

# Infant Mortality

## An Overview: 2012

Infant Deaths	
Number	104
Rate per 1,000 Live Births	8.60
Neonatal Deaths	
Number	69
Rate per 1,000 Live Births	5.71
Postneonatal Death	
Number	35
Rate per 1,000 Live Births	2.89

In comparison, there were 75 infant deaths in 2011, with the infant mortality rate of 6.34 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, and Figure 6, on the next page, displays, 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 2012, there were 104 South Dakota resident infant deaths reported for an infant mortality rate of 8.60 per 1,000 live births.

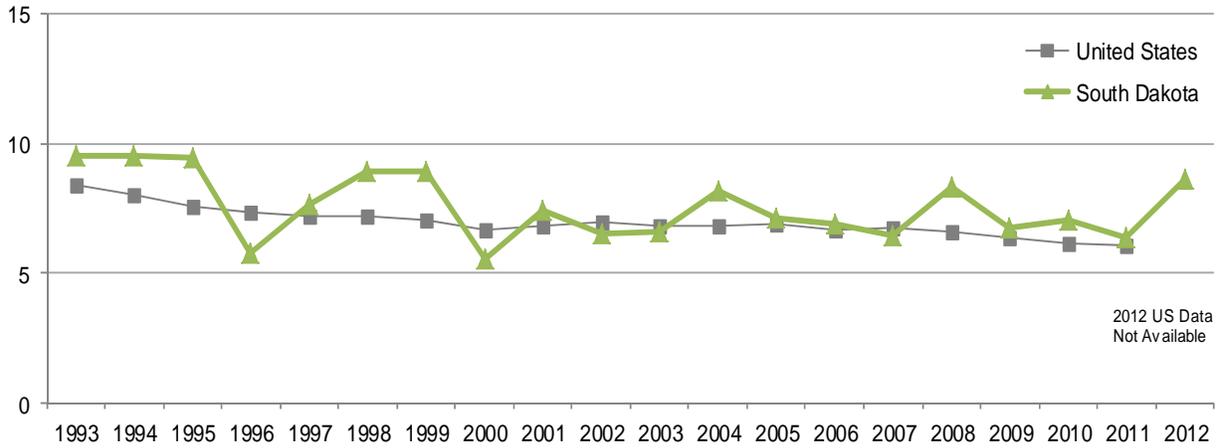
**Table 32**  
**Resident Infant Deaths and Infant Mortality Rates,**  
**South Dakota and United States, 1993-2012**

Year	United States		South Dakota	
	Number	Mortality Rate	Number	Mortality Rate
2012	NA	NA	104	8.60
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

