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Source of Payment for the Delivery: Births in a 33-state and District of Columbia Reporting Area, 2010

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Abstract

Objectives—This report presents new data from birth certificates on the principal source of payment for the delivery in 2010 for the following groups: private insurance, Medicaid, self-pay (uninsured), and other payment sources. These data are for the 33 states and District of Columbia that adopted the 2003 U.S. Standard Certificate of Live Birth by January 2010, representing 76% of all 2010 U.S. births. Trend data for the United States for 1990–2010 are also presented from the Centers for Disease Control and Prevention's National Center for Health Statistics, National Hospital Discharge Survey (NHDS), to provide a national comparison and historical context.

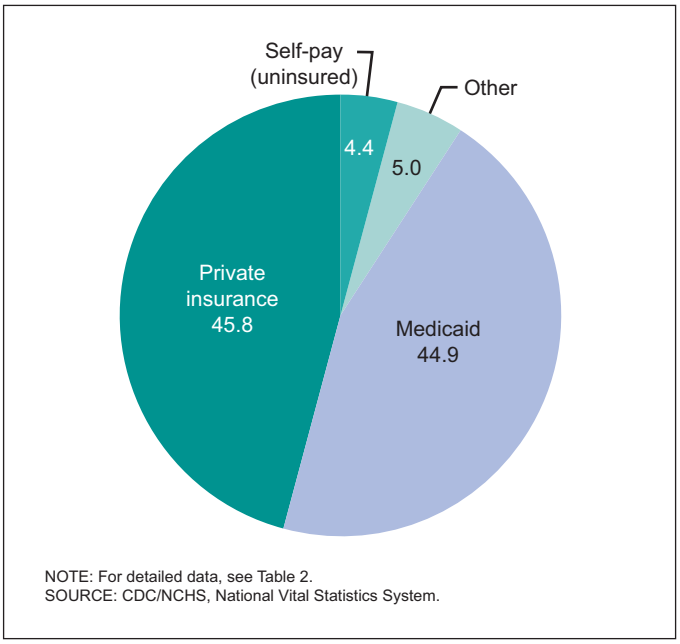
Methods—Tabular and graphical data on deliveries by the principal source of payment for 2010 from the birth certificate are compared with NHDS estimates. Trend data for 1990–2010 from NHDS are also presented. Detailed data from the birth certificate on maternal characteristics, prenatal care receipt, and cesarean delivery are provided.

Results—Private insurance was the most frequent payment source for deliveries in the birth certificate-revised reporting area in 2010 (45.8% of births), followed closely by Medicaid (44.9%), "other" payment sources (5.0%), and self-pay (4.4%). Similarly, NHDS data show that private insurance was the most common payment source for deliveries nationally in 2010, followed by Medicaid. Privately insured deliveries declined over the last decade, while the use of Medicaid insurance increased. Medicaid insurance of deliveries was highest for births to teenagers and for non-Hispanic black and Hispanic mothers, according to the birth certificate data. Privately insured mothers were most likely of all payment groups to receive early prenatal care and to have cesarean deliveries.

Keywords: birth certificate • Medicaid • health insurance • uninsured

Introduction

Health care coverage of reproductive-age women is a significant public health issue, as it is among the factors associated with increased use of reproductive health services, including prenatal care (1). Early prenatal care can detect and treat risk factors that could potentially lead to poor outcomes (1). As private insurance



NOTE: For detailed data, see Table 2.
SOURCE: CDC/NCHS, National Vital Statistics System.

Figure 1. Percent distribution of principal payment source for the delivery: 33-state and District of Columbia reporting area, 2010

coverage declined over the last three decades (2,3), Medicaid expanded to cover more pregnant women: The minimum income eligibility was increased [to 133% of federal poverty level (FPL)], and states were allowed to increase eligibility further (to 185% of FPL) (3–5). Low-income pregnant women who enroll in Medicaid have access to prenatal care services, labor and delivery services, and health care coverage for 60 days postpartum; their newborns receive 1 year of health care coverage (6).

Previous research has shown associations between the source of payment for the delivery and the management of labor and delivery—specifically, that privately insured mothers have higher rates of cesarean deliveries and obstetric interventions compared with those on Medicaid (7–10). Part of the difference has been attributed to variations in maternal demographic, economic, and clinical risk factors among payment groups. However, some studies have found that the differences in cesarean rates by payment groups persist after these confounding factors are controlled (7). Birth outcomes such as preterm delivery and low birth weight have also been shown to vary by payment source (i.e., more adverse outcomes for Medicaid recipients compared with privately insured mothers), but these differences are often diminished or eliminated when the other relevant factors are considered (11).

Data on the principal source of payment for deliveries became available with the 2003 revision of the U.S. Standard Certificate of Live Birth. In 2010, 33 states and the District of Columbia had adopted the revised standard and collected information on the payment source. This report presents these new data in detail for the first time. These data represent 76% of all U.S. births in 2010; in 2014, it is expected that all states will use the 2003 standard certificate.

The quality of these new birth certificate data is discussed in this report. One way in which quality is assessed is by comparison with nationally representative data on the source of payment for the delivery from the National Center for Health Statistics' National Hospital Discharge Survey (NHDS). Also discussed are the results from quality studies in two states that reveal how often the birth certificate data on source of payment accurately reflect the information found on the medical record, which is considered to be the gold standard.

One strength of birth certificate data is that they are based on 100% of birth records filed in the reporting area (and nationally when all states use the 2003 standard certificate in 2014) and can be used to examine rates and differentials for small groups and rare events. Such analyses are often difficult to undertake with survey data due to limited sample cases. This report illustrates the strengths of birth certificate data, for example, in the detailed analysis of payment source by maternal age combined with race and ethnicity. Prenatal care receipt and cesarean rates presented in this report for each payment group by race and ethnicity also showcase the uses of the birth certificate data.

The birth certificate also includes many other health items not in this report, such as maternal risk factors during pregnancy and infant gestational age and birth weight. More complex multivariate analyses using these health variables are possible and can be examined in more detail with birth certificate data.

Methods

Birth certificate data

Data from the birth certificate are based on 100% of the births registered in the 33 states and the District of Columbia that had implemented the 2003 revision of the birth certificate as of January 1, 2010. The 33 states are: California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, and Wyoming.

Births in the reporting area represent 76% of all births in the United States in 2010 but are not generalizable to the entire United States in 2010. There are important differences between the reporting area and the United States, most notably in the race and Hispanic origin distributions. Births to Hispanic women are somewhat overrepresented, while births to non-Hispanic white and black women are underrepresented [see Table I in Technical Notes and the *User Guide to the 2010 Natality Public Use File* (12)]. Smaller differences are seen between the reporting area and the United States in maternal age, marital status, and infant characteristics. Although not nationally representative, these birth certificate data have some advantages over sample survey data because, as noted, they are based on 100% of births filed in the reporting area and can be used to examine rare events and small population groups.

Records for states in the reporting area with missing information on the principal source of payment numbered 81,547 (of 3,055,884 births), or 2.7%. The majority of areas had less than 5% missing information, although two states had more than 20% (New Mexico, 27.2%, and Nevada, 23.1%; see Technical Notes). Because these two states represented only 2% of all births in the reporting area, their impact on the reporting area totals is minimal.

The principal source of payment for the delivery is the source that covered the majority of the delivery costs, even if there was more than one source. For ease of writing, the term "source of payment" will be used for this report. The four categories of payment groups included in this report are: private insurance, Medicaid, self-pay, and other payment sources. The Medicaid category includes state programs comparable with Medicaid. Births reported as self-pay are those in which no third-party payer was identified; these are generally considered to be births to the uninsured. Accordingly, in this report, the terms "self-pay" and "uninsured" are used interchangeably.

The "other" category is a heterogeneous group and includes Indian Health Service, CHAMPUS/TRICARE, other government programs, as well as other miscellaneous payment sources. A subset of the revised reporting area, comprising 25 states, provides more detailed payment groups within the broad "other" category. Analysis for this 25-state area reveals differences in the "other" composition by racial and ethnic group as well as by state; see Technical Notes for more detail. Due to its heterogeneity and more limited reporting area for detailed data, discussion of the "other" payment group is limited for this report.

