



1B.

NATALITY: MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH

In 2006, the number of resident births exceeded 100,000 for the first time in the State's history. The number more than doubled from 50,049 in 1980 (**Table 8A-1**) to 102,042 in 2006 (**Table 1B-2**).

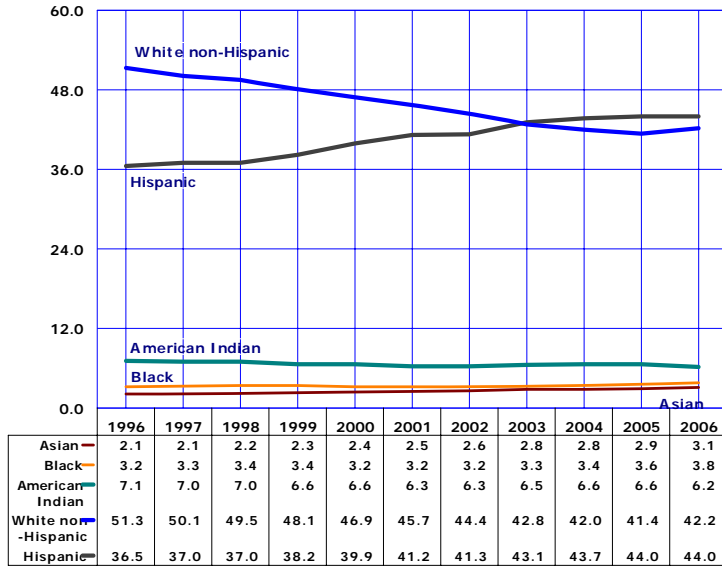
Compared to 2005, the number of resident births increased by an unprecedented 6.5 percent (**Table 1B-2**). All age groups of women spanning the years of 15 to 44 gave birth at a higher rate in 2006 relative to 2005, with the increase for 35 to 39 year old women being more than 23 percent (**Table 1B-2**).

Births rose by 12 percent for Black or African American mothers and by 11.8 percent for Asian or Pacific Islander mothers. Quite unexpectedly, the number of White non-Hispanic births also increased by 8.5 percent from 39,657 in 2005 to 43,013 in 2006 (**Table 1B-6, Table 1B-22**). Hispanic or Latino mothers also experienced a substantial increase of 6.4 percent from 42,156 births in 2005 to 44,862 in 2006. The number of births to American Indian or Alaska Native mothers increased by a mere 1.1 percent.

Among the specified Hispanic groups, births increased by 19.6 percent for Central and South American women and 7.3 percent for Mexican women (**Table 1B-22**). The number of births remained unchanged for Cuban women and declined for Puerto Rican women.

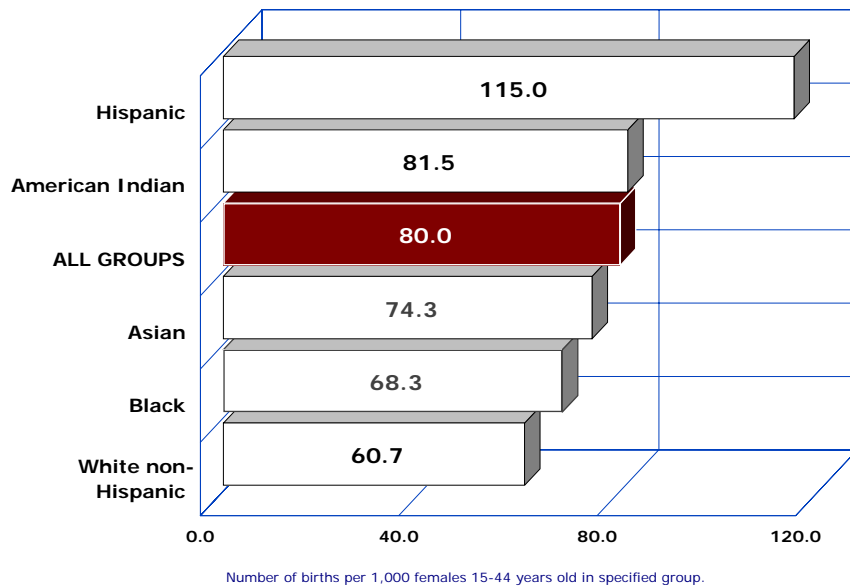
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Figure 1B-1
Percent of Resident Live Births by Race/Ethnicity and Year, Arizona, 1996-2006



White non-Hispanic and American Indian mothers each experienced decreased shares of all resident births in 2006 compared to 1996 (**Table 1B-2**). Hispanic women accounted for the largest share of annual resident births among the race/ethnic groups in Arizona since 2003. Among every 100 babies born in Arizona in 2006, 44 were Hispanics (44.0 percent, unchanged since 2005), 42 White non-Hispanics (42.2 percent, a slight increase from 41.4 percent in 2005), 6 American Indians (6.2 percent), 4 Blacks (3.8 percent), and 3 Asians or Pacific Islanders (3.1 percent). The remaining 1 percent of mothers giving birth in 2006 chose not to identify themselves by race/ethnicity.

Figure 1B-2
General Fertility Rates by Race/Ethnicity, Arizona, 2006



From among 1,275,622 women of childbearing age (15-44 years), 8 percent gave birth in 2006. The *general fertility rate* (the number of births per 1,000 women 15-44 years old) was the highest for Hispanic women (115 births per 1,000 or 11.5 percent) followed by American Indians (81.5 births per 1,000). Fertility rates for Asian or Pacific Islander (74.3 births per 1,000), Black or African American (68.3 per 1,000) and White non-Hispanic (60.7 per 1,000) were lower than the average for all groups (**Figure 1B-1**, **Table 1A-1**).

The 2006 fertility rates for all race/ethnic groups except White non-Hispanics were below the 2005 levels. The rate for White non-Hispanic women increased by 18.6 percent.

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

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Figure 1B-3
Total Fertility Rates by Race/Ethnicity,
Arizona, 2006

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 1996 to 2006, 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 2006, the total fertility rates differed substantially by race/ethnicity (**Figure 1B-3**). The 2006 total fertility rate of 3,250 for Hispanic women exceeded the generation replacement rate by 54 percent. The rate for White non-Hispanic women (1,874) was 11.2 percent lower than the replacement rate.

