



1B.

NATALITY: MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH

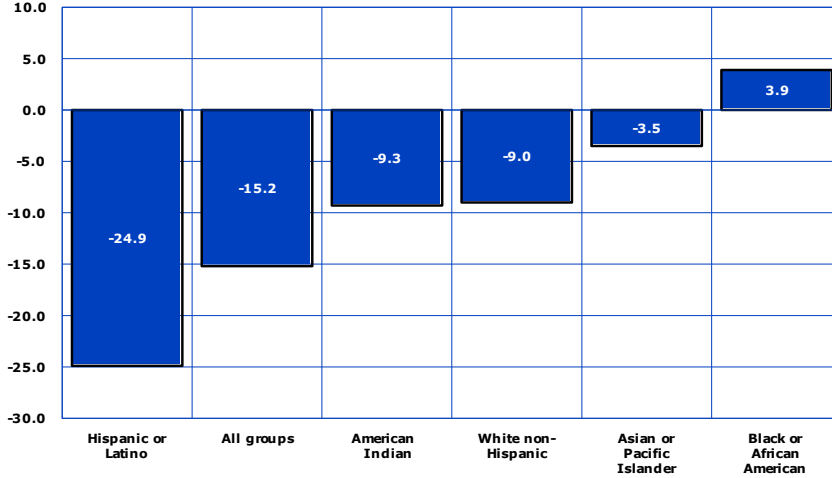
The number of resident births reached its recent peak in 2007 at 102,687 (**Table 1B-2**). In 2008, the number of resident births declined to 99,215; the first annual decline since 1991 (which, like 2008, also was an economic downturn year). The number of resident births declined again in 2009 to 92,616 and in 2010 to 87,053.

There were striking differences in how the number of births changed from 2007 to 2010 by mother's race/ethnicity. The number of births rose by 3.9 percent for Black or African American mothers. Compared to 2007, the number of births for all race/ethnic groups combined was 15.2 percent lower in 2010. Hispanic or Latino women experienced an unprecedented decrease of 24.9 percent (**Figure 1B-1**).

Since the 2008 edition of this report, we have been pointing out that Hispanics, unlike any other race/ethnic group in the State, faced in 2008-2010 not only the economic recession (shared by all), but also additional challenges such as the employer-sanction law (a penalty on employers hiring illegal immigrants), and a widespread practice of e-verify (checking the legal-residence status of those seeking employment). Considering all these factors, there is a reason to believe that there were fewer births among Hispanic or Latinos since 2007, because there were fewer Hispanic or Latino residents of Arizona in 2008-2010 than there were in 2007. In 2009, for the first time since 2003, the number of births among White non-Hispanics (39,781) exceeded the number of Hispanic or Latino births (38,362). In 2010, Hispanics or Latinos accounted for 11.5 percent fewer births than White non-Hispanic (34,333 vs. 38,777).

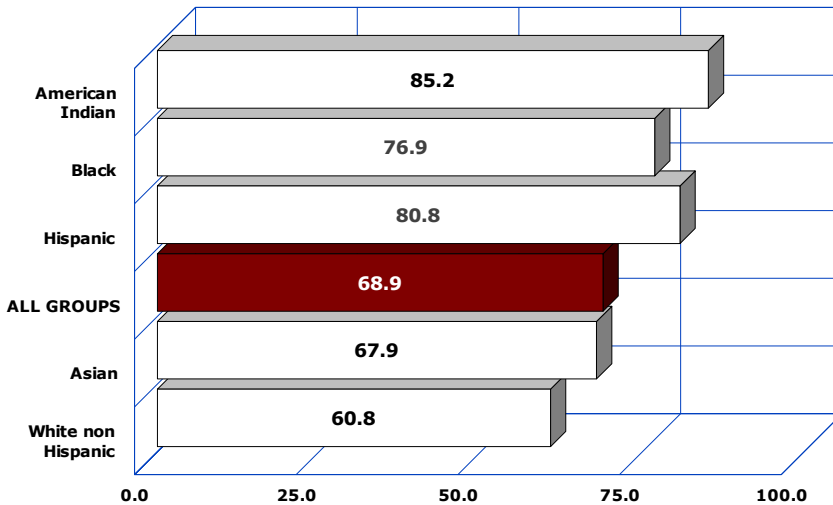
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Figure 1B-1
Percent Change from 2007 to 2010 in the Number of Resident Live Births by
Mother's Race/Ethnicity, Arizona



From 2007 to 2010, the number of resident live births declined by 15.2 percent (**Figure 1B-1**). All race/ethnic groups, except Blacks or African Americans, experienced a decline. The magnitude of the reduction in the number of births was the largest among Hispanics or Latinos (-24.9 percent), and the smallest among Asian or Pacific Islanders (-3.5 percent).

Figure 1B-2
General Fertility Rates by Race/Ethnicity among Females of all Ages,
Arizona, 2010



As we have already noted in Section 1A, the number of females aged 15-44 years was lower in 2010 (1,262,557; based on the 2010 census enumeration), compared to the 2009 estimate of 1,344,836. From among 1,262,557 women of childbearing age (15-44 years), 6.9 percent gave birth in 2010, same proportion as in 2009. The *general fertility rate* (the number of births per 1,000 women 15-44 years old) also remained unchanged since 2009. However, with a fertility rate of 85.3/1,000, American Indian replaced Hispanic or Latino women whose general fertility rate declined in 2010 to 75.9/1,000.

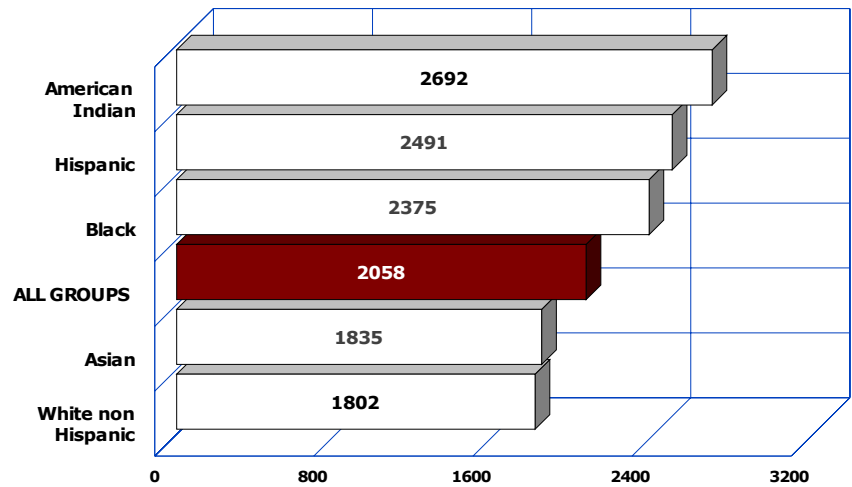
A comparison of fertility rates by county in Arizona is provided in **Table 5A-1**.

Number of births per 1,000 females 15-44 years old in specified group.

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The *total fertility rate* indicates the average number of births to a hypothetical cohort of 1,000 women, if they experienced throughout their childbearing years the age-specific birth rates observed in a given year. From 2000 to 2008, the Arizona total fertility rates always exceeded the rate of "replacement" (2,110 births per 1,000 women, **Table 1B-1**). The "replacement" rate is considered the value at which a given generation can exactly replace itself. In 2009, the total fertility rate declined to 2,058 births per 1,000 women of childbearing age and it remained unchanged in 2010. The total fertility rates differed substantially by race/ethnicity (**Figure 1B-3**). The 2010 total fertility rate of 2,692 for American Indian women exceeded the generation replacement rate by 27.6 percent. The rate for White non-Hispanic women (1,802) was 14.6 percent lower than the replacement rate.