Race and Hispanic origin are reported independently on the birth certificate. This report includes data for "single-race, non-Hispanic white," "single-race, non-Hispanic black," "single-race, non-Hispanic Asian," and Hispanic births. Detailed information on Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native (AIAN), and multiple-race births is not shown because of the small numbers of births for these groups in this reporting area; summary data are shown for these groups. Detailed results for Hispanic subgroups are also not shown.

Differences in maternal age among payment groups can influence the other characteristics examined in this report. Therefore, age adjustment is employed to eliminate the effect of maternal age among payment groups; see Technical Notes for more detailed information on the methodology used for age adjustment.

National Hospital Discharge Survey

Trend data on source of payment for 1990–2010 are from the National Hospital Discharge Survey, and include deliveries in the nonfederal, short-stay hospitals that participated in NHDS and are weighted to be nationally representative. Although data on payment source from NHDS are available since 1965, a major redesign of the survey occurred in 1988 and may affect trend data (13). Thus, the trends in this report are limited to 1990–2010.

NHDS data for 2010 are used as a national comparison to the birth certificate data to try to ascertain the data quality on an aggregate level. The categories of payment sources included in NHDS are generally more detailed than on the birth certificate and were recoded to be consistent with the birth certificate categories; see Technical Notes. Although the data for NHDS are per delivery compared to per birth for the birth certificate data, the effect of this difference is minimal; see the Results section for "Deliveries by payment source—birth certificate data and NHDS" for more detail on this and other discrepancies. The terms "births" and "deliveries" are used interchangeably in this report.

While national estimates on source of payment are available for NHDS, many important variables on the birth certificate examined in this report, such as Hispanic origin, are not available from this survey.

Results

Deliveries by payment source—birth certificate data and NHDS

- Private insurance was the most frequently reported source of payment in the revised birth certificate reporting area (45.8%), followed by Medicaid (44.9%), "other" payment sources (5.0%), and self-pay (4.4%) (Table A and Figure 1). Thus, about 91% of births were insured by either private insurance or Medicaid.
- National estimates of source of payment for deliveries from NHDS were similar to the birth certificate results: Private insurance was also the most common payment source, accounting for one-half of deliveries (50.1%), followed by Medicaid (43.4%), other payment sources (3.9%), and self-pay (2.7%) (Table 1 and Figure 2).

Although generally similar, differences were observed between NHDS and the birth certificate in 2010 in the distributions of source of payment for deliveries. Private insurance coverage was the most common payment source in both but was about 9% higher for NHDS (50.1%) than for the birth certificate (45.8%). Medicaid was the second most frequent payment source in both data sources but was about 3% higher for the birth certificate data (44.9%) than for NHDS (43.4%). However, these differences were not statistically significant, as the birth certificate figures were within the 95% confidence intervals of NHDS estimates for these two payment sources. Deliveries with self-pay and other payment sources were higher in the birth certificate data than in NHDS: 4.4% compared with 2.7% for self-pay, and 5.0% compared with 3.9% for "other" payment sources. These differences were statistically significant.

Table A. Percent distribution of births by principal payment source for the delivery, by race and Hispanic origin of mother: 33 reporting states and District of Columbia, 2010

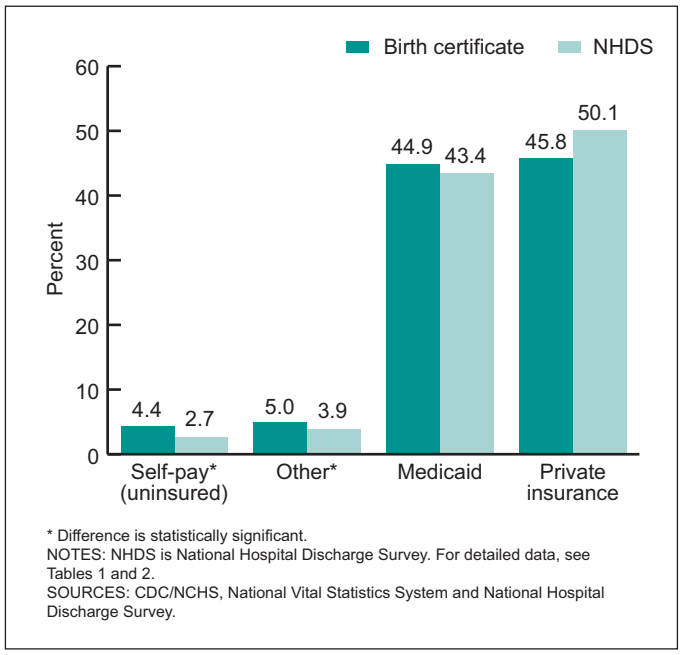
Race and Hispanic origin	All births	Total	Medicaid	Private insurance	Self-pay[1]	Other	Not stated
		Percent					
All races[2]	3,055,884	100.0	44.9	45.8	4.4	5.0	81,547
One race, non-Hispanic:							
White	1,573,540	100.0	33.0	59.7	2.9	4.3	31,144
Black	407,522	100.0	65.0	26.9	3.3	4.8	12,089
American Indian or Alaskan Native	21,744	100.0	65.1	18.2	1.9	14.9	710
Asian	163,307	100.0	25.9	66.4	3.9	3.8	2,750
Native Hawaiian or Other Pacific Islander	5,843	100.0	50.7	34.0	4.9	10.4	148
More than one race, non-Hispanic	46,775	100.0	48.5	42.5	2.4	6.6	990
Hispanic	799,928	100.0	61.4	24.4	8.2	6.0	19,789
Mexican	523,677	100.0	62.8	21.9	8.8	6.4	11,027
Puerto Rican	45,635	100.0	60.8	32.4	2.0	4.8	832
Cuban	15,215	100.0	54.2	40.7	2.6	2.4	167
Central or South American	103,241	100.0	51.6	28.4	13.3	6.7	3,462
Other or unknown	112,160	100.0	64.7	26.8	3.7	4.8	4,301

[1]No third-party payer listed; uninsured.

[2]Includes other races not shown and origin not stated.

NOTES: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births. Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with 1997 Office of Management and Budget standards; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

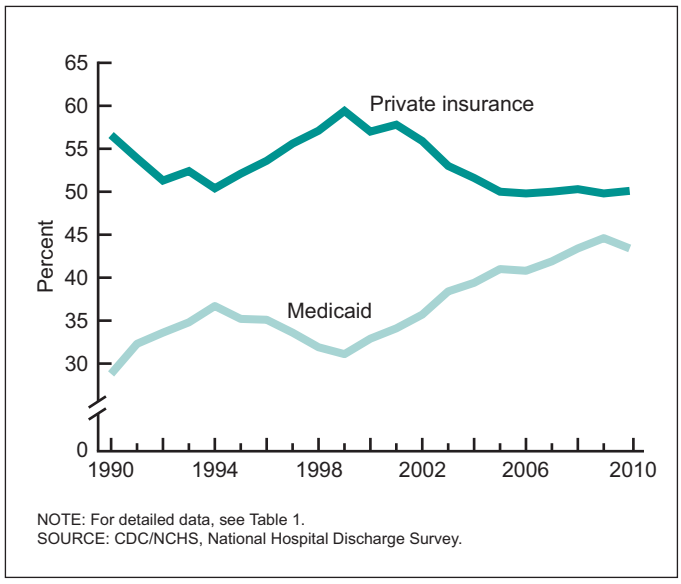


* Difference is statistically significant.
NOTES: NHDS is National Hospital Discharge Survey. For detailed data, see Tables 1 and 2.
SOURCES: CDC/NCHS, National Vital Statistics System and National Hospital Discharge Survey.

Figure 2. Birth certificate reporting area and National Hospital Discharge Survey data on principal payment source for the delivery, 2010

There are a few possible reasons for these differences. First, the birth certificate data are subnational, representing 76% of all births in the United States. This reporting area is not nationally representative, whereas NHDS is a nationally representative survey of deliveries in nonfederal, short-stay hospitals; see Technical Notes for more information on the birth certificate reporting area and, specifically, how the differences between the reporting area and the United States in concentrations of Hispanic women influence the source of payment data. A second possible reason for the differences in source of payment distributions is that birth certificate data include all U.S. hospitals in which women give birth, whereas NHDS includes only deliveries that are in nonfederal, short-stay hospitals.

