

2013-2015

Infant death review, South Dakota 2013-2015 and Infant mortality update, South Dakota 2016

30 September 2017

South Dakota Department of Health

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Definitions:

- Infant death: Death of a live born child less than one year (356 days) of age.
- Infant mortality rate: The number of infant deaths divided by the total number of live births X 1,000. *2015 South Dakota Vital Statistics Report, p 213.*
- Neonatal mortality rate: Death occurring to infant from birth through 27 days divided by the total number of live births X 1,000. *2015 South Dakota Vital Statistics Report, p 213.*
- Post-neonatal mortality rate: Death occurring to infant 28 days to 1 year of age divided by the total number of live births X 1,000. *2015 South Dakota Vital Statistics Report, p 213.*

Antiquity: “And this woman's child died in the night; because she overlaid it.” 1 Kings 3:19.

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Summary

This report summarizes the first statewide infant death review, which covered 97 infant deaths during the three-year period, 2013-2015. Major topics covered include county residence of deaths, manner of death, race stratification, and place of infant sleep. Limitations and recommendations are made. Key points include:

- 42% of the 97 infant deaths classified as “natural” deaths, 28% “accidental”, 4% homicide, and 26% as undetermined/unknown.
- 68% of deaths occurred at home, 8% in child daycare.
- 58 of the 97 infant deaths classified as “sleep-related”.
- 43% of sleep-related deaths were bed-sharing with another adult or child.
- South Dakota’s infant death review process must improve in standardization and quality statewide.
- Safe Sleep recommendations made based on the American Academy of Pediatrics’ “Recommendations for a Safe Infant Sleeping Environment”.

As preface, this paper reports South Dakota’s most recent infant mortality rate (2016), causes of death, demographic characteristics, historic trends, and compares the state to national rates.

- South Dakota’s 2016 infant mortality rate was 4.8 infant deaths per 1,000 live births, which was the lowest ever reported for the state.
- The previous year, 2015, the infant mortality rate was 7.3, ranking 41st in the United States. The five-year, 2012-2016, infant mortality rate was 6.8.
- 24.6% of infant deaths were caused by congenital malformations; 14.3% extreme immaturity; 10.6% accidents; 9.1% SIDS (sudden infant death syndrome); and 2.0% homicide.
- The American Indian infant mortality was approximately twice as high as the White infant mortality rate, 12.2 vs. 5.6 respectively, over the past five years.
- Of the accidental infant deaths, 81% were caused by suffocation and strangulation in bed or other unspecified threats to breathing, which should be preventable.

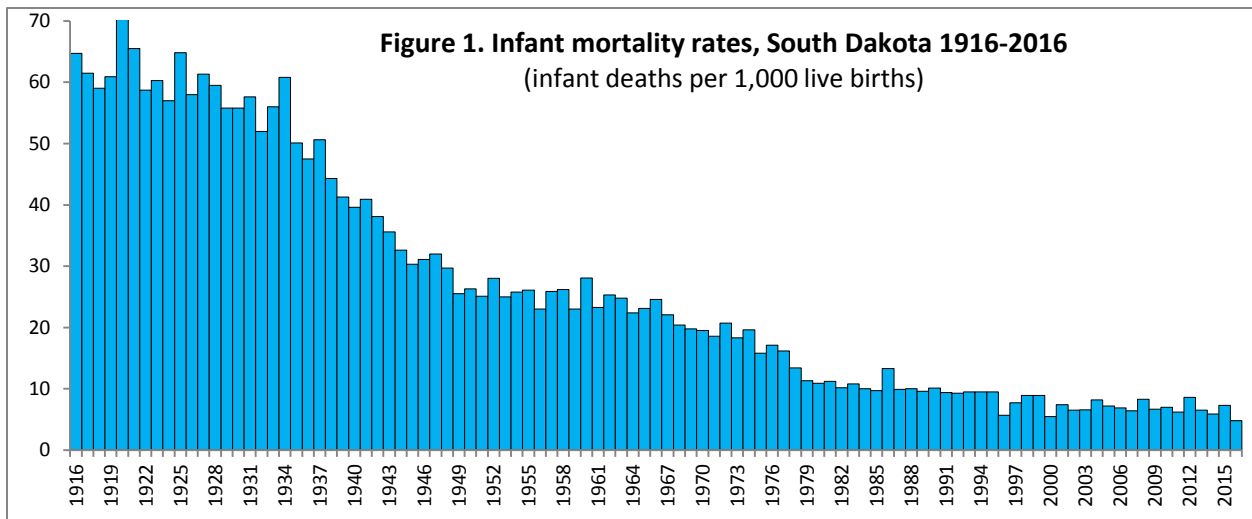
Conclusion

South Dakota’s infant mortality rate can be improved by preventing accidental deaths. Prevention activities should be directed to those at highest risk: American Indian infants and infants who sleep in unsafe settings. Counties with high infant mortality rates should be assisted in developing local prevention programs and interventions. The infant death review process should be standardized and strengthened using protocols of the National Center for the Review and Prevention of Child Deaths www.childdeathreview.org.

For more information or a copy of this report please see the South Dakota Department of Health website <http://doh.sd.gov/infant-mortality/default.aspx>.

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Preface: Summary of Infant Mortality in South Dakota. During the past 10 years 121,095 South Dakota infants were born and 823 infants died, which is a decade infant mortality rate (IMR) of 6.8 infant deaths per 1,000 live births. Over the past century South Dakota’s infant mortality decreased from a high of 70.4 infant deaths per 1,000 live births in 1920 to a low of 4.8 in 2016, which was the lowest ever reported (Figure 1). Considerable progress in reducing infant death was made during the 1930’s and 40’s due primarily to improved sanitation, vaccination and better maternal-child care. During the past 20 years however, the number of infant deaths has not decreased appreciably.

