

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

TRENDS AND PATTERNS IN NATALITY

BIRTHS AND BIRTH RATES

Following a decline in the annual number of births from 1990 to 1991, the number of babies born to Arizona residents increased for the ninth consecutive year from 80,505 in 2000 to 84,985 in 2000. This increase in the number of births was greater than 4.2 percent population increase and effected a 1.8 percent increase in birth rate (**Table 1B-1**) from 16.3 births per 1,000 population in 1999 to 16.6/1,000 in 2000. In 1999, one baby was born for about every 61 Arizonans, while one (1) birth per approximately 60 residents of the state occurred in 2000.

FERTILITY RATES

From among 1,084,634 women of childbearing age (15-44 years), 7.8 percent gave birth in 2000 compared to 7.7 percent in 1999. The 2000 total fertility rate of Arizona's women (2,395 in **Table 1B-1**) exceeded the generation replacement rate of 2,110 by 13.5 percent. Except for Asian female residents of Arizona, all race/ethnicity-specific fertility rates were lower in 2000 than in 1990 (**Figure 1B-1**).

MOTHER'S RACE AND ETHNICITY

White non-Hispanic, Black and American Indian mothers each accounted for smaller share of all births in 2000 than in 1990 (**Table 1B-2**). Compared to 1990, Hispanic women accounted for a 42 percent larger share of births in 2000. Among every 100

babies born in Arizona in 2000, there were 47 White non-Hispanics, 40 Hispanics, 7 American Indians, 3 Blacks and 2 Asians or Pacific Islanders. Mother's race/ethnicity was unknown for one percent of total births.

MOTHER'S EDUCATION

During 2000, 9.2 percent of the resident live births were to mothers who had less than a ninth grade education compared to 9.0 percent in 1999 and 8.8 percent in 1998. Four out of ten (38.8 percent) mothers giving birth in 2000 had some college education (13 or more grades completed, **Table 1B-21**).

ATTENDANT AT BIRTH

The proportion of births attended by doctors of medicine and doctors of osteopathy increased slightly from 89.9 percent of all births in 1998 to 91.3 percent in 2000. Total midwife deliveries accounted for 8.7 percent of all births in 2000 compared with 7.8 percent in 1990 (**Table 1B-2**).

PLACE OF DELIVERY

There was virtually no change in place of delivery-utilization patterns between 1991 and 2000. Among every 100 births, 99 were reported to have occurred in hospitals, clinics, medical centers or maternity homes (**Table 1B-2**).

MATERNAL AGE¹

Women in their thirties and forties accounted in 2000 for 30.4 percent of total births, the same fraction as in 1998 (**Table 1B-2**). The birth rates for women aged 30-34, 35-39, and 40-44 years in 2000 (92.4,000, 40.5/1,000 and 8.4/1,000 respectively) were the highest reported since 1990 (**Figure 1B-2, Table 1B-1**).

¹ The numbers and rates of births by maternal age for 1997-1999 were revised in May 2001 and differ from those previously published. A detailed re-examination is available online at: <http://www.hs.state.az.us/plan/2ktbap.htm>

Teenagers aged 19 years and younger accounted in 2000 for 14.3 percent of total births, practically the same fraction as reported for 1990 (**Table 1B-2**). The birth rate for teenagers 15-19 years old in 2000 was 67.6 births per 1,000 women in this age group, 16 percent lower than the rate of 71.7/1,000 in 1990. Arizona birth rates by ethnic group among teens aged 15-19 in 2000 were greater than among their respective national peers (**Figure 1B-3**).

MARITAL STATUS

Unwed mothers have accounted for an increasing annual proportion of births throughout the 1980s and 1990s, with their 39.3 percent in 2000 marking a new historical high (**Table 1B-2**). Fewer than 10,000 babies were born to unwed mothers in 1980 compared to 33,438 in 2000.

