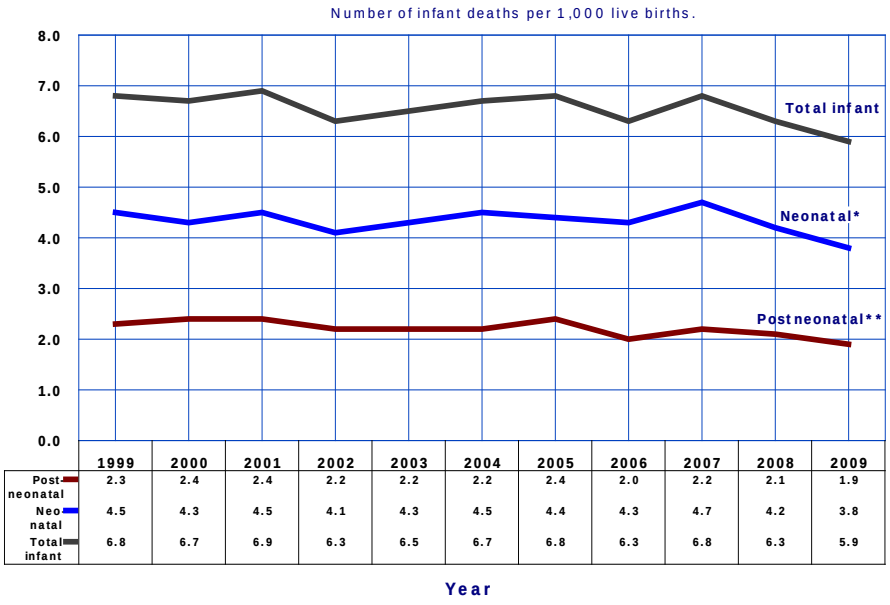
Infant mortality

Figure 2C-1
Infant Mortality Rates by Neonatal/Postneonatal Age and Year, Arizona, 1999-2009



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Post-neonatal	2.3	2.4	2.4	2.2	2.2	2.2	2.4	2.0	2.2	2.1	1.9
Neo natal	4.5	4.3	4.5	4.1	4.3	4.5	4.4	4.3	4.7	4.2	3.8
Total infant	6.8	6.7	6.9	6.3	6.5	6.7	6.8	6.3	6.8	6.3	5.9

Deaths to infants age 0-27 days.
**Deaths to infants age 28 days-1 year.

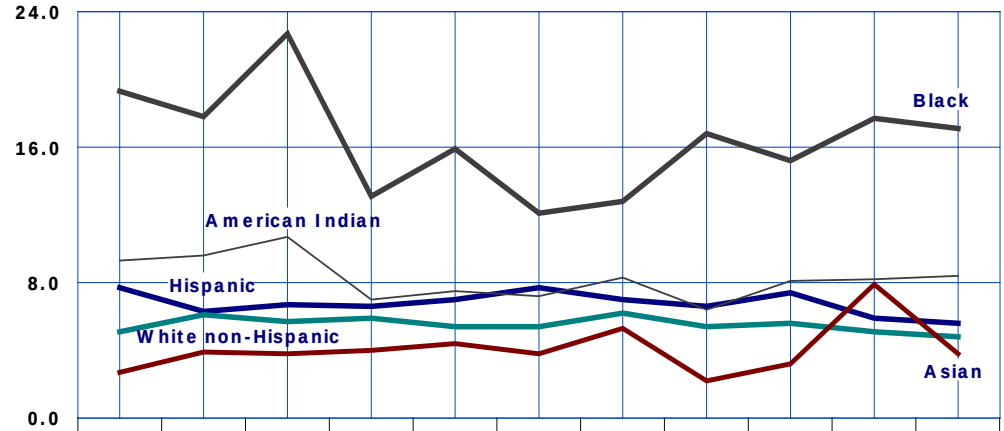
Infant mortality is defined as the number of deaths within the first year of life. The infant mortality rate (IMR) is computed as the number of infant deaths in a calendar year per 1,000 live births recorded for the same period.