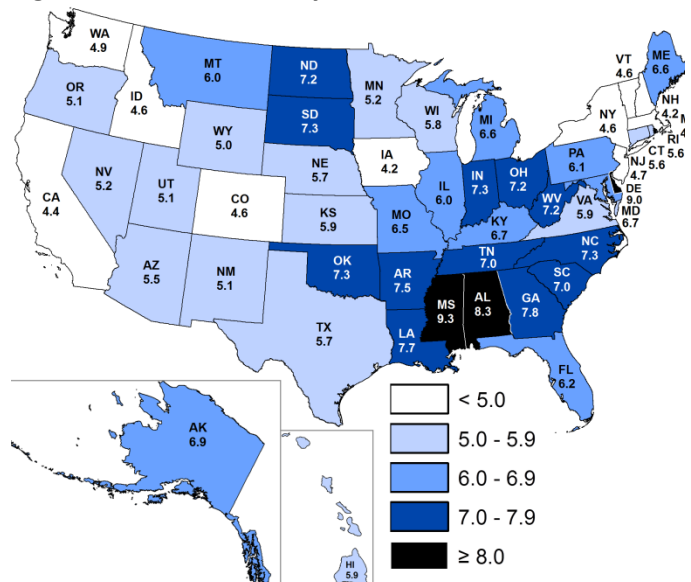


The national infant mortality rate was 5.8 deaths per 1,000 live births in 2015ⁱ. State infant mortality rates ranged from a low of 4.2 in Iowa and New Hampshire to a high of 9.3 in Mississippi (Figure 2). South Dakota ranked 41st with an infant mortality rate of 7.3 in 2015, the most recent comparable national data.

During the past decade, 2007-2016, infant mortality in South Dakota ranged from a high of 8.6 in 2012 to a low of 4.8 in 2016 (Figure 3). During this decade the median infant mortality rate for White race babies was 5.6, whereas the American Indian rate was 12.2 infant deaths per 1,000 live births.

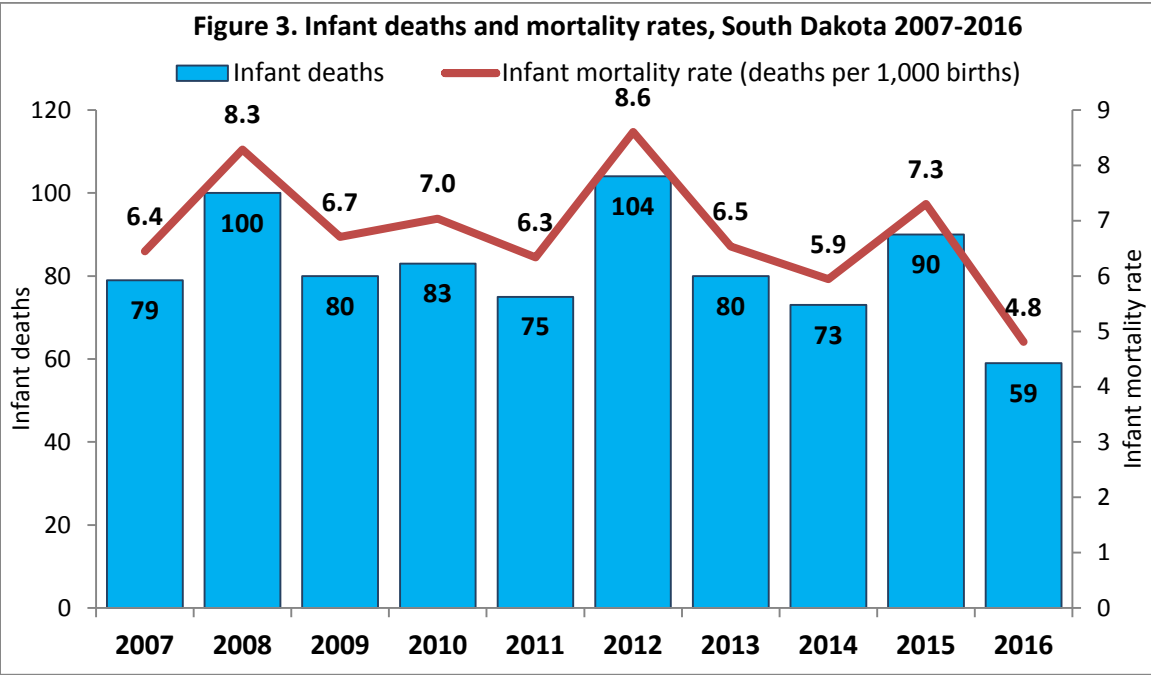
In South Dakota 39% of infant deaths occurred within 24 hours of birth over the past decade (2007-2016). Sixty-two percent of infant deaths were during the neonatal period, first 27 days of life, which is a neonatal mortality rate of 4.2. Thirty-eight percent of infants died during the post-neonatal period (28-365 days), which is a post-neonatal mortality rate of 2.6. The national Healthy People 2020 goals target a neonatal

