SUDDEN INFANT DEATH SYNDROME

TENNESSEE
1990-1998

State of Tennessee
Department of Health
Policy Planning and Assessment
Health Statistics and Research

SUDDEN INFANT DEATH SYNDROME

TENNESSEE 1990-1998

State of Tennessee
Department of Health
Policy Planning and Assessment
Health Statistics and Research

ACKNOWLEDGEMENTS

The 2001 report on Sudden Infant Death Syndrome in Tennessee has been produced with the cooperation of numerous individuals in the Tennessee Department of Health. The report was prepared by Derek Chapman, Ph.D., Epidemiologist, and David Law, Ph.D., Director of Research. Dr. Chapman and Dr. Law work for the Office of Health Statistics and Research, Bureau of Policy Planning and Assessment, Tennessee Department of Health.

We acknowledge valuable contributions from the following:

Tom Spillman of the Office of Health Statistics and Research provided data. Marguerite Lewis, Director of the Office of Health Statistics and Research and Richard Urbano, Ph.D., Assistant Commissioner, Bureau of Policy Planning and Assessment edited the report.

Department of Health
Authorization No. 343379 No. of Copies – 464
This public document was promulgated at a cost
of $1.05 per copy 8/01

SUDDEN INFANT DEATH SYNDROME

TENNESSEE, 1990-98

CONTENTS

WHAT IS SIDS?

Sudden Infant Death Syndrome (SIDS) is the "sudden death of an infant under 1 year of age which remains unexplained after a thorough case investigation, including performance of a complete autopsy, examination of the death scene, and review of the clinical history."[1]

In Tennessee, an autopsy is not required before determining SIDS as a cause of death. Because Tennessee-resident linked birth/death records were used as the basis of this report, SIDS deaths in the report may include cases where SIDS was recorded as the cause of death in the absence of an autopsy.

HOW ARE WE DOING?

SIDS is one of the leading causes of infant death in Tennessee, as it is nationally. The statistics in this report show that while the SIDS rate in Tennessee is decreasing overall, some population groups and regions in Tennessee are disproportionately affected by SIDS. Adequate access to health care and health education during pregnancy and at birth may be helpful in minimizing known risks associated with SIDS, especially infant sleep position and maternal smoking during pregnancy.

Areas of Concern. Although the Tennessee SIDS rate decreased over the period 1990 through 1998, there are a number of reasons for concern:

- The rate of SIDS was consistently higher in Tennessee than in the U.S. overall.
- The SIDS rate among black women was consistently higher than white women, particularly among black women with less than 12 years of education.
- Despite improving trends between 1990-1998, the rate of many strong predictors of SIDS remained high, (e.g., low maternal education (22% of all births), smoking (17%), and late or no prenatal care (16%)).
- Unmarried mothers, the most prevalent risk factor for SIDS in this study, increased from 30% to 35% of all births between 1990 and 1998.

Sleep position. The cause of Sudden Infant Death Syndrome is unknown, but a major risk factor associated with SIDS is prone infant sleep position. Infants who are put to sleep on their stomachs are more likely to die of SIDS than those put to sleep in the side or back position. The American Academy of Pediatricians recommended in 1992 that mothers be instructed to place their infants in the back position for sleeping. In 1994, the National Institute of Child Health and Development launched the “Back to Sleep” campaign to encourage parents to place infants on their backs for sleeping. Since 1992, the number of infants being placed to sleep on their stomachs in the U.S has decreased substantially. The corresponding dramatic decrease of SIDS deaths in the U.S. has been attributed to this change.

Although information on sleep position in Tennessee was not available for this study, research suggests that most of the risk factors in this study are also risk factors for placing an infant in the prone sleep position.[2-3] Thus, sleep position is an important area of intervention and education that should be addressed on a statewide level.

Other risk factors. Several risk factors in this study were associated with the occurrence of SIDS. According to these findings, infants at increased risk for SIDS deaths include:

- Infants 1-3 months of age
- Pre-term infants
- Low birth weight infants

The SIDS rate was also higher for infants whose mothers:

- Smoked during pregnancy
- Used alcohol during pregnancy
- Received late (initiated in third trimester) or no prenatal care
- Were less than 20 years old
- Had less than a high school education
- Were unmarried

Regional data. The SIDS rate from 1990-1998 was higher than the Tennessee average in the Southwest and Upper-Cumberland regions and in the Shelby, Davidson, and Madison metropolitan regions.

County data. In many counties, the birth rate was low and the SIDS rate could not be interpreted meaningfully. Thus, while county-level numbers of births and SIDS deaths are presented, the county-specific SIDS rate was calculated only for those counties with more than 3,500 births.

RECENT TRENDS

in Tennessee…

For the purposes of this report, SIDS cases met the following criteria based on data from death certificates of Tennessee residents:

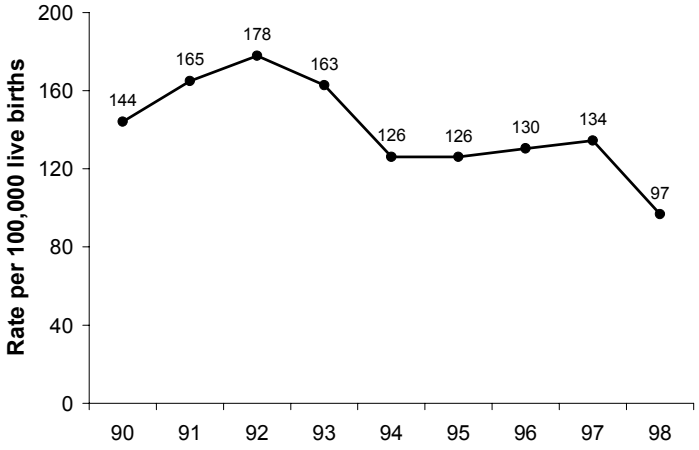
1) Tennessee resident birth recorded in Tennessee

2) under one year of age at time of death

3) an ICD-9 code representing SIDS reported on the death certificate

This may result in differences between the SIDS rates in this report and rate presented by the Tennessee Child Fatality Review Team, which requires an autopsy before determining SIDS as a cause of death.

