

# Infant Mortality

## An Overview: 2011

Infant Deaths	
Number	75
Rate per 1,000 Live Births	6.34
Neonatal Deaths	
Number	46
Rate per 1,000 Live Births	3.89
Postneonatal Death	
Number	29
Rate per 1,000 Live Births	2.45

In comparison, there were 83 infant deaths in 2010, with the infant mortality rate of 7.04 per 1,000 live births. Caution should be used when comparing these annual rates, because the number of South Dakota resident births creates a relatively small denominator to determine infant mortality rates; a small change in the number of infant deaths can result in a relatively large rate change. For example, as Table 32, below, displays and Figure 6, page 38, illustrates, large downward spikes occurred in 1996 and 2000. Decreases of 39 infants from 1995 to 1996 and 37 infants from 1999 to 2000 caused large downward spikes in infant mortality rates. Therefore, infant mortality rates should be monitored over a period of time.

During 2011, there were 75 South Dakota resident infant deaths reported for an infant mortality rate of 6.34 per 1,000 live births.

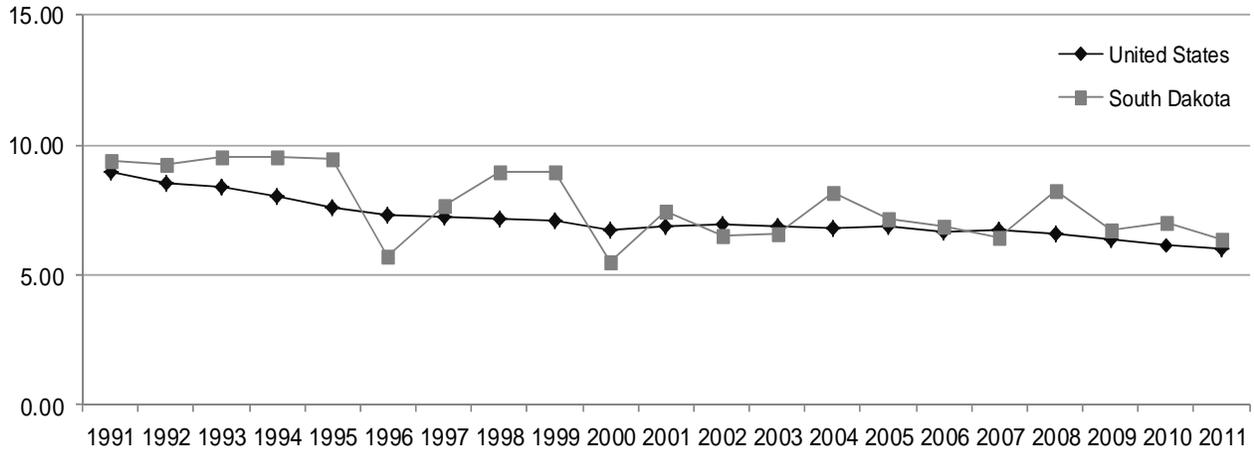
**Table 32**  
**Resident Infant Deaths and Infant Mortality Rates,**  
**South Dakota and United States, 1991-2011**

Year	United States		South Dakota	
	Number	Mortality Rate	Number	Mortality Rate
2011	*23,910	*6.05	75	6.34
2010	*24,586	*6.15	83	7.04
2009	26,412	6.39	80	6.71
2008	28,059	6.61	100	8.28
2007	29,138	6.75	79	6.45
2006	28,527	6.69	82	6.88
2005	28,440	6.87	82	7.15
2004	27,936	6.79	93	8.20
2003	28,025	6.85	73	6.62
2002	28,034	6.97	70	6.54
2001	27,568	6.85	78	7.45
2000	27,200	6.70	57	5.51
1999	27,937	7.06	94	8.94
1998	28,371	7.20	92	8.95
1997	28,045	7.21	78	7.67
1996	28,487	7.32	60	5.73
1995	29,583	7.59	99	9.46
1994	31,710	8.02	100	9.52
1993	33,466	8.37	102	9.52
1992	34,628	8.52	102	9.27
1991	36,766	8.94	103	9.42

Note: \* U.S. 2010 and 2011 data are provisional.  
Infant mortality rates are per 1,000 live births.