Figure 2. Infant Mortality Rates, United States, 2015

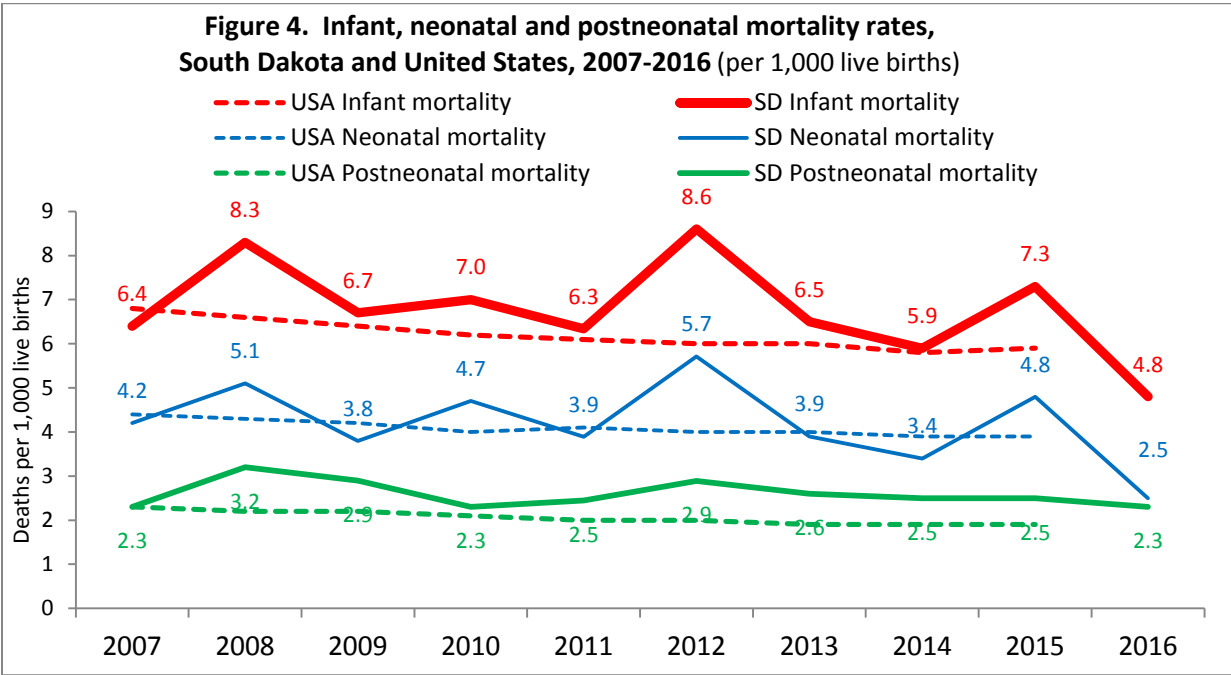


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mortality rate of 4.0 deaths per 1,000 live births and a post-neonatal mortality rate of 2.0.



South Dakota’s post-neonatal death rate has been consistently higher than the national post-neonatal death rate over the past decade; however our neonatal mortality rate has been lower than the national rate during 6 out of the past 10 years (Figure 4).



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Across South Dakota during the 10-year period, 2007 - 2016, county variation of infant mortality rates ranged from 0 infant deaths in five counties (Campbell, Haakon, Harding, Hyde and Miner) to 18.2 deaths per 1,000 live births in McPherson County (Figure 5). Fifteen counties had infant mortality rates greater than 10.0.

Figure 5. Infant mortality rates, South Dakota 2007-2016 (deaths per 1,000 live births)

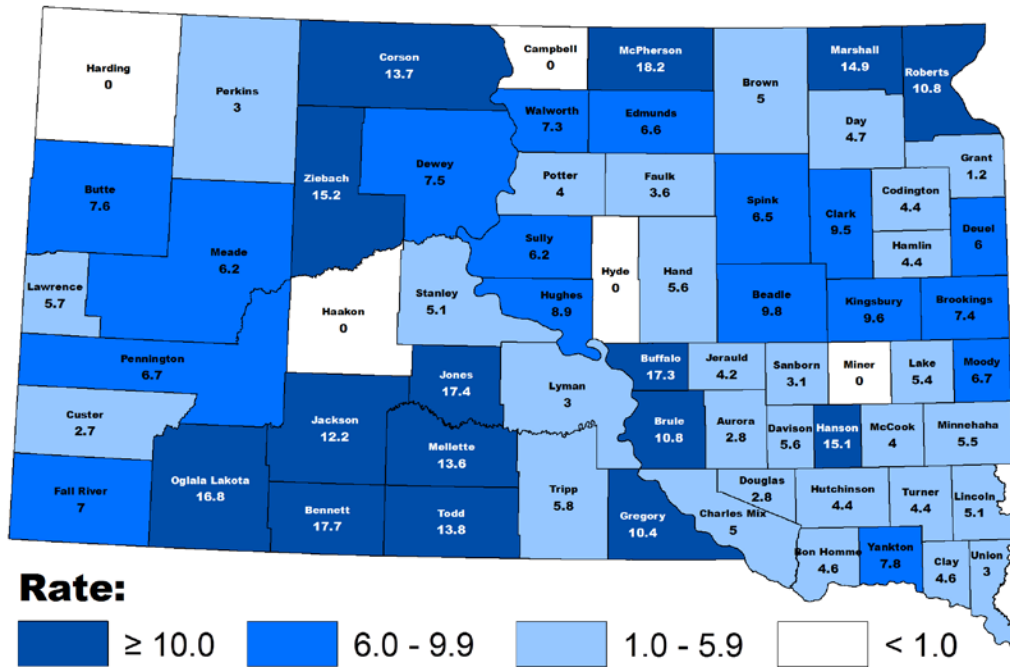


Table 1. Births, infant deaths and infant mortality rates (IMR)* by county, South Dakota 2007-2016.