Two decades ago, the proportion of nonmarital births among teenagers aged 15-19 years was below 50 percent (**Figure 1B-4**). In 2000, nonmarital births accounted for eight out of ten births to mothers 15-19 years old.

PERIOD OF GESTATION

The proportion of infants born at or before 37 completed weeks of gestation increased by 38.8 percent, from 13.4 percent of total births in 1990, to 18.6 percent both in 2000. The rise in births at 37 or fewer number of weeks of gestation is related to the substantial increase in medically induced births (50.5 percent since 1990) and the increase in multiple deliveries (multiple births are about 6 times more likely to be born preterm than singleton births).

MULTIPLE BIRTHS

The number of babies born in multiple deliveries increased by 43.2 percent from 1,586 in 1990 (**Table 1B-16**) to 2,271 in 2000, the latter being the highest number ever reported. In contrast, the number of single births increased by 24.6 percent over this period.

The number of twins increased by 40.4 percent, from 1,506 in 1990 to 2,115 in 2000 (**Figure 1B-5**). The number of live births in triplet and other higher order multiple deliveries rose from 62 in 1990 to 156 in 2000 (**Figure 1B-6**). The rise in the multiple-birth ratio has been associated with the increased childbearing among older women and expanded use of fertility drugs. Among mothers 45 years and older in 2000, births in twin and other higher order multiple deliveries accounted for 22.5 percent of all births, compared to 1.9 percent among mothers aged 20-24 years. Plurality is associated with low birthweight (LBW) and 59.3 percent of all babies born in multiple deliveries in 2000 weighed less than 2,500 grams or 5 pounds 8 ounces (calculated from data in **Table 1B-16**).

PRENATAL CARE

The percent of mothers who did receive early prenatal care (i.e., in the first trimester of pregnancy) increased from 66.2 in 1990 to 75.0 percent in 2000. The percent of women giving birth with no prenatal care declined slightly from 2.2 percent in 1999 to 2.1 percent in 2000 (**Table 1B-2**). In each year from 1990 to 2000, the percent of women giving birth who had received prenatal care in the first trimester was lower in Arizona compared to the nation (**Figure 1B-7**).

WEIGHT AT BIRTH

In 2000, 7.2 percent of the resident live births were classified as low birthweight (LBW) (under 2,500 grams or 5 pounds 8 ounces, **Table 1B-2**). This proportion of LBW births was the highest reported since at least 1980. In absolute numbers, 1,650 more newborns were placed at risk of poorer medical and developmental outcomes in 2000 than in 1990 (**Table 1B-3**). Compared to 1990, the LBW babies in 2000 were more likely to be born in multiple deliveries and to have older, unmarried mothers.

In each year from 1990 to 2000, the annual incidence of LBW babies was lower in Arizona compared to the nation (**Figure 1B-8**).

The incidence of very low birthweight births (VLBW, less than 1,500 grams or 3 pounds 4 ounces) increased from 1.2 percent in 1999 to 1.3 percent in 2000 (**Table 1B-2**).

REGIONAL COMPARISONS

Data for urban (Maricopa, Pima, Pinal and Yuma counties) and rural (all other counties) are given in **Tables 1B-4, 1B-5, 1B-6 and 1B-7**. The relative standing between women within the two regions on a number of maternal characteristics was similar in 1990 and 2000.

Rural relative to urban mothers were more likely to be teenagers; be unmarried; enter prenatal care in the third trimester; have a birth delivered by a midwife; and have a prior live birth. In each year from 1990 to 1999, the LBW rate was lower for urban than for rural babies. In contrast, rural compared to urban mothers were less likely to have a low birthweight baby in 2000.

The use of midwives was 2 times more common among rural than urban mothers in 2000, a situation probably stemming partially from the shortage of physicians with obstetrical practice in many rural areas.