Source: National Center for Health Statistics  
South Dakota Department of Health, Office of Health Statistics

**Figure 6**  
**Resident Infant Mortality Rates, South Dakota and United States, 1991-2011**

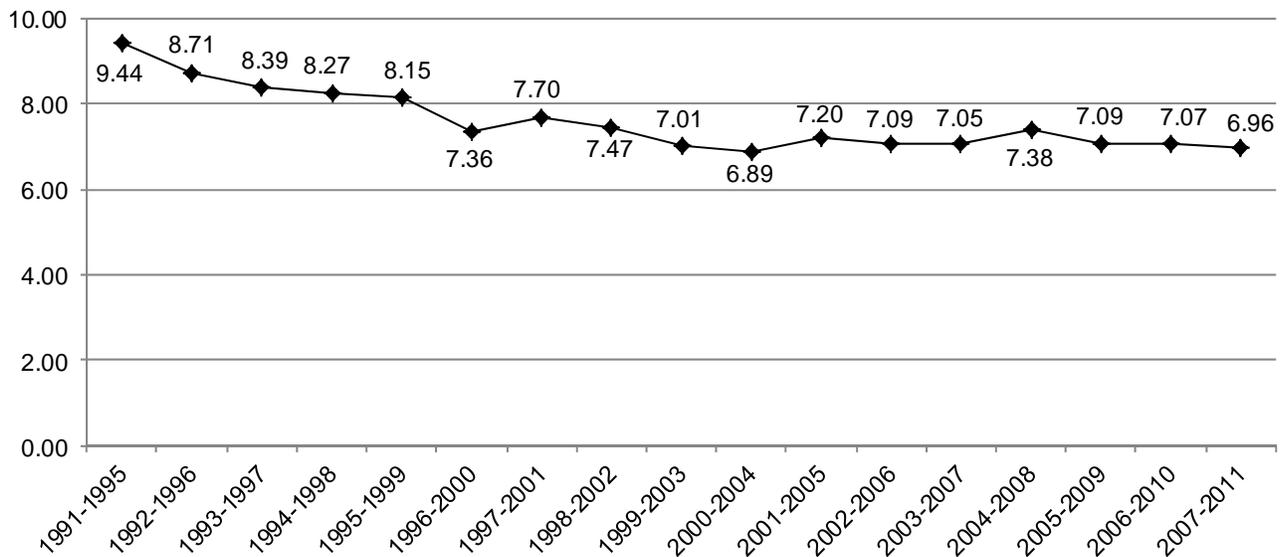


Note: Rate Per 1,000 Live Births. U.S. 2010 and 2011 data are provisional.  
 Source: National Center for Health Statistics and South Dakota Department of Health, Office of Health Statistics

Figure 7, below, displays South Dakota's infant mortality rate grouped in five year increments. This graph shows that since the early 1990's South Dakota's infant mortality

rate has decreased slightly, but in more recent years, the infant mortality has remained steady.

**Figure 7**  
**Resident Infant Mortality Rates for South Dakota, 1991-2011**



Note: Rate Per 1,000 Live Births.  
 Source: South Dakota Department of Health, Office of Health Statistics

Table 33, below, lists the overall leading causes of infant death in 2007-2011. The leading causes of infant death in 2011 can be broken down as follows: certain

conditions in perinatal period, 41.3 percent; congenital malformations, 22.7 percent; sudden infant death syndrome, 10.7 percent; and accidents with 6.7 percent.

**Table 33**  
**South Dakota Resident Leading Causes of Infant Death, 2007-2011**

	Total	2007	2008	2009	2010	2011
<b>Total Deaths</b>	<b>417</b>	<b>79</b>	<b>100</b>	<b>80</b>	<b>83</b>	<b>75</b>
<b>Certain Conditions in the Perinatal Period ..... (P00-P96)</b>	<b>166</b>	<b>33</b>	<b>34</b>	<b>32</b>	<b>36</b>	<b>31</b>
Extreme immaturity (Less than 28 comp wks of gestation)..... (P07.2)	44	4	10	11	8	11
Other preterm infants (28 comp wks or more but < 37 comp wks of gestations)..... (P07.3)	13	1	3	3	4	2
Neonatal cardiac failure ..... (P29.0)	11	3	1	6	0	1
Newborn affected by chorioamnionitis ..... (P02.7)	8	2	2	0	2	2
Primary atelectasis of newborn ..... (P28.0)	7	2	0	2	2	1
Necrotizing enterocolitis of newborn ..... (P77)	6	0	1	2	1	2
Newborn affected by other forms of placental separation and hemorrhage ..... (P02.1)	6	3	0	1	2	0
Newborn affected by premature rupture of membranes ..... (P01.1)	5	1	0	0	3	1
Hypoxic ischemic encephalopathy of newborn ..... (P91.6)	5	2	0	1	1	1
Respiratory distress syndrome of newborn..... (P22.0)	5	2	1	1	1	0
<b>Congenital Malformations, Deformations, &amp; Chromosomal Abnormalities...(Q00-Q99)</b>	<b>104</b>	<b>24</b>	<b>24</b>	<b>18</b>	<b>21</b>	<b>17</b>
Chromosomal abnormalities ..... (Q90-Q99)	24	5	7	2	5	5
Patau's syndrome ..... (Q91.4-Q91.7)	11	2	3	1	3	2
Edward's syndrome..... (Q91.0-Q91.3)	8	2	3	0	0	3
Congenital malformations of the nervous system ..... (Q00-Q07)	23	4	5	6	6	2
Anencephaly..... (Q00.0)	12	0	5	3	2	2
Congenital malformations of the heart ..... (Q20-Q24)	22	5	3	5	3	6
Congenital malformations and deformations of the musculoskeletal system..... (Q65-Q79)	10	3	3	2	2	0
Congenital malformations of the urinary system ..... (Q60-Q64)	8	4	1	1	1	1
Congenital malformations of the respiratory system ..... (Q30-Q34)	5	2	0	0	3	0
Multiple congenital malformations ..... (Q89.7)	5	1	2	0	1	1
<b>Sudden Infant Death Syndrome..... (R95)</b>	<b>48</b>	<b>8</b>	<b>12</b>	<b>13</b>	<b>7</b>	<b>8</b>
<b>Accidents..... (V01-X59, Y85-Y86)</b>	<b>29</b>	<b>4</b>	<b>7</b>	<b>6</b>	<b>7</b>	<b>5</b>
Accidental suffocation and strangulation in bed ..... (W75)	15	1	5	4	3	2
Unspecified threat to breathing ..... (W84)	5	0	1	2	1	1
<b>Symptoms, Signs, and Abnormal Clinical and Lab Findings .....(R00-R94)</b>	<b>14</b>	<b>4</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>
<b>Ill-Defined and Unknown Causes of Mortality .....(R96-R99)</b>	<b>13</b>	<b>2</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>Assault (homicide) .....(X85-Y09,Y87.1)</b>	<b>7</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>2</b>
<b>Influenza and Pneumonia..... (J09-J18)</b>	<b>5</b>	<b>0</b>	<b>1</b>	<b>1</b>	<b>0</b>	<b>3</b>
<b>All Other Causes</b>	<b>31</b>	<b>2</b>	<b>8</b>	<b>6</b>	<b>8</b>	<b>7</b>