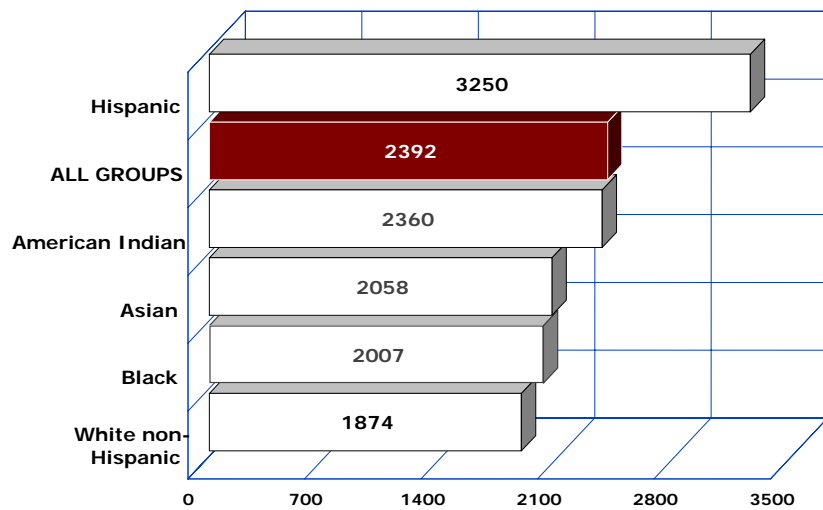
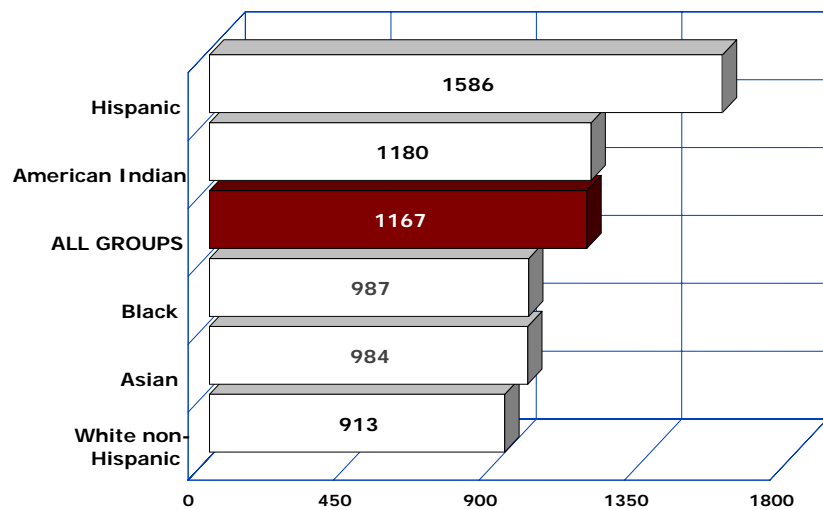


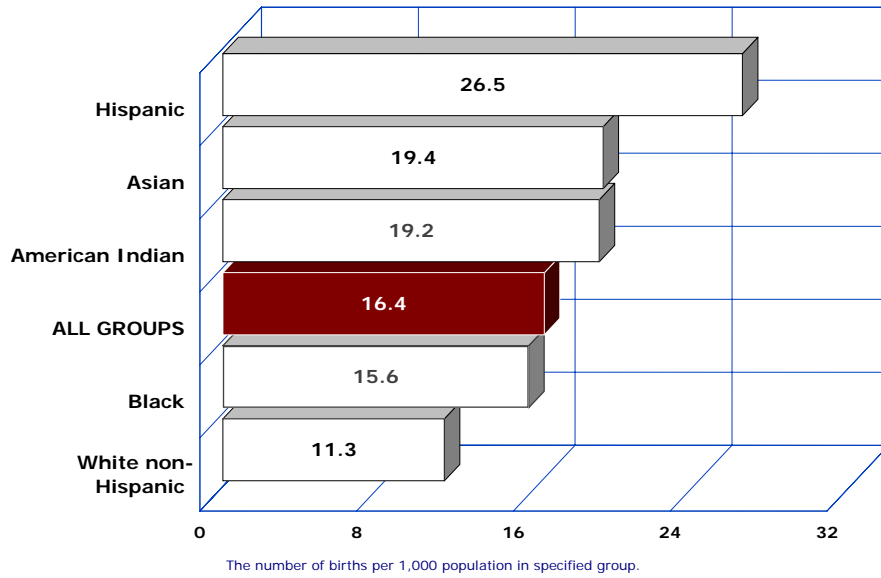
Figure 1B-4
Gross Reproduction Rates by Race/Ethnicity,
Arizona, 2006

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 2006, the gross reproduction rates in Arizona ranged from 913 for White non-Hispanic women to 1,586 for Hispanic women (**Figure 1B-4**, **Table 1B-1**).



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Figure 1B-5
Birth Rates per 1,000 Population by Race/Ethnicity,
Arizona, 2006

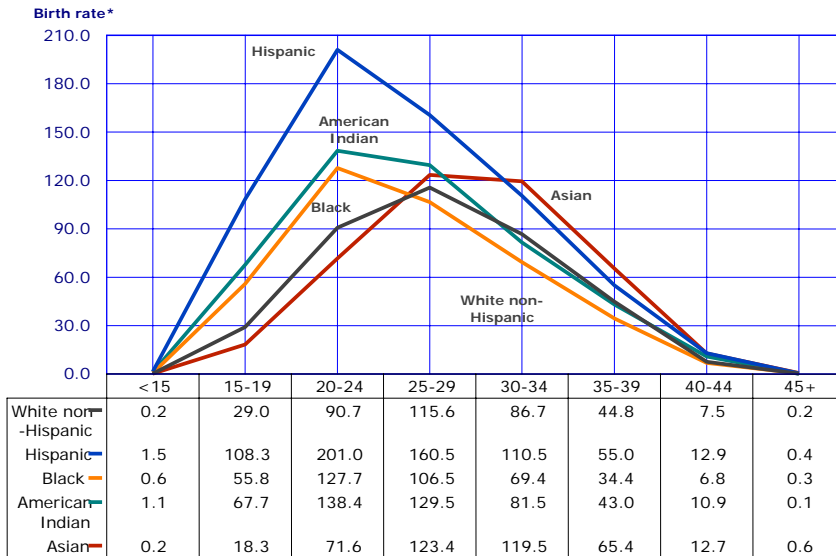


The crude birth rate, often simply called the birth rate, relates the number of births to the total population in a specified group. The birth rate is expressed as the total number of births per 1,000 persons, without regard to the age or sex distribution of the population.

The birth rate for Arizona increased from 15.8 births per 1,000 population in 2005 to 16.4/1,000 in 2006.

In 2006 the crude birth rates by mother's race/ethnicity ranged from 11.3 births per 1,000 White non-Hispanics to 26.5 per 1,000 Hispanics or Latinos (**Figure 1B-5**).

Figure 1B-6
Birth Rates by Mother's Age Group and Race/Ethnicity,
Arizona, 2006



* 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 2006, Hispanic or Latino women had the highest birth rates for women in age groups up to 30 years. In contrast, the birth rates for women aged 30 years or older were the highest among Asian or Pacific Islander women.

The birth rate for White non-Hispanic women aged 35-39 years reached a record high of 44.8 percent from the rate in 2005 (31.6/1,000).

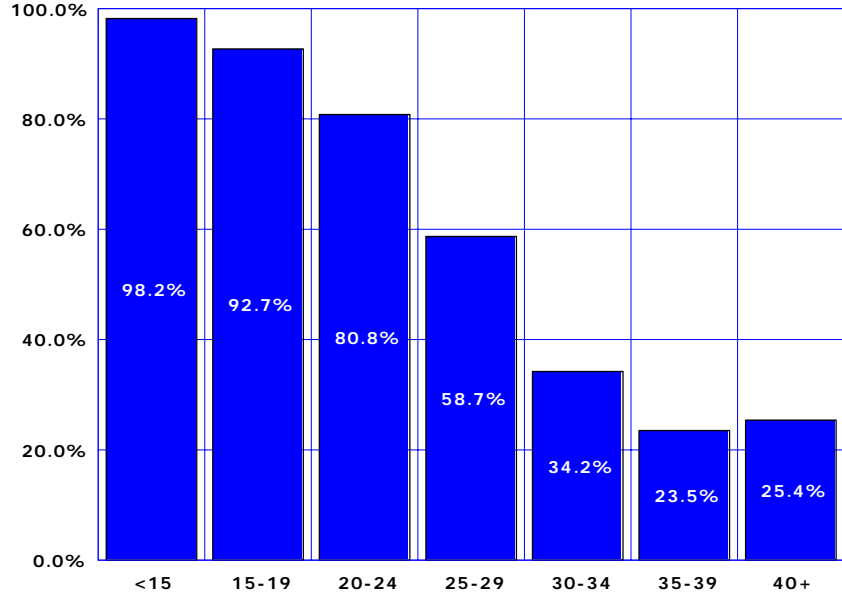
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Unmarried mothers have accounted for an increasing annual proportion of births throughout the 1980s and 1990s, with 43.9 percent in 2006 marking a new historical high. In 2006, 44,746 infants were born to unmarried mothers compared to 15,600 in 1986.