Another potential reason for differences between NHDS and the birth certificate in source of payment distributions is the unit of analysis: NHDS is per delivery, whereas the birth certificate data are per birth. Multiple births in the same delivery are represented separately in the birth certificate data but only once in NHDS. Because only about 3% of births in the birth certificate reporting area were multiple, the effect of this on the source of payment distribution was negligible.



NOTE: For detailed data, see Table 1.
SOURCE: CDC/NCHS, National Hospital Discharge Survey.

Figure 3. Deliveries insured by private insurance and Medicaid: National Hospital Discharge Survey, 1990–2010

Trends in deliveries by payment source—NHDS

- According to NHDS, private insurance was the most frequent payment source for deliveries every year of the 1990–2010 period but declined 16% from its recent high point, 59.4% in 1999, to its 2010 level (50.1%) (Table 1 and Figure 3).
- Births insured by Medicaid increased 40% from the recent low point in 1999, 31.1%, to 43.4% in 2010 and are up more than 50% since 1990.
- Deliveries to the uninsured (self-pay) accounted for 2.7% of all deliveries in 2010 and declined by more than one-half since 1990 (7.0%). Deliveries with "other" payment sources accounted for 3.9% of deliveries in 2010, 48% lower than in 1990.

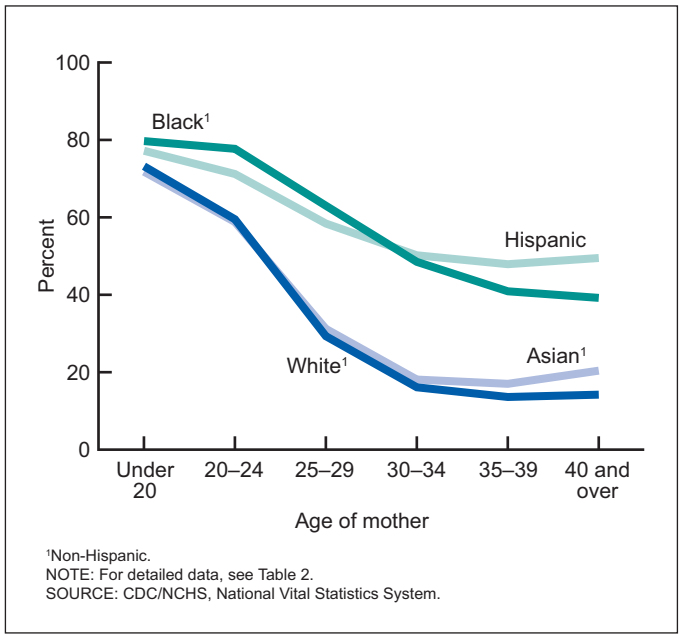
Source of payment by detailed characteristics—birth certificate data

Race and Hispanic origin

- Births to non-Hispanic Asian mothers were the most likely of any race and Hispanic origin group to be privately insured (66.4%), followed by births to non-Hispanic white mothers (59.7%) (Table A). Both of these groups were more than twice as likely as non-Hispanic black (26.9%), non-Hispanic AIAN (18.2%), or Hispanic mothers (24.4%) to have private insurance at delivery.
- Within detailed Hispanic groups, Cuban mothers were most likely to have private insurance (40.7%), while Mexican mothers were least likely to have this payment source (21.9%).
- Non-Hispanic Asian (25.9% of births) and white (33.0%) mothers were least likely to have Medicaid as the source of payment for their deliveries; non-Hispanic black (65.0% of births) and AIAN (65.1%) mothers were most likely of all racial and ethnic groups to be covered by Medicaid.
- Hispanic mothers (8.2% of births) were more than twice as likely as non-Hispanic white (2.9%), black (3.3%), AIAN (1.9%), or Asian (3.9%) mothers to be uninsured. Within Hispanic groups, Central or South American mothers were most likely to be uninsured (13.3%), and Puerto Rican (2.0%) and Cuban (2.6%) mothers were least likely.

Age of mother

- The proportion of mothers with private insurance at delivery generally increased with age—from 14.9% of births to teenagers to about two-thirds of births to mothers aged 35–39 (66.6%)—and then declined slightly to 65.4% for mothers aged 40–54 (Table 2).



[1]Non-Hispanic.
NOTE: For detailed data, see Table 2.
SOURCE: CDC/NCHS, National Vital Statistics System.

Figure 4. Births with Medicaid as the principal payment source for the delivery, by mother's age and race and ethnicity: 33-state and District of Columbia reporting area, 2010

- Deliveries insured by Medicaid declined with age, from three in four births to teenaged mothers (76.0%) to one in four births for mothers aged 35–39 (25.1%), and then increased to 25.9% for mothers aged 40–54.
- The percentage of mothers with no insurance fluctuated very little with age, ranging between 4.1% and 5.0% for all age groups.
- Increasing private insurance coverage with advancing maternal age was evident until age 40 for all race and Hispanic groups, as was the concomitant decline in Medicaid coverage.
- All racial and ethnic groups had greater than 70% Medicaid insurance for deliveries to teenaged mothers, ranging between 71.8% for non-Hispanic Asian mothers to 79.7% for non-Hispanic black mothers.
- The decline in births insured by Medicaid by age was much steeper for non-Hispanic white and Asian mothers than for non-Hispanic black or Hispanic mothers (Figure 4). For mothers aged 35 and over, about 14% of non-Hispanic white mothers had Medicaid-insured births compared with almost one-half of Hispanic mothers.
- Hispanic mothers had a higher proportion of births to uninsured women in all age groups (ranging between 7.2% and 8.6%) than did the other racial and ethnic groups.

Maternal characteristics

This section analyzes the maternal age distribution within payment categories as well as other demographic characteristics of the mother. Both the observed and age-adjusted levels are shown in Table B.

Table B. Selected maternal characteristics by principal source of payment for the delivery: Total of 33 reporting states and the District of Columbia, 2010

Selected characteristic	Characteristic reported	Total	Medicaid	Private insurance	Self-pay[1]	Other	Not stated
Age (years)		Percent					
Under 25	1,016,795	33.3	51.3	15.0	32.6	40.1	. . .
25–34	1,596,884	52.3	40.6	64.1	52.1	48.9	. . .
35 or over	442,205	14.5	8.1	21.0	15.3	11.0	. . .
All ages	3,055,884	100.0	100.0	100.0	100.0	100.0	. . .
Unmarried							
Observed	1,803,395	41.0	65.5	17.3	42.1	36.7	34,304
Age adjusted[2]	. . .	. . .	60.8	24.6	42.4	34.9	. . .
Education							
Less than high school education							
Observed	597,375	19.8	32.6	4.5	44.0	24.4	37,890
Age adjusted[2]	. . .	. . .	31.5	6.8	44.2	23.8	. . .
Bachelor's degree or higher							
Observed	804,154	26.6	5.1	50.3	15.2	16.8	37,890
Age adjusted[2]	. . .	. . .	6.6	41.5	16.0	18.5	. . .
Mothers born outside the 50 states and District of Columbia							
Observed	742,401	24.4	27.1	18.0	55.8	31.0	81,547
Age adjusted[2]	. . .	. . .	31.8	16.1	55.8	32.1	. . .

. . . Category not applicable.
[1]No third-party payer listed; uninsured.
[2]Based on the distribution of maternal age for the reporting area.

NOTE: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

- About one-half of mothers on Medicaid were under age 25 (51.3%), and almost two-thirds were unmarried (65.5%). Privately insured mothers were older and less likely to be unmarried—only 15.0% were under age 25, and 17.3% were unmarried (Table B).
- Age adjustment reduced the difference in the percentage of unmarried mothers between Medicaid and privately insured deliveries, but the level was more than twice as high for mothers with Medicaid.
- Privately insured mothers were 10 times more likely to have a bachelor's degree or higher (50.3%) than mothers with Medicaid-insured births (5.1%), while uninsured mothers (15.2%) and those with other payment sources (16.8%) were intermediate.
- Uninsured mothers were the most likely of all groups to have less than a high school education (44.0%).
- Age adjustment reduced the difference in educational attainment between mothers with Medicaid and mothers who were privately insured, but even after adjustment, privately insured mothers were six times more likely to have a bachelor's degree or higher compared with mothers with Medicaid.
- The majority of mothers with self-pay were born outside the 50 states and District of Columbia (55.8%), compared with 18.0% of privately insured mothers and 27.1% of mothers on Medicaid. The vast majority of uninsured Hispanic mothers (86.7%) were born outside the United States and District of Columbia (data not shown). Age adjustment did not alter these patterns.

