25.5 (3.8)	*

*Does not meet standards of precision and reliability; less than 30 sample cases.
[1]Includes races other than white and black.

Table 11. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to wantedness status and race of child: United States, 1988 National Maternal and Infant Health Survey

Wantedness status and race of child	*All births in thousands*	*Total*	*Trimester of pregnancy prenatal care began*		
			1st	*2d*	*3d or no care*
	Number	Percent and standard error			
All races[1]	3,899	100.0	78.3 (0.5)	16.6 (0.5)	5.1 (0.3)
Wanted then or earlier	2,213	100.0	86.8 (0.6)	10.3 (0.6)	2.9 (0.3)
Wanted later	1,413	100.0	68.1 (1.1)	24.8 (1.0)	7.1 (0.6)
Unwanted	272	100.0	62.6 (2.2)	25.2 (2.0)	12.2 (1.5)
White	3,033	100.0	81.6 (0.6)	14.3 (0.6)	4.1 (0.3)
Wanted then or earlier	1,854	100.0	88.2 (0.7)	9.3 (0.6)	2.5 (0.3)
Wanted later	1,021	100.0	71.5 (1.4)	22.6 (1.3)	6.0 (0.7)
Unwanted	158	100.0	69.4 (3.5)	20.4 (3.1)	*
Black	667	100.0	62.7 (0.7)	27.5 (0.7)	9.8 (0.4)
Wanted then or earlier	231	100.0	75.2 (1.1)	18.9 (1.0)	5.9 (0.6)
Wanted later	332	100.0	57.1 (1.1)	32.3 (1.0)	10.6 (0.7)
Unwanted	104	100.0	52.2 (1.9)	31.6 (1.8)	16.2 (1.4)

*Does not meet standards of precision and reliability; less than 30 sample cases.
[1]Includes races other than white and black.

Table 12. Number and percent distribution of live births by trimester of pregnancy prenatal care began, according to wantedness and marital status: United States, 1988 National Maternal and Infant Health Survey

Wantedness and marital status	*All births in thousands*	*Total*	*Trimester of pregnancy prenatal care began*		
			1st	*2d*	*3d or no care*
	Number	Percent and standard error			
All births	3,899	100.0	78.3 (0.5)	16.6 (0.5)	5.1 (0.3)
Wanted then or earlier	2,213	100.0	86.8 (0.6)	10.3 (0.6)	2.9 (0.3)
Wanted later	1,413	100.0	68.1 (1.1)	24.8 (1.0)	7.1 (0.6)
Unwanted	272	100.0	62.6 (2.2)	25.2 (2.0)	12.2 (1.5)
Married	2,904	100.0	85.1 (0.6)	11.8 (0.5)	3.1 (0.3)
Wanted then or earlier	1,919	100.0	89.5 (0.6)	8.3 (0.6)	2.2 (0.3)
Wanted later	821	100.0	77.2 (1.3)	18.3 (1.2)	4.6 (0.6)
Unwanted	164	100.0	72.7 (3.0)	20.5 (2.7)	6.8 (1.7)
Unmarried	995	100.0	58.4 (1.3)	30.9 (1.2)	10.8 (0.8)
Wanted then or earlier	295	100.0	68.6 (2.4)	24.1 (2.2)	7.3 (1.3)
Wanted later	591	100.0	55.3 (1.7)	34.0 (1.7)	10.7 (1.0)
Unwanted	109	100.0	47.3 (3.1)	32.3 (2.9)	20.4 (2.6)

Appendix
Technical notes

Computation of percents

Percent distributions are computed using only events for which the characteristic is reported. The number of events with information not stated is subtracted from the total before computation of these measures.

Accuracy of reporting

In 1994 month of pregnancy prenatal care began was not reported for 2.3 percent of the births. Information on when prenatal care is initiated is either self-reported by the mother or derived from the medical record, both of which may have inaccuracies (16).

Tests of significance for the National Maternal and Infant Health Survey (NMIHS)

The standard error (SE) may be used to assess the statistical signifance of the difference between two rates or percents. If the difference between two rates (R_1-R_2) exceeds:

$$1.96 \sqrt{\mathrm{SE}_{R_1}^2 + \mathrm{SE}_{R_2}^2}$$

it may be regarded as statistically significant at the 0.05 level.

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