Two decades ago, the proportion of births among unmarried women aged 20-24 years was 29.9 percent. This proportion rose to 48.6 between 1986 and 1996. In 2006, eight out of ten 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-7
Percent Births to Unmarried Mothers by Age Group, Arizona, 2006

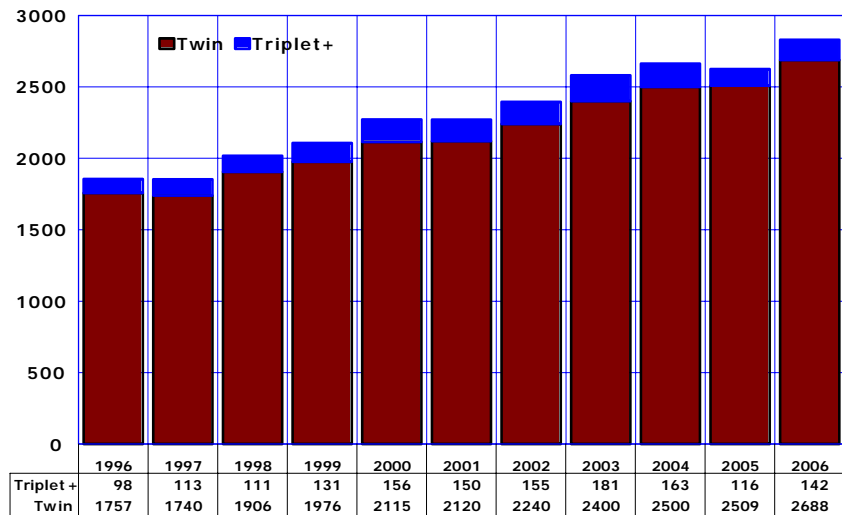


There were 2,830 multiple birth events in Arizona in 2006, the highest number ever recorded in the State. (**Figure 1B-8**). The number of babies born in twin deliveries increased by 53 percent from 1,757 in 1996 to 2,688 in 2006 (**Figure 1B-8**). The number of triplet and higher order multiple birth events also increased by 44.9 percent from 98 in 1996 to 142 in 2006.

The number of singleton births increased by 36.6 percent over this period, from 72,658 in 1996 to 99,216 in 2006 (**Table 1B-16**).

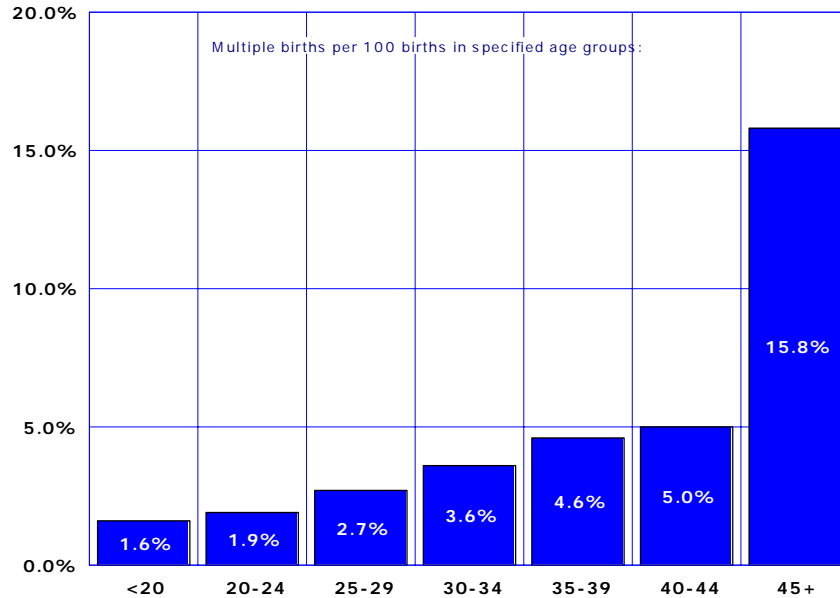
The number of multiple birth events, as a proportion of total births, has increased from 2.7 percent in 2005, to 2.8 percent in 2006 (**Table 1B-2**).

Figure 1B-8
Number of Births in Twin and Triplet+ Deliveries by Year, Arizona, 1996-2006



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Figure 1B-9
Risk for Multiple Births by Mother's Age Group,
Arizona, 2006

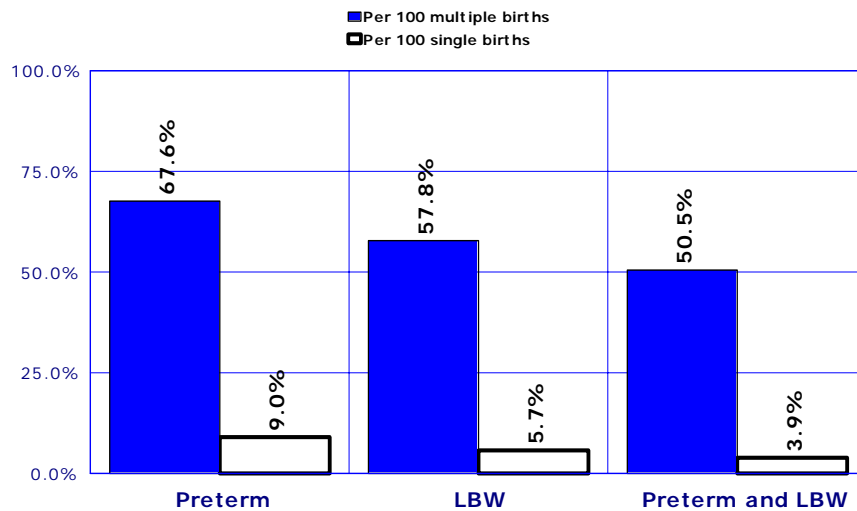


The rise in multiple births has been associated with two related trends: 1) advances in, and greater access to, assisted reproductive technology (ART), and 2) the older age of childbearing (women in their thirties and forties are more likely to have a multiple birth than younger women even without the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

In 2006, the proportion of multiple births increased with maternal age, with a precipitous rise at age 45 years and over. Among women aged 45 years and over 15.8 percent of all births were twins, triplets or quadruplets (**Figure 1B-9**).

Nationally, of 48,756 infants born through ART, 51 percent were born in multiple-birth deliveries (*Assisted reproductive technology surveillance – United States 2003. In: Surveillance Summaries, May 26, 2006. MMWR 2006:55 (No. SS-4).*

Figure 1B-10
Infants Born Too Early (Preterm) and Infants Born Too Small
(LBW) Among Multiple and Single Births,
Arizona, 2006



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

Infants born in multiple deliveries tend to be born at shorter gestations and smaller than those born in singleton deliveries (**Figure 1B-10**). In 2006, infants born in multiple deliveries were 13 times more likely (50.5 vs. 3.9 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 more than two-thirds of infant deaths (**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 nearly 26 times that of normal weight infants (57 deaths per 1,000 births vs. 2.2/1,000; **Figure 2C-3**).