Note: \* U.S. 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, 1993-2012**

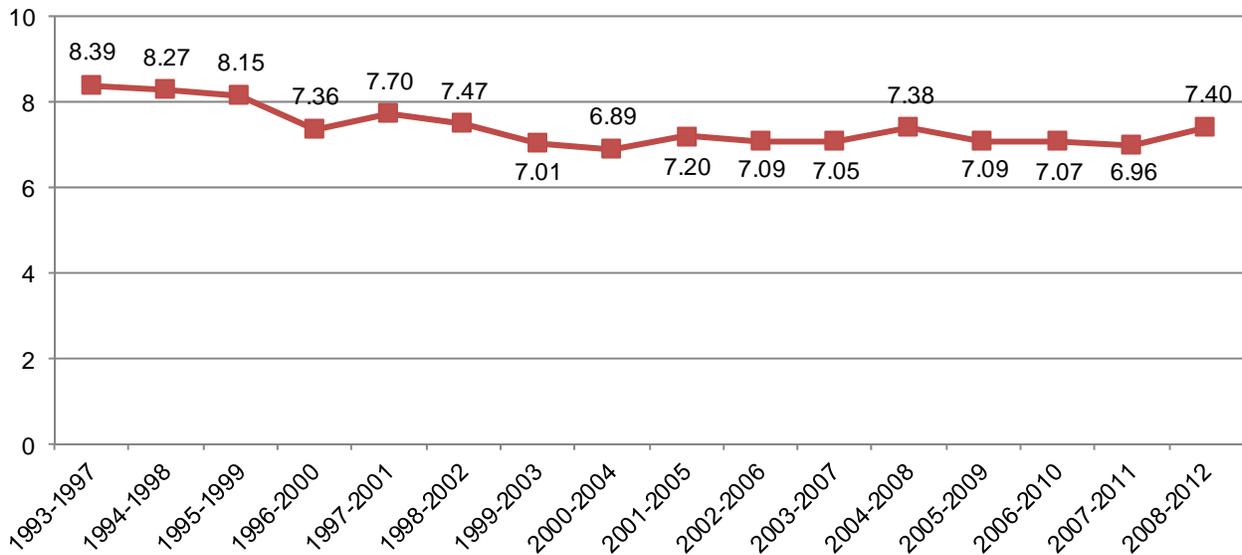


Note: Rate Per 1,000 Live Births. U.S. 2011 data are provisional.  
 Source: National Center for Health Statistics and South Dakota Department of Health, Office of Health Statistics

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, 1993-2012**



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 2008-2012. The leading causes of infant death in 2012 can be broken down as follows: certain

conditions in perinatal period, 45.2 percent; congenital malformations, 27.9 percent; accidents, 8.7 percent; and sudden infant death syndrome with 5.8 percent.

**Table 33**  
**South Dakota Resident Leading Causes of Infant Death, 2008-2012**

	Total	2008	2009	2010	2011	2012
<b>Total Deaths</b>	<b>442</b>	<b>100</b>	<b>80</b>	<b>83</b>	<b>75</b>	<b>104</b>
<b>Certain Conditions in the Perinatal Period (P00-P96)</b>	<b>180</b>	<b>34</b>	<b>32</b>	<b>36</b>	<b>31</b>	<b>47</b>
Extreme immaturity (Less than 28 comp wks of gestation) (P07.2)	52	10	11	8	11	12
Other preterm infants (28 comp wks or more but < 37 comp wks of gestations) (P07.3)	14	3	3	4	2	2
Neonatal cardiac failure (P29.0)	11	1	6	0	1	3
Newborn affected by chorioamnionitis (P02.7)	9	2	0	2	2	3
Necrotizing enterocolitis of newborn (P77)	7	1	2	1	2	1
Hypoxic ischemic encephalopathy of newborn (P91.6)	6	0	1	1	1	3
Newborn affected by premature rupture of membranes (P01.1)	6	0	0	3	1	2
Primary atelectasis of newborn (P28.0)	6	0	2	2	1	1
Unspecified intraventricular (nontraumatic) hemorrhage of newborn (P52.3)	5	2	0	0	0	3
Newborn affected by incompetent cervix (P01.0)	5	0	0	0	3	2
Newborn affected by other forms of placental separation and hemorrhage (P02.1)	5	0	1	2	0	2
Hydrops fetalis not due to hemolytic disease (P83.2)	5	1	1	1	0	2
Neonatal cardiac dysrhythmia (P29.1)	5	4	0	0	0	1
<b>Congenital Malformations, Deformations, &amp; Chromosomal Abnormalities (Q00-Q99)</b>	<b>109</b>	<b>24</b>	<b>18</b>	<b>21</b>	<b>17</b>	<b>29</b>
Congenital malformations of the heart (Q20-Q24)	24	3	5	3	6	7
Chromosomal abnormalities (Q90-Q99)	22	7	2	5	5	3
Patau's syndrome (Q91.4-Q91.7)	9	3	1	3	2	0
Edward's syndrome (Q91.0-Q91.3)	7	3	0	0	3	1
Congenital malformations of the nervous system (Q00-Q07)	22	5	6	6	2	3
Anencephaly (Q00.0)	13	5	3	2	2	1
Congenital malformations and deformations of the musculoskeletal system (Q65-Q79)	10	3	2	2	0	3
Congenital malformations of the urinary system (Q60-Q64)	8	1	1	1	1	4
Congenital malformation, unspecified (Q89.9)	6	1	2	0	2	1
<b>Sudden Infant Death Syndrome (R95)</b>	<b>46</b>	<b>12</b>	<b>13</b>	<b>7</b>	<b>8</b>	<b>6</b>
<b>Accidents (V01-X59, Y85-Y86)</b>	<b>34</b>	<b>7</b>	<b>6</b>	<b>7</b>	<b>5</b>	<b>9</b>
Accidental suffocation and strangulation in bed (W75)	18	5	4	3	2	4
Unspecified threat to breathing (W84)	7	1	2	1	1	2
<b>Ill-Defined and Unknown Causes of Mortality (R96-R99)</b>	<b>13</b>	<b>6</b>	<b>1</b>	<b>2</b>	<b>2</b>	<b>2</b>
<b>Symptoms, Signs, and Abnormal Clinical and Lab Findings (R00-R94)</b>	<b>10</b>	<b>8</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>0</b>
Influenza and Pneumonia (J09-J18)	7	1	1	0	3	2
Assault (homicide) (X85-Y09, Y87.1)	6	0	1	2	2	1
Heart Disease (I00-I09, I11, I13, I20-I51)	5	2	0	0	0	3
<b>All Other Causes</b>	<b>32</b>	<b>6</b>	<b>6</b>	<b>8</b>	<b>7</b>	<b>5</b>