SIDS Mortality Rate
Tennessee, 1990-1998

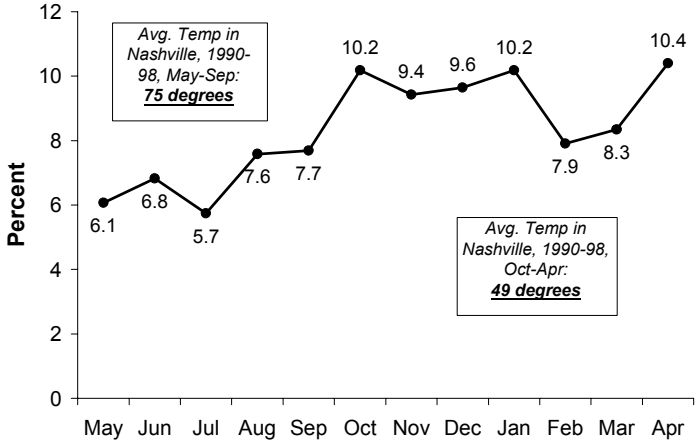


Number of SIDS deaths in Tennessee

1990	106
1991	121
1992	129
1993	117
1994	91
1995	91
1996	95
1997	99
1998	74

- Overall, the Tennessee SIDS rate has decreased 33% since 1990.

Percentage of SIDS Deaths by Month
Tennessee, 1990-1998



Consistent with prior research, SIDS rates displayed noticeable seasonal variation, with a much higher rate in the colder months.

- Some investigators have suggested that respiratory infections[4] and overheating due to thicker clothes and more bedding[5] during cold weather might precipitate SIDS in developmentally vulnerable infants.

- Because 20-52% of SIDS victims are found with their nose and mouths turned into underlying bedding,[6] soft bedding including comforters and pillows should not be placed near infants.[7]

Tennessee vs. United States

Back to Sleep

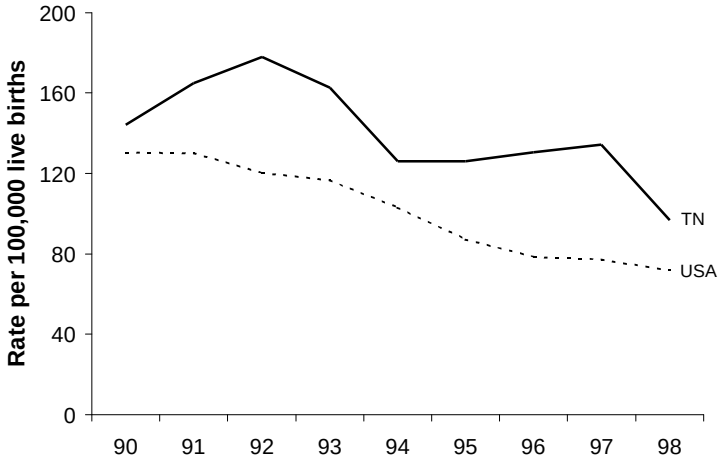
The American Academy of Pediatrics recommended in June 1992 that infants be placed on their backs for sleeping.[8]

In June 1994, the National Institute of Child Health and Development launched the "Back to Sleep" campaign[9-10] *to encourage parents to place infants on their backs for sleeping.*

The reported rate of prone sleep in the United States decreased from 45% to 26% between 1994 and 1996.[11]

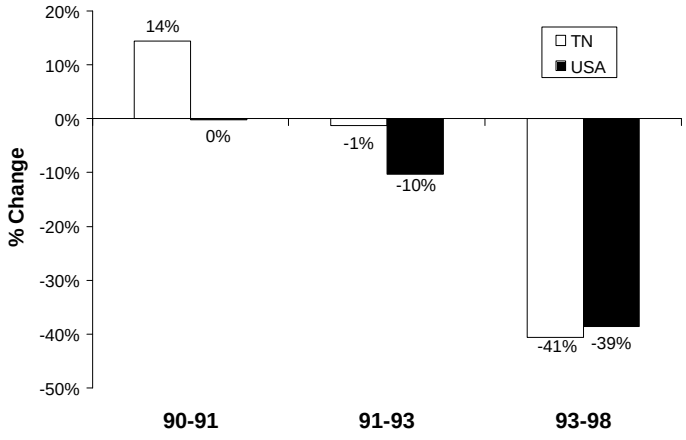
- Between 1990 and 1998 the U.S. SIDS rate decreased by 45%.
- **During this period the Tennessee SIDS rate decreased by 33%.**

Trend in SIDS Mortality Rate
Tennessee vs. United States, 1990-1998



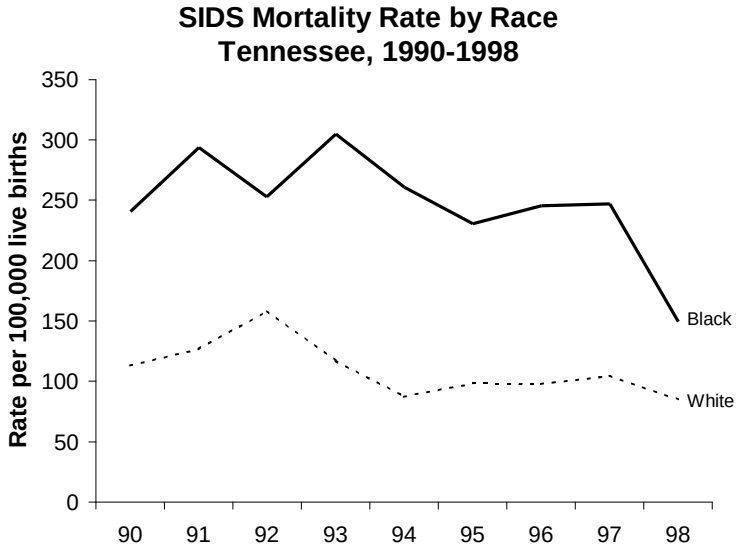
- In June 1992, the American Academy of Pediatrics recommended that infants be placed on their backs for sleeping;[8] from 1991-1993, the U.S. SIDS rate decreased by 10%.
- **During this period the Tennessee SIDS rate decreased by 1%.**
- In June 1994, the national "Back to Sleep" campaign[9-10] was launched; there was a dramatic decrease of 39 % in the U.S. SIDS rate between 1993 and 1998.
- **The Tennessee SIDS rate for the same period decreased by 41%.**

Changes in SIDS Mortality Rate
Tennessee vs. United States, 1990-1998



trends by maternal ethnicity…

The SIDS rate for infants born to black mothers in Tennessee was consistently higher than that for white mothers.