In 2009, 547 Arizona infants died before reaching their first birthday, 154 fewer than in 2007. Even if the risk of infant mortality remained the same as it was in 2007, 68 fewer infant deaths can be attributed to the absolute reduction in the number births by 10,071 from 2007 to 2009 ((10,071 x 6.8)/1,000) =68.5).

Based on the actual number of infant deaths and live births in 2009, the infant mortality rate decreased to 5.9/1,000; the lowest IMR ever recorded in the State's history (**Figure 2C-1**)

More-detailed infant mortality data from the linked birth/infant death data set are used below to analyze some of the factors contributing to the decrease. In the linked file, the information from the death certificate is linked to information from the birth certificate for each resident infant less than 1 year of age who died in Arizona in 2009.

Figure 2C-2
Infant Mortality Rates* by Race/Ethnicity and Year, Arizona, 1999-2009



	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Asian	2.7	3.9	3.8	4.0	4.4	3.8	5.3	2.2	3.2	7.9	3.8
White non Hispanic	5.1	6.1	5.7	5.9	5.4	5.4	6.2	5.4	5.6	5.1	4.8
American Indian	9.3	9.6	10.7	7.0	7.5	7.2	8.3	6.4	8.1	8.2	8.4
Hispanic	7.7	6.3	6.7	6.6	7.0	7.7	7.0	6.6	7.4	5.9	5.6
Black	19.3	17.8	22.7	13.1	15.9	12.1	12.8	16.8	15.2	17.7	17.1

Number of infant deaths per 1,000 live births in specified group.

In 2009, 96.5 percent* of all infant death records were successfully matched to their corresponding birth records. Among the 547 infants who died in 2009, 61 were born in 2008.

The mortality risk for infants varies by race/ethnicity. Infants of Asian or Pacific Islander mother, followed by babies of White non-Hispanic and Hispanic or Latino mothers had the lowest infant mortality rates among the race/ethnic groups in 2009 (**Figure 2C-2, Table 2C-2**

In 2009, Black infants continued to have the worst survival chances among the ethnic groups (**Figure 2C-2**). The Black IMR slightly decreased from 17.7/1,000 in 2008 to 17.1/1,000 in 2009.

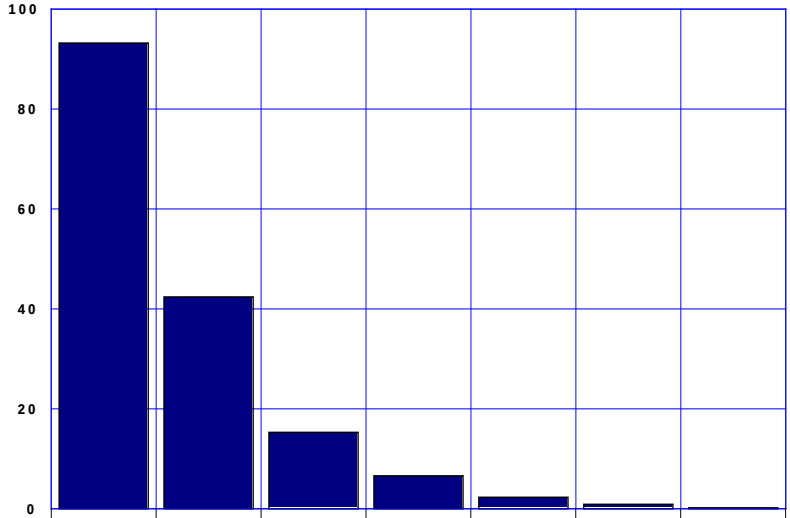
*Infant death records that were not linked to their corresponding birth certificates include unrecorded home births (i.e., no birth certificates was issued) and out-of-State births (i.e., the State issuing the certificate of birth did not send a copy to Arizona).

Newborn weight at birth is one of the most important predictors of an infant's survival chances. In 2009, the infant mortality rate for low birthweight infants (LBW: less than 2,500 grams) was 52.4 deaths per 1,000 live births. Similarly, the infant mortality rate for very low birthweight infants (VLBW: less than 1,500 grams) was 252.3 deaths per 1,000 live births.