Variations by state

- Private insurance was the most common payment source for the majority of states in the reporting area (22 of 33), with New Hampshire (62.8%) and Maryland (61.4%) having the largest percentages of births with this payment source (Table 3).
- Medicaid was the most frequent payment source in 10 states and the District of Columbia. The percentage of births with Medicaid as the principal source of payment for the delivery varied from more than 50% in New Mexico (57.5%), Oklahoma (55.1%), Tennessee (54.1%), and South Carolina (51.5%) to less than 30% in Maryland (28.8%) and North Dakota (29.3%).
- Wide variation was observed in Medicaid-insured births by area, even within racial and ethnic categories. In the revised reporting area, Maryland had among the lowest percentage of Medicaid-insured births for all racial and ethnic groups; Oklahoma was among the highest.
- Births to uninsured mothers comprised 16.4% of births in Nevada, the state with the highest percentage for this group. The percentage of births to uninsured mothers for Florida (9.0%) was also more than twice the average for the reporting area; the level exceeded 8% in Idaho (8.7%), Texas (8.2%), and New Mexico (8.2%).
- Areas with the lowest percentages of uninsured deliveries included the District of Columbia (0.8%), Illinois and Washington (both at 1.1%), Michigan (1.3%), and Vermont (1.4%).

Prenatal care

Table 4 shows prenatal care receipt by payment source for the large racial and ethnic groups. Age-adjusted levels are also shown because maternal age is an important factor in prenatal care receipt—younger mothers are less likely to get first-trimester care and more likely to get late or no care (14).

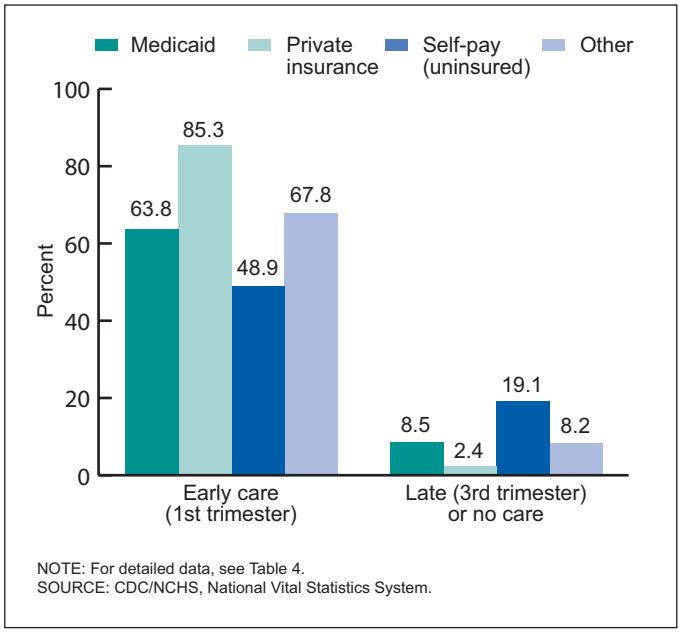


Figure 5. Prenatal care receipt, by principal payment source for the delivery: 33-state and District of Columbia reporting area, 2010

- The vast majority of mothers with private insurance at delivery received prenatal care in the first trimester of pregnancy (85.3%), whereas less than one-half of uninsured women received early care (48.9%) (Table 4 and Figure 5). About two-thirds of mothers on Medicaid received prenatal care in the first trimester (63.8%). Age adjustment slightly reduced the disparity in first-trimester prenatal care receipt between privately insured and Medicaid-insured mothers.
- A small percentage of privately insured mothers had late or no prenatal care (2.4%) compared with almost one in five uninsured mothers (19.1%). Just above 8% of women with Medicaid-insured deliveries received late or no care (8.5%).
- Across all racial and ethnic groups of mothers, those who were privately insured at delivery were most likely of all payment groups to have first-trimester prenatal care, and uninsured mothers were most likely to have late or no care.
- Almost 30% of uninsured non-Hispanic black mothers received late or no prenatal care (29.3%), the highest level of any racial and ethnic group.

Cesarean rates by payment source

Total cesarean delivery rates by payment source are shown in Table 5 for the racial and ethnic groups by broad maternal age groups. Age-adjusted levels are also shown, because maternal age is an important determinant of cesarean delivery: Older mothers have more risk factors and complications of labor and delivery that would make a cesarean delivery medically necessary (14).

- The total cesarean delivery rate was 11% higher for births to privately insured mothers (35.2 per 100 total births) than for births

to mothers on Medicaid (31.6); births to uninsured mothers had the lowest cesarean delivery rate of all groups at 24.3 (Table 5).

- Cesarean rates for mothers with private insurance were slightly lower than for Medicaid-insured deliveries for mothers under age 35, but higher for the oldest mothers (aged 35 and over).
- The age-adjusted total cesarean rate was slightly lower for privately insured mothers (33.1%) than for those with Medicaid (33.4%), reversing the observed pattern.
- The lowest cesarean rates were for the uninsured at all ages; age adjustment did not eliminate these differences.

- Higher cesarean rates for births to privately insured than to Medicaid-insured mothers were evident for all racial and ethnic groups, as was the lower cesarean rate for uninsured mothers.
  - The age-adjusted cesarean rate for non-Hispanic white mothers was the same for those with private insurance and Medicaid (32.8% each), while the rate for the uninsured was still about one-half (17.3%).
  - Age adjustment did not eliminate the differences in cesarean rates by payment source for non-Hispanic Asian, black, and Hispanic mothers—rates were higher for privately insured than Medicaid-insured deliveries, and rates for uninsured deliveries were lower than both.
- Most of the variation in cesarean rates between privately insured mothers and those on Medicaid was for the primary cesarean rate (26.1 compared with 22.0 first cesareans per 100 births to women without a previous cesarean delivery), as the repeat cesarean rate was essentially the same (91.4 and 91.3 repeat cesareans, respectively, per 100 births to women with a previous cesarean delivery) (Table C). Age adjustment reduced, but did not eliminate, the difference in the primary cesarean rate between privately insured and Medicaid-insured births.
- Both primary and repeat cesarean rates were lower for uninsured mothers than for mothers with private insurance or Medicaid—the primary rate was more than 25% lower, whereas the repeat rate was about 10% lower.

Discussion

This report presents detailed data on source of payment for the delivery from the birth certificate for the first time. About three-quarters of U.S. births are represented in the reporting area; these data are expected to become available for all states in data year 2014. Birth certificate data have some advantages over sample survey data in that they are derived from 100% of birth records filed in the reporting area and can be used to examine differentials for rare events and for smaller population groups.

A comparison of these new data with those of NHDS for 2010 showed overall consistency—private insurance was the most common payment source in both, followed by Medicaid, "other" payment sources, and self-pay (uninsured). One-half of all NHDS deliveries were privately insured compared with about 46% of births from the birth certificate data, although this difference was not statistically significant. Similarly, the difference between NHDS and birth certificate data for Medicaid payment of deliveries was not statistically significant. This consistency between the two sources is encouraging in terms of the birth certificate data quality, because some discrepancy between the two data sources would be expected given the differences in scope of coverage.

Table C. Cesarean delivery rates, by principal source of payment for the delivery: 33 reporting states and District of Columbia, 2010

[Cesarean delivery rates are the number of live births by cesarean delivery per 100 live births in specified group]

Source of payment	Total cesarean		Primary cesarean[1]		Repeat cesarean[2]	
	Observed	Age adjusted[3]	Observed	Age adjusted[3]	Observed	Age adjusted[3]
All races[4]			Rate			
Total	32.8	. . .	23.6	. . .	90.8	. . .
Medicaid	31.6	33.4	22.0	22.5	91.4	91.2
Private insurance	35.2	33.1	26.1	25.1	91.3	91.3
Self-pay[5]	24.3	24.2	16.1	16.1	82.3	82.4
Other	29.9	30.8	20.9	21.3	88.8	89.0
			Number			
Total[6]	3,055,884	. . .	2,610,957	. . .	421,467	. . .
Not stated[7]	81,547	. . .	55,291	. . .	6,469	. . .