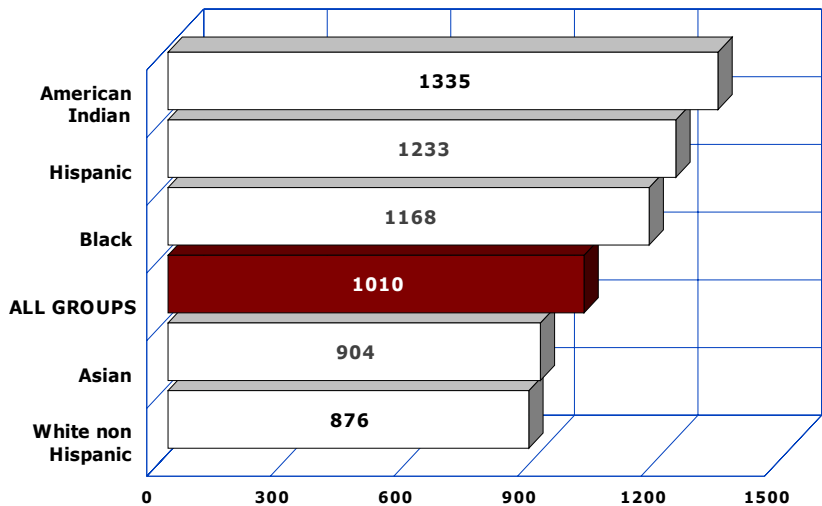
Figure 1B-3
Total Fertility Rates by Race/Ethnicity, Arizona, 2010



The sum of age group-specific birth rates multiplied by five (the number of years in the age group). The rate of 2,058 above for example, means that if a hypothetical group of 1,000 women were to have the same birth rates in each age group that were observed in the actual childbearing population in 2009, they would have a total of 2,058 children (or 2.1 children each) by the time they reached the end of the reproductive period (taken here as age 50), assuming that all of the women survived to that age.

Figure 1B-4
Gross Reproduction Rates by Race/Ethnicity, Arizona, 2010

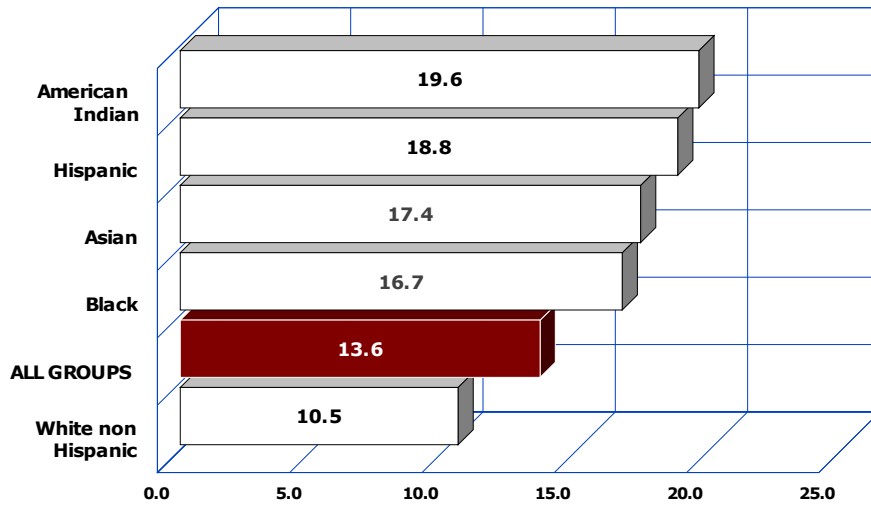
Another measure used to summarize reproduction patterns is the *gross reproduction rate*. It represents the average number of daughters born to a hypothetical cohort of 1,000 women if they experienced the age-specific birth rates observed in a given year throughout their childbearing years. This measure is similar to the total fertility rate except that it measures only female births, since reproduction is largely dependent on the number of females in a given population. In 2010, the gross reproduction rates in Arizona ranged from 876 for White non-Hispanic women to 1,335 for American Indian women (**Figure 1B-4, Table 1B-1**).



The sum of birth rates by 5-year age groups multiplied by the proportion of births that were female. The gross reproduction rate represents the average number of daughters born to a hypothetical cohort of 1,000 women if they experienced the age-specific birth rates observed in a given year throughout their childbearing years, and if none of the cohort was to die during her childbearing years.

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Figure 1B-5
Birth Rates per 1,000 Population by Race/Ethnicity, Arizona, 2010



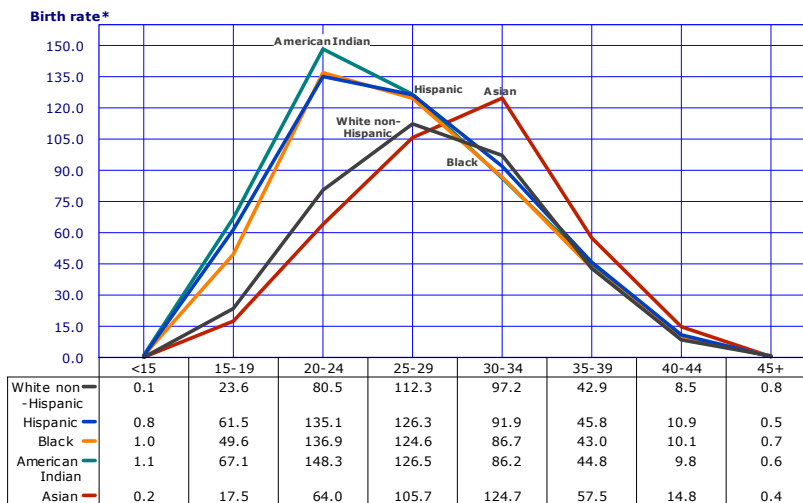
Number of births per 1,000 population in specified group.

The crude birth rate, often simply called the birth rate, relates the number of births to the total population in a specified group. The birth rate is expressed as the total number of births per 1,000 persons, without regard to the age or sex distribution of the population.

The birth rate for Arizona decreased to 13.6/1,000 in 2010 (a decline of 18.1 from the rate of 16.6/1,000 seen in 2000).

In 2010 the crude birth rates by mother's race/ethnicity ranged from 10.5 births per 1,000 White non-Hispanics to 19.6 per 1,000 American Indians (**Figure 1B-5**). It is important to note that the actual number of births among American Indians actually declined from 6,170 in 2009 to 5,815 in 2010. Compared to the 2009 population estimate of 346,080 American Indians in the State, the 2010 census counted substantially fewer American Indians (296,529).

Figure 1B-6
Birth Rates by Mother's Age Group and Race/Ethnicity, Arizona, 2010



*Number of births per 1,000 females in specified group.

The age-specific birth rates (the number of births to mothers in a particular age group per 1,000 women in that age group) differed substantially by race/ethnicity (**Figure 1B-6**).

In 2010, American Indian women had the highest birth rates for women in age groups up to 34 years. In contrast, the birth rates for women aged 35 years or older were the highest among Asian or Pacific Islander women.

The birth rate for Asian or Pacific Islander women aged 45 years or older (16.8 births per 1,000 women) was 2.3 times than the birth rate of 7.2/1,000 White non-Hispanic in this age group in 2010.

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Figure 1B-7
Percent Births to Unmarried Mothers by Age Group, Arizona, 2010

Unmarried mothers have accounted for an increasing annual proportion of births throughout the 1980s and 1990s, with 44.7 percent in 2010 (Table 1B-2). In 2010, 47,269 infants were born to unmarried mothers compared to 33,438 in 2000.