Source: South Dakota Department of Health, Office of Health Statistics

There were 46 neonatal deaths (deaths occurring to infants from birth through 27 days old) for a rate of 3.89 deaths per 1,000 live births. There were 29 postneonatal deaths (deaths occurring to infants 28 days

to 1 year of age) for a rate of 2.45 deaths per 1,000 live births. In comparison, 2010 neonatal and postneonatal rates were 4.75 and 2.29 per 1,000 live births, respectively.

## Infant Mortality by Race

Beginning with the 2010 data, race is now assigned based on standards set forth by the National Center for Health Statistics and the US Census Bureau in order for South Dakota's race data to be comparable. Race is no longer allocated as it had been since the 2000 Census started allowing multiple races to be reported. All race data in this section are now categorized in the following manner:

Single-race White  
 Single-race American Indian  
 Two or more races

The remaining single-race categories (Black, Asian, Pacific Islander) are included in the totals, but are not shown specifically in any tables.

Table 34a, below, indicates that from 2010 to 2011, the number of South Dakota resident infant deaths decreased for whites and increased for American Indians. Table 34b, below, displays infant mortality grouped by five-year increments. In this table, the infant mortality decreases for both whites and American Indians.

**Table 34a**  
**South Dakota Resident Infant Deaths and Mortality**  
**Rates by Infant's Race, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2011	43	4.82	24	12.29	4	11.76	75	6.34
2010	54	5.84	19	10.35	8	24.54	83	7.04
2009	56	6.00	19	10.08	2	5.87	80	6.71
2008	60	6.36	29	14.56	9	29.80	100	8.28
2007	51	5.33	21	10.22	6	21.43	79	6.45
2006	50	5.34	26	13.33	2	7.41	82	6.88
2005	55	6.13	25	14.36	1	2.07	82	7.15
2004	62	6.95	28	16.63	2	4.07	93	8.20

Note: Infant mortality rates are per 1,000 live births.  
 Source: South Dakota Department of Health, Office of Health Statistics

**Table 34b**  
**South Dakota Resident Infant Deaths and Mortality Rates by**  
**Infant's Race, Five-Year Increments, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2007-2011	264	5.68	112	11.52	29	18.25	417	6.96
2006-2010	271	5.77	114	11.73	27	17.77	424	7.07
2005-2009	272	5.83	120	12.47	20	11.94	423	7.09
2004-2008	278	6.01	129	13.69	20	10.96	436	7.38

Note: Infant mortality rates are per 1,000 live births.  
 Source: South Dakota Department of Health, Office of Health Statistics

When analyzed by race, Table 35a, below, indicates that the South Dakota resident neonatal mortality rate per 1,000 live births decreased for both whites and American Indians from 2010 to 2011. The American Indian neonatal mortality rate has been

consistently higher than white neonatal mortality rates for each year since 2004. In Table 35b, below, the neonatal mortality is grouped in five-year increments. This indicates that the neonatal mortality rate has shown little change since 2004.