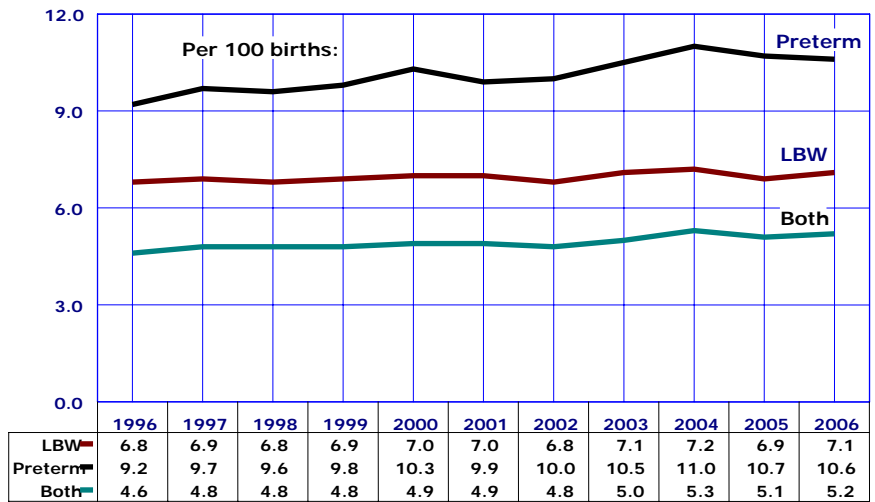
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Figure 1B-11
Preterm and Low Birthweight (LBW) Births by Year,
Arizona, 1996-2006

The proportion of preterm births decreased slightly from 11.0 percent in 2004 to 10.7 percent in 2005 and 10.6 percent in 2006. The percent of preterm births (at less than 37 completed weeks of gestation) has risen fairly steadily over the last decade, from 9.2 percent in 1996.

The proportion of infants born earlier than expected and smaller (at less than 2,500 grams) increased from 4.6 percent in 1996 to 5.3 percent in 2004 but it has declined to 5.1 percent in 2005 and then it rose to 5.2 percent in 2006 (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 is less than 37 weeks of gestation;
Low birthweight (LBW) is less than 2,500 grams (less than 5 pounds 8 ounces).

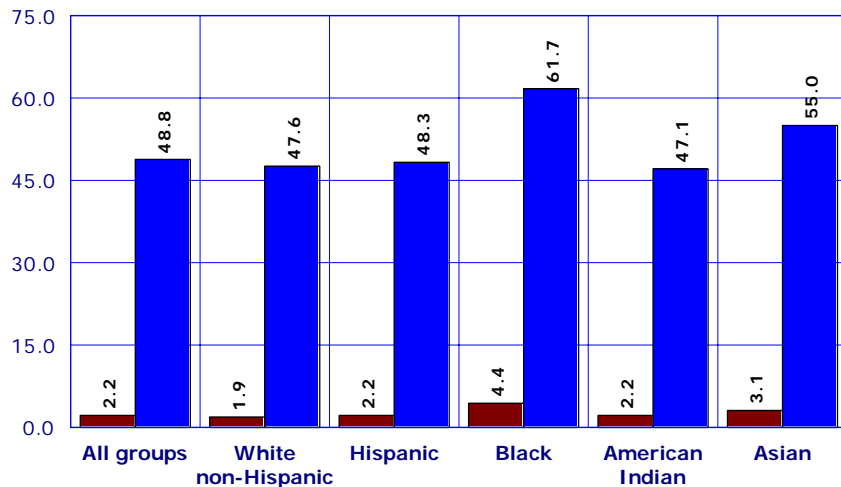
Note: In this report, the primary measure used to determine the gestational age is the clinical estimate of gestation as reported on the birth certificate.

Figure 1B-12
Low-Birthweight (LBW) Births by Length of Gestation and
Mother's Race/Ethnicity, Arizona, 2006

In 2006, 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 22.2 times (48.8 vs. 2.2 percent) more likely to be LBW than infants born at term (Figure 1B-12). Seven out of ten (72.7 percent) LBW babies born in 2006 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.

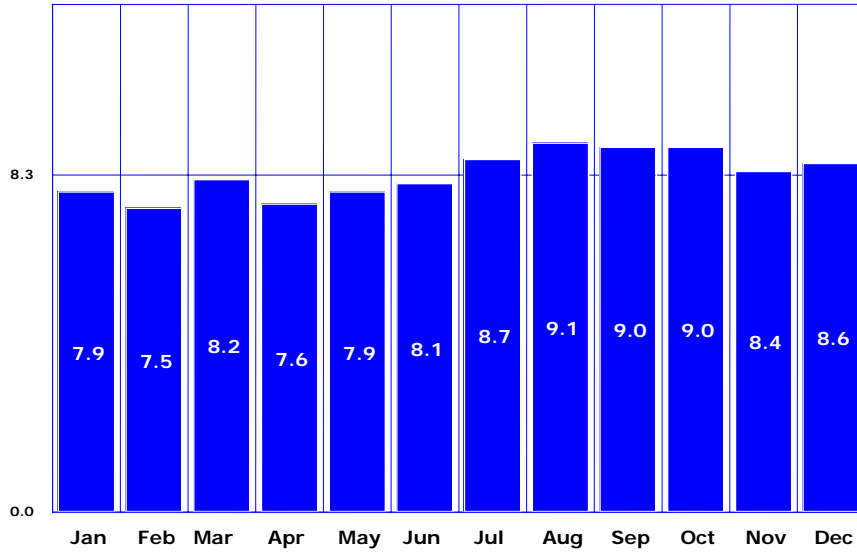
Number of LBW babies per 100 births in specified group:
■ Term ■ Preterm



Preterm is less than 37 weeks of gestation;
Low birthweight (LBW) is less than 2,500 grams (less than 5 pounds 8 ounces).

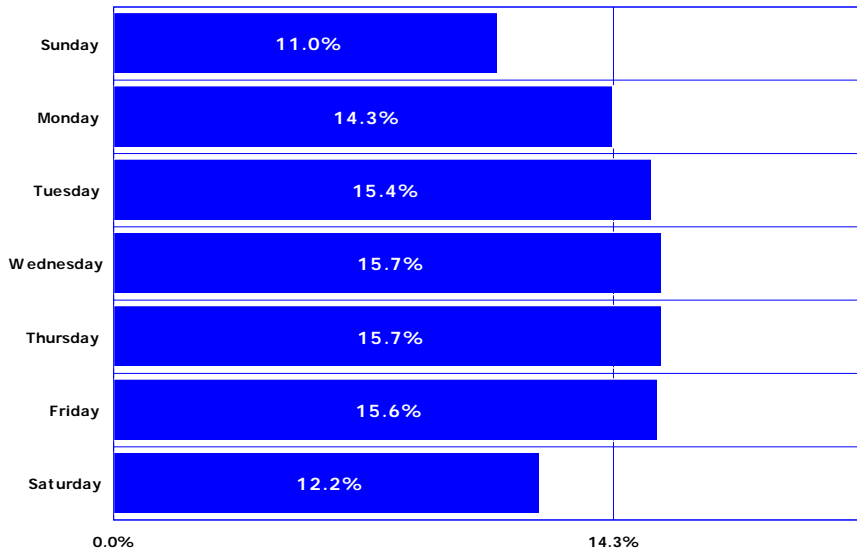
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Figure 1B-13
Percent Resident Births by Month,
Arizona, 2006



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. The American pattern is characterized by a trough in April - May, and a peak in August -October (**Figure 1B-13**).