A decade ago, the proportion of births among unmarried women aged 20-24 years was 51.0 percent. This proportion continued to rise by a percentage point on average per year between 2000 and 2010. In 2010, six out of ten (62.9 percent) mothers 20-24 years old were unmarried (Figure 1B-7).

Births and birth ratios by mother's marital status, age group, and race/ethnicity are given in Table 1B-23. County-level information is provided in Table 5B-14 and 5B-15. Community-level information is in Table 9A.

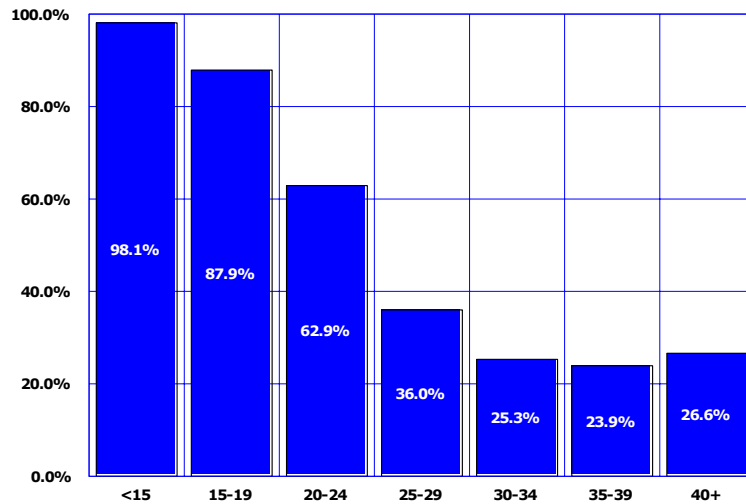
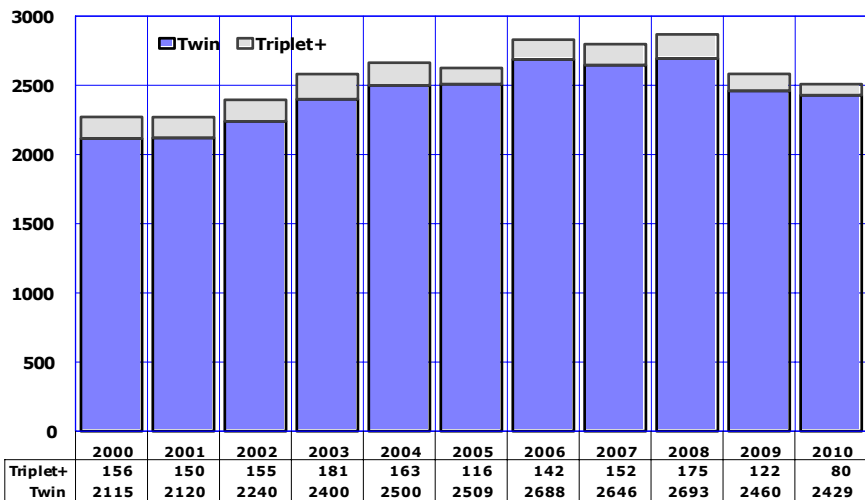


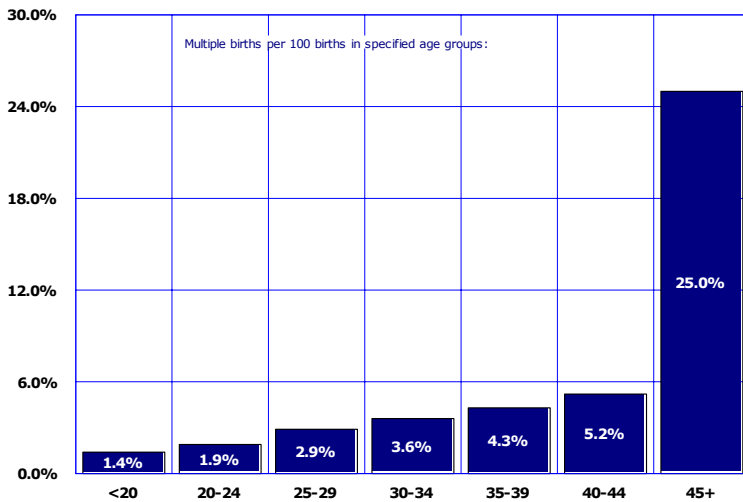
Figure 1B-8
Number of Births in Twin and Triplet+ Deliveries by Year, Arizona, 2000-2010

The number of multiple birth events in Arizona declined from 2,868 in 2008, (the highest number ever recorded) to 2,509 in 2010 (Figure 1B-8). The number of babies born in twin deliveries decreased from 2,693 in 2008 to 2,429 in 2010 (Figure 1B-8). The number of triplet and higher order multiple birth events decreased by 54.3 percent from 175 in 2008 to 80 in 2010.



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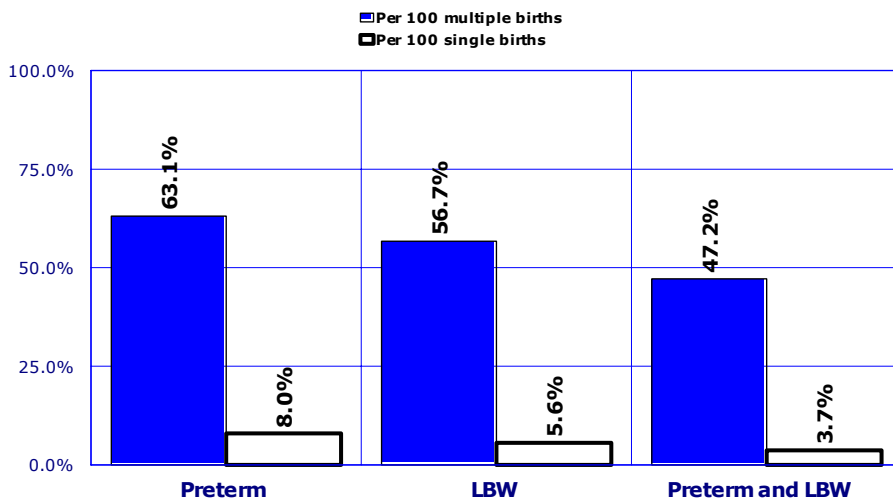
Figure 1B-9
Risk for Multiple Births by Mother's Age Group, Arizona, 2010



The rise in multiple births has been associated with two related trends: 1) advances in, and greater access to, assisted reproductive technology (ART), and 2) the older age of childbearing (women in their thirties and forties are more likely to have a multiple birth than younger women even without the use of fertility therapies).

In 2010, the proportion of multiple births increased with maternal age, with a precipitous rise at age 45 years and older. Among women aged 45 years and older 25.0 percent of all births were twins, triplets, or quadruplets (Figure 1B-9).

Figure 1B-10
Infants Born too Early (Preterm) and Infants Born too Small (LBW) among Multiple and Single Births, Arizona, 2010



Infants born in multiple deliveries tend to be born at shorter gestations and smaller than those born in singleton deliveries (Figure 1B-10). In 2010, infants born in multiple deliveries were 12.8 times more likely (47.2 vs. 3.7 percent) to be born earlier than expected (at less than 37 completed weeks of gestation) and smaller (at less than 2,500 grams) than singleton births.

Preterm birth is a leading cause of infant morbidity and mortality, accounting for almost two-thirds of infant deaths (60.3 percent; Figure 2C-4 in section 2C on Age-Specific Mortality). The weight of the newborn also is an important predictor of future morbidity and mortality. For LBW infants, the risk of dying in the first year of life is more than 10 times that of normal weight infants (56.7 deaths per 1,000 births vs. 5.6/1,000

Preterm = < 37 weeks of gestation;
LBW = low birthweight (less than 2,500 grams or 5 pounds 8 ounces).