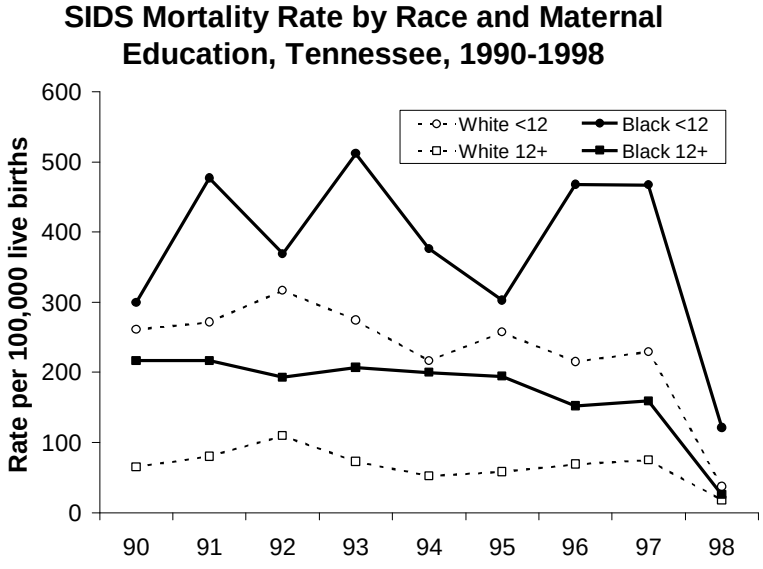


The SIDS rate for black Tennesseans was consistently higher than for whites. The 1998 SIDS rate for infants born to black mothers was nearly double that of infants born to white mothers.

The black-white difference in SIDS rate decreased dramatically in 1998.

- *White mothers…*There was a 25% decrease in SIDS from 1990-98.
- *Black mothers…*There was a 38% decrease in the SIDS rate over the same time period.
- *Other races/ethnicities...*Birth rate and infant deaths among Tennessee's other racial and ethnic groups were too small to allow meaningful interpretation of SIDS mortality rates.

Black women with less than 12 years of education remain at highest risk for SIDS.



RISK FACTORS

Past research suggests among all of the variables available on birth/death certificate records, the following key risk factors are related to SIDS: [12-14]

Child Factors
- Prone infant sleep position*
- Age (1-3 months)
- Preterm birth
- Low birth weight (<2500g)

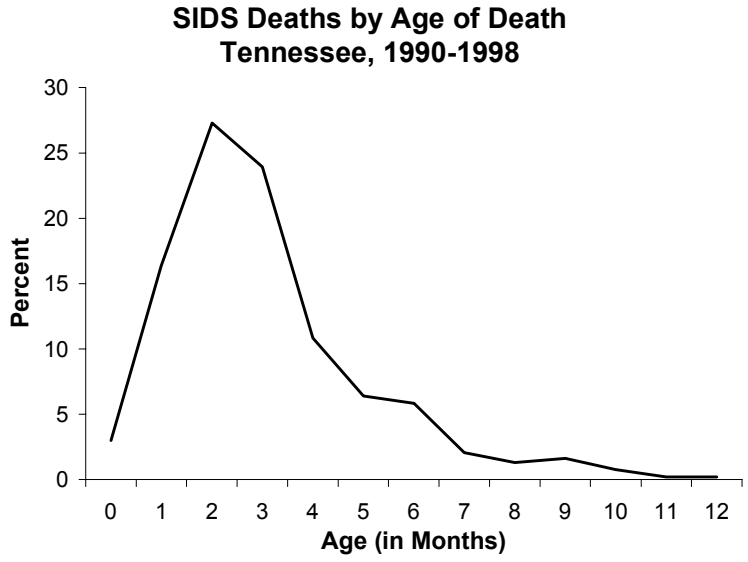
Maternal Factors
- Tobacco use during pregnancy
- Alcohol use during pregnancy
- Inadequate prenatal care
- Age (<20 years)
- Less than 12 years of education
- Unmarried at time of birth

*Note: Information on sleep position in Tennessee was not available for this report.

These risk factors do not imply causation, and not all individuals with a given risk factor will have a child with SIDS. Risk factors can either be causal or function as markers for other more proximate causes. For example, many risk factors such as low maternal education do not "cause" SIDS. Rather, these risk factors identify certain subgroups of the population at increased risk for SIDS. Preventive interventions can then be directed towards these high-risk groups.

In order to understand the impact of these risk factors on SIDS in Tennessee, it is important to examine trends in the prevalence of each of these risk factors. By monitoring these risk factors and their relationships with SIDS rates, we can better target prevention efforts in Tennessee.