Figure 1B-14
Percent Resident Births by Day of the Week, Arizona, 2006



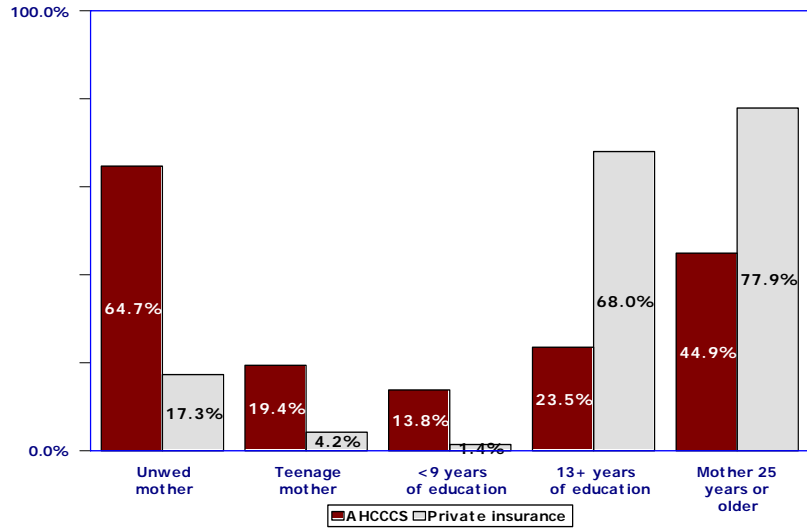
On average 280 infants were born per day in 2006 to Arizona residents. The daily average of resident live births in 2006 was substantially lower on weekends than on weekdays (**Figure 1B-14**). Many studies suggest that weekly, daily and hourly variations observed in hospitals and clinics are not due 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 2006, only 5.3 percent of repeat cesarean deliveries occurred on Sundays, compared to 18.9 percent on Fridays. The rate of induction of labor was substantially lower on Sundays (8.7 percent) then it was on Tuesdays (17.4 percent).

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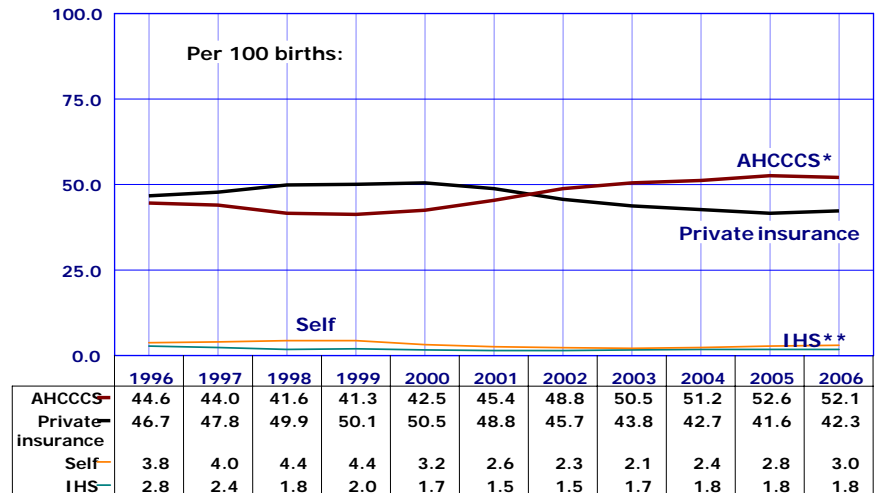
The number of years of maternal education was the only possible index of socioeconomic status (SES) on the birth certificate prior to 1989. Paying party for the delivery became another SES indicator in 1989. The Arizona Health Care Cost Containment System (AHCCCS, the State's Medicaid Program) versus 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 2.9 times more likely to have some college education than were AHCCCS mothers (68.0 and 23.5 percent respectively, **Figure 1B-20**). Fourteen percent of AHCCCS mothers had 0-8 years of education, ten times the proportion of PHI mothers. Only 17.3 percent of mothers with PHI were unmarried compared to 64.7 percent of AHCCCS mothers. Eight out of ten (77.9 percent) mothers with PHI were at least 25 years old compared to 44.9 percent of AHCCCS mothers.

Figure 1B-15
Comparison of Selected Sociodemographic Characteristics by the Payee for Delivery, Arizona, 2006



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

Figure 1B-16
Births by Payer and Year, Arizona, 1996-2006



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

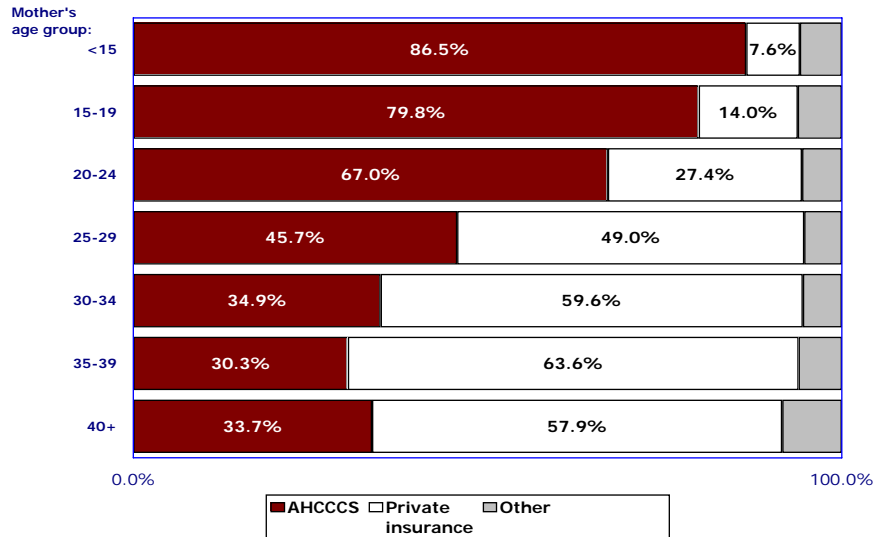
** The Indian Health Service.

Since 2002, the share of resident births paid for by AHCCCS continues to exceed the share paid by private health insurance (**Figure 1B-17**). 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 was essentially unchanged between 2005 and 2006. The share of private health insurance slightly increased from 41.6 percent in 2005 to 42.3 percent in 2006. The payment source was the mothers themselves and/or their families (i.e., self-pay) in 3 percent of the deliveries. The Indian Health Service paid for 1.8 percent of the births in 2006, with 96 percent of those births to American Indian mothers (**Table 1B-28**; see also **Table 1B-25**).