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

There were 69 neonatal deaths (deaths occurring to infants from birth through 27 days old) for a rate of 5.71 deaths per 1,000 live births. There were 35 postneonatal deaths (deaths occurring to infants 28 days

to 1 year of age) for a rate of 2.89 deaths per 1,000 live births. In comparison, in 2011 neonatal and postneonatal rates were 3.89 and 2.45 per 1,000 live births, respectively.

## Infant Mortality by Race

Beginning with the 2004 data, race is 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 2011 to 2012, the number of South Dakota resident infant deaths increased for whites and American Indians. Table 34b, below, displays infant mortality grouped by five-year increments.

**Table 34a**  
**South Dakota Resident Infant Deaths and Mortality Rates**  
**by Infant's Race, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2012	58	6.37	26	13.43	10	25.06	104	8.60
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, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2008-2012	271	5.89	117	12.19	33	19.32	442	7.40
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 increased for both whites and American Indians from 2011 to 2012. 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, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2012	43	4.72	15	7.75	6	15.04	69	5.71
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, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2008-2012	184	4.00	58	6.04	22	12.88	277	4.64
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	3.90	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 increased for white infants and decreased for American Indian infants from 2011 to 2012. 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 has shown little change and American Indians has decreased.

**Table 36a**  
**South Dakota Resident Postneonatal Deaths and Mortality Rates**  
**by Infant's Race, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2012	15	1.65	11	5.68	4	10.03	35	2.89
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	2.02	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, 2004-2012**

Year	Race of Infant						Total	
	White		American Indian		Two or more races			
	Num	Rate	Num	Rate	Num	Rate	Num	Rate
2008-2012	87	1.89	59	6.15	11	6.44	165	2.76
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 2008 to 2012. The overall leading cause of infant death for South Dakota residents from 2008 to 2012 was certain conditions in perinatal period. Certain conditions in perinatal period accounted for 40.7 percent of all infant deaths in South Dakota from 2008 to 2012. The largest contributor to this group was extreme immaturity.

When analyzed by race, the leading cause of death for white infants was certain conditions in perinatal period with 111 white infant deaths or 41.0 percent of all white infant deaths. The leading cause of death for American Indian infants was certain conditions in the perinatal period with 41 American Indian infant deaths or 35.0 percent of all American Indian infant deaths.