. . . Category not applicable.

[1]Number of women having a cesarean delivery per 100 births to women without a previous cesarean delivery.

[2]Number of women having a cesarean delivery per 100 births to women with a previous cesarean delivery.

[3]Based on the distribution of maternal age for the reporting area for total, primary, and repeat cesarean deliveries.

[4]Includes other races not shown and origin not stated.

[5]No third-party payer listed; uninsured.

[6]Number of births to residents of areas reporting principal source of payment for the delivery.

[7]No response reported for selected source of payment; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth but occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

NOTE: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

The source of payment information on the birth certificate also appeared to be of good quality on a unit record basis. Quality studies in two states found generally good agreement between the entries on the birth certificate compared with the medical record for private insurance and Medicaid (15). See the "Data quality of principal source of payment from birth certificate" section of Technical Notes for more details.

Findings from birth certificate for the reporting area

Data for the revised reporting area show wide variation across age and race and Hispanic groups in source of payment for the delivery. Younger mothers as well as non-Hispanic black and Hispanic mothers are most likely to have Medicaid-insured deliveries. Both in total and at all ages, Hispanic mothers are about twice as likely as mothers of the other race groups to be uninsured.

Maternal characteristics vary widely by payment group, as privately insured mothers are generally older, less likely to be unmarried, more educated, and less likely to have been born outside of the United States and District of Columbia than other payment groups. Considerable variation was also observed by state in births by source of payment, and Medicaid coverage varied substantially by state within the major race and Hispanic groups. Prenatal care receipt and cesarean rates varied substantially by payment source of the delivery, and some of these differences persisted even after taking into account maternal age.

National data on the source of payment from the birth certificate, expected with the 2014 data year, will be a resource for researchers over the next decade to track trends in access to health care, as well as to conduct research on the associations between payment source and maternal and child health.

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List of Detailed Tables

Table 1. Percent distribution of deliveries by principal source of payment: National Hospital Discharge Survey, 1990–2010

Year	All deliveries	Medicaid	Private insurance	Self-pay[1]	Other[2]
2010	100.0	43.4	50.1	2.7	3.9
2009	100.0	44.6	49.8	2.5	3.1
2008	100.0	43.4	50.3	3.1	3.2
2007	100.0	41.9	50.0	3.4	4.7
2006	100.0	40.8	49.8	3.8	5.6
2005	100.0	41.1	50.0	3.5	5.5
2004	100.0	39.4	51.6	3.7	5.3
2003	100.0	38.4	53.0	3.4	5.2
2002	100.0	35.7	55.9	3.6	4.8
2001	100.0	34.1	57.8	3.8	4.3
2000	100.0	32.9	57.0	4.9	5.2
1999	100.0	31.1	59.4	5.1	4.5
1998	100.0	31.9	57.1	4.9	6.2
1997	100.0	33.6	55.6	4.7	6.1
1996	100.0	35.1	53.6	4.2	7.1
1995	100.0	35.2	52.1	4.8	8.0
1994	100.0	36.7	50.4	4.3	8.5
1993	100.0	34.8	52.4	5.0	7.7
1992	100.0	33.6	51.3	6.5	8.6
1991	100.0	32.3	53.9	6.2	7.7
1990	100.0	28.8	56.6	7.0	7.5

[1]No third-party payer listed; uninsured.

[2]Includes worker's compensation, Medicare, other government, no charge, and other.

SOURCE: CDC/NCHS, National Hospital Discharge Survey, 1990–2010.

Table 2. Percent distribution of births by principal payment source for the delivery, by age and race and Hispanic origin of mother: 33 reporting states and District of Columbia, 2010

[Percentages are number of live births with specified payment source per 100 live births in specified groups]

Payment source and race and Hispanic origin of mother	Age of mother (years)						
	All ages	Under 20	20–24	25–29	30–34	35–39	40–54
All races[1]				Percent			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Medicaid	44.9	76.0	66.4	41.1	27.4	25.1	25.9
Private insurance	45.8	14.9	22.8	49.3	64.2	66.6	65.4
Self-pay[2]	4.4	4.1	4.4	4.5	4.3	4.6	5.0
Other	5.0	5.1	6.3	5.2	4.0	3.8	3.7
				Number			
Total[3]	3,055,884	287,888	728,907	866,867	730,017	354,202	88,003
Not stated[4]	81,547	7,679	19,040	23,391	19,404	9,509	2,524
White[5]				Percent			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Medicaid	33.0	73.2	59.5	29.3	16.1	13.6	14.2
Private insurance	59.7	20.0	31.0	63.1	78.0	80.4	79.0
Self-pay[2]	2.9	2.0	3.0	3.0	2.8	3.1	4.1
Other	4.3	4.8	6.4	4.5	3.1	2.8	2.7
				Number			
Total[3]	1,573,540	105,476	341,592	475,924	414,496	189,201	46,851
Not stated[4]	31,144	2,075	6,711	9,660	8,158	3,614	926
Black[5]				Percent			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Medicaid	65.0	79.7	77.7	63.0	48.5	40.9	39.2
Private insurance	26.9	13.5	14.8	28.8	42.4	49.8	50.7
Self-pay[2]	3.3	2.6	2.7	3.2	4.1	4.7	5.1
Other	4.8	4.1	4.9	5.1	5.0	4.6	4.9
				Number			
Total[3]	407,522	61,092	127,754	101,600	71,247	35,855	9,974
Not stated[4]	12,089	1,874	3,673	2,987	2,147	1,096	312
Asian[5]				Percent			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Medicaid	25.9	71.8	58.8	31.2	18.1	17.0	20.4
Private insurance	66.4	18.3	31.1	60.5	74.7	76.2	72.1
Self-pay[2]	3.9	3.7	4.5	4.1	3.8	3.6	3.8
Other	3.8	6.2	5.6	4.2	3.4	3.2	3.7
				Number			
Total[3]	163,307	2,311	14,389	44,706	59,502	34,528	7,871
Not stated[4]	2,750	43	284	839	940	526	118
Hispanic[6]				Percent			
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Medicaid	61.4	77.2	71.2	58.4	50.2	47.9	49.5
Private insurance	24.4	10.3	14.4	26.7	35.3	38.0	37.2
Self-pay[2]	8.2	7.2	7.9	8.5	8.6	8.5	7.8
Other	6.0	5.4	6.5	6.3	5.9	5.6	5.5
				Number			
Total[3]	799,928	105,639	215,248	215,321	161,391	82,629	19,700
Not stated[4]	19,789	2,552	5,255	5,545	3,933	2,006	498

[1]Includes other races not shown and origin not stated.

[2]No third-party payer listed; uninsured.

[3]Number of births to residents of areas reporting principal source of payment for the delivery.

[4]No response reported for selected source of payment; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth but occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

[5]Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with 1997 Office of Management and Budget standards; see Technical Notes. Data by race reflect non-Hispanic origin and exclude mothers reporting multiple races.

[6]Includes all persons of Hispanic origin of any race.