In 2000, the Arizona Health Care Cost Containment System (AHCCCS) paid for 41 percent of the urban but for 49 percent of the rural deliveries (percentages calculated from data in **Table 1B-26**). Private insurance paid for the majority (53.3 percent) of deliveries to urban mothers. It remained a minority payee for rural mothers (33.7 percent of all rural deliveries).

Rural mothers were more likely to smoke during pregnancy than were urban mothers in 2000 (9.9 vs. 6.3 percent respectively).

The percent of infants born with a congenital anomaly in 2000 was 2.8 times greater among rural (2.8 percent of all rural births) than urban newborns (1.0 percent of all urban births).

In 2000, urban newborns were admitted to newborn intensive care units at a higher rate than rural newborns (6.1 and 4.0 percent respectively). LBW newborns comprised 57.6 percent of rural admissions but 49.3 percent of urban admissions (calculated from data in **Table 5B-24**).

MATERNAL CHARACTERISTICS AND NEWBORN'S HEALTH: 2000 STATUS

PROFILE OF WHITE NON-HISPANIC NEWBORNS

The total number of births to White non-Hispanic mothers increased from 38,711 in 1999 to 39,850 in 2000. The LBW rate of White non-Hispanic infants was 16.1 percent higher in 2000 than it was in 1990 (7.2 vs. 6.2 percent, **Table 1B-8**). The incidence of White non-Hispanic births through the end of the last day of the 37th week of gestation increased from a low of 13.3 percent in 1990 to 18.9 percent in 2000. Babies born at gestational age of 37 or less weeks accounted for 81.2 percent of white non-Hispanic LBW infants in 2000 compared to 74.8 percent in 1990. The majority of white non-Hispanic LBW babies in 2000 were girls (**Table 1B-9**); were delivered in a hospital; were born to mothers who began prenatal care early (81.4 percent) and had 5 or more prenatal visits (83.3 percent), medical risks or complications (70.9 percent) and a prior live birth (56.0 percent). Mothers of White non-Hispanic LBW infants were 3.5 times more likely to be older than 29 years (40.1 percent) than to be teenagers (11.4 percent). Twenty-nine out of one hundred LBW newborns were born in multiple deliveries and 43.0 percent were delivered by caesarean section.

PROFILE OF HISPANIC NEWBORNS

The total number of births to Hispanic mothers increased by 75.4 percent from 17,663 in 1990 to 30,784 in 2000 (**Table 1B-10**). The number of Hispanic LBW almost

doubled during that period, from 1,237 in 1990 to 2,310 in 2000 (**Table 1B-11**). The 2000 LBW rate of 6.8 percent was 6.3 percent greater than the 1990 rate of 6.4 percent. The majority of Hispanic LBW babies were born to unmarried mothers (58.1 percent) who began prenatal care in the first trimester (60.5 percent); had 5 or more prenatal visits (73.8 percent); had medical risks and or complications (67.0 percent) and a prior live birth (59.7 percent). Among Hispanic LBW babies, 77.2 percent were born at gestational age of 37 or less weeks in 2000. Thirty-three out of one hundred Hispanic LBW babies were delivered by caesarean section in 2000. Hispanic mothers of LBW newborns were equally likely to be teenagers (23.4 percent) or to be older than 29 years (23.7 percent).

PROFILE OF BLACK NEWBORNS

The annual number of births to Black mothers increased for the fifth consecutive year from 2,233 in 1995 to 2,760 in 2000 (**Table 1B-12**). The Black LBW rate increased from 12.0 percent in 1999 to 12.7 in 2000. As in previous years, it was the highest LBW rate among the ethnic groups (**Table 1B-12, Table 1B-13**). Among Black LBW newborns, 82.3 percent were born at 37 or less weeks of gestation in 2000 compared to 79.3 percent in 1999. Infants weighing no more than 1,500 grams or very low birthweight (VLBW) had their greatest representation among Black newborns (2.3 percent of their total live births). The majority of Black LBW babies were born to mothers who were unmarried (68.0 percent), began prenatal care in the first trimester (67.1 percent) and had 5 or more prenatal visits (76.6 percent), medical risks or complications (69.7 percent) and a prior live birth (65.4 percent). One-third (33.4 percent) were delivered by caesarean section, the second lowest rate among the ethnic groups. Black mothers of LBW babies were slightly less likely to be teenagers (23.7) than mothers older than 29 years (24.9 percent).