The absolute number of low birthweight births actually declined for the second consecutive year from 7,285 in 2007 to 7,026 in 2008, and 6,573 in 2009. However, the proportion of babies whose weight at birth was less than 1,000 grams increased from 7.7 percent of all low birthweight births in 2008 to 8.0 percent in 2009 (**Table 1B-3**).

Together, births of infants weighing less than 1,000 grams accounted for 0.6 percent of births, and 44.1 percent of all infant deaths. Infants weighing less than 500 grams in 2009 had a very high mortality rate of 93.2 percent (**Figure 2C-3**).

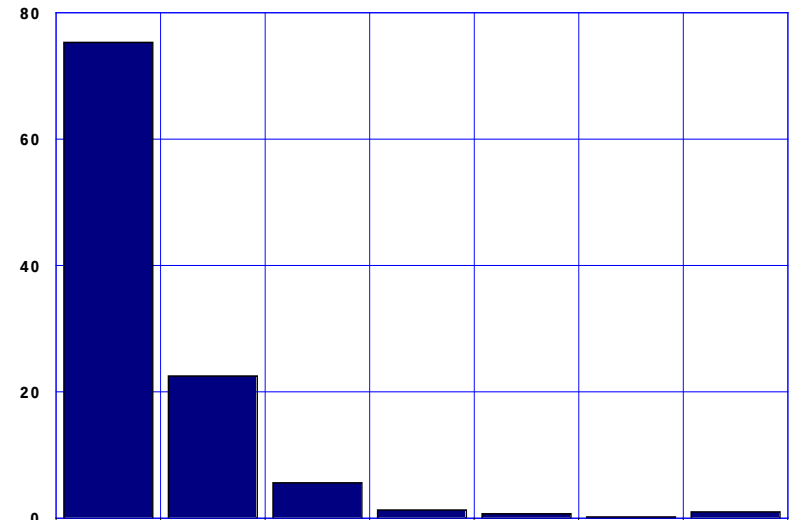
Figure 2C-3
Proportion of Infant Deaths by Birthweight, Arizona, 2009



	< 500 grams	500-749 grams	750-999 grams	1000-1499 grams	1500-1999 grams	2000-2499 grams	2500+ grams
No. of newborns	148	165	216	577	1211	4262	86024
No. of infant deaths	138	70	33	38	28	38	180
Infant deaths per 100 newborns	93.2	42.4	15.3	6.6	2.3	0.9	0.2

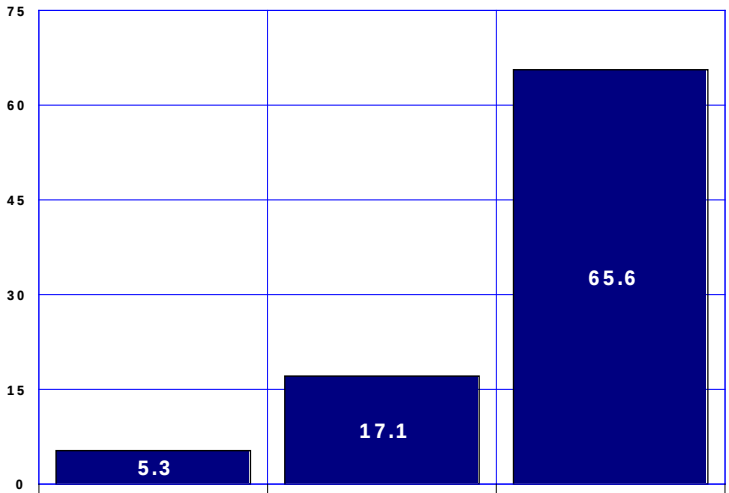
As with low birthweight, preterm and very preterm infants have a large impact on the total infant mortality rate because of their much higher risk of infant mortality. For example, births at less than 27 weeks of gestation accounted for only 0.6 percent of all births but 43.7 percent of infant deaths in Arizona in 2009. Births at less than 24 weeks of gestation have a very high infant mortality rate of 75.3 percent (**Figure 2C-4**). Overall, preterm infants (those born at less than 37 weeks of gestation) accounted for 10.0 percent of births (**Table 1B-2**) and 64.4 percent of all infant deaths.