**Table 37**  
**South Dakota Resident Infant Deaths by Cause of Death and Race, 2008-2012**

	Total		Race			
			White		American Indian	
	Num	Rate	Num	Rate	Num	Rate
<b>Total Deaths</b>	<b>442</b>	<b>7.40</b>	<b>271</b>	<b>5.89</b>	<b>117</b>	<b>12.19</b>
<b>Certain Conditions in the Perinatal Period (P00-P96)</b>	<b>180</b>	<b>3.01</b>	<b>111</b>	<b>2.41</b>	<b>41</b>	<b>4.27</b>
Extreme immaturity (Less than 28 comp wks of gestation) (P07.2)	52	0.87	23	0.50	13	1.35
Other preterm infants (28 comp wks or more but < 37 comp wks of gestation) (P07.3)	14	0.23	7	0.15	7	0.73
Neonatal cardiac failure (P29.0)	11	0.18	6	0.13	3	0.31
Newborn affected by chorioamnionitis (P02.7)	9	0.15	4	0.09	4	0.42
Necrotizing enterocolitis of newborn (P77)	7	0.12	4	0.09	1	0.10
Hypoxic ischemic encephalopathy of newborn (P91.6)	6	0.10	5	0.11	1	0.10
Newborn affected by premature rupture of membranes (P01.1)	6	0.10	5	0.11	1	0.10
Primary atelectasis of newborn (P28.0)	6	0.10	6	0.13	0	0.00
Unspecified intraventricular (nontraumatic) hemorrhage of newborn (P52.3)	5	0.08	2	0.04	2	0.21
Newborn affected by incompetent cervix (P01.0)	5	0.08	5	0.11	0	0.00
Newborn affected by other forms of placental separation and hemorrhage (P02.1)	5	0.08	5	0.11	0	0.00
Hydrops fetalis not due to hemolytic disease (P83.2)	5	0.08	4	0.09	1	0.10
Neonatal cardiac dysrhythmia (P29.1)	5	0.08	4	0.09	0	0.00
<b>Congenital Malformations, Deformations, &amp; Chromosomal Abnormality (Q00-Q99)</b>	<b>109</b>	<b>1.83</b>	<b>78</b>	<b>1.69</b>	<b>20</b>	<b>2.08</b>
Congenital malformations of the heart (Q20-Q24)	24	0.40	17	0.37	5	0.52
Chromosomal abnormalities (Q90-Q99)	22	0.37	16	0.35	2	0.21
Patau's syndrome (Q91.4-Q91.7)	9	0.15	7	0.15	0	0.00
Edward's syndrome (Q91.0-Q91.3)	7	0.12	5	0.11	1	0.10
Congenital malformations of the nervous system (Q00-Q07)	22	0.37	17	0.37	3	0.31
Anencephaly (Q00.0)	13	0.22	12	0.26	1	0.10
Congenital malformations and deformations of the musculoskeletal system (Q65-Q79)	10	0.17	8	0.17	1	0.10
Congenital malformations of the urinary system (Q60-Q64)	8	0.13	6	0.13	2	0.21
Congenital malformation. Unspecified (Q89.9)	6	0.10	4	0.09	2	0.21
<b>Sudden Infant Death Syndrome (R95)</b>	<b>46</b>	<b>0.77</b>	<b>29</b>	<b>0.63</b>	<b>15</b>	<b>1.56</b>
<b>Accidents (V01-X59, Y85-Y86)</b>	<b>34</b>	<b>0.57</b>	<b>14</b>	<b>0.30</b>	<b>16</b>	<b>1.67</b>
Accidental suffocation and strangulation in bed (W75)	18	0.30	7	0.15	9	0.94
Other accidental threats to breathing (W84)	7	0.12	3	0.07	3	0.31
<b>III-Defined and Unknown Causes of Mortality (R96-R99)</b>	<b>13</b>	<b>0.22</b>	<b>5</b>	<b>0.11</b>	<b>6</b>	<b>0.62</b>
<b>Symptoms, Signs, and Abnormal Clinical and Lab Findings (R00-R94)</b>	<b>10</b>	<b>0.17</b>	<b>7</b>	<b>0.15</b>	<b>2</b>	<b>0.21</b>
<b>Influenza and Pneumonia (J09-J18)</b>	<b>7</b>	<b>0.12</b>	<b>3</b>	<b>0.07</b>	<b>4</b>	<b>0.42</b>
<b>Assault (homicide) (X85-Y09, Y87.1)</b>	<b>6</b>	<b>0.10</b>	<b>4</b>	<b>0.09</b>	<b>1</b>	<b>0.10</b>
<b>Heart Disease (I00-I09, I11, I13, I20-I51)</b>	<b>5</b>	<b>0.08</b>	<b>0</b>	<b>0.00</b>	<b>4</b>	<b>0.42</b>
<b>All Other Causes</b>	<b>32</b>	<b>0.54</b>	<b>20</b>	<b>0.43</b>	<b>8</b>	<b>0.83</b>

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 498.59, a neonatal mortality rate of

467.61, and a postneonatal mortality rate of 30.99. The highest rates occurred below 2,500 grams which is considered low birth weight babies. The lowest rate occurred in the 3,500-3,999 gram group with 2.18.