**Table 35a**  
**South Dakota Resident Neonatal Deaths and Mortality Rates by Infant's Race, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2011	30	3.36	10	5.12	3	8.82	46	3.89
2010	37	4.00	14	7.63	4	12.27	56	4.75
2009	34	3.64	7	3.71	2	5.87	45	3.77
2008	40	4.24	12	6.02	7	23.18	61	5.05
2007	37	3.87	9	4.38	4	14.29	51	4.16
2006	30	3.20	10	5.13	1	3.70	43	3.61
2005	41	4.57	9	5.17	1	2.07	52	4.54
2004	44	4.93	12	7.13	1	2.04	57	5.03

Note: Neonatal mortality rates are per 1,000 live births.  
Source: South Dakota Department of Health, Office of Health Statistics

**Table 35b**  
**South Dakota Resident Neonatal Deaths and Mortality Rates by Infant's Race, Five-Year Increments, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2007-2011	178	3.83	52	5.35	20	12.59	259	4.32
2006-2010	178	3.79	52	5.35	18	11.85	256	4.27
2005-2009	182	3.80	47	4.88	15	8.96	252	4.23
2004-2008	192	4.15	52	5.52	14	7.67	264	4.47

Note: Neonatal mortality rates are per 1,000 live births.  
Source: South Dakota Department of Health, Office of Health Statistics

Table 36a, below, indicates that the postneonatal mortality rate per 1,000 live births decreased for white infants and increased for American Indian infants from 2010 to 2011. The American Indian postneonatal mortality rate has been

consistently higher than white postneonatal mortality rates for each year since 2004. When looking at the data in five-year increments as shown in Table 36b, below, the postneonatal mortality for whites and American Indians has decreased.

**Table 36a**  
**South Dakota Resident Postneonatal Deaths and Mortality Rates by Infant's Race, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2011	13	1.46	14	7.17	1	2.94	29	2.45
2010	17	1.84	5	2.72	4	12.27	27	2.29
2009	22	2.36	12	6.37	0	0.00	35	2.93
2008	20	2.12	17	8.53	2	6.62	39	3.23
2007	14	1.46	12	5.84	2	7.14	28	2.29
2006	20	2.13	16	8.20	1	3.70	39	3.27
2005	14	1.56	16	9.19	0	0.00	30	2.62
2004	18	1.59	16	9.50	1	2.04	36	3.17

Note: Postneonatal mortality rates are per 1,000 live births.  
Source: South Dakota Department of Health, Office of Health Statistics

**Table 36b**  
**South Dakota Resident Postneonatal Deaths and Mortality Rates by Infant's Race, Five-Year Increments, 2004-2011**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2007-2011	86	1.85	60	6.17	9	5.66	158	2.64
2006-2010	93	1.98	62	6.38	9	5.92	168	2.80
2005-2009	90	1.93	73	7.59	5	2.99	171	2.87
2004-2008	86	1.86	77	8.17	6	3.29	172	2.91

Note: Postneonatal mortality rates are per 1,000 live births.  
Source: South Dakota Department of Health, Office of Health Statistics

Table 37, below, shows the leading causes of infant death from 2007 to 2011. The overall leading cause of infant death for South Dakota residents from 2007 to 2011 was certain conditions in perinatal period. Certain conditions in perinatal period accounted for 39.8 percent of all infant deaths in South Dakota from 2007 to 2011.

When analyzed by race, the leading cause of death for white infants was certain conditions in perinatal period with 108 white infant deaths or 40.9 percent of all white infant deaths. The leading cause of death for American Indian infants was certain conditions in the perinatal period with 36 American Indian infant deaths or 32.1 percent of all American Indian infant deaths.