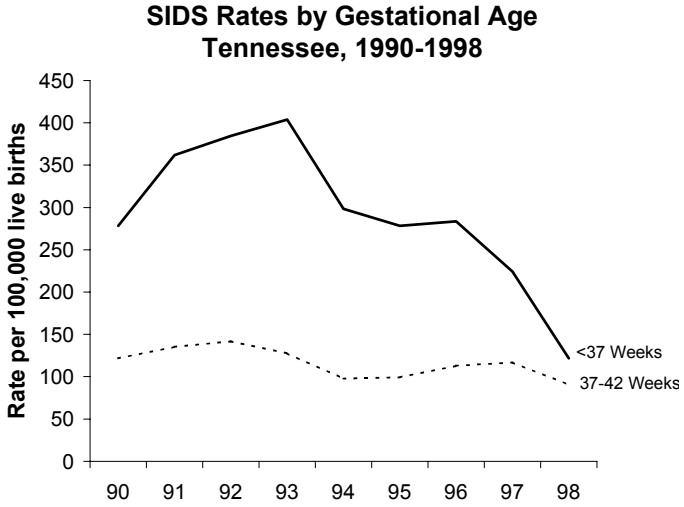
age of infant and SIDS…

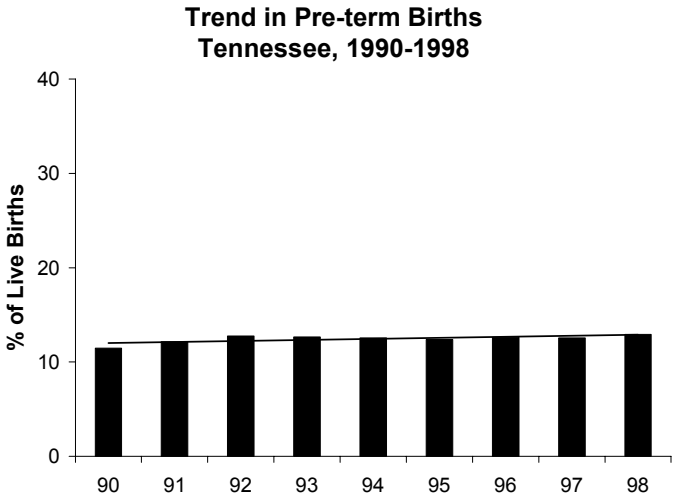


Infant Age at Death

- Consistent with prior research and national rates, SIDS deaths were highest at the end of the 2nd month
- 68% of SIDS deaths in TN occurred between 1-3 months of age

gestational age, birth weight, and SIDS…

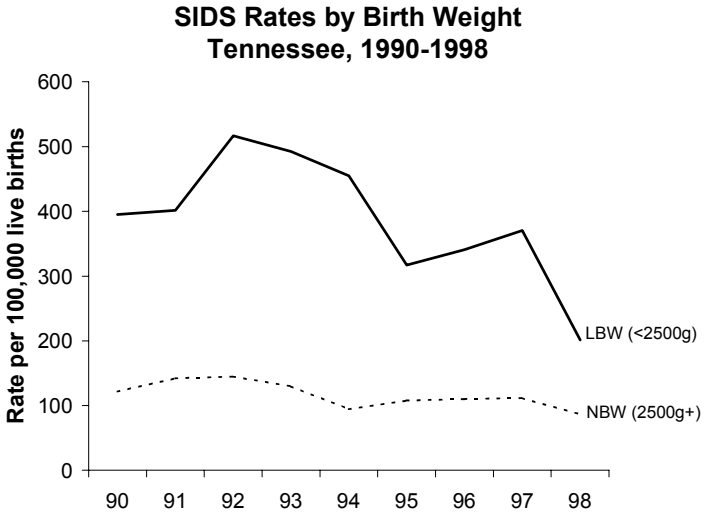


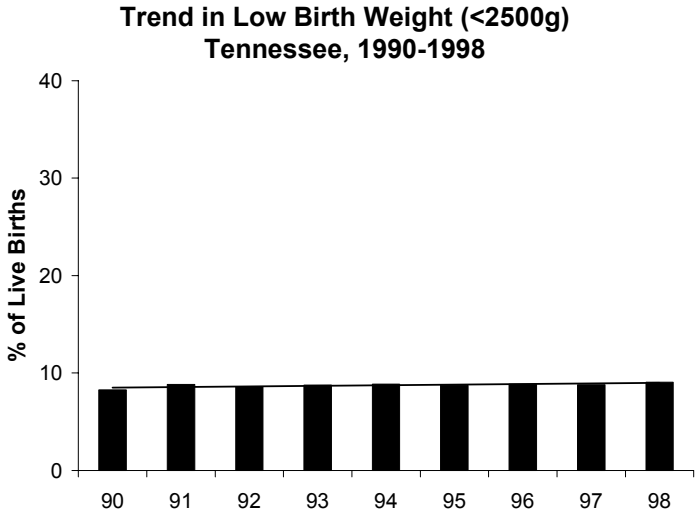


Good News

Risk for SIDS among low birth weight and pre-term infants has declined sharply since 1992, likely a result of the "Back to Sleep" campaign.

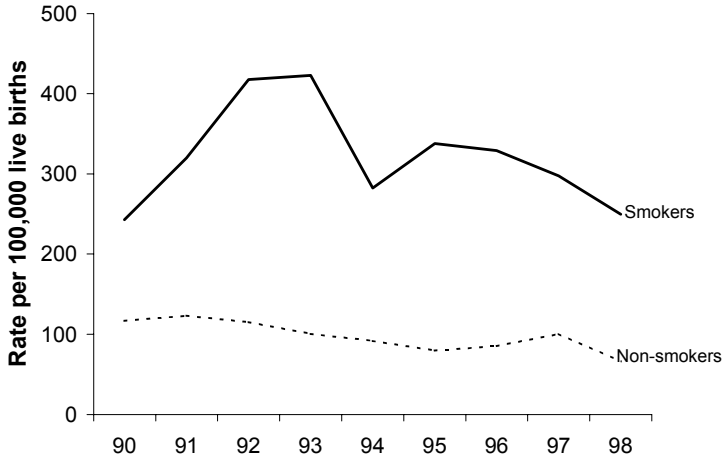
- Research suggests that prone sleeping position is an even greater risk factor for premature infants, as premature infants sleeping on their stomachs may be less able than term infants to move their head from a face down position.[15]
- Prevention of low birth weight and pre-term births should be a top public health priority due to its association with SIDS, infant mortality, and a number of other poor health and developmental outcomes.[16]





tobacco use and SIDS…

SIDS Rates by Maternal Smoking During Pregnancy Tennessee, 1990-1998



Smoking During Pregnancy

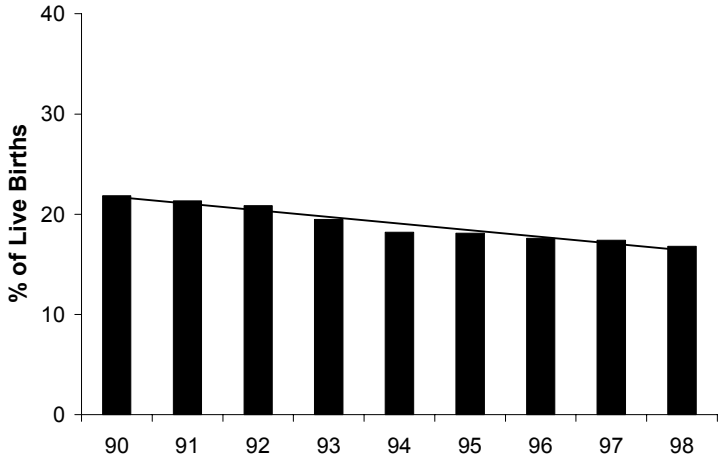
The SIDS rate for mothers who reported smoking during pregnancy was more than three times that of mothers who reported that they did not smoke.