(Counties with 1 or 2 deaths are shown as ≤ 2)

County	Births	Infant deaths	IMR*	County	Births	Infant deaths	IMR*
Aurora	363	≤ 2	2.8	Hyde	132	0	0
Beadle	3,048	30	9.8	Jackson	735	9	12.2
Bennett	679	12	17.7	Jerauld	240	≤ 2	4.2
Bon Homme	659	3	4.6	Jones	115	≤ 2	17.4
Brookings	4,051	30	7.4	Kingsbury	628	6	9.6
Brown	4,966	25	5.0	Lake	1,295	7	5.4
Brule	742	8	10.8	Lawrence	2,445	14	5.7
Buffalo	520	9	17.3	Lincoln	7,894	40	5.1
Butte	1,319	10	7.6	Lyman	676	≤ 2	3.0
Campbell	126	0	0	Marshall	604	9	14.9
Charles Mix	1,600	8	5.0	McCook	751	3	4.0
Clark	5,29	5	9.5	McPherson	220	4	18.2
Clay	1,531	7	4.6	Meade	3,220	20	6.2
Codington	3,871	17	4.4	Mellette	369	5	13.6
Corson	879	12	13.7	Miner	251	0	0
Custer	748	≤ 2	2.7	Minnehaha	28,479	156	5.5
Davison	2,683	15	5.6	Moody	895	6	6.7
Day	632	3	4.7	Oglala Lakota	3,456	58	16.8
Deuel	499	3	6.0	Pennington	15,451	103	6.7
Dewey	1461	11	7.5	Perkins	331	≤ 2	3.0
Douglas	359	≤ 2	2.8	Potter	250	≤ 2	4.0
Edmunds	457	3	6.6	Roberts	1,760	19	10.8

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Fall River	574	4	7.0	Sanborn	322	≤2	3.1
Faulk	274	≤2	3.6	Spink	770	5	6.5
Grant	807	≤2	1.2	Stanley	393	≤2	5.1
Gregory	481	5	10.4	Sully	162	≤2	6.2
Haakon	215	0	0	Todd	2,753	38	13.8
Hamlin	1,126	5	4.4	Tripp	686	4	5.8
Hand	356	≤2	5.6	Turner	904	4	4.4
Hanson	464	7	15.1	Union	1,679	5	3.0
Harding	151	0	0	Walworth	682	5	7.3
Hughes	2,371	21	8.9	Yankton	2,695	21	7.8
Hutchinson	913	4	4.4	Ziebach	396	6	15.2
*Infant mortality rate (deaths per 1,000 live births)				South Dakota	121,095	823	6.78
2 missing county designation							

During the five year period 2012-2016, there were 406 infant deaths reported. Of those infant deaths 24.6% of were caused by congenital malformations, deformations and chromosomal abnormalities (Table 2). The next leading causes of death were extreme immaturity 14.3%, accidents 10.6%, and SIDS (sudden infant death syndrome) 9.1%. Of the 43 accidental deaths, 81% were caused by suffocation and strangulation in bed or other unspecified threats to breathing, which should be preventable.

Table 2. Leading causes of infant death, South Dakota 2012-2016ⁱⁱ

	Year	2012	2013	2014	2015	2016	Total
Total infant deaths (ICD-10 code)		104	80	73	90	59	406
Congenital malformations, deformations, and chromosomal abnormalities (Q00-Q99)		29	18	21	19	13	100
Chromosomal abnormalities (Q90-Q99)		3	3	6	6	5	23
Congenital malformations of heart (Q20-Q24)		7	3	3	2	3	18
Congenital malformations of nervous system (Q00-Q07)		3	3	7	2	3	18
Congenital malformations and deformations of musculoskeletal system (Q65-Q79)		3	4	1	4	1	13
Congenital diaphragmatic hernia (Q79.0)		0	2	1	3	0	6
Congenital malformations, other		13	3	3	2	1	22
Extreme immaturity and other preterm infants (<37 week gestation) (P07.2-P07.3)		14	16	10	11	7	58
Accidents (V01-X59, Y85-Y86)		9	8	7	11	8	43
Accidental suffocation and strangulation in bed (W75)		4	1	5	10	6	26
Unspecified threat to breathing (W84)		2	4	2	0	1	9
Accidents, other		3	3	0	1	1	8
Sudden infant death syndrome (R95)		6	9	5	11	6	37
Ill-defined and unknown causes of mortality (R96-R99)		2	2	4	7	5	20
Newborn affected by other forms of placental separation and hemorrhage (P02.1)		2	1	2	4	0	9
Neonatal cardiac dysrhythmia (P29.1)		1	1	1	3	2	8
Assault (homicide) (X85-Y09, Y87.1)		1	1	2	2	2	8
Primary atelectasis of newborn (P28.0)		1	2	2	2	0	7
Newborn affected by chorioamnionitis (P02.7)		3	1	0	2	0	6
Influenza and pneumonia (J09-J18)		2	1	2	1	0	6
Newborn affected by premature rupture of membranes (P01.1)		2	0	0	1	2	5
Hydrops fetalis not due to hemolytic disease (P83.2)		2	0	1	0	2	5
Neonatal cardiac failure (P29.0)		3	2	0	0	0	5
All Other Causes		27	18	16	16	12	89

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Infant death review

Recommendations of the South Dakota Governor’s 2011 Task Force on Infant Mortalityⁱⁱⁱ included “Improve data collection and analysis” with its key strategy to “expand South Dakota’s established infant mortality review committees to include areas not currently served”. Infant deaths have been reviewed in the 10-county Sioux Falls region since 1996, in the Rapid City region since 1998, and within the Indian Health Service (IHS) intermittently, but statewide infant and child death review had never been realized until the current initiative was launched in 2013. South Dakota now has two infant death review teams: (1) East River encompassing 44 counties, 69% of births and 70% of the state’s population; and (2) West River encompassing 22 counties, 31% of births and 30% of the state’s population.

Methods. An infant mortality event is a live-born baby who dies before their first birthday (365 days), and the infant mortality rate (IMR) is the number of infant deaths per 1,000 live births. Birth and death reporting is required by South Dakota law SDCL 34-25.^{iv} Infant deaths occurring after the baby was discharged from the hospital or birthing center are investigated and documented using standardized protocols of the National Center for the Review & Prevention of Child Deaths (NCRPCD).^v The investigations are done by local coroners, physicians, law enforcement and pathologists. The East River and West River Death Review Coordinators gather pertinent information using the NCRPCD case report form (Appendix 1).^{vi} The methodology is specified by the National Center for Fatality Review and Prevention and supported by numerous child health and welfare organizations. The coordinators periodically convene the death review committees to evaluate the infant deaths. All the cases are reviewed by Department of Health staff and entered into the Child Death Review Case Reporting System database. The two regional and one state-level infant death teams meet to review the cases, make summary conclusions and issue prevention recommendations.