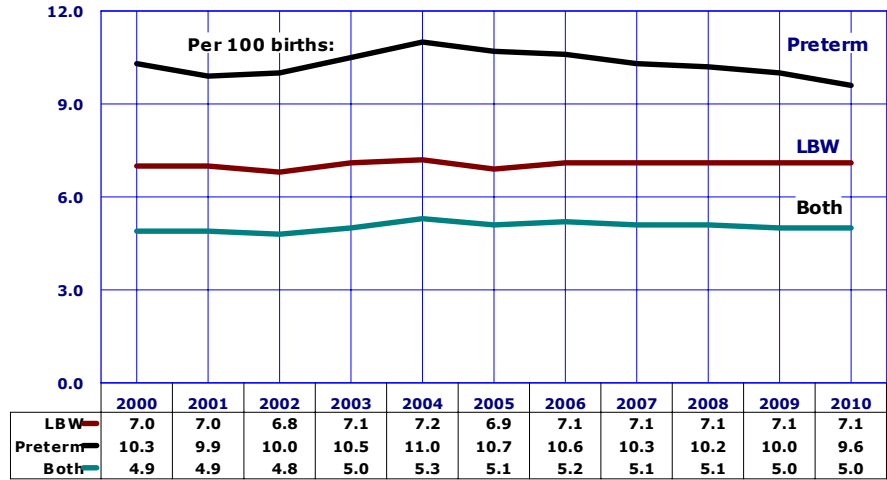
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Figure 1B-11
Preterm and Low Birthweight (LBW) Births by Year, Arizona, 2000-2010

The proportion of preterm births decreased from 10.0 percent of all births in 2009 to 9.6 percent in 2010.

The proportion of infants born earlier than expected and smaller (at less than 2,500 grams) remained unchanged at 5.0 in 2010 (Figure 1B-11).

Detailed characteristics of births by birthweight and gestational age are provided in Table 1B-33. Comparative data by county of residence are available in Table 5B-16 – Table 5B-24.



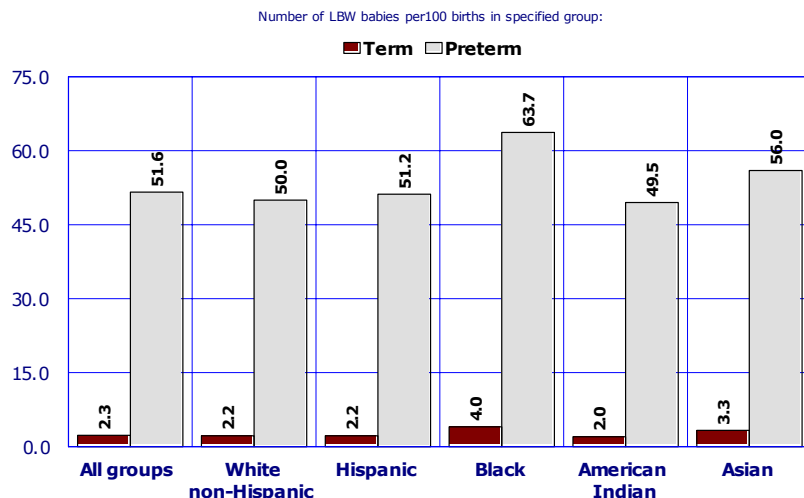
Preterm = < 37 weeks of gestation;
LBW = low birthweight (less than 2,500 grams or 5 pounds 8 ounces).

Note: In this report, the primary measure used to determine the gestational age is the clinical estimate of gestation as reported on the birth certificate.

Figure 1B-12
Low-Birthweight (LBW) Births by Length of Gestation and Mother's Race/Ethnicity, Arizona, 2010

In 2006, 2007, 2008, 2009 and 2010 7.1 percent of all babies were born at low birthweight (LBW), or at less than 2,500 grams (5 pounds 8 ounces). Preterm delivery is the strongest risk factor for LBW. Infants born at less than 37 completed weeks of gestation are 22.4 times (51.6 vs. 2.3 percent) more likely to be LBW than infants born at term (Figure 1B-12). Seven out of ten (70.2 percent) LBW babies born in 2010 were preterm (Table 1B-3).

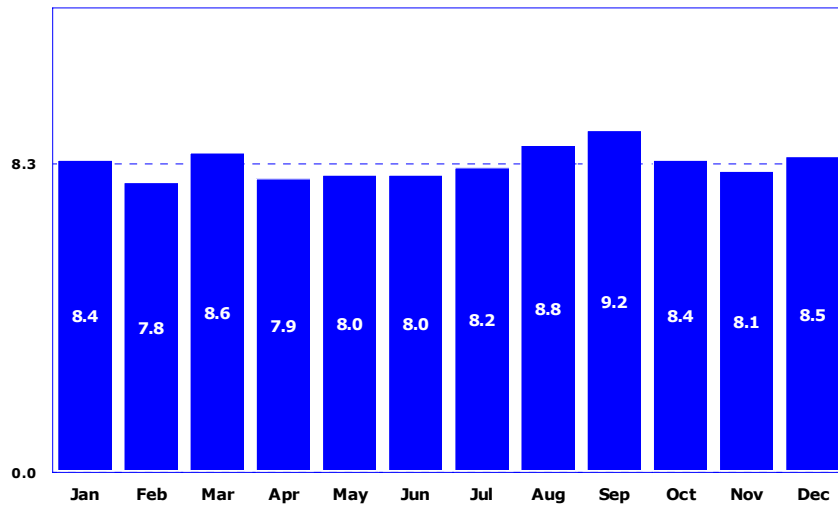
County-level data for LBW newborns are available in Tables 5B-16 – 5B-23. Community-level information is in Table 9A.



Preterm = < 37 weeks of gestation;
LBW = low birthweight (less than 2,500 grams or 5 pounds 8 ounces).

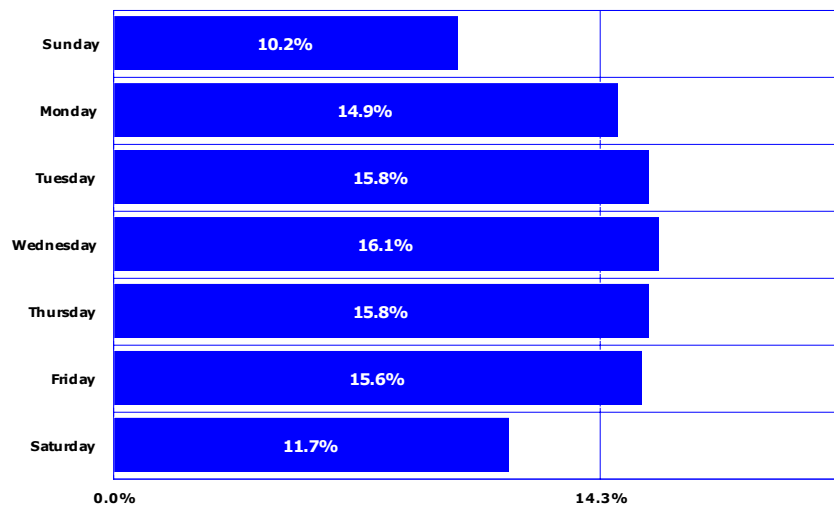
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Figure 1B-13
Percent of Resident Births by Month, Arizona, 2010



If there was no monthly variation in proportional contribution to the annual birth total, 8.3 percent of births would occur monthly. However, seasonal fluctuations in births have been observed in virtually all historical and contemporary human populations. Arizona's pattern in 2010 was characterized by a trough in April - June, and a peak in August - October (**Figure 1B-13**).