- Smoking is one of the most important *preventable* risk factors for SIDS.
- Mothers who smoke prenatally usually continue to smoke in the postnatal period.[17]
- "Public health interventions that focus on smoking cessation among pregnant women, and more particularly on primary smoking prevention efforts among teenage girls, may lead to a substantial decrease in SIDS. . ."[18]

Good News

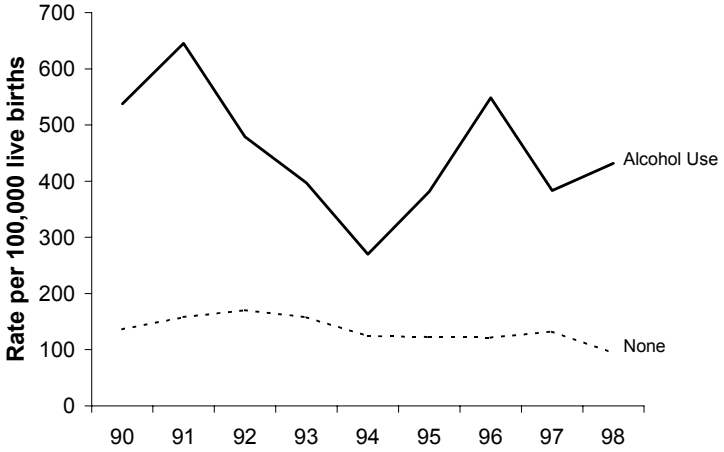
The average percent of mothers who reported smoking during pregnancy decreased from 22% in 1990 to 17% in 1998.

Trend in Maternal Smoking During Pregnancy, Tennessee, 1990-1998



alcohol use and SIDS…

SIDS Rates by Maternal Alcohol Use During Pregnancy, Tennessee, 1990-1998



Alcohol Use During Pregnancy

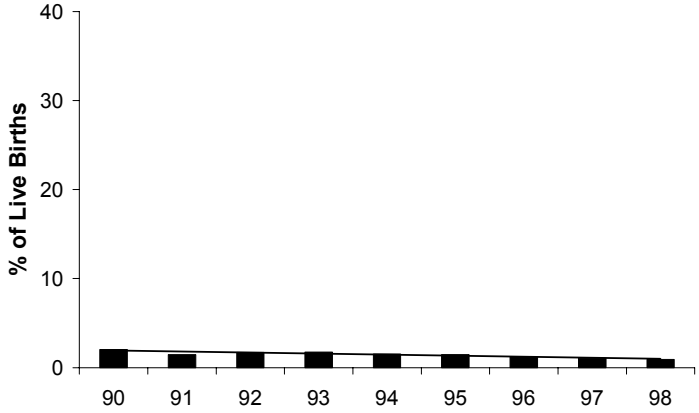
- Alcohol use during pregnancy was associated with the highest SIDS rate.
- 59% of women who used alcohol had 2 or more additional risk factors.

- 61% of women who reported prenatal alcohol use also reported tobacco use during pregnancy.
- Women who used alcohol during pregnancy were twice as likely to have a child born low birth weight compared to women who did not use alcohol.

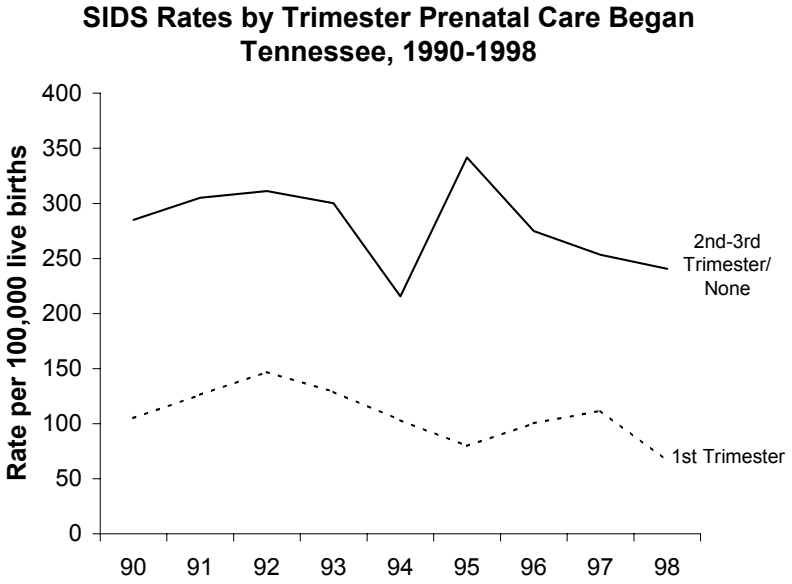
Good News

In Tennessee, the percentage of mothers reporting alcohol use during pregnancy decreased 55% between 1990 and 1998.

Trend in Births to Women Reporting Alcohol Use During Pregnancy Tennessee, 1990-1998



prenatal care and SIDS…



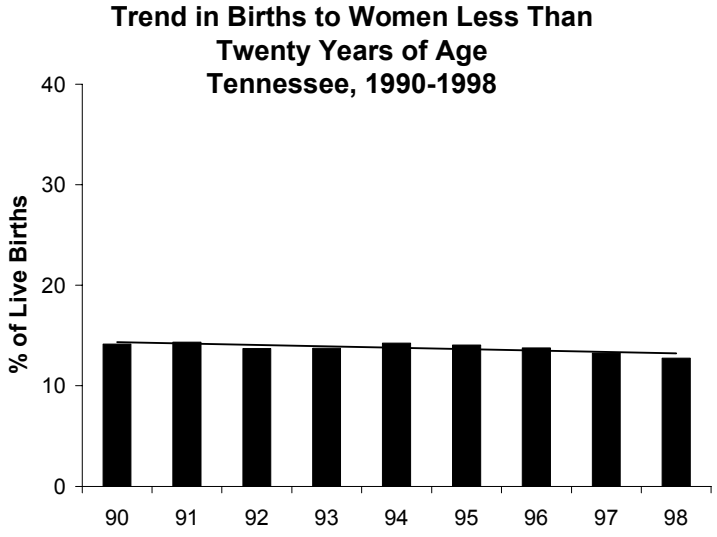
Prenatal Care

- Women with prenatal care beginning in the 2nd trimester had a SIDS rate 2.1 times greater than women with 1st trimester care.
- Mothers with 3rd trimester only or no prenatal visits had a SIDS rate 3.8 times greater than mothers with 1st trimester care.