South Dakota’s first statewide infant death review report includes three years of data, 2013-2015. During these three years 36,847 babies were born and 243 died during infancy, which is an infant mortality rate of 6.6 deaths per 1,000 live births (Table 3). During this period the 243 resident infant deaths occurred in 51 of our 66 counties and the 97 reviewed deaths were from 36 counties. Counties with the most reviewed infant deaths were Minnehaha 17, Pennington 11, and Oglala Lakota 8 (Table 5). Fifty infant death reviews were West River, 46 were East River, and one unassigned county.

Results. Of the 243 infant deaths, 146 infants, 60.1%, died before leaving the hospital, and 97, 39.9%, babies died after hospital discharge and before their first birthday (Figure 6). These 97 infant deaths were investigated and reviewed. The majority of

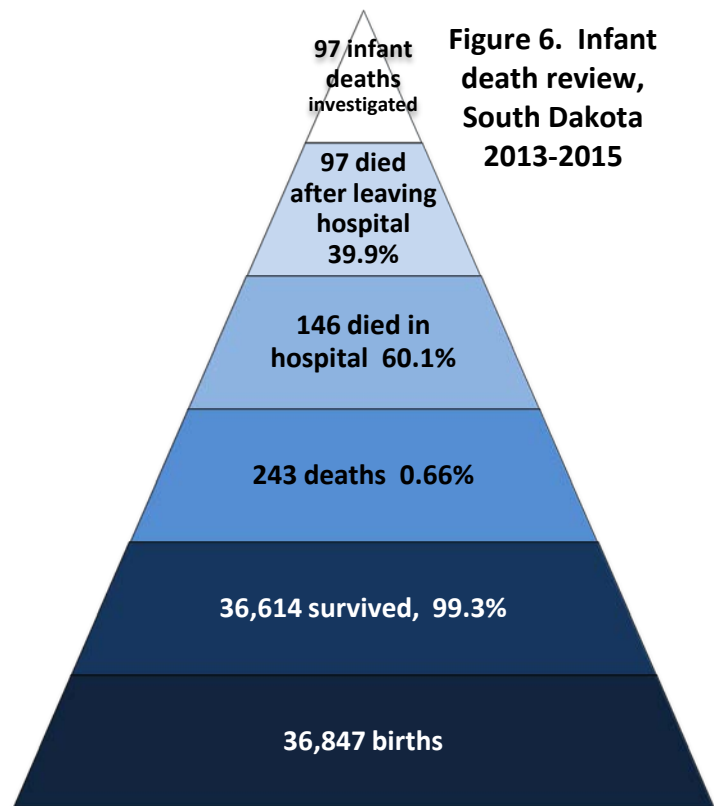


Figure 6. Infant death review, South Dakota 2013-2015

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hospitalized deaths were babies born extremely early or with congenital malformations, chromosomal abnormalities or other fatal conditions, and these were not investigated or reviewed.

Of the 97 infant deaths reviewed 66% were male and 34% were female. Racially, 46.4% were White infants, 43.3% were American Indian and 10.3% were other or multirace.

Year	Births	Deaths	IMR	Deaths reviewed
2013	12,243	80	6.5	34
2014	12,281	73	5.9	28
2015	12,323	90	7.3	35
TOTAL	36,847	243	6.6	97

Thirteen, 13.4%, of the 97 infant deaths reviewed were neonates less than one month of age, 68, 70.1%, were 1-5 months of age, and 16 deaths, 16.5%, were infants 6-11 months of age.

Table 4a. Births, infant deaths, infant mortality rate* and infant deaths reviewed by resident county (^eEast River, ^wWest River), **South Dakota 2013-2015** (*deaths per 100,000 live births)

County	Births	Infant deaths	Infant mortality rate*	Infant deaths reviewed	County	Births	Infant deaths	Infant mortality rate*	Infant deaths reviewed
^e Aurora	115	0	0	0	^w Jackson	216	3	13.9	1
^e Beadle	1,000	7	7.0	2	^e Jerauld	72	0	0	0
^e Bennett	212	7	33.0	4	^w Jones	30	0	0	0
^e Bon Homme	189	2	10.6	1	^e Kingsbury	191	2	10.5	1
^e Brookings	1,307	10	7.7	2	^e Lake	396	3	7.6	0
^e Brown	1,486	9	6.1	4	^w Lawrence	695	5	7.2	3
^e Brule	216	2	9.3	0	^e Lincoln	2,270	11	4.8	5
^e Buffalo	153	2	13.1	1	^w Lyman	214	1	4.7	0
^w Butte	375	3	8.0	1	^e McCook	236	0	0	1
^e Campbell	40	0	0	0	^e McPherson	76	0	0	0
^e Charles Mix	481	2	4.2	1	^e Marshall	204	1	4.9	0
^e Clark	179	2	11.2	1	^w Meade	942	2	2.1	0
^e Clay	454	2	4.4	0	^w Mellette	112	1	8.9	1
^e Codington	1163	2	1.7	0	^e Miner	82	0	0	0
^w Corson	268	2	7.5	1	^e Minnehaha	8,856	43	4.9	17
^w Custer	222	1	4.5	0	^e Moody	279	3	10.8	2
^e Davison	776	4	5.2	1	^w OglalaLakota	1,001	15	15.0	8
^e Day	181	1	5.5	1	^w Pennington	4,672	31	6.6	11
^e Deuel	137	1	7.3	0	^w Perkins	108	1	9.3	1
^w Dewey	449	7	15.6	4	^e Potter	68	1	14.7	0
^e Douglas	116	1	8.6	1	^e Roberts	559	4	7.2	1
^e Edmunds	147	1	6.8	1	^e Sanborn	111	0	0	0
^w Fall River	194	1	5.2	0	^e Spink	216	1	4.6	0
^e Faulk	93	0	0	0	^w Stanley	119	0	0	0
^e Grant	251	1	4.0	0	^e Sully	43	0	0	0
^w Gregory	157	2	12.7	1	^w Todd	803	11	13.7	5
^w Haakon	63	0	0	0	^w Tripp	207	1	4.8	1
^e Hamlin	363	2	5.5	0	^e Turner	271	2	7.4	1
^e Hand	104	0	0	0	^e Union	459	2	4.4	0
^e Hanson	141	5	35.5	0	^e Walworth	241	1	4.1	0
^w Harding	58	0	0	0	^e Yankton	800	9	11.3	2
^e Hughes	733	8	10.9	5	^w Ziebach	98	1	10.2	2
^e Hutchinson	329	1	3.0	1	Unknown	1	1		1
^e Hyde	48	0	0	0	South Dakota	36,847	243	6.6	97