NOTE: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

Table 3. Percent distribution of births by principal source of payment for the delivery and percentage of Medicaid-insured births, by race and Hispanic origin of mother: 33 reporting states and District of Columbia, 2010

[By place of residence]

State or area	All births[1]	Medicaid	Private insurance	Self-pay[2]	Other	Percent of Medicaid-insured births			
						White[3]	Black[3]	Asian[3]	Hispanic[4]
Total of reporting area	100.0	44.9	45.8	4.4	5.0	33.0	65.0	25.9	61.4
California	100.0	47.7	45.7	2.1	4.5	23.7	57.0	21.7	66.8
Colorado	100.0	37.0	51.8	4.2	7.1	23.1	55.1	22.5	63.3
Delaware	100.0	48.7	46.3	1.5	3.5	34.8	65.3	20.9	83.1
District of Columbia	100.0	46.8	40.4	0.8	12.0	2.3	73.3	15.9	41.6
Florida	100.0	48.9	39.5	9.0	2.6	41.7	67.1	23.9	48.3
Georgia	100.0	47.4	35.1	5.7	11.9	37.6	66.3	21.8	37.4
Idaho	100.0	38.7	47.9	8.7	4.6	36.0	59.5	21.7	50.8
Illinois	100.0	49.5	47.9	1.1	1.4	31.5	78.3	25.4	76.8
Indiana	100.0	46.7	46.9	4.5	1.8	39.0	76.8	36.2	73.9
Iowa	100.0	39.5	56.3	2.9	1.3	35.2	82.1	23.2	59.5
Kansas	100.0	32.8	50.8	7.5	8.9	29.3	61.9	15.5	36.0
Kentucky	100.0	43.6	43.0	3.2	10.2	42.7	57.2	21.7	39.3
Maryland	100.0	28.8	61.4	4.7	5.2	18.4	43.6	13.4	36.5
Michigan	100.0	45.4	52.6	1.3	0.7	39.8	57.0	24.8	72.3
Missouri	100.0	46.0	48.9	3.0	2.0	39.6	76.2	22.1	56.6
Montana	100.0	35.9	44.2	6.7	13.1	31.8	*	20.8	51.8
Nebraska	100.0	31.8	57.3	7.2	3.7	25.4	67.6	25.5	43.0
Nevada	100.0	31.7	46.9	16.4	5.0	26.1	55.8	17.4	34.0
New Hampshire	100.0	32.6	62.8	2.0	2.6	32.2	56.0	14.2	42.7
New Mexico	100.0	57.5	23.7	8.2	10.5	43.6	61.7	27.9	58.8
New York	100.0	46.3	48.5	1.7	3.6	26.7	63.4	52.0	72.1
North Dakota	100.0	29.3	56.4	2.1	12.2	21.9	65.4	17.6	45.9
Ohio	100.0	41.2	49.5	4.7	4.6	35.1	70.7	12.8	43.6
Oklahoma	100.0	55.1	34.3	2.1	8.5	47.0	73.9	39.3	79.1
Oregon	100.0	43.7	50.6	2.3	3.5	36.9	64.3	20.3	66.5
Pennsylvania	100.0	32.6	58.6	5.7	3.2	24.7	57.3	19.2	54.0
South Carolina	100.0	51.5	37.6	5.2	5.8	40.3	73.1	25.8	47.1
South Dakota	100.0	36.2	55.1	2.5	6.2	26.1	51.8	25.0	41.7
Tennessee	100.0	54.1	40.5	2.5	2.9	46.9	77.6	26.1	58.8
Texas	100.0	48.3	35.8	8.2	7.7	34.0	62.5	20.7	57.5
Utah	100.0	30.6	59.6	6.2	3.6	24.3	65.5	23.3	59.6
Vermont	100.0	46.9	49.6	1.4	2.1	46.5	83.3	31.7	42.1
Washington	100.0	39.2	50.4	1.1	9.3	28.8	58.0	21.8	73.1
Wyoming	100.0	40.8	48.5	5.9	4.8	35.8	66.2	32.8	58.7

* Figure does not meet standards of reliability or precision; based on fewer than 20 births in the numerator.

[1]Total number of births to residents of areas reporting principal source of payment for the delivery.

[2]No third-party payer listed; uninsured.

[3]Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with 1997 Office of Management and Budget standards; see Technical Notes. Data by race reflect non-Hispanic origin and exclude mothers reporting multiple races.

[4]Includes all persons of Hispanic origin of any race.

SOURCE: CDC/NCHS, National Vital Statistics System.

Table 4. Births by prenatal care receipt and principal payment source for the delivery, by race and Hispanic origin of mother: 33 reporting states and District of Columbia, 2010

Payment source and race and Hispanic origin of mother	Prenatal care			
	1st trimester care		Late[1] or no care	
	Observed	Age adjusted[2]	Observed	Age adjusted[2]
All races[3]		Percent		
Total	73.1	. . .	6.2	. . .
Medicaid	63.8	64.8	8.5	8.3
Private insurance	85.3	83.1	2.4	3.0
Self-pay[4]	48.9	48.8	19.1	19.1
Other	67.8	68.3	8.2	8.0
		Number		
Total[5]	3,055,884	. . .	3,055,884	. . .
Not stated[6]	81,547	. . .	81,547	. . .
White[7]		Percent		
Total	78.3	. . .	4.3	. . .
Medicaid	65.8	66.5	7.0	7.1
Private insurance	86.9	85.4	2.0	2.4
Self-pay[4]	50.9	50.8	17.0	17.0
Other	74.2	75.2	6.1	5.9
		Number		
Total[5]	1,573,540	. . .	1,573,540	. . .
Not stated[6]	31,144	. . .	31,144	. . .
Black[7]		Percent		
Total	62.5	. . .	10.3	. . .
Medicaid	57.5	58.0	11.5	11.4
Private insurance	76.9	73.6	4.8	5.7
Self-pay[4]	43.1	42.8	29.3	29.3
Other	64.3	64.2	9.7	9.7
		Number		
Total[5]	407,522	. . .	407,522	. . .
Not stated[6]	12,089	. . .	12,089	. . .
Asian[7]		Percent		
Total	78.6	. . .	4.5	. . .
Medicaid	63.1	64.4	8.2	7.7
Private insurance	85.9	85.2	2.3	2.5
Self-pay[4]	61.1	61.4	15.6	15.4
Other	75.3	76.3	5.6	5.3
		Number		
Total[5]	163,307	. . .	163,307	. . .
Not stated[6]	2,750	. . .	2,750	. . .
Hispanic[8]		Percent		
Total	67.6	. . .	8.1	8.0
Medicaid	65.4	66.0	8.2	8.0
Private insurance	82.2	79.9	3.2	3.8
Self-pay[4]	47.6	47.4	18.7	18.8
Other	59.7	59.7	10.7	10.7
		Number		
Total[5]	799,928	. . .	799,928	. . .
Not stated[6]	19,789	. . .	19,789	. . .

. . . Category not applicable.

[1]Prenatal care initiated in the third trimester.

[2]Based on distribution of maternal age for the reporting area within each race or ethnic group.

[3]Includes other races not shown and origin not stated.

[4]No third-party payer listed; uninsured.

[5]Number of births to residents of areas reporting principal payment source for the delivery.

[6]No response reported for selected source of payment; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth but occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

[7]Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with 1997 Office of Management and Budget standards; see Technical Notes. Data by race reflect non-Hispanic origin and exclude mothers reporting multiple races.

[8]Includes all persons of Hispanic origin of any race.

NOTE: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

Table 5. Cesarean delivery rates by principal payment source for the delivery, by age and race and Hispanic origin of mother and age-adjusted rates: 33 reporting states and District of Columbia, 2010

[Cesarean delivery rates are the number of live births by cesarean delivery per 100 live births in specified group]

Payment source and race and Hispanic origin of mother	Age of mother (years)				Age adjusted[1]
	All ages	Under 25	25–34	35 and over	
All races[2]			Percent		
Total	32.8	26.7	33.7	43.8	. . .
Medicaid	31.6	27.4	34.5	43.0	33.4
Private insurance	35.2	26.2	34.1	45.2	33.1
Self-pay[3]	24.3	20.4	24.6	32.0	24.2
Other	29.9	24.6	31.6	42.1	30.8
			Number		
Total[4]	3,055,884	1,016,795	1,596,884	442,205	. . .
Not stated[5]	81,547	26,719	42,795	12,033	. . .
White[6]			Percent		
Total	32.3	26.3	32.6	42.7	. . .
Medicaid	30.7	27.3	33.4	41.3	32.8
Private insurance	34.3	25.7	33.4	44.0	32.8
Self-pay[3]	16.8	16.2	17.0	20.5	17.3
Other	28.7	23.8	29.9	40.4	29.8
			Number		
Total[4]	1,573,540	447,068	890,420	236,052	. . .
Not stated[5]	31,144	8,786	17,818	4,540	. . .
Black[6]			Percent		
Total	35.5	29.4	38.6	49.1	. . .
Medicaid	33.7	29.7	37.5	45.5	34.8
Private insurance	40.9	29.5	41.5	52.8	37.2
Self-pay[3]	31.8	24.6	33.7	42.7	30.5
Other	34.4	27.9	37.0	50.1	34.2
			Number		
Total[4]	407,522	188,846	172,847	45,829	. . .
Not stated[5]	12,089	5,547	5,134	1,408	. . .
Asian[6]			Percent		
Total	33.6	21.4	31.9	42.7	. . .
Medicaid	29.6	20.5	29.8	40.9	31.7
Private insurance	35.6	23.9	32.9	43.3	34.7
Self-pay[3]	29.9	17.4	28.2	40.6	30.3
Other	31.5	21.8	29.9	42.4	32.3
			Number		
Total[4]	163,307	16,700	104,208	42,399	. . .
Not stated[5]	2,750	327	1,779	644	. . .
Hispanic[7]			Percent		
Total	32.2	25.8	34.4	44.4	. . .
Medicaid	31.6	26.5	34.7	43.5	32.5
Private insurance	36.4	26.0	36.4	47.8	33.7
Self-pay[3]	27.6	21.6	29.4	38.1	27.4
Other	30.2	24.5	32.2	41.3	30.3
			Number		
Total[4]	799,928	320,887	376,712	102,329	. . .
Not stated[5]	19,789	7,807	9,478	2,504	. . .