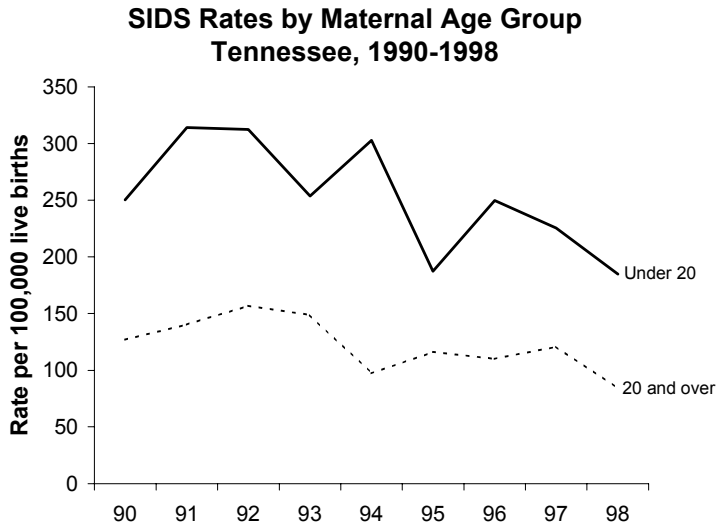
- Timely receipt of prenatal care allows health care providers to identify women at risk for low birth weight and other adverse pregnancy conditions and outcomes.[19]
- It is important that women receive an assessment of risk status and medical screening tests as early as possible, so that appropriate medical, educational, nutritional, and social support intervention services can be initiated early in the pregnancy.

Good News

Overall in Tennessee, the percentage of mothers receiving late prenatal care decreased from 22% in 1990 to 16% in 1998.



maternal age and SIDS…

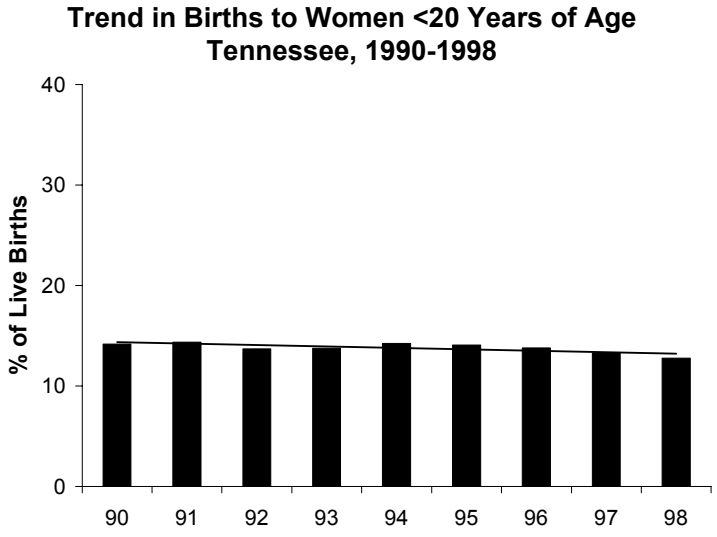


Teenage Mothers

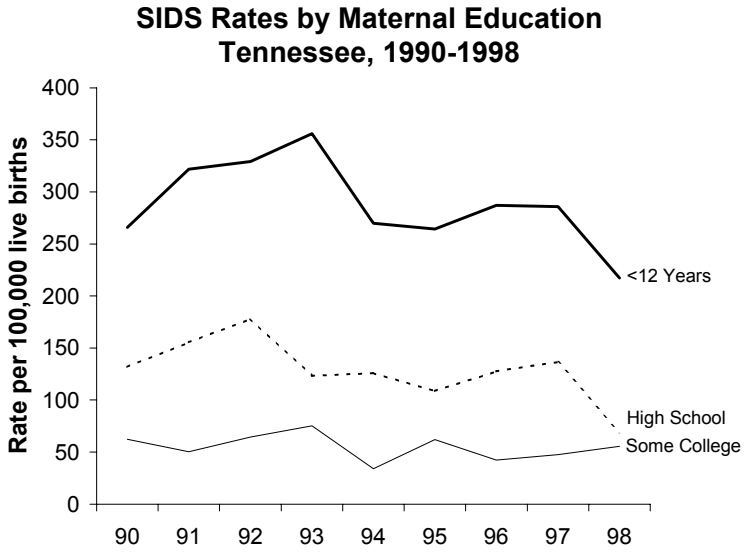
Compared to women who were 20 or older, SIDS was three times more likely among infants born to teenage mothers.

- Teenage mothers in Tennessee were twice as likely to have inadequate prenatal care.
- In a King County, Washington study, despite knowledge of sleep position advice, teenagers were over 10 times more likely to place their infants prone than were older mothers.[3]

The percentage of births to teenage women has remained at about 14% since 1990.



maternal education and SIDS…



Maternal Education

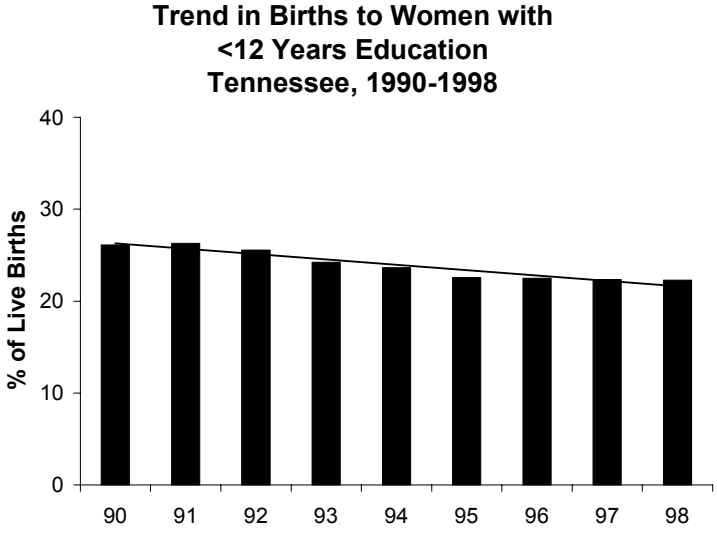
The rate of SIDS among women with less than 12 years of education was 5.1 times greater than for women with some post-secondary education.