Figure 1B-14
Percent of Resident Births by Day of the Week, Arizona, 2010



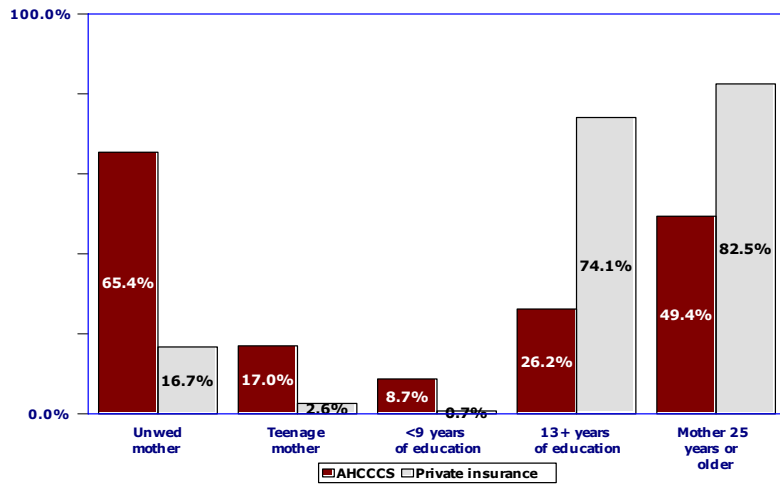
On average 238 infants were born per day in 2010 to Arizona residents. The daily average of resident live births in 2010 was substantially lower on weekends than on weekdays (**Figure 1B-14**). Many studies suggest that weekly, daily and hourly variations observed in hospitals and clinics are not due to a biological rhythm of labor, but to increased frequency of obstetric interventions in the timing of delivery (induced labors and elective cesarean deliveries), making it more aligned with the work week schedule.

In 2010, only 5.3 percent of repeat cesarean deliveries occurred on Sundays, compared to 17.9 percent on Mondays. The rate of induction of labor was substantially lower on Saturdays (8.0 percent) than it was on Thursdays (17.5 percent).

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The number of years of maternal education was the only possible index of socioeconomic status (SES) on the birth certificate prior to 1989. Paying party for the delivery became another SES indicator in 1989. The Arizona Health Care Cost Containment System (AHCCCS, the State's Medicaid Program) versus private health insurance (PHI) compares mothers of lower and higher SES respectively. The payee's SES indicator is strongly related to the maternal education indicator. PHI mothers were 2.8 times more likely to have some college education than were AHCCCS mothers (74.1 and 26.2 percent respectively, **Figure 1B-15**). More than 8 percent of AHCCCS mothers had 0-8 years of education, 12.4 times the proportion of PHI mothers. Only 16.7 percent of mothers with PHI were unmarried compared to 65.4 percent of AHCCCS mothers. Eight out of ten mothers with PHI were at least 25 years old compared to 49.4 percent of AHCCCS mothers.

Figure 1B-15
Comparison of Selected Sociodemographic Characteristics by the Payee for Delivery, Arizona, 2010

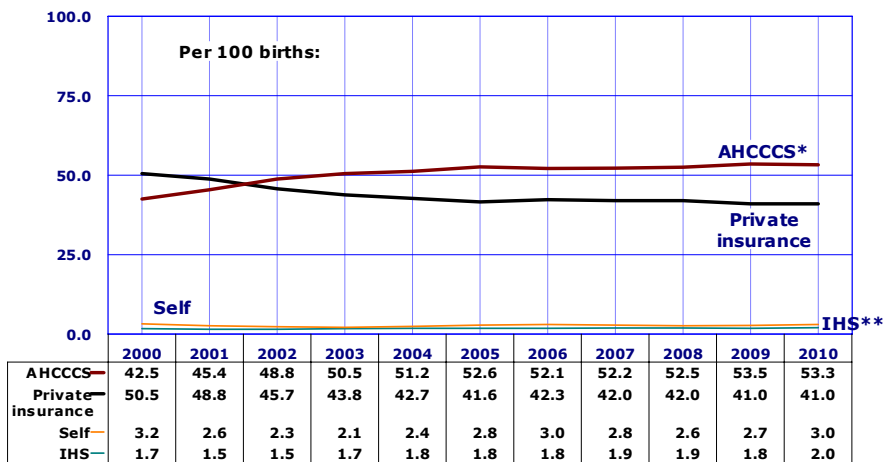


Note: The Arizona Health Care Cost Containment System (AHCCCS) is the State's Medicaid program.

Since 2002, the share of resident births paid for by AHCCCS continues to exceed the share paid by private health insurance (**Figure 1B-16**). In 1989, private insurance paid for a slight majority (50.6 percent) of all deliveries and AHCCCS was the payee for the next largest share of deliveries at 26.5 percent, followed by the payment by the women themselves at 12.1 percent.

The AHCCCS share remained virtually unchanged from 2009 at 53.3 of all deliveries in 2010. The share of private health insurance also remained unchanged at 41 percent in both in 2009 and 2010. The payment source was the mothers themselves and/or their families (i.e., self-pay) in 3.0 percent of the deliveries. The Indian Health Service paid for 2.0 percent of the births in 2010 (**Table 1B-28**; see also **Table 1B-25**).

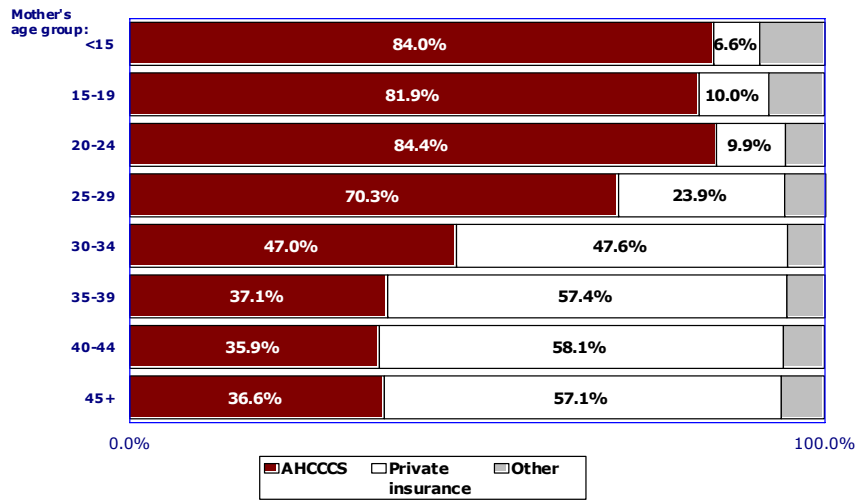
Figure 1B-16
Births by Payer and Year, Arizona, 2000-2010



* The Arizona Health Care Cost Containment System (AHCCCS) is the State's Medicaid program.
** The Indian Health Service.

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Figure 1B-17
Payee for Delivery by Mother's Age Group, Arizona, 2010



In 2010, the Arizona Health Care Cost Containment System paid for the absolute majority of the deliveries to mothers 29 years or younger (**Figure 1B-17**). In contrast, private insurance was the largest payer for the deliveries of women giving birth who were 30 years old or older in 2010 (based on data in **Table 1B-28**).