**Table 37**  
**South Dakota Resident Infant Deaths by Cause of Death and Race, 2007-2011**

	Total	Rate	Race			
			White	Rate	American Indian	Rate
<b>Total Deaths</b>	<b>417</b>	<b>6.96</b>	<b>264</b>	<b>5.68</b>	<b>112</b>	<b>11.52</b>
<b>Certain Conditions in the Perinatal Period.....(P00-P96)</b>	<b>166</b>	<b>2.77</b>	<b>108</b>	<b>2.32</b>	<b>36</b>	<b>3.70</b>
Extreme immaturity (Less than 28 comp wks of gestation) .....(P07.2)	44	0.73	24	0.52	11	1.13
Other preterm infants (28 comp wks or more but < 37 comp wks of gestation) .....(P07.3)	13	0.22	7	0.15	6	0.62
Neonatal cardiac failure .....(P29.0)	11	0.18	8	0.17	2	0.21
Newborn affected by chorioamnionitis .....(P02.7)	8	0.13	2	0.04	4	0.41
Primary atelectasis of newborn.....(P28.0)	7	0.12	7	0.15	0	0.00
Newborn affected by other forms of placental separation and hemorrhage .....(P02.1)	6	0.10	5	0.11	1	0.10
Necrotizing enterocolitis of newborn .....(P77)	6	0.10	3	0.06	1	0.10
Newborn affected by premature rupture of membranes .....(P01.1)	5	0.08	4	0.09	1	0.10
Hypoxic ischemic encephalopathy of newborn .....(P91.6)	5	0.08	4	0.09	1	0.10
Respiratory distress syndrome of newborn.....(P22.0)	5	0.08	4	0.09	0	0.00
<b>Congenital Malformations, Deformations, &amp; Chromosomal Abnormality..... (Q00-Q99)</b>	<b>104</b>	<b>1.74</b>	<b>76</b>	<b>1.63</b>	<b>21</b>	<b>2.16</b>
Chromosomal abnormalities ..... (Q90-Q99)	24	0.40	19	0.41	1	0.10
Patau's syndrome ..... (Q91.4-Q91.7)	11	0.18	8	0.17	1	0.10
Edward's syndrome ..... (Q91.0-Q91.3)	8	0.13	7	0.15	0	0.00
Congenital malformations of the nervous system..... (Q00-Q07)	23	0.38	17	0.37	5	0.51
Anencephaly ..... (Q00.0)	12	0.20	11	0.24	1	0.10
Congenital malformations of the heart..... (Q20-Q24)	22	0.37	14	0.30	6	0.62
Congenital malformations and deformations of the musculoskeletal system ..... (Q65-Q79)	10	0.17	9	0.19	1	0.10
Congenital malformations of the urinary system..... (Q60-Q64)	8	0.13	8	0.17	0	0.00
Congenital malformations of the respiratory system..... (Q30-Q34)	5	0.08	2	0.04	3	0.31
Multiple congenital malformations..... (Q89.7)	5	0.08	3	0.06	2	0.21
<b>Sudden Infant Death Syndrome ..... (R95)</b>	<b>48</b>	<b>0.80</b>	<b>29</b>	<b>0.62</b>	<b>18</b>	<b>1.85</b>
<b>Accidents.....(V01-X59, Y85-Y86)</b>	<b>29</b>	<b>0.48</b>	<b>12</b>	<b>0.26</b>	<b>15</b>	<b>1.54</b>
Accidental suffocation and strangulation in bed.....(W75)	15	0.25	6	0.13	8	0.82
Other accidental threats to breathing.....(W84)	5	0.08	2	0.04	3	0.31
<b>Symptoms, Signs, and Abnormal Clinical and Lab Findings .....(R00-R94)</b>	<b>14</b>	<b>0.23</b>	<b>9</b>	<b>0.19</b>	<b>3</b>	<b>0.31</b>
<b>Ill-Defined and Unknown Causes of Mortality.....(R96-R99)</b>	<b>13</b>	<b>0.22</b>	<b>5</b>	<b>0.11</b>	<b>7</b>	<b>0.72</b>
<b>Assault (homicide).....(X85-Y09, Y87.1)</b>	<b>7</b>	<b>0.12</b>	<b>4</b>	<b>0.09</b>	<b>1</b>	<b>0.10</b>
<b>Influenza and Pneumonia..... (J09-J18)</b>	<b>5</b>	<b>0.08</b>	<b>2</b>	<b>0.04</b>	<b>3</b>	<b>0.31</b>
<b>All Other Causes</b>	<b>31</b>	<b>0.52</b>	<b>19</b>	<b>0.41</b>	<b>8</b>	<b>0.82</b>

Note: Failure of the races to add to the total is due to other and unknown races.  
Source: South Dakota Department of Health, Office of Health Statistics

### Infant Mortality and Birth Weight

Table 38, below, displays infant mortality rates by birth weight. The highest mortality rate was for babies born who weighed less than 1,000 grams with an infant mortality rate of 488.10, a neonatal mortality rate of

452.38, and a postneonatal mortality rate of 35.71. The highest rates occurred below 2,500 grams which is considered low birth weight babies.

**Table 38**  
**South Dakota Resident Infant Mortality Rates by Birth Weight, 2007-2011**

<b>Birth Weight (in Grams)</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Total</b>	<b>59,886</b>	<b>417</b>	<b>6.96</b>	<b>4.32</b>	<b>2.64</b>
<1,000	336	164	488.10	452.38	35.71
1,000-1,499	338	21	62.13	44.38	17.75
1,500-1,999	786	28	35.62	26.72	8.91
2,000-2,499	2,433	31	12.74	7.81	4.93
2,500-2,999	9,553	49	5.13	2.30	2.83
3,000-3,499	23,456	72	3.07	0.72	2.34
3,500-3,999	17,642	33	1.87	0.34	1.53
4,000-4,499	4,632	15	3.24	0.65	2.59
4,500+	688	1	1.45	1.45	0.00

Note: Infant, neonatal, and postneonatal mortality rates are per 1,000 live births. Failure of births to add to total is due to unknown birth weights.

Source: South Dakota Department of Health, Office of Health Statistics

### Infant Mortality and Prenatal Care

Table 39, below, displays infant mortality rates by prenatal care. The highest infant mortality rate, 51.28, occurred when mothers did not have prenatal care. This is

true for neonatal and postneonatal mortality rates. In comparison, when mothers received prenatal care in the first trimester the infant mortality rate was only 5.53.