Figure 2C-4
Proportion of Infant Deaths by Gestational Age, Arizona, 2009



	20-23 weeks	24-27 weeks	28-31 weeks	32-35 weeks	36 weeks	37-41 weeks	42 weeks or more
No. of newborns	219	329	762	3817	4168	82978	289
No. of infant deaths	165	74	43	43	27	172	3
Infant deaths per 100 newborns	75.3	22.5	5.6	1.3	0.7	0.2	1

Figure 2C-4.2
Infant Mortality Rates for Single and Multiple Births, Arizona, 2009



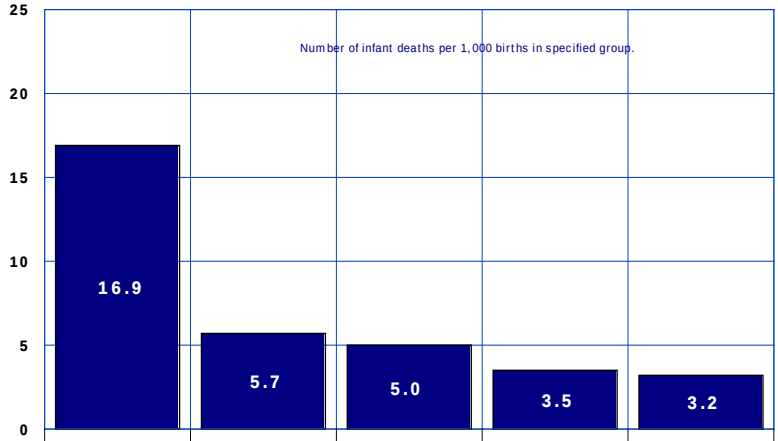
	Singleton births	Twin births	Triplet or higher order multiples
No. of newborns	90034	2460	122
No. of infant deaths	478	42	8
Infant deaths per 1,000 newborns	5.3	17.1	65.6

As already noted in Section 1B, infants born in multiple deliveries tend to be born at shorter gestations and smaller than those in singleton deliveries. In 2009, infants born in multiple deliveries were 12.5 times more likely (47.6 vs. 3.8 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 (**Figure 1B-10**).

The infant mortality rate for single births was 5.3 in 2009 (**Figure 2C-4.2**). The infant mortality rate for twin births was 17.1, and for triplets or higher order multiples it was 65.6 (the latter rate, based on only 8 infant deaths, is not statistically reliable).

Babies born in multiple deliveries accounted for 2.8 percent of births (**Table 1B-2**), but 9.1 percent of all infant deaths in Arizona in 2009.

Figure 2C-4.3
Infant Mortality Rates by Maternal Weight Gain during Pregnancy, Arizona, 2009



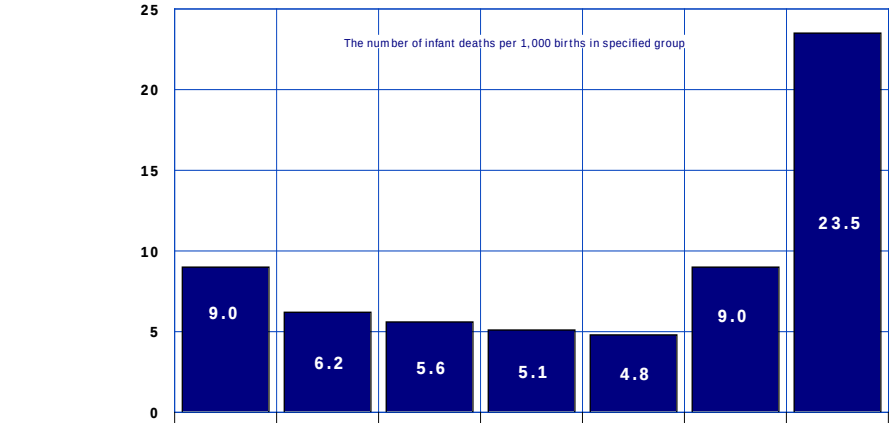
	0-15 pounds	16-20 pounds	21-24 pounds	25-30 pounds	31+ pounds
No. of newborns	12956	11936	6746	22362	38141
No. of infant deaths	219	68	34	79	123
Infant deaths per 1,000 newborns	16.9	5.7	5	3.5	3.2

Infant mortality rates vary with maternal weight gain during pregnancy. Insufficient or excessive weight gain during pregnancy can negatively impact both maternal and pregnancy outcome. In 2009, as in previous years, the risk of infant death decreased with increasing maternal weight gain, including maternal weight gain of 31 or more pounds (**Figure 2C-4.3**). Among the 38,141 women giving birth in 2009 who gained 31 or more pounds, 41.9 percent had weight gains of more than 40 pounds, considered excessive for all women regardless of their body mass index.