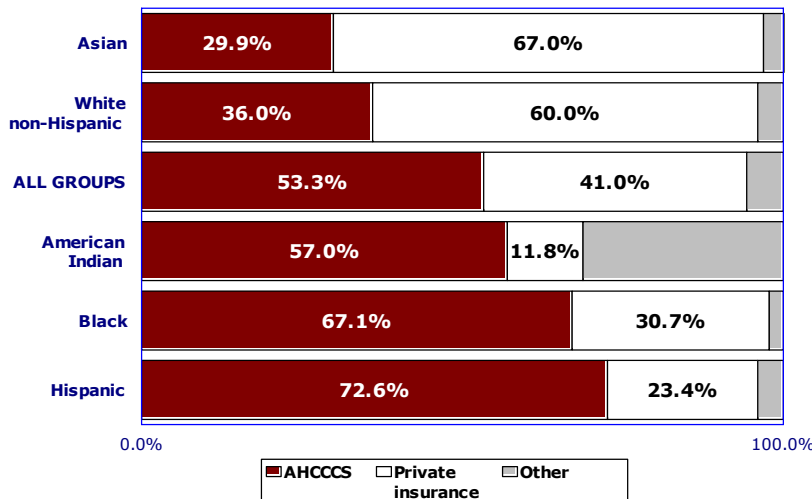
For each of the age groups the AHCCCS share substantially increased since 1989. Below are the proportions of deliveries paid for by the AHCCCS in 1989:

- <15 years: 45.3 percent
- 15-19 years: 49.0 percent
- 20-24 years: 34.3 percent
- 25-29 years: 19.4 percent
- 30-34 years: 14.5 percent
- 35-39 years: 13.9 percent
- 40+ years: 14.2 percent.

From 1989 to 2010, the AHCCCS share more than doubled among mothers 25 years old or older.

Note: The Arizona Health Care Cost Containment System (AHCCCS) is the State's Medicaid program.

Figure 1B-18
Payee for Delivery by Mother's Race/Ethnicity, Arizona, 2010



In 2010, private insurance was the largest payer for deliveries of Asian (at 67.0 percent) and White non-Hispanic infants (at 60.0 percent). In contrast, the Arizona Health Care Cost Containment System was the largest payer for deliveries of Hispanic or Latino (72.6 percent), Black or African American (67.1 percent) and American Indian women (57.0 percent).

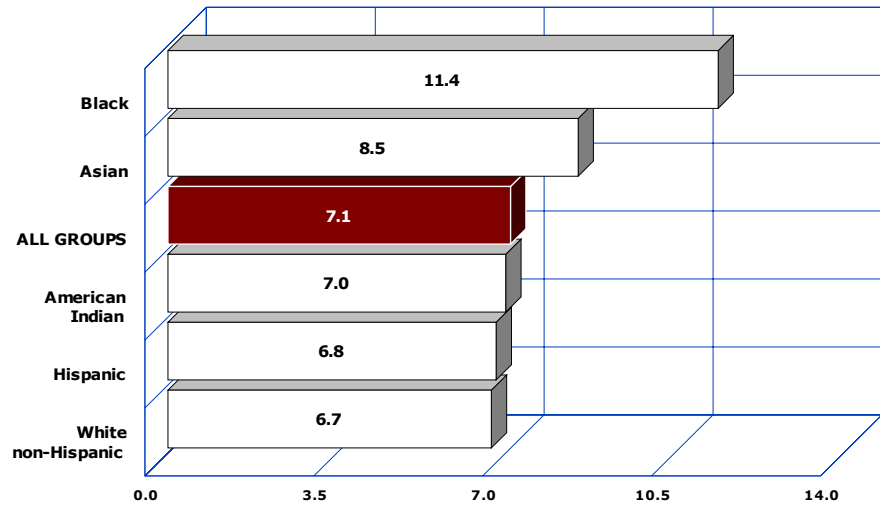
The Indian Health Service as a payer accounted for a 28.5 percent share of deliveries of American Indian or Alaska Native infants in the State (**Figure 1B-18**, based on data in **Table 1B-28**).

Hispanics or Latino accounted for 53.8 percent of the 46,393 deliveries paid for by the AHCCCS. Thirty percent of all AHCCCS births were to White non-Hispanic women (based on data in **Table 1B-28**).

Note: The Arizona Health Care Cost Containment System (AHCCCS) is the State's Medicaid program. Other = Indian Health Service, self, or unknown.

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Figure 1B-19
Percent Low Birthweight* by Mother's Race/Ethnicity,
Arizona Residents, 2010

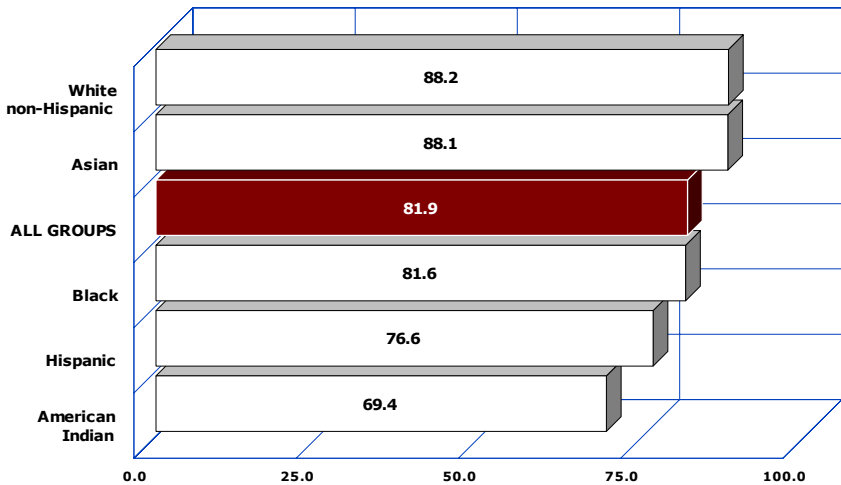


In 2010, 7.1 percent of all Arizona infants were born at a low birthweight (LBW), or at less than 2,500 grams (5 pounds 8 ounces), unchanged from 2006.

In Arizona, LBW rates differed by mother's race/ethnic group. LBW rates were highest for newborns of Black or African American mothers (11.4 percent) and Asian or Pacific Islander mothers (8.5 percent) mothers. Newborns of American Indian and Hispanic or Latino and White non-Hispanic mothers had the lowest LBW rates (6.8 and 6.7 percent respectively; based on data in **Table 1B-26**).

Low birthweight is less than 2,500 grams (less than 5 pounds 8 ounces).
 Note: The latest available U.S. ratio is for 2005.

Figure 1B-20
First Trimester Prenatal Care by Mother's Race/Ethnicity,
Arizona Residents, 2010

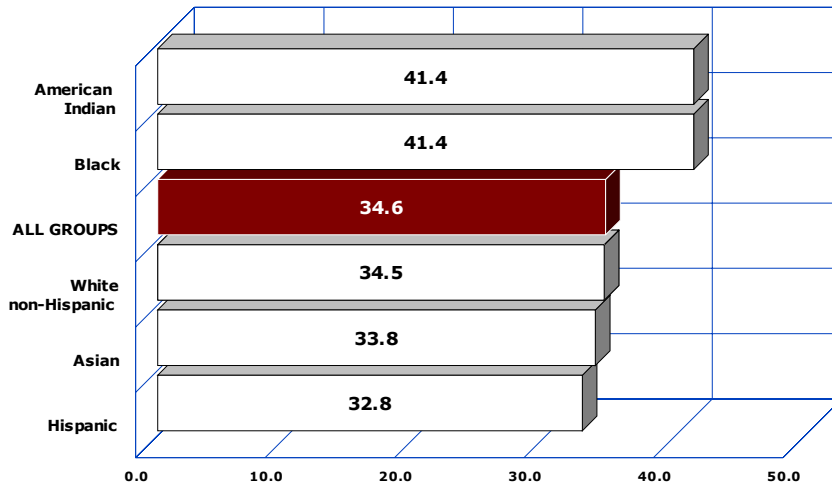


The percent of Arizona mothers giving birth who received early prenatal care (i.e., in the first trimester) increased from 80.3 in 2009 to 81.9 in 2010 (**Table 1B-2**).