**Table 39**  
**South Dakota Resident Infant Mortality Rates by Prenatal Care, 2007-2011**

<b>Trimester Prenatal Care Began</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Total</b>	<b>59,886</b>	<b>417</b>	<b>6.96</b>	<b>4.32</b>	<b>2.64</b>
First Trimester	40,857	226	5.53	3.23	2.30
Second Trimester	14,359	106	7.38	4.60	2.79
Third Trimester	3,191	27	8.46	4.70	3.76
No Prenatal Care	429	22	51.28	44.29	6.99

Note: Infant mortality rates are per 1,000 live births.

Failure of births and infant deaths to add to the total is due to unknown trimester prenatal care began.

Source: South Dakota Department of Health, Office of Health Statistics

### Infant Mortality and Gestation Period

Table 40, below, displays infant mortality rates by gestation period. The highest infant mortality rate occurred to those with less than 25 weeks with a rate of 775.15. The

highest neonatal mortality rate and postneonatal mortality rate both occurred at less than 25 weeks with a rate of 745.56 and 29.59, respectively.

**Table 40**  
**South Dakota Resident Infant Mortality Rates by Gestation Period, 2007-2011**

<b>Weeks of Gestation</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Total</b>	<b>59,886</b>	<b>417</b>	<b>6.96</b>	<b>4.32</b>	<b>2.64</b>
<25 Weeks	169	131	775.15	745.56	29.59
25-29 Weeks	344	43	125.00	95.93	29.07
30-31 Weeks	256	17	66.41	50.78	15.63
32 Weeks	242	4	16.53	12.40	4.13
33 Weeks	356	7	19.66	11.24	8.43
34 Weeks	572	13	22.73	10.49	12.24
35 Weeks	964	15	15.56	10.37	5.19
36 Weeks	2,197	12	5.46	2.73	2.73
37 Weeks	4,998	32	6.40	2.80	3.60
38 Weeks	10,325	39	3.78	0.97	2.81
39 Weeks	18,793	52	2.77	0.69	2.08
40 Weeks	15,298	31	2.03	0.85	1.18
41 Weeks	4,722	14	2.96	0.85	2.12
42+ Weeks	529	4	7.56	1.89	5.67

Note: Infant mortality rates are per 1,000 live births.

Failure of births and infant deaths to add to the total is due to unknown weeks of gestation.

Source: South Dakota Department of Health, Office of Health Statistics

### Infant Mortality and Tobacco Use

Table 41, below, displays infant mortality rates by tobacco use of the mother. Mothers who reported they did use tobacco while pregnant had an infant mortality rate

of 9.97, while mothers who reported they did not use tobacco while pregnant had an infant mortality rate of 6.18.

**Table 41**  
**South Dakota Resident Infant Mortality Rates by Tobacco Use of Mother, 2007-2011**

<b>Tobacco Use of Mother</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Total</b>	<b>59,886</b>	<b>417</b>	<b>6.96</b>	<b>4.32</b>	<b>2.64</b>
Yes	10,728	107	9.97	4.94	5.03
No	48,570	300	6.18	4.12	2.06

Note: Infant mortality rates are per 1,000 live births.

Failure of births to add to the total is due to unknown tobacco use of the mother.

Source: South Dakota Department of Health, Office of Health Statistics

## Infant Mortality and Mother Demographics

The following tables, 42a-42d, compare infant mortality rates among different demographics of the mother, different previous pregnancy histories, different labor and delivery situations, and different post-delivery conditions. The comparison is done using the Chi-Square test. An explanation of this test is given in the Technical Notes section on pages 234-235.

The rates denoted with an asterisk are the ones found to illustrate an association with the variables listed in the left column. For example, the test indicates that when there is a change in the education of the mother, there is an associated change with the

infant mortality rate as well as the neonatal and post-neonatal mortality rate.

However, it should be noted that this test does not consider relationships among multiple variables at the same time. Therefore, dependencies detected by Chi-square analyses may be unrealistic or non-causal. There may be other unseen factors that make the variables appear to be associated. However, if properly used, this test is a very useful tool for the evaluation of associations and can be used as a preliminary analysis of more complex statistical evaluations.