**Table 38**  
**South Dakota Resident Infant Mortality Rates by Birth Weight, 2008-2012**

Birth Weight (in Grams)	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Total</b>	<b>59,725</b>	<b>442</b>	<b>7.40</b>	<b>4.64</b>	<b>2.76</b>
<1,000	355	177	498.59	467.61	30.99
1,000-1,499	343	19	55.39	37.90	17.49
1,500-1,999	740	27	36.49	27.03	9.46
2,000-2,499	2,353	34	14.45	8.07	6.37
2,500-2,999	9,421	45	4.78	2.23	2.55
3,000-3,499	23,101	77	3.33	0.87	2.47
3,500-3,999	17,910	39	2.18	0.50	1.68
4,000-4,499	4,779	19	3.98	1.05	2.93
4,500+	703	2	2.84	1.42	1.42

Note: Infant, neonatal, and postneonatal mortality rates are per 1,000 live births.  
Failure of births to add to total is due to not stated 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, 55.29, 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 5.98.

**Table 39**  
**South Dakota Resident Infant Mortality Rates by Prenatal Care, 2008-2012**

Trimester Prenatal Care Began	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Total</b>	<b>59,725</b>	<b>442</b>	<b>7.40</b>	<b>4.64</b>	<b>2.76</b>
First Trimester	40,645	243	5.98	3.57	2.41
Second Trimester	14,269	106	7.43	4.91	2.52
Third Trimester	3,236	29	8.96	4.33	4.64
No Prenatal Care	416	23	55.29	43.27	12.02

Note: Infant mortality rates are per 1,000 live births.  
Failure of births and infant deaths to add to the total is due to not stated 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 783.78. The

highest neonatal mortality rate and postneonatal mortality rate both occurred at less than 25 weeks with a rate of 751.35 and 32.43, respectively.

**Table 40**  
**South Dakota Resident Infant Mortality Rates by Gestation Period, 2008-2012**

Weeks of Gestation	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Total</b>	<b>59,725</b>	<b>442</b>	<b>7.40</b>	<b>4.64</b>	<b>2.76</b>
<25 Weeks	185	145	783.78	751.35	32.43
25-29 Weeks	347	42	121.04	95.10	25.94
30-31 Weeks	254	15	59.06	47.24	11.81
32 Weeks	236	5	21.19	12.71	8.47
33 Weeks	326	9	27.61	12.27	15.34
34 Weeks	533	10	18.76	9.38	9.38
35 Weeks	889	15	16.87	13.50	3.37
36 Weeks	2,112	17	8.05	4.26	3.79
37 Weeks	4,830	38	7.87	3.93	3.93
38 Weeks	10,001	40	4.00	0.90	3.10
39 Weeks	19,215	51	2.65	0.52	2.13
40 Weeks	15,308	35	2.29	0.91	1.37
41 Weeks	4,829	14	2.90	1.04	1.86
42+ Weeks	551	2	3.63	0.00	3.63

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

Failure of births and infant deaths to add to the total is due to not stated 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 11.27 while mothers who reported they did not use tobacco while pregnant had an infant mortality rate of 6.44.

**Table 41**  
**South Dakota Resident Infant Mortality Rates by Tobacco Use of Mother, 2008-2012**

Tobacco Use of Mother	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Total</b>	<b>59,725</b>	<b>442</b>	<b>7.40</b>	<b>4.64</b>	<b>2.76</b>
Yes	10,382	117	11.27	5.78	5.49
No	48,926	315	6.44	4.31	2.13

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

Failure of births to add to the total is due to not stated 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 page 230.