- The increase in risk for SIDS among women with less than 12 years of education in Tennessee was second only to that of very low birth weight (<1500g).

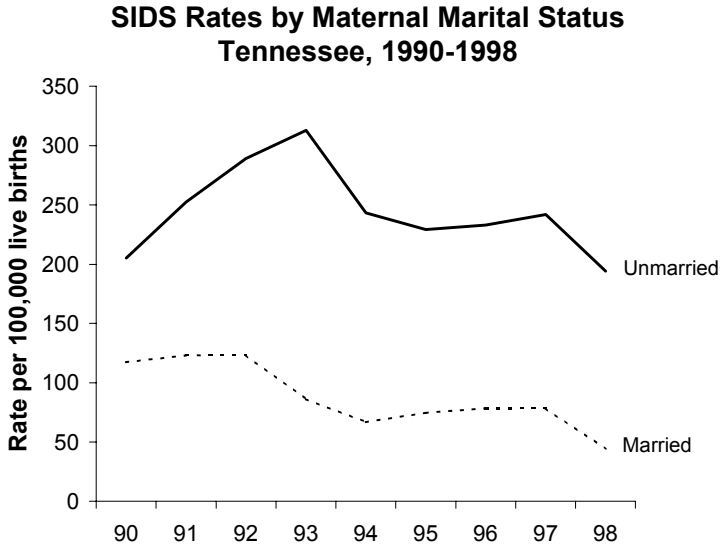
- In Tennessee, women with less than 12 years of education were more than twice as likely to be unmarried, smoke, and receive inadequate prenatal care. They were also 1.5 times more likely to use alcohol and have a low birth weight child.

Good News

The percentage of Tennessee women giving birth who had less than 12 years of education decreased from 26% in 1990 to 22% in 1998.



marital status and SIDS…



Marital Status

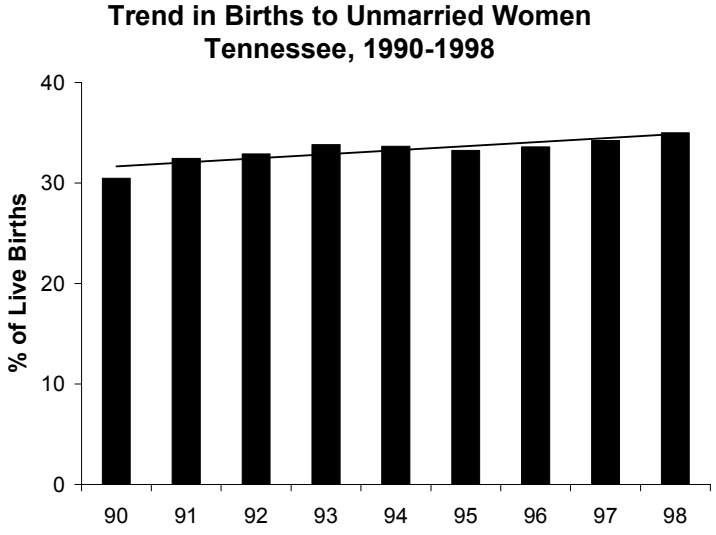
On average, the rate of SIDS between 1990 and 1998 was 2.7 times higher for mothers who were not married at time of birth.

- "Marital status may serve as a marker for the "wantedness" of the child, the economic status of the mother, and the social support the mother has—all of which are factors that may influence the health of the mother and infant."[20]

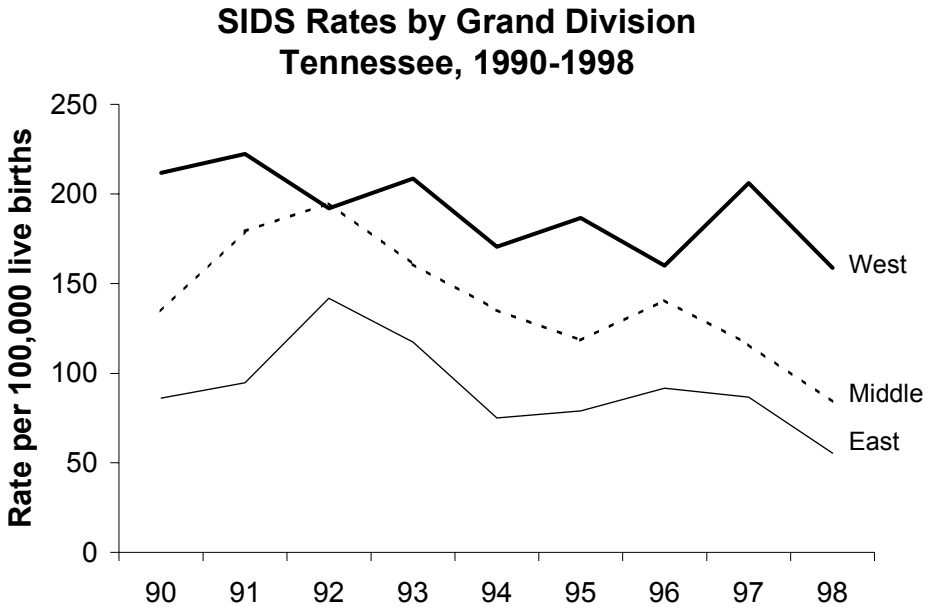
- In Tennessee, unmarried mothers were 4.5 times more likely to have late (began in 3rd trimester) or no prenatal care.

- The percent of women giving birth who were unmarried has increased.

- In 1990, 30% of women giving birth were not married. The percent of births to unmarried mothers increased to 35% in 1998.