In Arizona, American Indian, Hispanic or Latino, and Black or African American mothers were least likely to begin prenatal care in the first trimester (**Figure 1B-20**). The highest rates of utilization of early prenatal care were among White non-Hispanic and Asian or Pacific Islander mothers (based on data in **Table 1B-26**).

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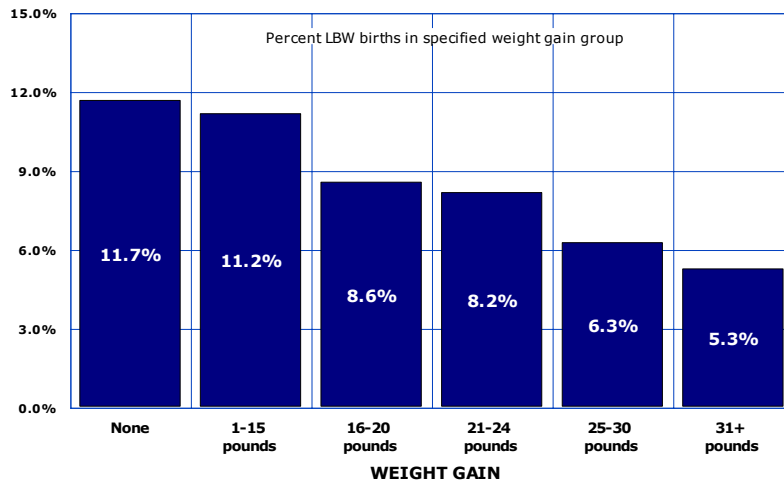
Figure 1B-21
Maternal Medical Risk Factors per 100 Births by Mother's Race/Ethnicity, Arizona, 2010



Maternal medical risk factors (such as anemia, diabetes, hypertension, or kidney disease) can contribute to serious pregnancy complications and infant deaths, if not treated properly. In 2010, American Indian or Alaska Native and Black or African American women giving birth had the highest proportion of medical risk factors (41.4 percent, **Figure 1B-21**).

Births with medical risk factors reported per 100 births in specified group.

Figure 1B-22
Risk for Low-Birthweight by Maternal Weight Gain during Pregnancy, Arizona, 2010



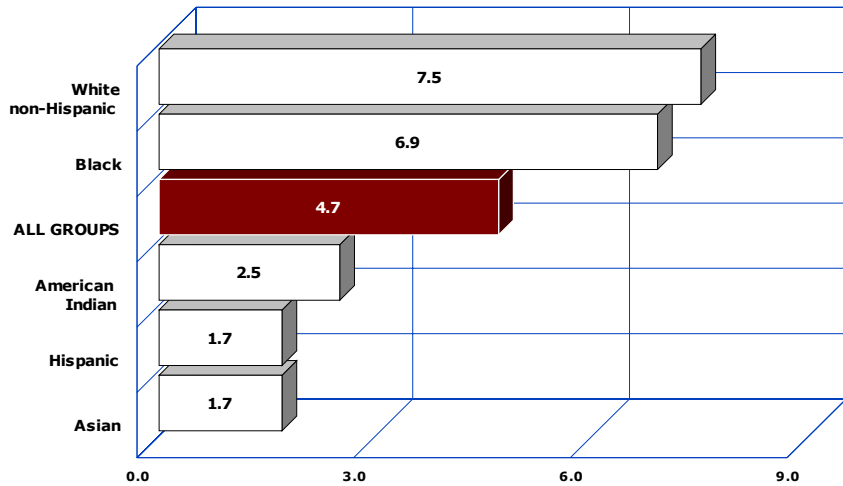
Maternal weight gain during pregnancy is a determinant of both fetal growth and birthweight. Insufficient or excessive weight gain during pregnancy can negatively affect both maternal and pregnancy outcome (see **Figure 2C-4.3**). Women who are of normal weight (average body mass index or BMI) should gain 21-35 pounds during pregnancy. Women who are underweight should gain more (28-40 pounds), and women who are overweight should gain less (15 to 25 pounds). Unfortunately, it is not possible to determine whether weight gain is within the recommendations for the mother's BMI because the mother's pre-pregnancy weight and height is not reported on the birth certificate.

Maternal weight gain has been shown to be correlated with infant birthweight. In 2010, as in previous years, the percent of infants with low birthweight decreased with increasing maternal weight gain (**Figure 1B-22**).

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Figure 1B-23
Self-reported Tobacco Use during Pregnancy by Race/Ethnicity, Arizona, 2010

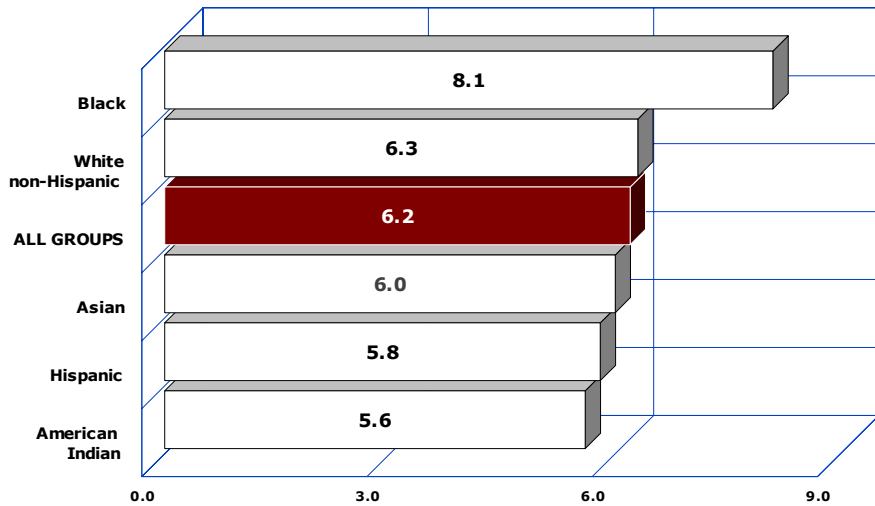
Cigarette smoking during pregnancy has been associated with reduced infant weight at birth, intrauterine growth retardation and preterm births. Smoking during pregnancy was reported by 4.7 percent of women giving birth in 2010 (Table 1B-26, Table 5B-30), compared to 10.5 percent in 1989, when this information was first reported on Arizona birth certificates. It is unclear, whether this decline means that women giving birth in Arizona are less likely to use tobacco during pregnancy or, perhaps, less likely to report it when they use. White non-Hispanic and Black mothers continued to be more likely to report smoking than American Indian, Asian, and Hispanic (Figure 1B-23).



Mothers giving birth who reported tobacco use per 100 births in specified group.

Figure 1B-24
Rates of Admission to Newborn Intensive Care Units per 100 Births by Mother's Race/Ethnicity, Arizona, 2010

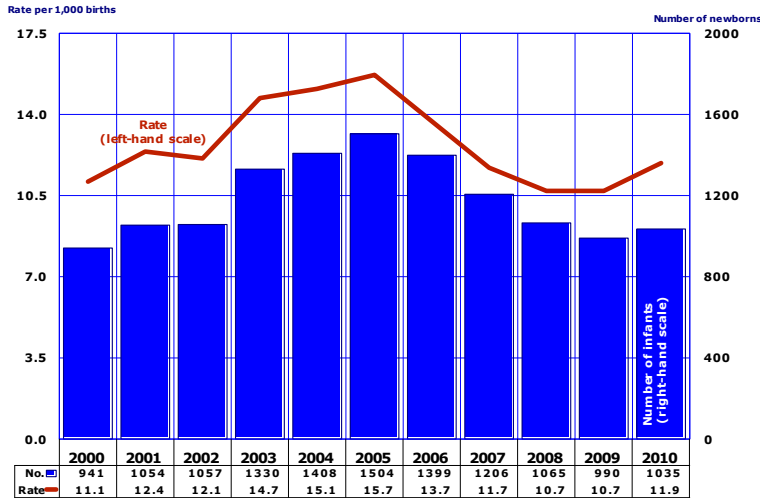
More than 5,000 or 6.2 percent of newborns in 2010 were admitted to newborn intensive care units (NICUs). Surprisingly, only 47.1 percent of the NICU admissions were low birthweight (LBW) babies. Prematurity, i.e., gestational age before 37 weeks captured more NICU admissions than did LBW, with 58.0 admissions being premature (based on data in Table 1B-33). The proportion of NICU admissions differed among race/ethnic groups. In 2010, the rate of NICU admissions for Black or African American (8.1 percent) was the highest among race/ethnic groups (Table 1B-26).