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, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Education</b>					
11 years or less	7,622	95	12.46*	7.48*	4.99*
12+ years	49,006	293	5.98*	3.92*	2.06*
<b>Marital Status</b>					
Single	22,897	222	9.70*	5.63*	4.06*
Married	36,795	207	5.63*	3.89*	1.74*
<b>Mother's WIC Status</b>					
No WIC	35,719	231	6.47*	4.79	1.68*
WIC	23,190	184	7.93*	3.97	3.97*
<b>Age</b>					
<20	5,125	57	11.12*	6.44	4.68*
20-24	15,214	124	8.15*	4.73	3.42*
25-29	20,047	124	6.19*	3.69	2.49*
30-34	13,432	81	6.03*	4.84	1.19*
35+	5,895	43	7.29*	4.75	2.54*
<b>BMI</b>					
Underweight (<18.5)	2,060	19	9.22*	2.43*	6.80*
Recommended (18.5-24.9)	28,650	164	5.72*	3.66*	2.06*
Overweight (25.0-29.9)	14,896	118	7.92*	5.10*	2.82*
Obese (30.0-34.9)	7,474	68	9.10*	5.89*	3.21*
Very Obese (35.0-39.9)	3,560	19	5.34*	4.49*	0.84*
Morbidly Obese (40.0+)	2,166	21	9.70*	6.00*	3.69*
<b>Diabetes</b>					
No Pre-Existing Diabetes	59,215	414	6.99*	4.42*	2.57*
Pre-Existing Diabetes	443	14	31.60*	22.57*	9.03*
<b>Gestational Diabetes</b>					
No Gestational Diabetes	56,653	416	7.34*	4.66	2.68
Gestational Diabetes	3,005	12	3.99*	2.66	1.33
<b>Chlamydia</b>					
No Chlamydia	58,294	414	7.10	4.61	2.49*
Chlamydia	1,323	13	9.83	1.51	8.31*
<b>Hypertension-Eclampsia</b>					
No Hypertension-eclampsia	59,531	425	7.14*	4.54	2.60
Hypertension-eclampsia	127	3	23.62*	15.75	7.87

**Table 42a (continued)**  
**South Dakota Resident Infant Mortality Rates by Demographics of Mother, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Payment Source</b>					
Medicaid	20,797	183	8.80*	4.81*	3.99*
Private Insurance	32,932	178	5.41*	4.01*	1.40*
Self-Pay	1,417	22	15.53*	10.59*	4.94*
Indian Health Service	1,718	28	16.30*	7.57*	8.73*
Champus/Tricare	1,689	8	4.74*	4.14*	0.59*
Other Government	233	4	17.17*	8.58*	8.58*
Other	525	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, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Number of Living Children</b>					
0	21,873	161	7.36*	5.30*	2.06
1	18,517	120	6.48*	3.83*	2.65
2	10,744	81	7.54*	4.28*	3.26
3	4,903	27	5.51*	2.65*	2.86
4+	3,654	40	10.95*	7.12*	3.83
<b>Number of Dead Children</b>					
0	58,839	394	6.70*	4.21*	2.48*
1+	838	33	39.38*	27.45*	11.93*
<b>Number of Previous Pregnancies</b>					
0	18,046	120	6.65*	4.71*	1.94*
1	16,325	113	6.92*	4.35*	2.57*
2	11,291	82	7.26*	4.16*	3.10*
3	6,584	37	5.62*	3.65*	1.97*
4	3,456	29	8.39*	3.76*	4.63*
5+	3,944	46	11.66*	7.86*	3.80*
<b>Previous Pre-Term Infant</b>					
No	57,606	405	7.03*	4.46	2.57
Yes	2,052	23	11.21*	7.31	3.90
<b>Other Poor Previous Pregnancy Outcomes</b>					
No	57,466	397	6.91*	4.35*	2.56
Yes	2,192	31	14.14*	10.04*	4.11
<b>Infertility Treatment</b>					
No	58,863	413	7.02*	4.37*	2.65
Yes	795	15	18.87*	18.87*	0.00
<b>Infertility Treatment – Drugs, Insemination</b>					
No	59,102	414	7.00*	4.37*	2.64
Yes	555	14	25.23*	25.23*	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, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Tocolysis</b>					
No	58,431	389	6.66*	4.16*	2.50*
Yes	1,188	38	31.99*	23.57*	8.42*
<b>Cervical Cerclage</b>					
No	59,426	422	7.10*	4.49*	2.61
Yes	193	5	25.91*	20.73*	5.18
<b>Premature Rupture of Membranes</b>					
No	57,157	376	6.58*	4.04*	2.54
Yes	2,481	51	20.56*	16.12*	4.43
<b>Antibiotics Received by the Mother During Labor</b>					
No	44,195	301	6.81	4.14*	2.67
Yes	15,480	127	8.20	5.68*	2.52
<b>Precipitous Labor</b>					
No	57,342	397	6.92*	4.32*	2.60
Yes	2,296	30	13.07*	10.02*	3.05
<b>Induction of Labor</b>					
No	41,800	361	8.64*	5.45*	3.18*
Yes	17,875	67	3.75*	2.41*	1.34*
<b>Augmentation of Labor</b>					
No	43,298	365	8.43*	5.43*	3.00*
Yes	16,377	63	3.85*	2.20*	1.65*
<b>Non-Vertex Presentation</b>					
No	57,220	336	5.87*	3.32*	2.55
Yes	2,455	92	37.47*	32.99*	4.48
<b>Steroids for Fetal Lung Maturation Received by the Mother Prior to Delivery</b>					
No	58,826	401	6.82*	4.35*	2.46*
Yes	849	27	31.80*	17.67*	14.13*
<b>Clinical Chorioamnionitis Diagnosed During Labor – Maternal Temp <math>\geq 38^{\circ}\text{C}</math></b>					
No	59,343	416	7.01*	4.38*	2.63
Yes	332	12	36.14*	33.13*	3.01
<b>Fetal Intolerance of Labor Requiring In-Utero Resuscitative Measures, Further Fetal Assessment or Operative Delivery</b>					
No	55,221	384	6.95*	4.35*	2.61
Yes	4,454	44	9.88*	6.96*	2.92
<b>Epidural or Spinal Anesthesia During Labor</b>					
No	18,280	184	10.07*	7.22*	2.84*
Yes	30,815	119	3.86*	1.98*	1.88*
<b>Fetal Presentation</b>					
Cephalic	56,828	333	5.86*	3.31*	2.55
Breech	2,209	86	38.93*	34.40*	4.53
<b>Method of Delivery</b>					
Vaginal	42,952	264	6.15*	3.96*	2.19
Vaginal after previous C-section	1,200	15	12.50*	8.33*	4.17
Primary C-section	9,014	103	11.43*	6.99*	4.44
Repeat C-section	6,506	46	7.07*	4.46*	2.61