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Table 4b. Births, infant deaths, infant mortality rate* and infant deaths reviewed by resident county (^eEast River, ^wWest River), **South Dakota 2013-2015** (*deaths per 100,000 live births) Counties with 1 or 2 deaths are shown as ≤2

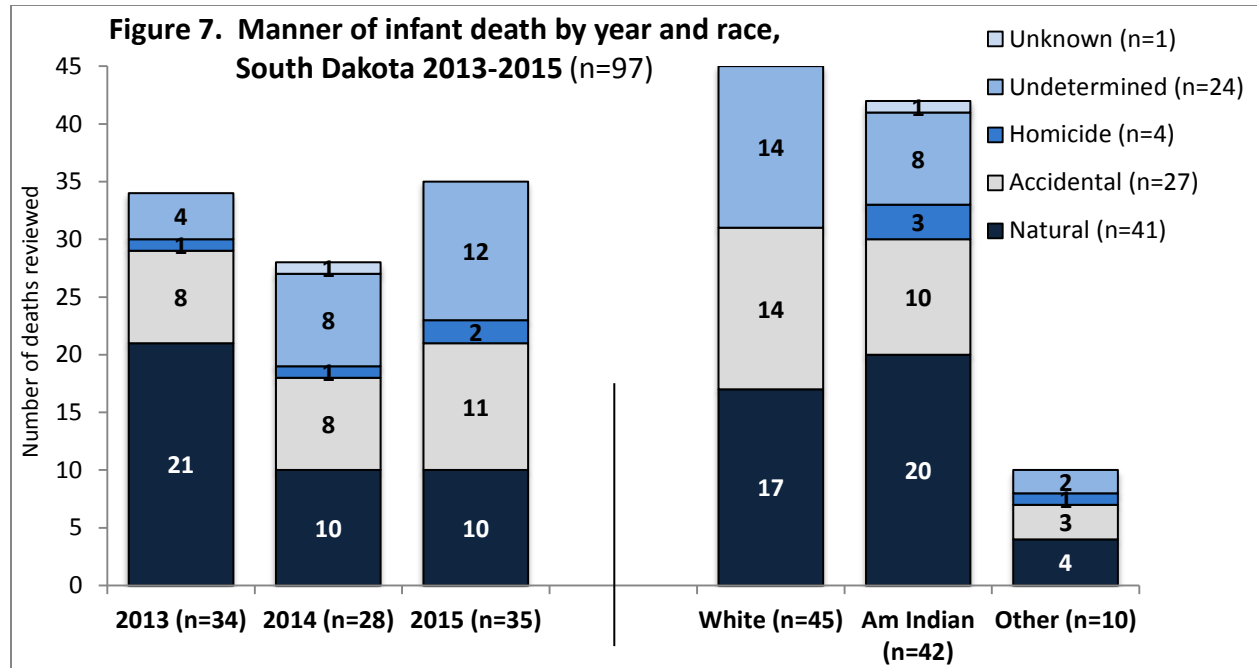
County	Births	Infant deaths	Infant mortality rate*	Infant deaths reviewed	County	Births	Infant deaths	Infant mortality rate*	Infant deaths reviewed
^e Aurora	115	0	0	0	^w Jackson	216	3	13.9	≤2
^e Beadle	1,000	7	7.0	≤2	^e Jerauld	72	0	0	0
^e Bennett	212	7	33.0	4	^w Jones	30	0	0	0
^e Bon Homme	189	≤2	10.6	≤2	^e Kingsbury	191	≤2	10.5	≤2
^e Brookings	1,307	10	7.7	≤2	^e Lake	396	3	7.6	0
^e Brown	1,486	9	6.1	4	^w Lawrence	695	5	7.2	3
^e Brule	216	≤2	9.3	0	^e Lincoln	2,270	11	4.8	5
^e Buffalo	153	≤2	13.1	≤2	^w Lyman	214	≤2	4.7	0
^w Butte	375	3	8.0	≤2	^e McCook	236	0	0	≤2
^e Campbell	40	0	0	0	^e McPherson	76	0	0	0
^e Charles Mix	481	≤2	4.2	≤2	^e Marshall	204	≤2	4.9	0
^e Clark	179	≤2	11.2	≤2	^w Meade	942	≤2	2.1	0
^e Clay	454	≤2	4.4	0	^w Mellette	112	≤2	8.9	≤2
^e Codington	1163	≤2	1.7	0	^e Miner	82	0	0	0
^w Corson	268	≤2	7.5	≤2	^e Minnehaha	8,856	43	4.9	17
^w Custer	222	≤2	4.5	0	^e Moody	279	3	10.8	≤2
^e Davison	776	4	5.2	≤2	^w OglalaLakota	1,001	15	15.0	8
^e Day	181	≤2	5.5	≤2	^w Pennington	4,672	31	6.6	11
^e Deuel	137	≤2	7.3	0	^w Perkins	108	≤2	9.3	≤2
^w Dewey	449	7	15.6	4	^e Potter	68	≤2	14.7	0
^e Douglas	116	≤2	8.6	≤2	^e Roberts	559	4	7.2	≤2
^e Edmunds	147	≤2	6.8	≤2	^e Sanborn	111	0	0	0
^w Fall River	194	≤2	5.2	0	^e Spink	216	≤2	4.6	0
^e Faulk	93	0	0	0	^w Stanley	119	0	0	0
^e Grant	251	≤2	4.0	0	^e Sully	43	0	0	0
^w Gregory	157	≤2	12.7	≤2	^w Todd	803	11	13.7	5
^w Haakon	63	0	0	0	^w Tripp	207	≤2	4.8	≤2
^e Hamlin	363	≤2	5.5	0	^e Turner	271	≤2	7.4	≤2
^e Hand	104	0	0	0	^e Union	459	≤2	4.4	0
^e Hanson	141	5	35.5	0	^e Walworth	241	≤2	4.1	0
^w Harding	58	0	0	0	^e Yankton	800	9	11.3	≤2
^e Hughes	733	8	10.9	5	^w Ziebach	98	≤2	10.2	≤2
^e Hutchinson	329	≤2	3.0	≤2	Unknown	1	1		1
^e Hyde	48	0	0	0	South Dakota	36,847	243	6.6	97