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Figure 1B-17
Payee for Delivery by Mother's Age Group,
Arizona, 2006



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

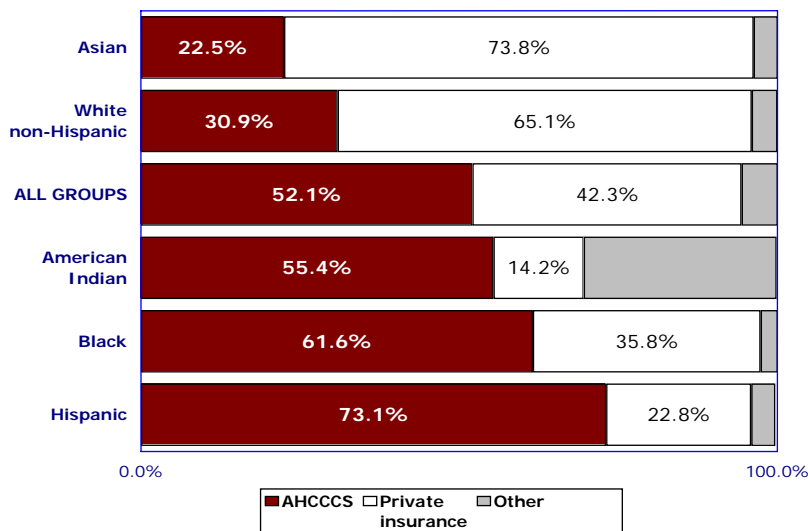
In 2006, the Arizona Health Care Cost Containment System paid for the absolute majority of the deliveries to mothers 24 years or younger (**Figure 1B-17**). In contrast, private insurance was the largest payer for the deliveries of women giving birth who were 25 years old or older in 2006 (based on data 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 2006, the AHCCCS share more than doubled among mothers 25 years old or older.

Figure 1B-18
Payee for Delivery by Mother's Race/Ethnicity,
Arizona, 2006



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

In 2006, private insurance was the largest payer for deliveries of Asian (at 73.8 percent) and White non-Hispanic infants (at 65.1 percent). In contrast, the Arizona Health Care Cost Containment System was the largest payer for deliveries of Hispanic or Latino (73.1 percent), Black or African American (61.6 percent) and American Indian women (55.4 percent).

The Indian Health Service as a payer accounted for a 27 percent share of deliveries of American Indian or Alaska Native infants in the State (**Figure 1B-18**, based on data in **Table 1B-28**).

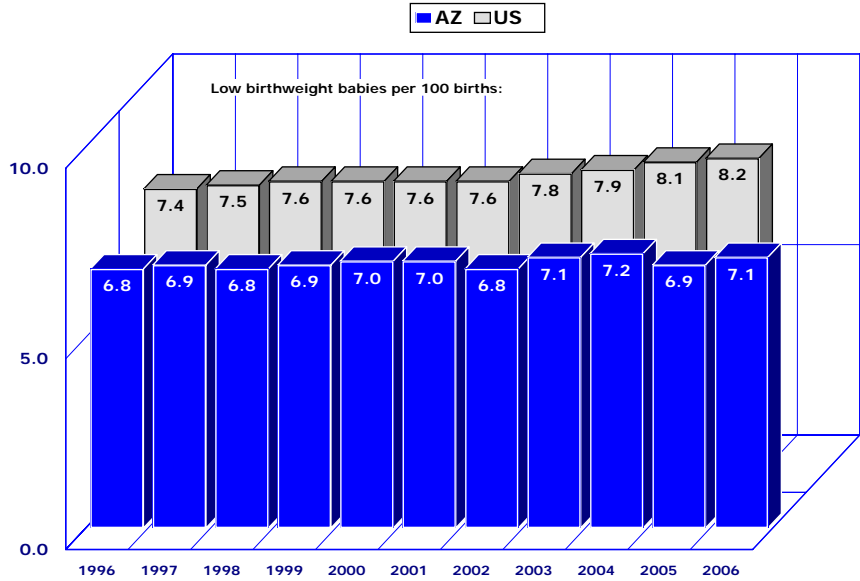
Hispanics or Latino accounted for 61.8 percent of the 53,121 deliveries paid for by the AHCCCS. Only 16 percent of all AHCCCS births were to White non-Hispanic women. All other race/ethnic groups combined accounted for 13.2 percent of the AHCCCS deliveries (based on data in **Table 1B-28**).

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Figure 1B-19
Percent Low Birthweight,* Arizona and United States,
1996-2006

In 2006, 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), an increase from 6.9 percent in 2005. In each year from 1996 to 2006, the annual incidence of LBW infants was lower in Arizona compared to the nation (Figure 1B-19). The 2005 LBW ratio of 8.2 percent of all births nationally was the highest reported in more than three decades.

In Arizona, LBW rates differed by the payee for delivery. LBW rates were highest for self-pay (8.6 percent) and the Arizona Health Care Cost Containment System (AHCCCS, 7.5 percent) mothers. Newborns of IHS (Indian Health Service) mothers had the lowest LBW rate (4.8 percent) followed by private health insurance (PHI) mothers (6.6 percent; based on data in tables 1B-28 and 5B-20).

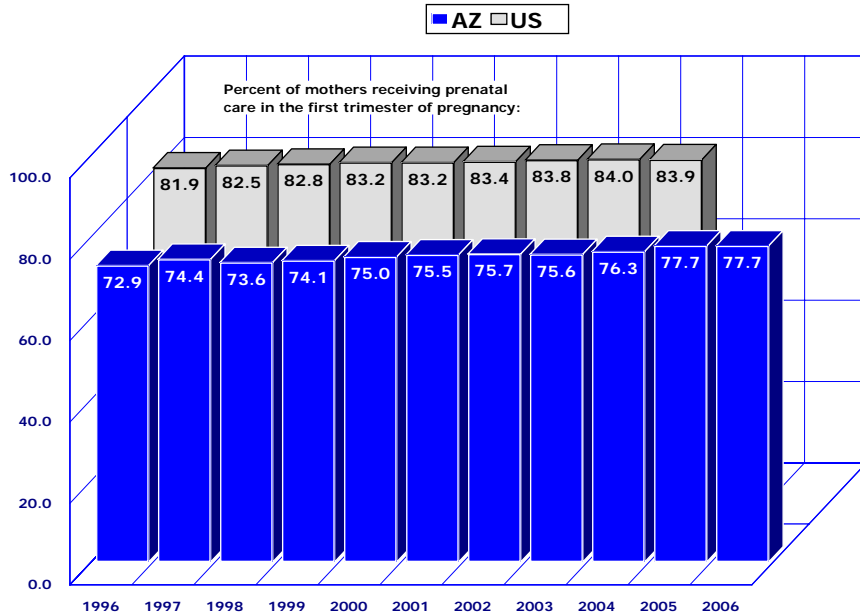


*Low birthweight is less than 2,500 grams (less than 5 pounds 8 ounces).
Note: The latest available U.S. ratio is for 2005.

Figure 1B-20
First Trimester Prenatal Care, Arizona and United States,
1996-2006

The percent of Arizona mothers giving birth who received early prenatal care (i.e., in the first trimester) increased from 72.9 percent in 1996 to 77.7 percent both in 2005 and 2006. In each year from 1996 to 2006, the percent of women giving birth who received prenatal care in the first trimester was lower in Arizona when compared to the nation (Figure 1B-20).