**Table 42c (continued)**  
**South Dakota Resident Infant Mortality Rates by Labor and Delivery, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Maternal Transfusion</b>					
No	59,383	422	7.11*	4.48*	2.63
Yes	248	5	20.16*	20.16*	0.00
<b>Unplanned Operating Procedure Following Delivery</b>					
No	59,462	420	7.06*	4.46*	2.61
Yes	169	7	41.42*	35.50*	5.92

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, 2008-2012**

	Births	Infant Deaths	Infant Mortality Rate	Neonatal Mortality Rate	Postneonatal Mortality Rate
<b>Five Minute APGAR Score</b>					
0-7	1,956	258	131.90*	119.63*	12.27*
8	5,114	39	7.63*	2.54*	5.08*
9	48,044	110	2.29*	0.35*	1.94*
10	4,402	9	2.04*	0.00*	2.04*
<b>Ten Minute APGAR Score</b>					
0-2	154	136	883.12*	883.12*	0.00
3-7	232	40	172.41*	150.86*	21.55
8-10	103	7	67.96*	58.25*	9.71
<b>Plurality</b>					
1	57,906	376	6.49*	3.94*	2.56*
2+	1,808	53	29.31*	24.34*	4.98*
<b>Breastfeeding at the Time of Discharge</b>					
No	14,963	94	6.28*	2.07*	4.21*
Yes	43,935	109	2.48*	0.39*	2.09*
<b>Assisted Ventilation Required Immediately Following Delivery</b>					
No	56,999	316	5.54*	3.30*	2.25*
Yes	2,671	111	41.56*	30.70*	10.86*
<b>Assisted Ventilation for More than Six Hours</b>					
No	58,438	356	6.09*	3.78*	2.31*
Yes	1,232	71	57.63*	39.77*	17.86*
<b>Neonatal Intensive Care Unit Admission</b>					
No	54,451	296	5.44*	3.54*	1.89*
Yes	5,219	131	25.10*	14.75*	10.35*
<b>Newborn Given Surfactant Replacement Therapy</b>					
No	59,227	387	6.53*	4.15*	2.38*
Yes	443	40	90.29*	54.18*	36.12*
<b>Antibiotics Received by the Newborn for Suspected Neonatal Sepsis</b>					
No	56,879	361	6.35*	4.10*	2.25*
Yes	2,791	66	23.65*	13.26*	10.39*

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