Of the 97 deaths reviewed, 42% were classified in manner of death as “Natural”, 28% were “Accidental”, 4% were “Homicide”, and 26% were classified as “Undetermined” or “Unknown”. Thirty-eight percent of White race infants were classified as natural and 31% as accidental, while Native American deaths were classified as 42% natural and 22% accidental (Figure 7).

Sixty-eight percent of the deaths occurred in the infant’s home, 8% occurred in child daycare, 6% occurred in a hospital, 8% occurred in other places outside the home, and 9% in an unknown or unnoted locations. Eight infants died in childcare facilities (1 in a licensed daycare center, 3 in a licensed daycare home, and 4 in unlicensed homecare settings). Autopsies were performed on 79% of deaths, no autopsy on 19%, and 2% it is not known if an autopsy was performed or not.

The 41 “Natural” deaths included 10 Sudden Infant Death Syndrome (SIDS) deaths, 7 due to congenital anomalies, 4 with pneumonia, 13 with other causes and 7 undetermined or unknown, according the death certificates.

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The 27 “Accidental” deaths included 24 asphyxia deaths, 2 motor vehicle deaths and 1 weapon-related death. The 24 asphyxia deaths included 16 due to accidental suffocation or strangulation in bed due to bed linen or pillow, or overlay by another person; 7 due to other or unspecified threats to breathing; and 1 death due to food causing obstruction of respiratory tract, according to the death certificates. One of the motor vehicle deaths was attributed to a van accident where the infant was in a child seat, but the seat was used incorrectly. The second motor vehicle death was in an unknown type of vehicle where the infant car seat was used correctly. There were no deaths due to drowning, fire or exposure to cold.

The four “Homicide” deaths were caused by 2 blunt force injury to the head, 1 inflicted head trauma and 1 vigorously shaken. A fifth homicide of a South Dakota infant occurred out-of-state and was not reviewed by the South Dakota team.

The 41 natural causes of infant deaths reviewed include the following:

- Sudden Infant Death Syndrome (SIDS): 10
- Congenital Anomalies: 7
- Pneumonia: 4
- Cardiovascular: 3
- Prematurity: 3
- Influenza: 1
- Malnutrition/dehydration: 1
- Neurologic: 1
- Other infectious disease: 2
- Other medical: 2
- Undetermined: 4
- Unknown: 3

The 27 accidental causes of infant deaths reviewed include the following:

- Asphyxia: 24
- Motor vehicle accident: 2
- Firearm: 1

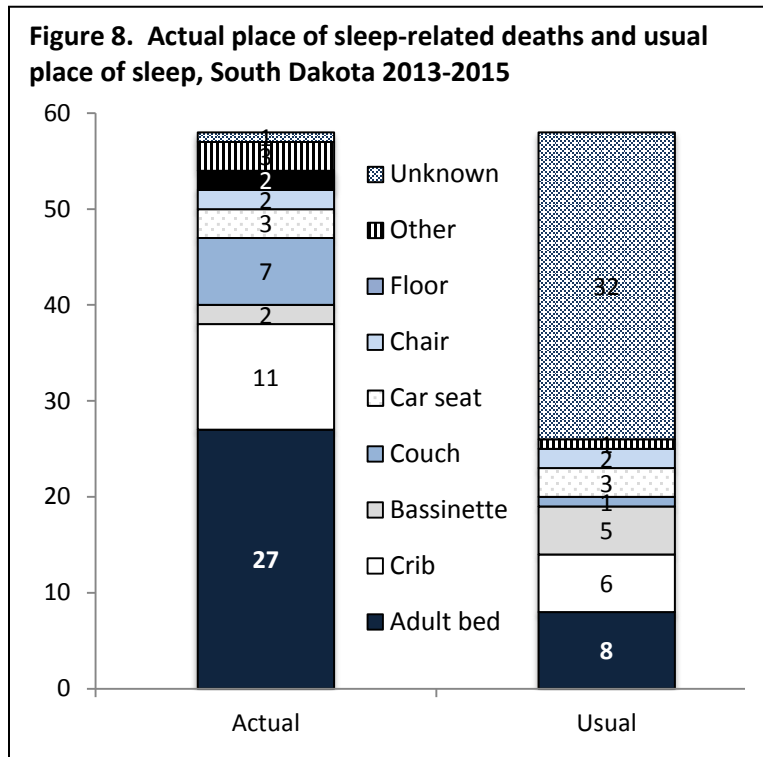
The 4 homicide causes of infant deaths reviewed include the following:

- Weapon: 2
- Head trauma: 1
- Vigorously shaken: 1

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Sleep-related infant deaths. Of the 97 infant deaths reviewed, 58 (60%) of the deaths were classified as sleep-related (Question H2 on case report form 4.1, NCRPDC).^{vi} During the three years the sleep-related deaths ranged from 15 in 2013 to 25 deaths in 2015. Twenty-two (38%) of the sleep-related deaths were classified as accidental in manner, 14 (24%) natural causes and 22 (38%) classified as manner undetermined. Race stratification shows 58% of White race, 62% of American Indian and 60% of other-race infant deaths reviewed were sleep-related (Table 5).