There is no coincidence that mother's weight gain has been shown to have a positive correlation with infant birthweight (**Figure 1B-22**).

Infant mortality rates vary with maternal age. In 2009, infant mortality decreased with increasing maternal age through 35-39 years of age but increased for infants born to women 40 years of age or older. (**Figure 2C-4.4**). The number of births to women 45 years or older increased by 27.8 percent from 133 in 2008 to 170 in 2009.

Figure 2C-4.4
Infant Mortality Rates by Mother's Age Group, Arizona, 2009

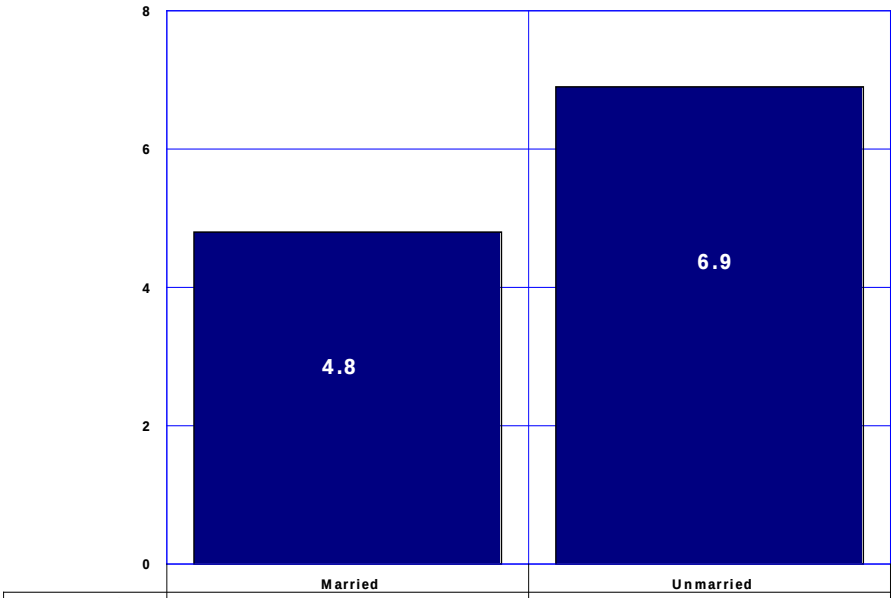


	<20	20-24	25-29	30-34	35-39	40-44	45+
No. of newborns	7451	23874	26440	19732	9431	2008	170
No. of infant deaths	67	147	147	100	45	18	4
Infant deaths per 1,000 newborns	9	6.2	5.6	5.1	4.8	9	23.5

Infants born to unmarried mothers accounted for the absolute majority of infant deaths in 2009 (288 vs. 237); while the number of births to married mothers exceeded by 18.9 percent the number of births to unmarried mothers (49,748 vs. 41,856; **Table 1B-26**). In 2009, infants of married mothers had an infant mortality rate of 4.8 deaths per 1,000 live births, 30.4 percent lower than the rate for infants of unmarried mothers (6.9 infant deaths per 1,000 live births; **Figure 2C-4.5**). The effect of marital status on infant mortality suggests that marital status is a proxy measure of factors traditionally related to infant mortality such as poverty conditions, access to health care or social support. Mother's marital status may signify the presence or absence of emotional, social, and financial resources.

Additional information is available in our special report on "Marital Status and Health, Arizona Residents, 2006" at www.azdhs.gov/plan/report/ms/ms06/index.htm

Figure 2C-4.5
Infant Mortality Rates by Mother's Marital Status, Arizona, 2009



	Married	Unmarried
No. of newborns	49748	41856
No. of infant deaths	237	288