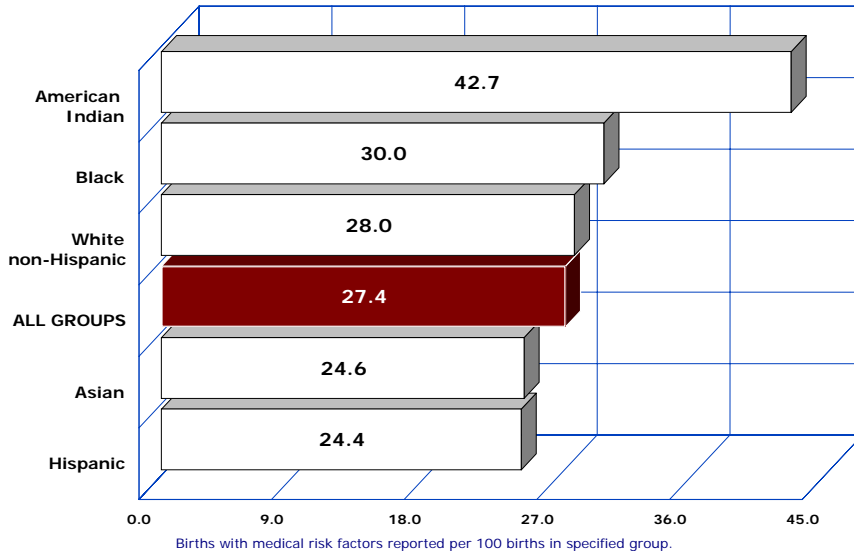
In Arizona, IHS mothers were least likely to begin prenatal care in the first trimester (58.6 percent), followed by self-pay (63.5 percent) and AHCCCS mothers (68.4 percent). Whereas nine out of ten (91.3 percent) of PHI mothers received early prenatal care (based on data in Table 1B-28).



Note: The latest available U.S. ratio is for 2004.

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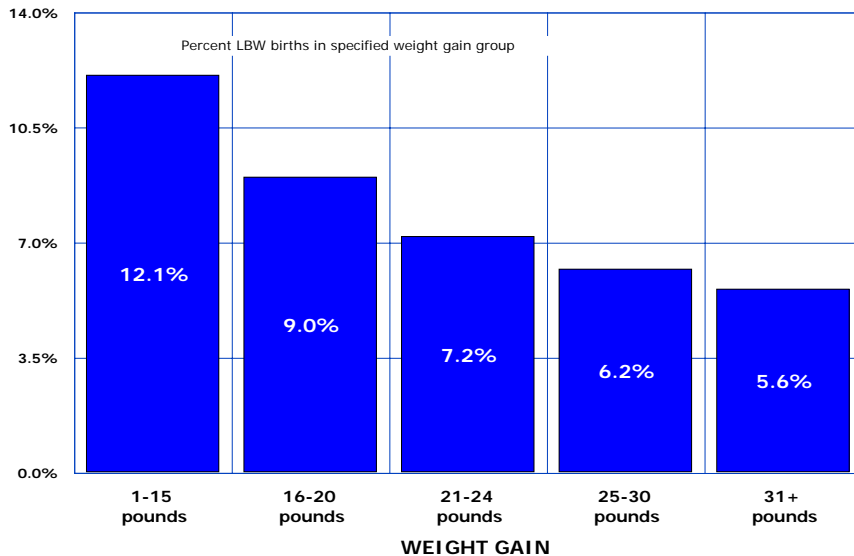
Figure 1B-21
Maternal Medical Risk Factors per 100 Births
by Mother's Race/Ethnicity, Arizona, 2006



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 2006, American Indian or Alaska Native women giving birth had the highest proportion of medical risk factors (42.7 percent, **Figure 1B-21**), followed by Black or African American and White non-Hispanic women.

Not surprisingly, IHS mothers had the highest rate of noted medical risk factors at 47.7 percent, followed by PHI mothers at 27.3 percent, self-pay mothers at 26.7 percent and AHCCCS mothers at 26.5 percent (**Table 1B-27**).

Figure 1B-22
Risk for Low-Birthweight by Maternal Weight Gain
During Pregnancy, Arizona, 2006



Maternal weight gain during pregnancy is a determinant of both fetal growth and birthweight. 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 2006, 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, 2006

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 5.1 percent of women giving birth in 2006 (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).

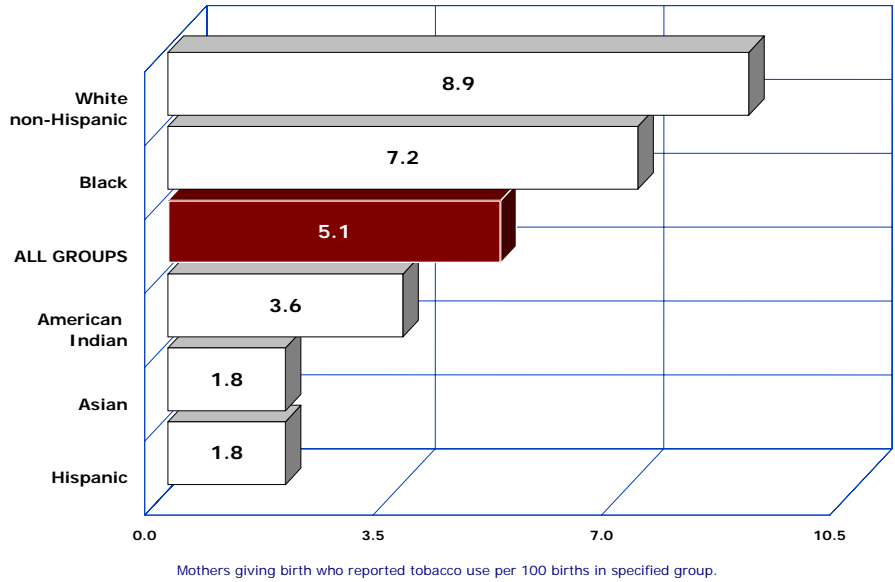
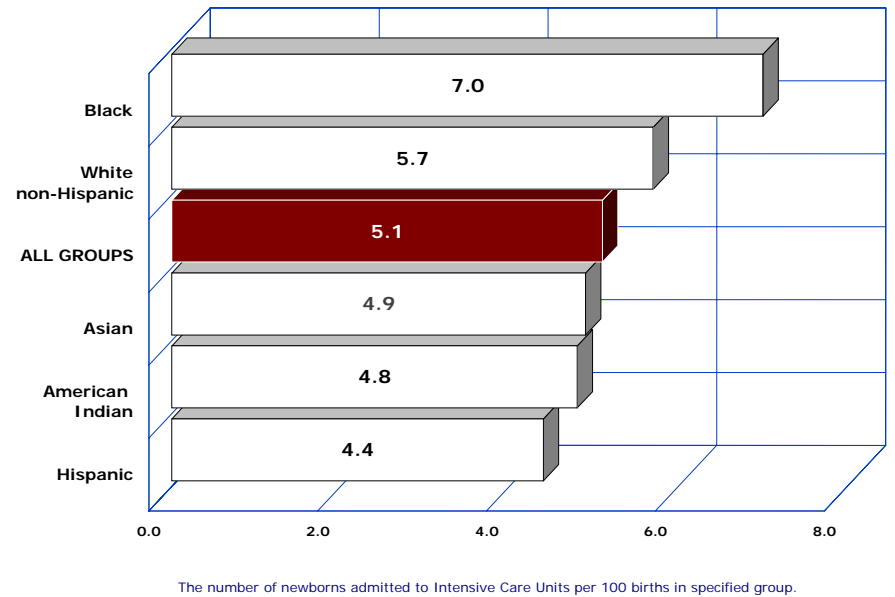


Figure 1B-24
Rates of Admission to Newborn Intensive Care Units
per 100 Births, Arizona, 2006