Of the 58 infant deaths associated with sleeping situations, 47% were found in an adult bed, 19% in a crib, and 12% on a couch (Figure 8, Table 5). Of these babies, 33% were found on their stomachs, 29% on their backs, 10% on their sides, and the sleep position of 28% was either unknown or left blank on the investigation worksheet. Forty percent of sleep-related infant deaths occurred while sharing a bed with an adult and 3% were sleeping with another child, but none were sleeping with pets or other animals. This information was left blank on the investigation protocol worksheet for a majority of cases. Of the 58 infants who died in sleep-related events, 46% of White infants, 38% of American Indian and 20% of other race infants were found bed-sharing with another adult or child.



Of the sleep-related deaths 19% routinely slept in a crib or bassinette, while 14% routinely slept in an adult bed and 5% in a car seat (Figure 8, Table 5). For 55% of sleep-related deaths it is not known where the baby usually slept or the question was not answered on the investigation worksheet.

Table 5. Sleep related deaths: place of death and usual sleep place of infants who died with sleep-related situations, South Dakota 2013-2015 (*crib or bassinette)

Race	Total deaths reviewed	Sleep-related deaths	Place of sleep-related death					Usual sleep place				
			Adult bed	Crib*	Couch	Car seat	Other or unk	Adult bed	Crib*	Couch	Car seat	Other or unk
White	45	26 (58%)	11	6	5	0	4	5	7	0	0	14
Am Indian	42	26 (62%)	13	4	2	3	4	2	4	1	2	17
Other	10	6 (60%)	3	3	0	0	0	1	0	0	1	4
Total	97	58 (60%)	27	13	7	3	8	8	11	1	3	35

Limitations. This was the first statewide infant death review in South Dakota and our first effort at using the Child Death Review Case Reporting System. The state does not have a medical examiner system that would assure standardization and quality statewide. Death investigations are conducted at

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the county level by a mixture of pathologists, physicians, law enforcement officers and county coroners who have a range of education, training, expertise and experience. Some of the death scene investigators were unable or unwilling to use the standard case report form, and some did not answer all of the investigation questions. South Dakota does not have laws that would facilitate uniformity, cooperation, data sharing, confidentiality and privacy.

Recommendations

- American Academy of Pediatrics' "Recommendations for a Safe Infant Sleeping Environment" should be distributed to healthcare workers who should discuss the recommendations with parents of newborns before discharge from the hospital. ^{vii}
<http://pediatrics.aappublications.org/content/pediatrics/early/2016/10/20/peds.2016-2938.full.pdf>
- Childcare workers should be given the above recommendations as guidance standards for childcare sites.
- Every infant in South Dakota should have a safe place to sleep. If a family is unable to afford an approved crib, contact the South Dakota Department of Health at 1-800-305-3064.
- To reduce the risk of SIDS, infants should be placed on their back for every sleep by every caregiver until the child reaches 1 year of age. ^{vii}
- Infants should be placed on a firm sleep surface (e.g., mattress in a safety-approved crib) covered by a fitted sheet with no other bedding, bumper pads, or soft objects to reduce the risk of suffocation and SIDS. ^{vii}
- Infants should sleep in parents' room, close to the parents' bed, but on a separate surface designated for infants, ideally for the first year, but at least for the first six months of life. ^{vii}
- Soft objects and loose bedding should be kept away from infant's sleep area to reduce risk of SIDS, suffocation, entrapment and strangulation. ^{vii}
- Avoid tobacco and marijuana smoke exposure during pregnancy and in the infant's environment after birth. ^{vii}
- Avoid alcohol and illegal drug use during pregnancy and after birth. ^{vii}
- Consider offering a pacifier at nap time and bedtime. ^{vii}
- Infants should be immunized according to ACIP schedule
www.cdc.gov/vaccines/parents/downloads/parent-ver-sch-0-6yrs.pdf
- Avoid overheating and head covering of infants. ^{vii}
- Infants should always ride in a rear-facing car seat in the vehicle's backseat (NHTSA, National Highway Transportation Safety Administration www.safercar.gov/parents/CarSeats/Right-Car-Seat-Age-Size.htm?view=full). South Dakota law mandating child safety seats SDCL 32-37-1
http://www.sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Type=Statute&Statute=32-37
- Continue to support training for local law enforcement and county coroners on infant death investigation and documentation requirements.
- Provide training and technical assistance to support comprehensive completion of the Child Death Investigation forms.

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Representatives from:

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- Bureau of Indian Affairs
- Pennington County Sheriff's Department
- South Dakota Department of Social Services
- Rapid City Fire Department
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Appendix. Infant death case investigation report form. National Center for the Review & Prevention of Child Deaths (NCRPCD).

www.childdeathreview.org/wp-content/uploads/NCRPCD-Docs/CDRPrintCase_v4-1.pdf

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^{iv} SDCL 34-25 www.sdlegislature.gov/Statutes/Codified_Laws/DisplayStatute.aspx?Statute=34-25&Type=Statute
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