. . . Category not applicable.

[1]Based on distribution of maternal age for the reporting area within each race or ethnic group.

[2]Includes other races not shown and origin not stated.

[3]No third-party payer listed; uninsured.

[4]Number of births to residents of areas reporting principal source of payment for the delivery.

[5]No response reported for selected source of payment; includes births to residents of states using the 2003 U.S. Standard Certificate of Live Birth but occurring in states using the 1989 U.S. Standard Certificate of Live Birth.

[6]Race and Hispanic origin are reported separately on the birth certificate. Race categories are consistent with 1997 Office of Management and Budget standards; see Technical Notes. Data by race reflect non-Hispanic origin and exclude mothers reporting multiple races.

[7]Includes all persons of Hispanic origin of any race.

NOTE: The reporting area of 33 states plus the District of Columbia represents 76% of all U.S. births; see Technical Notes.

SOURCE: CDC/NCHS, National Vital Statistics System.

Technical Notes

Sources of data

Birth certificate

Birth data in this report are based on 100% of births registered in the 33 states (California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, and Wyoming) and District of Columbia that implemented the 2003 U.S. Standard Certificate of Live Birth as of January 1, 2010. The 3,055,884 births to residents of this reporting area comprised 76% of all U.S. 2010 births (Table I).

National Hospital Discharge Survey

The National Hospital Discharge Survey (NHDS) is a survey of the information from discharge records in nonfederal, short-stay hospitals and is nationally representative. This report uses data from NHDS for 1990–2010. A detailed description of NHDS is published elsewhere (13). Information from NHDS used in this report is for women giving birth (diagnostic codes V270–V279).

Missing information on birth certificate

Information on the percentage of records with missing information for the items included in this report is shown by state in Table II. Data for residents of the revised 33-state plus District of Columbia reporting area where the birth occurred outside of the reporting area (i.e., in a jurisdiction that has not adopted the 2003 U.S. Standard Certificate of Live Birth) are excluded from the analysis. This percentage was 0.5% for the revised reporting area and ranged from nearly zero (0.04%) in Washington and Wyoming to 7.9% in New Hampshire.

The comparatively high level of unknown data for New Hampshire (8.5% for the source of payment information) reflects the fact that nearly 8% of births to New Hampshire residents occurred not in New Hampshire, but in states (particularly Massachusetts) that had not yet implemented the 2003 revision of the U.S. Standard Certificate of Live Birth in 2010. Similarly, but to a lesser extent, 3.6% of births to residents of the District of Columbia occurred in states with the unrevised certificate, mostly in Virginia.

Generalizability of birth certificate data

Births in the revised reporting area are not a random sample of all births, and the findings are not generalizable to the entire United States. As noted in the Methods section, the race and Hispanic-origin distributions of births for the reporting area are substantively different from those for the entire United States (Table I). The

Table I. Percentage of live births, by selected demographic characteristics: United States and total of 33 revised states and District of Columbia, 2010

Characteristic of mother	33 states and District of Columbia[1]	United States
Race and Hispanic origin of mother		
Non-Hispanic white[2]	53.02	†54.44
Non-Hispanic black[2]	13.94	†14.85
Hispanic[3]	26.39	†23.80
Mexican	17.28	†15.06
Puerto Rican	1.51	†1.67
Cuban	0.50	†0.43
Central or South American	3.41	†3.59
Other and Unknown Hispanic	3.70	†3.04
American Indian or Alaska Native[4]	1.01	†1.17
Asian or Pacific Islander	6.07	†6.17
Unmarried women	40.99	†40.84
Age of mother (years)		
Under 20	9.42	†9.31
20–24	23.85	23.80
25–29	28.37	28.35
30–34	23.89	†24.06
35–39	11.59	11.62
40–54	2.88	2.87
Total number of births	3,055,884	3,999,386

† Difference significant at $p = 0.05$.

[1]California, Colorado, Delaware, District of Columbia, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Maryland, Michigan, Missouri, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, South Carolina, South Dakota, Tennessee, Texas, Utah, Vermont, Washington, and Wyoming.

[2]Race and Hispanic origin are reported separately on birth certificates. Race categories are consistent with 1977 Office of Management and Budget (OMB) standards. All states in the reporting area of 33 states and the District of Columbia reported multiple-race data for 2010. The multiple-race data for the area were bridged to the single-race categories of the 1977 OMB standards for comparability with other states; see Technical Notes.

[3]Includes persons of Hispanic origin of any race.

[4]Includes births to Aleuts and Eskimos.

SOURCE: CDC/NCHS, National Vital Statistics System.

Table II. Birth records for which data were not stated and resident births occuring in unrevised states: 33 reporting states and District of Columbia, 2010

[By place of residence]

State or area	Source of payment for the delivery	Educational attainment	Mother's birthplace	Month prenatal care began	Final route and method of delivery	Births occurring in unrevised states[1]
	Percent					
Total of reporting areas	2.7	1.7	0.4	5.0	0.6	0.5
California	0.3	3.6	0.1	2.8	0.1	0.1
Colorado	0.4	1.1	0.1	1.3	0.1	0.1
District of Columbia	0.6	5.1	1.0	32.1	3.6	3.6
Delaware	8.9	1.2	0.8	1.4	0.3	0.2
Florida	0.5	0.6	0.3	7.1	0.2	0.2
Georgia	11.3	4.9	1.2	23.9	0.7	0.2
Idaho	0.3	0.6	0.2	0.5	0.1	0.0
Illinois	3.2	1.3	0.2	5.3	0.5	0.3
Indiana	0.3	0.5	0.5	0.6	0.1	0.0
Iowa	1.0	0.9	0.4	1.3	0.9	0.9
Kansas	0.9	0.6	0.1	2.6	0.1	0.1
Kentucky	1.0	1.2	0.4	4.3	0.7	0.6
Maryland	8.2	1.8	0.3	18.4	1.4	1.2
Michigan	0.4	0.8	0.2	3.0	0.2	0.2
Missouri	8.2	0.6	0.4	4.9	0.5	0.2
Montana	2.4	0.8	0.0	2.8	0.1	0.1
Nebraska	2.1	0.1	0.1	2.4	0.1	0.1
Nevada	23.1	1.6	0.4	11.3	0.2	0.2
New Hampshire	8.5	8.4	0.1	10.9	7.9	7.9
New Mexico	27.2	2.0	0.3	6.5	0.4	0.3
New York	1.6	1.8	0.1	3.3	1.6	1.2
North Dakota	4.2	2.5	0.4	3.4	1.8	1.8
Ohio	4.0	1.8	0.5	7.7	1.7	1.2
Oklahoma	2.0	1.9	0.1	4.9	1.6	1.6
Oregon	0.5	0.5	0.2	0.7	0.0	0.0
Pennsylvania	2.9	1.6	3.5	4.8	1.0	0.9
South Carolina	2.9	2.7	0.0	3.3	2.4	2.4
South Dakota	0.8	0.7	0.1	1.8	0.5	0.5
Tennessee	5.4	0.8	0.2	6.2	0.4	0.4
Texas	0.2	0.2	0.1	1.1	0.1	0.1
Utah	3.9	2.3	0.2	1.6	0.1	0.1
Vermont	0.8	1.2	0.1	1.2	0.7	0.7
Washington	1.0	0.8	0.6	5.4	0.0	0.0
Wyoming	0.7	1.1	0.2	1.2	0.1	0.0

0.0 Quantity more than zero but less than 0.05.

[1]Data represent states using the 2003 U.S. Standard Certificate of Live Birth. Births to residents of states using the 2003 U.S. Standard Certificate of Live Birth but occurring in states using the 1989 U.S. Standard Certificate of Live Birth are coded as not stated; see Technical Notes.