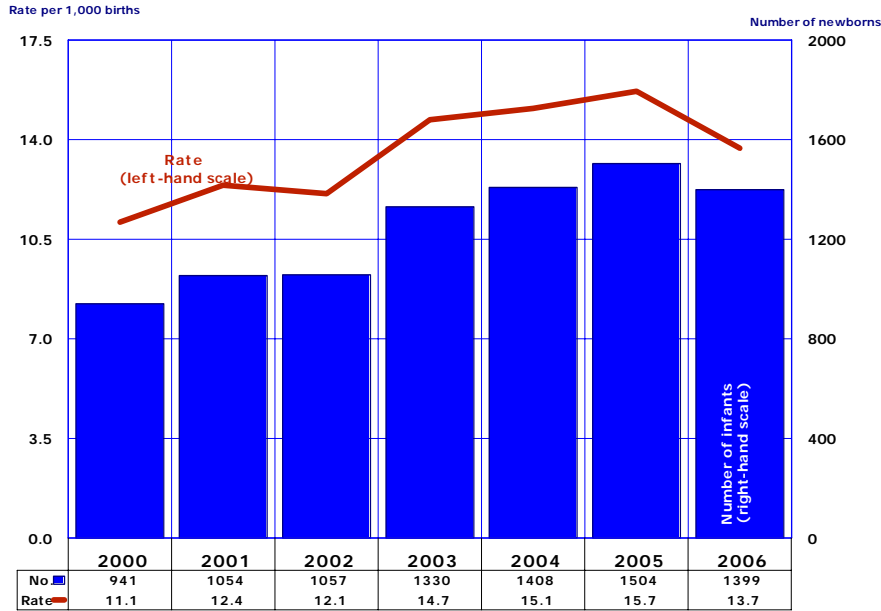
More than 5,200 or 5.1 percent of newborns in 2006 were admitted to newborn intensive care units (NICUs). Surprisingly, only 52.7 percent of the NICU admissions were low birthweight (LBW) babies. Prematurity, i.e., gestational age before 37 weeks captured more NICU admissions than did LBW, with 62.4 admissions being premature (based on data in Table 1B-33). The proportion of NICU admissions differed among race/ethnic groups. In 2006, the rate of NICU admissions for Black or African American (7 percent) was the highest among race/ethnic groups.

Newborns of self-paying mothers were admitted to NICUs at the highest rate (6.9 percent) and newborns of IHS mothers at the lowest rate (2.2 percent), more than a threefold difference. Newborns of PHI mothers and AHCCCS mothers had admission rates of 5.3 percent and 5.0 percent respectively.



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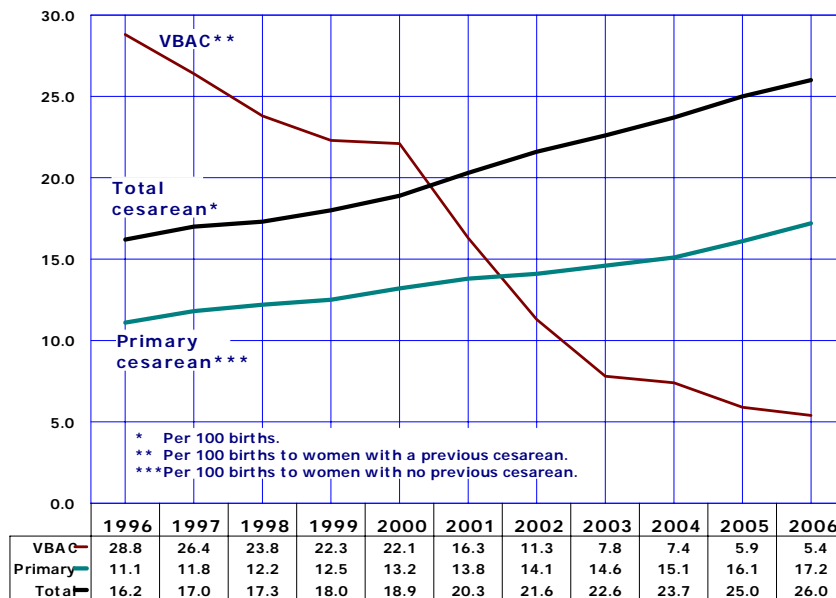
Figure 1B-25
Newborns Who Were Hospitalized After Birth Because They Were
Affected by Maternal Use of Drugs During Pregnancy, Arizona,
2000-2006



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. The number of newborns hospitalized after birth due to maternal drug use during pregnancy increased from 941 in 2000 to 1,504 in 2005. In 2006, there were 1,399 inpatient hospitalizations related to noxious influences affecting the fetus. Ten percent or 144 of the 1,399 babies born to drug dependent mothers were also diagnosed with drug withdrawal syndrome.

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/2006drugc206.xls>

Figure 1B-26
Total and Primary Cesarean Deliveries and
Vaginal Births After Previous Cesarean (VBAC),
Arizona, 1996-2006



The rate of cesarean delivery increased to an all time high of 26 percent of all resident births in 2006 (Figure 1B-26, Table 1B-2). The rise in the total rate is due to both an increase in the primary cesarean rate and a decrease in the rate of vaginal birth after cesarean delivery (VBAC). The primary cesarean rate in 2006 (17.2 per 100 live births to women who had no previous cesarean) was 55 percent higher than in 1996 (11.1 per 100 live births). The rate of vaginal birth after previous cesarean delivery (VBAC) declined 81.3 percent from a high of 28.8 in 1996 to 5.4 in 2006. This steep decline in the rate of VBAC implies a corresponding rise in the rate of repeat cesarean deliveries. The repeat rate increased from 71.2 to 94.6 percent among women with a previous cesarean between 1996 and 2006.

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Figure 1B-27
Abnormal Conditions of the Newborn by Gestational Age,
Arizona, 2006

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**).

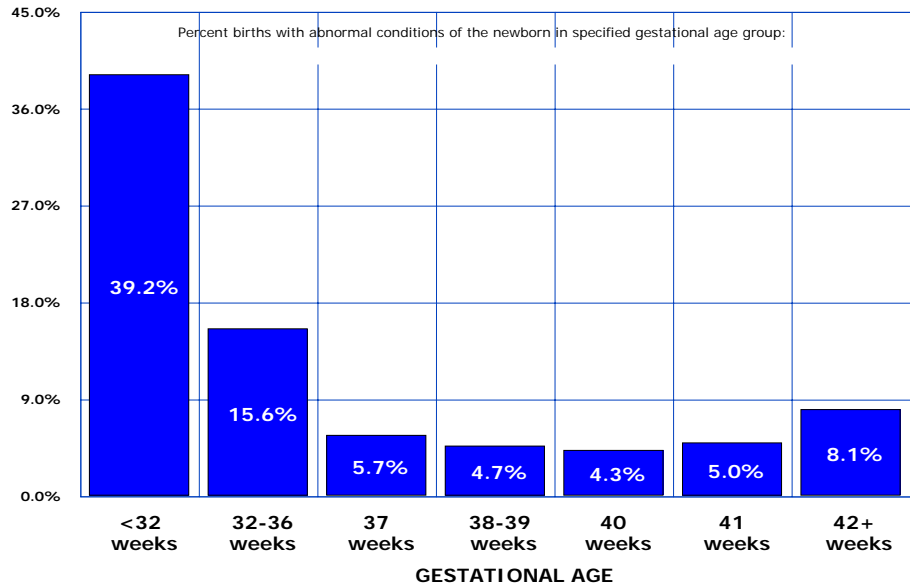


Figure 1B-28
The Incidence of Down's Syndrome by Mother's
Age Group, Arizona, 2006

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 2006 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 40 years and over (**Figure 1B-28**). The incidence rate of 377.5 cases of Down's Syndrome per 100,000 births to women 40 years or older was 7.4 times greater than the incidence rate of 51.0 for women of all ages.