PROFILE OF AMERICAN INDIAN NEWBORNS

The total number of live births to American Indian mothers was lower in 2000 (5,602) than it was in 1990 but it was greater than in any year between 1994 and 1999. The LBW rate for American Indian newborns increased from 6.1 percent in 1990 to 7.6 percent in 1999 and then declined to 6.9 percent in 2000 (**Table 1B-14**). Babies born at gestational age of 37 or less weeks of gestation accounted for 79.2 percent of American Indian LBW newborns in 2000. The majority of American Indian LBW babies were born to mothers who were unmarried (69.9 percent), had 5 or more prenatal visits (66.2 percent), medical risks or complications (78.4 percent) and a prior live birth (70.1 percent). Four out of ten LBW babies were delivered by caesarean section. American Indian mothers of LBW newborns were more likely to be older than 29 years (30.6 percent) than to be teenagers (17.7 percent).

PROFILE OF ASIAN NEWBORNS

The total number of live births to Asian mothers increased 2.2 times, from 932 in 1990 to 2,041 in 2000 (**Table 1B-22**). Unmarried mothers accounted in 2000 for 15.1 percent of Asian births, the lowest proportion among the ethnic groups. Seven out of ten (65.6 percent) Asian mothers had some college education, the highest fraction among the ethnic groups.

The LBW rate decreased from 8.2 percent of all Asian births in 1999 to 7.6 percent in 2000 (calculated from data in **Table 1B-26**). Among 2000 Asian LBW newborns, 78.0 percent, were born at 37 or less weeks of gestation. The majority of Asian LBW babies were born to mothers who were married (80.0 percent), began prenatal care in the first trimester (76.8 percent), had 5 or more prenatal visits (81.9 percent) and medical risks or complications of labor and/or delivery (64.5 percent). Asian mothers of

LBW newborns were 5.7 times more likely to be older than 29 years (43.8 percent) than to be teenagers (7.7 percent).

PARTY PAYING FOR THE DELIVERY

The share of deliveries paid for by private insurance remained unchanged since 1999 at 50.5 percent of all deliveries. In 2000, as in the 1990-1999 period, private insurance paid for the majority (71.9 percent) of deliveries to White non-Hispanic mothers (**Table 1B-29**).

The Arizona Health Care Cost Containment System (AHCCCS) paid for 42.5 percent of the total deliveries in 2000, an increase from the 41.5 in 1999. Among maternal ethnic groups, American Indian mothers had the largest share of deliveries paid for by public sources (AHCCCS or Indian Health Service) at 75.8 percent, followed by Hispanic deliveries at 63.5 percent, Black deliveries at 52.3 percent, White non-Hispanic deliveries at 24.2 percent and Asian deliveries at 15.3 percent.

The Indian Health Service (IHS) paid for 1.7 percent of the births in 2000, with 93.2 percent of those births to American Indian mothers. The payment source was the mothers themselves and/or their families (i.e., self-pay) in 3.2 percent of the deliveries and the payment source was unknown for 2.2 percent of the deliveries.

Almost 24 percent of AHCCCS mothers were teenagers under the age of 20 compared to 6 percent of women giving birth in 2000 who had private insurance coverage (**Figure 1B-9**).

Sixty-seven percent of IHS (and 63.6 percent of AHCCCS) mothers were unwed compared to 17.3 percent of women giving birth in 2000 who had private insurance coverage (**Figure 1B-10**, **Table 1B-28**).

Infants of mothers with private health insurance had the lowest LBW ratio in 2000 (6.5 percent; **Figure 1B-11**). Babies of

mothers who paid themselves for the delivery had the highest LBW ratio of 8.1 percent.