NOTE: The percentage of nonresponse is the same for all specific checkboxes within a category except for the category "Method of delivery," which allows for nonresponse for each specific checkbox shown.

SOURCE: CDC/NCHS, National Vital Statistics System.

Hispanic population is overrepresented in the reporting area due to the inclusion of two states with large Hispanic populations, California and Texas. Births to Hispanic mothers comprised 24% of all births in the United States in 2010, but 26% of the births in the reporting area. This overrepresentation of Hispanic women may affect the distribution of source of payment, because these deliveries are more likely to be Medicaid-insured and uninsured than births to non-Hispanic white women. If the racial and ethnic distribution for the entire United States was applied to the reporting area, the overall percentage of privately insured births would decrease slightly, from 45.8% to 45.4%; Medicaid-insured births would also decline, from 44.9% to 43.8%.

Principal source of payment for this delivery

The 2003 revision of the U.S. Standard Certificate of Live Birth added the item of principal source of payment for this delivery. The instructions to the birth information specialist (or other person completing the facility worksheet for input to the electronic birth certificate) are to check the box that best describes the principal source of payment for this delivery. This information is usually found on the hospital or admitting office face sheet (16). While 2.7% of births had unknown payment source for the entire reporting area, considerable variation was found by state (Table II). About one-quarter of births in New Mexico (27.2%) and Nevada (23.1%) had unknown payment source, the highest of all areas. About one-third of the reporting area (12 states and District of Columbia) had less than 1% of births with unknown payment source.

More detailed information on the source of payment beyond the standard four categories is available from a 25-state reporting area (a subset of the 33-state and District of Columbia reporting area). For these states, the "other" category is further delineated into the following: Indian Health Service (IHS), CHAMPUS/TRICARE (health

care for military families), and other government (programs other than Medicaid and its state equivalents), with a residual category of "other" as well. The other eight states and District of Columbia do not report this detail. Overall, only about 2% of the births attributed to the broad "other" category were IHS, while 36% were other government, 33% were CHAMPUS/TRICARE, and 29% were still "other." However, the more detailed data for the broad "other" payment sources differed by racial and ethnic group. More than one-half of the "other" category for American Indian or Alaska Native (AIAN) were IHS, and about one-quarter were other government. For the remaining race and Hispanic groups, only a fraction of "other" were attributed to IHS and most were likely CHAMPUS/TRICARE (health care for military families) and other government. These differences in the "other" category by racial and ethnic group also contributed to differences by area. For example, states with higher percentages of AIAN mothers, such as South Dakota and Montana, had a higher percentage of "other" payment sources attributable to IHS than areas with a smaller percentage of AIAN mothers.

From NHDS, the item used in this report was "principal expected source of payment" and included the following categories: worker's compensation, Medicare, Medicaid, other government, Blue Cross/Blue Shield, HMO/PPO, other private insurance, self-pay, no charge, and other. To be as comparable as possible with the birth certificate categories, these data were recoded as follows: Blue Cross/Blue Shield, HMO/PPO, and other private insurance are coded as "private insurance"; worker's compensation, Medicare, other government, no charge, and other as "other"; Medicaid as "Medicaid"; and self-pay as "self-pay."

Data quality of principal source of payment from birth certificate

Birth certificate data are subject to error from several possible sources. There has been only limited evaluation of the data quality of items new to the 2003 birth certificate revision so far. A quality study fielded by the National Center for Health Statistics in two states compared the birth certificate information with that on the medical records for a total of eight hospitals in the states (15). This study found typically good agreement (termed sensitivity) between the medical record and the birth certificate on privately insured and Medicaid-insured births. The data quality of the smaller categories of payment, "other" payment sources, and self-pay was harder to assess but was also generally good.

When private insurance was indicated on the medical record (considered the gold standard), it was also indicated on the birth certificate 82% of the time in one state and 86% of the time in another. Six of eight hospitals in the study had more than 80% agreement, and four hospitals had more than 90% agreement. The sensitivity was slightly less for Medicaid-insured births (79% and 73%, respectively). The false positive rate (indicated on the birth certificate but not on the medical record) was generally low (below 10%), but it did reach 28% in one of the two states for private insurance. In both states, when private insurance was indicated on the medical record but not on the birth certificate, it was almost always misclassified on the birth certificate to one of the other categories (for example, "self-pay"), as was Medicaid. The pattern of misclassification varied between the two states and, therefore, further studies are needed to determine how this would impact the data on a large scale.

In general, the numbers for self-pay and "other" insurance were small in this quality study and, therefore, sufficient numbers to analyze data quality were available for only one of the two states for self-pay and for the other state for "other." When "other" insurance was indicated on the medical record, it was also indicated on the birth certificate 88% of the time. However, the false positive rate was 35% for birth certificate data (on the birth certificate but not in the medical record). For the self-pay category, agreement between the birth certificate and the medical record when this item was indicated was also generally good (76%). As with the "other" category, the false positive rate on the birth certificate was quite high (44%), suggesting misclassification from other categories. Larger, additional studies are needed to assess national levels of underreporting and misclassification for this item, especially for the less common categories of payment. Numerous quality improvement efforts are under way and it is expected that quality will improve as hospital personnel become more familiar both with this item and with the increased automatic transfer of data from hospital electronic medical records to state electronic registration systems.

Other birth certificate items

The following data items were used in this report and have been discussed in detail in the *User Guide to the 2010 Natality Public Use File* (12): race of mother, Hispanic origin of mother, age of mother, marital status of mother, educational attainment of mother, prenatal care, and method of delivery.

Listed below is specific information on these items applicable only to this report:

Race of mother

The 2003 revision of the U.S. Standard Certificate of Live Birth allows the reporting of more than one race (multiple races) for each parent. Accordingly, multiple-race data were reported by each of the states included in this report. This report primarily includes data for single race (only one race reported) but also includes multiple race data in Table A. Information on the processing and tabulation of data by single race is presented in an earlier report (17). Single-race groups with more than 100,000 births (white, black, and Asian) are included in the detailed results.

Educational attainment of mother

Levels of educational attainment shown in this report include "12th grade or less with no diploma" for the "Less than high school education" category shown in Table B. The following categories are grouped together for the "Bachelor's degree or higher" category in Table B: bachelor's degree, master's degree, and doctorate or professional degree.

Age adjustment

Maternal age differs by source of payment groups and alone can account for some of the variation in other maternal characteristics, as well as in prenatal care receipt and cesarean delivery rates among these groups. Age adjustment by the direct method is a technique that controls for these age differences among groups and shows what the results would be if all groups had the same age

distribution. In Tables B, C, 4, and 5, the age distribution for the total of the broad maternal age groups (under 25, 25–34, and over 35) is used for each payment category—ratios of maternal age are multiplied by the age-specific rates of maternal characteristics, prenatal care receipt, and rates of cesarean delivery to derive age-adjusted rates. The procedure so described was performed separately in each race and Hispanic group for the age adjustments by race and Hispanic origin in Tables 4 and 5.

Computations of percentages and percent distributions

Births for which a particular characteristic is unknown were subtracted from the figures for total births that were used as denominators before percentages and percent distributions were computed. See the *User Guide to the 2010 Natality Public Use File* (12) for more detail. The same procedure was used for NHDS data.

Random variation and significance testing for birth certificate data

For information and discussion on random variation and significance testing, see the *User Guide to the 2010 Natality Public Use File* (12).

Definitions of medical terms

Detailed definitions, recommended sources, and keywords for the medical and health data items are available in the *Guide to Completing the Facility Worksheets for the Certificate of Live Birth and Report of Fetal Death* (16).

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