**Table 42a**  
**South Dakota Resident Infant Mortality Rates by Demographics of Mother, 2007-2011**

	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Education</b>					
11 years or less	7,536	89	11.81*	6.37*	5.44*
12+ years	49,093	283	5.76*	3.67*	2.10*
<b>Marital Status</b>					
Single	22,917	215	9.38*	5.24*	4.15*
Married	36,913	202	5.47*	3.68*	1.79*
<b>Mother's WIC Status</b>					
No WIC	35,592	206	5.79*	4.33	1.46*
WIC	23,290	190	8.16*	3.69	4.47*
<b>Age</b>					
<20	5,383	60	11.15*	6.32	4.83*
20-24	15,566	118	7.58*	4.05	3.53*
25-29	20,032	118	5.89*	3.54	2.35*
30-34	13,020	74	5.68*	4.38	1.31*
35+	5,864	47	8.02*	5.29	2.73*
<b>BMI</b>					
Underweight (<18.5)	2,048	18	8.79*	2.44*	6.35*
Recommended (18.5-24.9)	28,818	160	5.55*	3.47*	2.08*
Overweight (25.0-29.9)	14,834	110	7.42*	4.25*	3.17*
Obese (30.0-34.9)	7,528	63	8.37*	5.31*	3.06*
Very Obese (35.0-39.9)	3,528	19	5.39*	4.54*	0.85*
Morbidly Obese (40.0+)	2,073	25	12.06*	7.72*	4.34*
<b>Diabetes</b>					
No Pre-Existing Diabetes	59,309	405	6.83*	4.16*	2.66
Pre-Existing Diabetes	430	11	25.58*	18.60*	6.98
<b>Gestational Diabetes</b>					
No Gestational Diabetes	56,865	405	7.12*	4.34	2.78
Gestational Diabetes	2,874	11	3.83*	2.78	1.04
<b>Chlamydia</b>					
No Chlamydia	58,421	402	6.88	4.28	2.60*
Chlamydia	1,272	13	10.22	3.14	7.08*
<b>Hypertension-Eclampsia</b>					
No Hypertension-eclampsia	59,591	412	6.91*	4.23*	2.68
Hypertension-eclampsia	148	4	27.03*	20.27*	6.76

**Table 42a (continued)**  
**South Dakota Resident Infant Mortality Rates by Demographics of Mother, 2007-2011**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Payment Source</b>					
Medicaid	21,068	184	8.73*	4.60*	4.13*
Private Insurance	32,592	167	5.12*	3.68*	1.44*
Self-Pay	1,392	22	15.80*	11.49*	4.31*
Indian Health Service	1,614	26	16.11*	6.20*	9.91*
Champus/Tricare	1,595	6	3.76*	3.13*	0.63*
Other Government	378	3	7.94*	5.29*	2.65*
Other	663	0	0.00*	0.00*	0.00*

Note: \*The Chi-square statistic is significant at the 0.05 level.  
Source: South Dakota Department of Health, Office of Health Statistics

**Table 42b**  
**South Dakota Resident Infant Mortality Rates by Previous Pregnancy History, 2007-2011**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Number of Living Children</b>					
0	21,988	147	6.69*	4.82*	1.86*
1	18,626	122	6.55*	3.60*	2.95*
2	10,819	75	6.93*	4.07*	2.87*
3	4,886	29	5.94*	2.25*	3.68*
4+	3,513	43	12.24*	7.69*	4.55*
<b>Number of Dead Children</b>					
0	58,966	388	6.58*	4.04*	2.54*
1+	849	26	30.62*	18.85*	11.78*
<b>Number of Previous Pregnancies</b>					
0	18,140	113	6.23*	4.47*	1.76*
1	16,414	107	6.52*	3.78*	2.74*
2	11,427	74	6.48*	3.68*	2.80*
3	6,568	41	6.24*	3.81*	2.44*
4	3,385	33	9.75*	4.43*	5.32*
5+	3,838	45	11.72*	7.56*	4.17*
<b>Other Poor Previous Pregnancy Outcomes</b>					
No	57,749	385	6.67*	4.05*	2.61*
Yes	1,990	31	15.58*	10.55*	5.03*
<b>Infertility Treatment</b>					
No	59,005	402	6.81*	4.08*	2.73
Yes	734	14	19.07*	19.07*	0.00
<b>Infertility Treatment – Drugs, Insemination</b>					
No	59,238	405	6.84*	4.12*	2.72
Yes	500	11	22.00*	22.00*	0.00

Note: \*The Chi-square statistic is significant at the 0.05 level.  
Source: South Dakota Department of Health, Office of Health Statistics