Among the three institutional payee groups, babies of IHS mothers had the lowest LBW ratios in the period from 1990 to 1999 (**Figure 1B-12**). Infant of mothers with private health insurance had the next lowest LBW ratios, followed by newborns of AHCCCS mothers. It appears that the differences in the socioeconomic status alone cannot account for these differences in the incidence of low birthweight births among the three payee groups.

MEDICAL RISK FACTORS

The presence of medical risk factors during pregnancy is often indicative of the potential for adverse pregnancy outcome, such as low birthweight and some congenital anomalies (birth defects). Low birthweight and congenital anomalies in turn are among the leading causes of infant death. The most frequently reported risk factors in 2000 (**Table 1B-26**) were *pregnancy-associated hypertension* with a rate of 30.4 cases per 1,000 live births, *diabetes* (22.8 per 1,000 live births), followed by *anemia* (16.8 per 1,000). American Indian mothers were at substantially elevated risk of having each of the three above medical conditions. The rate of *diabetes* was elevated to 67.1/1,000, the rate of *pregnancy-associated hypertension* was 56.1/1,000 and the rate of *anemia* was elevated to 48.4 cases per 1,000 live births. Black, White non-Hispanic and Hispanic mothers had lower rates of *diabetes* (18.1/1,000, 18.7/1,000 and 20.2/1,000 respectively) than did (19.3) Asian mothers (31.4).

Many of the medical risk factors are associated with elevated risk for low birthweight (**Table 1B-33**). These include *eclampsia* (37.6 percent were LBW), *hydramnios* (22.5 percent of babies born to mothers with an excess of amniotic fluid were LBW), *chronic and pregnancy-associated hypertension* (20.2 percent were

LBW), and *previous small-for-gestational-age (SGA) infant* (19.8 percent).

In contrast, mothers who have previously given birth to an infant weighing 4,000 grams or more were at substantially lower risk of giving birth to an LBW infant (only 3.7 percent of babies born to mothers in this group were LBW).

COMPLICATIONS OF LABOR AND DELIVERY

Two complications were reported at a rate greater than 30 per 1,000 live births: *meconium, moderate/heavy* (44.1 per 1,000 births) and *breech malpresentation* (34.4/1,000). Of the 15 complications, 9 had higher rates for low birthweight infants and 5 among those (*abruptio placenta, placenta previa, rupture of the membrane, seizures, and breech malpresentation*) had the proportion of LBW births of at least 23 percent (**Table 1B-33**).

MATERNAL WEIGHT GAIN

Maternal weight gain during pregnancy is an important determinant of both fetal growth and birthweight. In 1990, the National Academy of Sciences recommended weight-gain guidelines that varied according to mother's body mass index (BMI). Women who are of normal weight (average BMI) should gain 21-35 pounds during a normal 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 the weight gain was within the recommendations for the mother's BMI, because information of the mother's pre-pregnancy weight and height is not collected on the birth certificate

In 2000, 30.6 percent of Arizona's women giving birth gained less than 25 pounds (**Table 1B-26**). The proportion of low birthweight births was 8.8 percent among mothers who gained less than 25 pounds,

compared with 5.5 percent of LBW births among mothers who gained at least 25 pounds (based on data in **Table 1B-33**).

TOBACCO SMOKING DURING PREGNANCY

Cigarette smoking during pregnancy has been associated with reduced infant birthweight, intrauterine growth retardation and preterm births. Smoking during pregnancy was reported by 6.8 percent of women giving birth in 2000 (**Table 1B-26, Table 5B-30**), compared to 7.3 percent in 1999. As in the past, 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 were more likely to report smoking (11.0 percent) than American Indian (3.6 percent), Asian (2.5 percent), and Hispanic (2.4 percent).