The number of newborns admitted to Intensive Care Units per 100 births in specified group.

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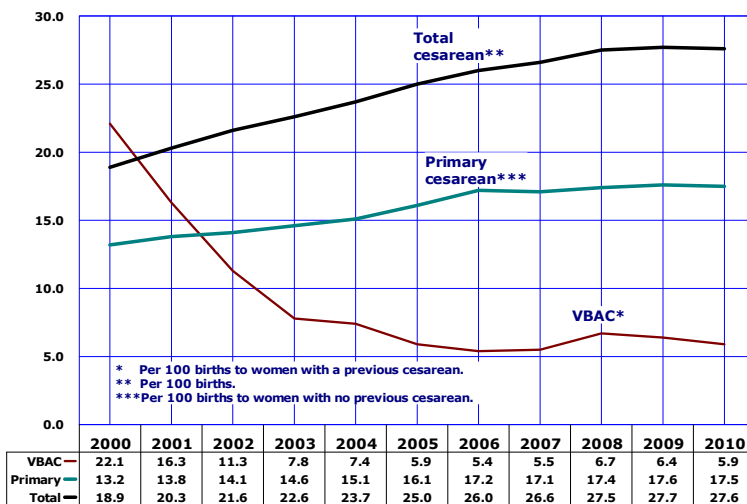
Figure 1B-25
Newborns Who Were Hospitalized after Birth because They Were Affected by Maternal Use of Drugs during Pregnancy, Arizona, 2000-2010



Information about maternal drug use during pregnancy is not reported on Arizona birth certificates. However, it can be obtained from the hospital discharge database. There are several diagnostic codes which identify exposure of fetus or newborn to specific noxious substances (such as narcotics, hallucinogenic agent, or cocaine) transmitted via placenta or breast milk. Following the four years of decline between 2005 and 2009 in the number of newborns hospitalized after birth due to maternal drug use during pregnancy increased from 990 in 2009 to 1,035 in 2010.

The diagnostic codes and additional information about hospitalizations related to noxious influences affecting the fetus are available online on the Health Status and Vital Statistics website at <http://www.azdhs.gov/plan/hip/for/substance/index.htm>

Figure 1B-26
Total and Primary Cesarean Deliveries and Vaginal Births after Previous Cesarean (VBAC), Arizona, 2000-2010



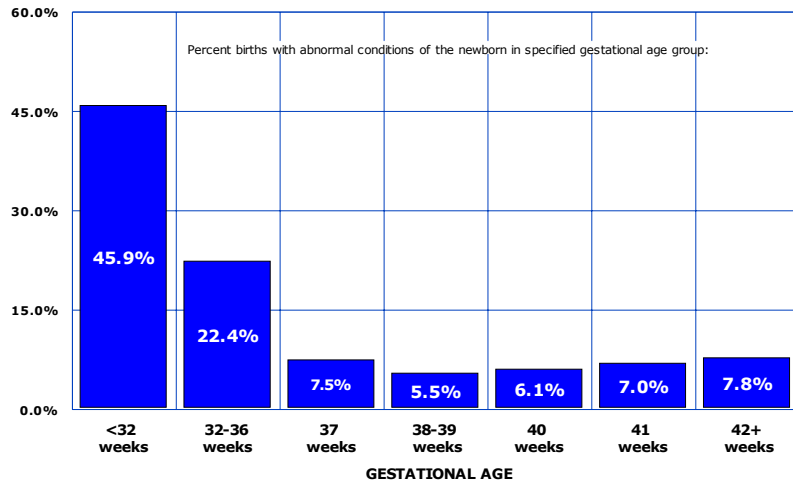
The rate of cesarean delivery increased to an all time high of 27.7 percent of all resident births in 2009 (Figure 1B-26, Table 1B-2). It declined by not much in 2010 (27.6 vs. 27.7).

The primary cesarean rate in 2010 (17.1 per 100 live births to women who had no previous cesarean) was 29.5 percent higher than in 2000 (13.2 per 100 live births). The rate of repeat cesarean deliveries almost doubled from 5.7 percent in 2000 to 10.5 percent in 2010.

The rate of vaginal birth after previous cesarean delivery (VBAC) declined 73.3 percent from a recent high of 22.1 in 2000 to 5.9 in 2010.

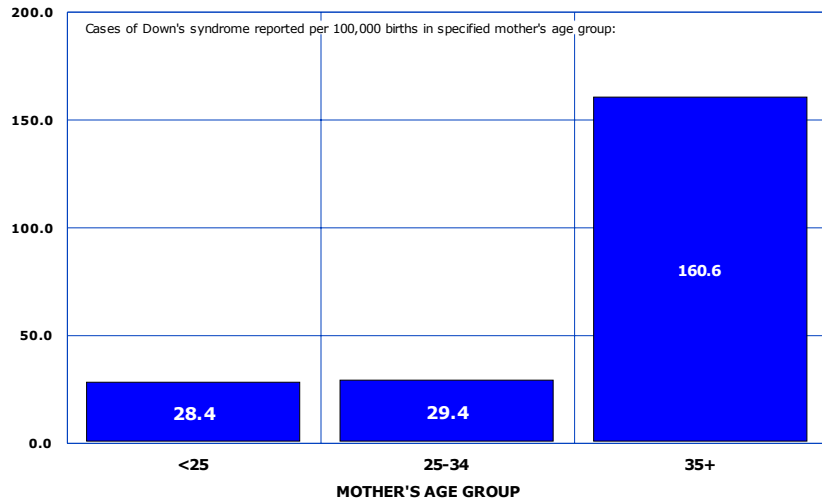
1B. NATALITY: MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH

Figure 1B-27
Abnormal Conditions of the Newborn by Gestational Age, Arizona, 2010



Since the first year these data were collected, three of the eight specific abnormal conditions listed on the birth certificate have been reported most frequently: *assisted ventilation less than 30 minutes, assisted ventilation of 30 minutes or longer, and hyaline membrane disease/ respiratory distress syndrome (RDS)*. *Hyaline membrane disease/RDS* is a common cause of morbidity in preterm infants. The rates of abnormal conditions are the highest among very preterm (less than 32 weeks of gestation), moderately preterm (32-36 weeks of gestation) and post-term (42+ weeks) infants (**Figure 1B-27**).

Figure 1B-28
The Incidence of Downs Syndrome by Mother's Age Group, Arizona, 2010



Congenital anomalies (birth defects) are the leading cause of infant death in Arizona and nationally. They are also the cause of physical defects and metabolic diseases.

For various anomalies, rates vary widely with maternal age. For example, in 2010 as in prior years, the rate of Down's Syndrome, the most frequently recognized cause of mental retardation was substantially higher for births to mothers aged 35 years and over (**Figure 1B-28, Table 1B-34**). The incidence rate of 160.6 cases of Down's Syndrome per 100,000 births to women 35 years or older was 5.7 times greater than the incidence rate of 28.4 for women aged 24 years or younger.