**Table 42c**  
**South Dakota Resident Infant Mortality Rates by Labor and Delivery, 2007-2011**

	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate</b>	<b>Neonatal Mortality Rate</b>	<b>Postneonatal Mortality Rate</b>
<b>Tocolysis</b>					
No	58,426	379	6.49*	3.92*	2.57*
Yes	1,277	36	28.19*	19.58*	8.61*
<b>Cervical Cerclage</b>					
No	59,499	410	6.89*	4.20*	2.69
Yes	204	5	24.51*	19.61*	4.90
<b>Premature Rupture of Membranes</b>					
No	56,951	358	6.29*	3.67*	2.62
Yes	2,772	57	20.56*	16.23*	4.33
<b>Antibiotics Received by the Mother During Labor</b>					
No	45,158	298	6.60	3.79*	2.81
Yes	14,628	117	8.00	5.67*	2.32
<b>Precipitous Labor</b>					
No	57,381	380	6.62*	3.94*	2.68
Yes	2,342	35	14.94*	11.96*	2.99
<b>Induction of Labor</b>					
No	41,227	341	8.27*	4.97*	3.30*
Yes	18,559	74	3.99*	2.64*	1.35*
<b>Augmentation of Labor</b>					
No	43,627	346	7.93*	4.91*	3.03*
Yes	16,159	69	4.27*	2.48*	1.79*
<b>Non-Vertex Presentation</b>					
No	57,696	346	6.00*	3.38*	2.62
Yes	2,090	69	33.01*	28.23*	4.78
<b>Moderate/Heavy Meconium Staining of The Amniotic Fluid</b>					
No	55,455	393	7.09	4.42*	2.67
Yes	4,331	22	5.08	2.08*	3.00
<b>Steroids for Fetal Lung Maturation Received by the Mother Prior to Delivery</b>					
No	58,902	389	6.60*	4.07*	2.53*
Yes	884	26	29.41*	15.84*	13.57*
<b>Clinical Chorioamnionitis Diagnosed During Labor – Maternal Temp <math>\geq 38^{\circ}\text{C}</math></b>					
No	59,487	403	6.77*	4.10*	2.67
Yes	299	12	40.13*	33.44*	6.69
<b>Fetal Intolerance of Labor Requiring In-Utero Resuscitative Measures, Further Fetal Assessment or Operative Delivery</b>					
No	55,308	370	6.69*	4.01*	2.68
Yes	4,478	45	10.05*	7.15*	2.90
<b>Epidural or Spinal Anesthesia During Labor</b>					
No	18,361	170	9.26*	6.10*	3.16*
Yes	30,741	124	4.03*	2.18*	1.85*
<b>Fetal Presentation</b>					
Cephalic	57,088	332	5.82*	3.21*	2.61*
Breech	2,139	75	35.06*	29.92*	5.14*

**Table 42c (continued)**  
**South Dakota Resident Infant Mortality Rates by Labor and Delivery, 2007-2011**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Method of Delivery</b>					
Vaginal	42,939	255	5.94*	3.63*	2.31
Vaginal after previous C-section	1,140	15	13.16*	8.77*	4.39
Primary C-section	9,209	103	11.18*	6.95*	4.23
Repeat C-section	6,488	44	6.78*	4.01*	2.77
<b>Maternal Transfusion</b>					
No	59,455	407	6.85*	4.14*	2.71
Yes	261	8	30.65*	30.65*	0.00
<b>Unplanned Operating Procedure Following Delivery</b>					
No	59,533	406	6.82*	4.13*	2.69
Yes	183	9	49.18*	43.72*	5.46

Note: \*The Chi-square statistic is significant at the 0.05 level.  
Source: South Dakota Department of Health, Office of Health Statistics

**Table 42d**  
**South Dakota Resident Infant Mortality Rates by Post Delivery Conditions, 2007-2011**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Five Minute APGAR Score</b>					
0-7	2,226	240	107.82*	96.59*	11.23*
8	6,317	37	5.86*	1.74*	4.12*
9	46,951	119	2.53*	0.47*	2.07*
10	4,184	10	2.39*	0.00*	2.39*
<b>Ten Minute APGAR Score</b>					
0-2	142	126	887.32*	887.32*	0.00
3-7	214	30	140.19*	130.84*	9.35
8-10	154	5	32.47*	25.97*	6.49
<b>Plurality</b>					
1	58,043	377	6.50*	3.89*	2.60*
2+	1,823	40	21.94*	16.46*	5.49*
<b>Breastfeeding at the Time of Discharge</b>					
No	15,154	89	5.87*	1.98*	3.89*
Yes	43,756	123	2.81*	0.57*	2.24*
<b>Assisted Ventilation Required Immediately Following Delivery</b>					
No	57,128	317	5.55*	3.17*	2.38*
Yes	2,627	97	36.92*	27.41*	9.52*
<b>Assisted Ventilation for More than Six Hours</b>					
No	58,431	344	5.89*	3.53*	2.36*
Yes	1,324	70	52.87*	35.50*	17.37*
<b>Neonatal Intensive Care Unit Admission</b>					
No	54,568	297	5.44*	3.32*	2.13*
Yes	5,187	117	22.56*	13.88*	8.68*
<b>Newborn Given Surfactant Replacement Therapy</b>					
No	59,314	372	6.27*	3.81*	2.46*
Yes	441	42	95.24*	61.22*	34.01*
<b>Antibiotics Received by the Newborn for Suspected Neonatal Sepsis</b>					
No	56,945	357	6.27*	3.86*	2.41*
Yes	2,810	57	20.28*	11.74*	8.54*

Note: \*The Chi-square statistic is significant at the 0.05 level.  
Source: South Dakota Department of Health, Office of Health Statistics