ALCOHOL USE DURING PREGNANCY

The most notable effect of heavy maternal drinking during pregnancy is *fetal alcohol syndrome*, which is characterized by growth retardation, facial malformations and dysfunctions of the central nervous system. In 2000, 1.2 percent of all live births were to mothers who reported alcohol use (**Table 1B-26, Table 5B-30**). American Indian, Black, and White non-Hispanic mothers were more likely than Asian and Hispanic mothers to report the use of alcohol. The rates of babies born with *fetal alcohol syndrome* were substantially higher among American Indian mothers (3.6 cases per 10,000 births) than they were among White non-Hispanic (0.2/10,000) and Hispanics (0.3/10,000). No cases of fetal alcohol syndrome were reported in 2000 among Blacks and Asians.

OBSTETRIC PROCEDURES

The most frequent obstetric procedure reported in 2000 was *electronic fetal monitoring*, done for 80 percent of all live births (**Table 1B-26**). At least 77 percent of mothers in each ethnic group received this procedure, with the highest level (85.6 percent) for Blacks. Of the mothers who had live births in 2000, 72.3 percent received *ultrasound*. White non-Hispanic mothers had the highest rate of *induction of labor* (20.9 percent) and Hispanic mothers had the lowest rate (10.6 percent).

METHOD OF DELIVERY

The overall caesarean delivery rate rose for the fourth consecutive year from 16.2/100 births in 1996 to 18.9/100 in 2000 (**Table 1B-2, Table 4A-11**). This latest rise in the total caesarean rates is the result of both a slight increase in rate of primary (or first) caesarean deliveries (from 10.2 percent in 1996 to 12.1 percent in 2000) and an increase in the rate of repeat caesareans from 71.2 per 100 live births to women who had a previous caesarean in 1996 to 77.9 in 2000 (**Table 4A-11**). The rate of caesarean deliveries for low birthweight infants increased from 35.2/100 in 1999 to 38.0/100 in 2000 (the highest rate of the 11-year period 1990-2000; **Table 1B-3**).

ABNORMAL CONDITIONS OF THE NEWBORN

The abnormal conditions with the highest rates per 100 live births were *assisted ventilation less than 30 minutes* (1.5 percent), *assisted ventilation 30 minutes or longer* (0.5 percent) and *hyaline membrane disease* (0.3 percent). *Birth injury* and *fetal alcohol syndrome* are likely to be underreported on birth certificates (the identification of *fetal alcohol syndrome* more often occurs after the birth certificate has been completed). The rates of abnormal conditions in 2000 were higher for Black births (11.5 percent), than for Hispanic (8.7

percent), White non-Hispanic (8.5 percent), American Indian (8.3 percent), and Asian (6.3 percent).

CONGENITAL ANOMALIES (BIRTH DEFECTS)

Congenital anomalies are among the leading causes of fetal and infant mortality. In 2000 in Arizona, the overall rates of birth defects ranged from 1.9 per 100 births among American Indians, 1.5 per 100 White non-Hispanic babies, 1.1 among Black babies, 0.9 among Hispanic newborns to 0.8 among Asian babies (**Figure 1B-13, Table 1B-26, Table 1B-35**). The rate of *Down's syndrome* was 1.5 per 1,000 births among mothers 35 years or older, 3.8 times greater than the rate of 0.4/1,000 for mothers 34 years old and younger (calculated from data in **Table 1B-34**).

NEWBORN INTENSIVE CARE

The number of newborns admitted to newborn intensive care units (NICUs) declined from 5,319 in 1999 (6.6 percent of total births) to 4,958 in 2000 (5.8 percent of all newborns, **Table 1B-26**). Gestational age of 37 or less completed weeks of gestation, captured more NICU admissions than did low birthweight (65.9 and 50.2 percent, respectively, **Table 1B-33**). Differences in NICU admissions by maternal ethnic group ranged from a low of 4.3 percent for newborns of Asian mothers, to a high of 10.5 percent among Black newborns (**Figure 1B-14**).