REGIONAL DATA



State of Tennessee Grand Divisions

EAST GRAND DIVISION COUNTIES

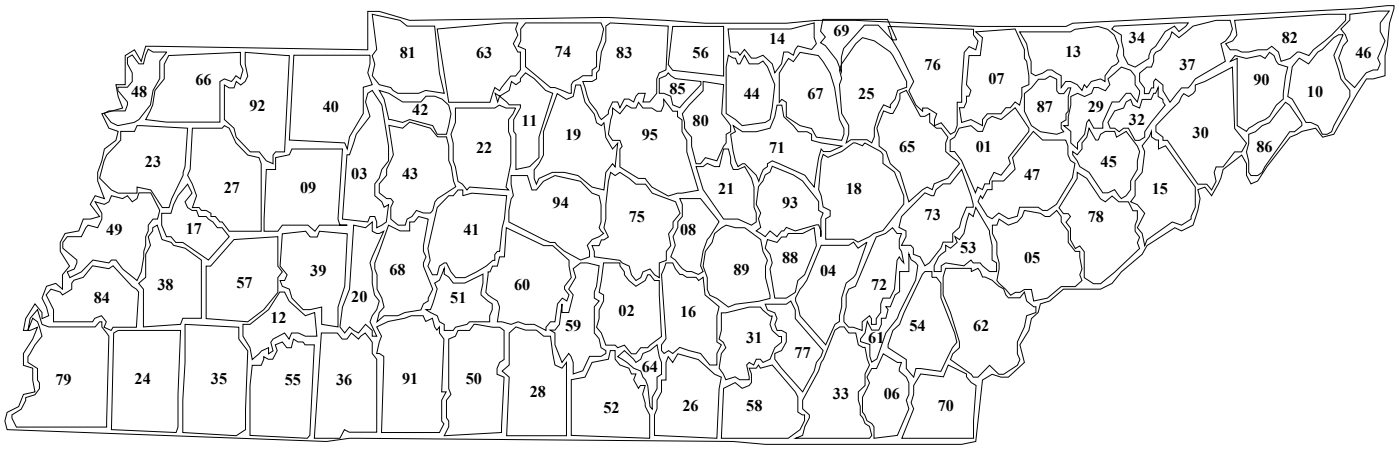
Anderson, Bledsoe, Blount, Bradley, Campbell, Carter, Claiborne, Cocke, Cumberland, Grainger Greene, Hamblen, Hamilton, Hancock, Hawkins, Jefferson, Johnson, Knox, Loudon, Marion, McMinn, Meigs, Monroe, Morgan, Polk, Rhea, Roane, Scott, Sevier, Sullivan, Unicoi, Union, Washington**.**

MIDDLE GRAND DIVISION COUNTIES

Bedford, Cannon, Cheatham, Clay, Coffee, Davidson, Dekalb, Dickson, Fentress, Franklin, Giles, Grundy, Hickman, Houston, Humphreys, Jackson, Lawrence, Lewis, Lincoln, Macon, Marshall, Maury, Montgomery, Moore, Overton, Perry, Pickett, Putnam, Robertson, Rutherford, Sequatchie, Smith, Stewart, Sumner, Trousdale, Van Buren, Warren, Wayne, White, Williamson, Wilson.

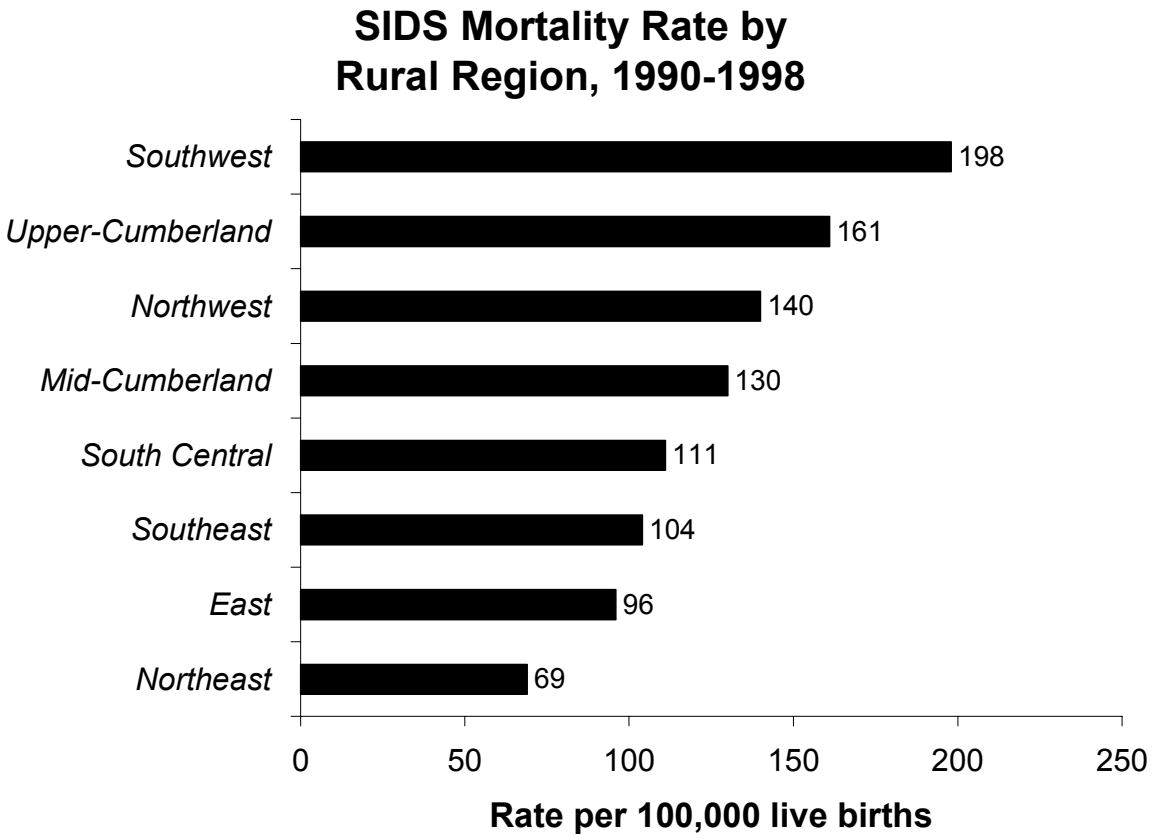
WEST GRAND DIVISION COUNTIES

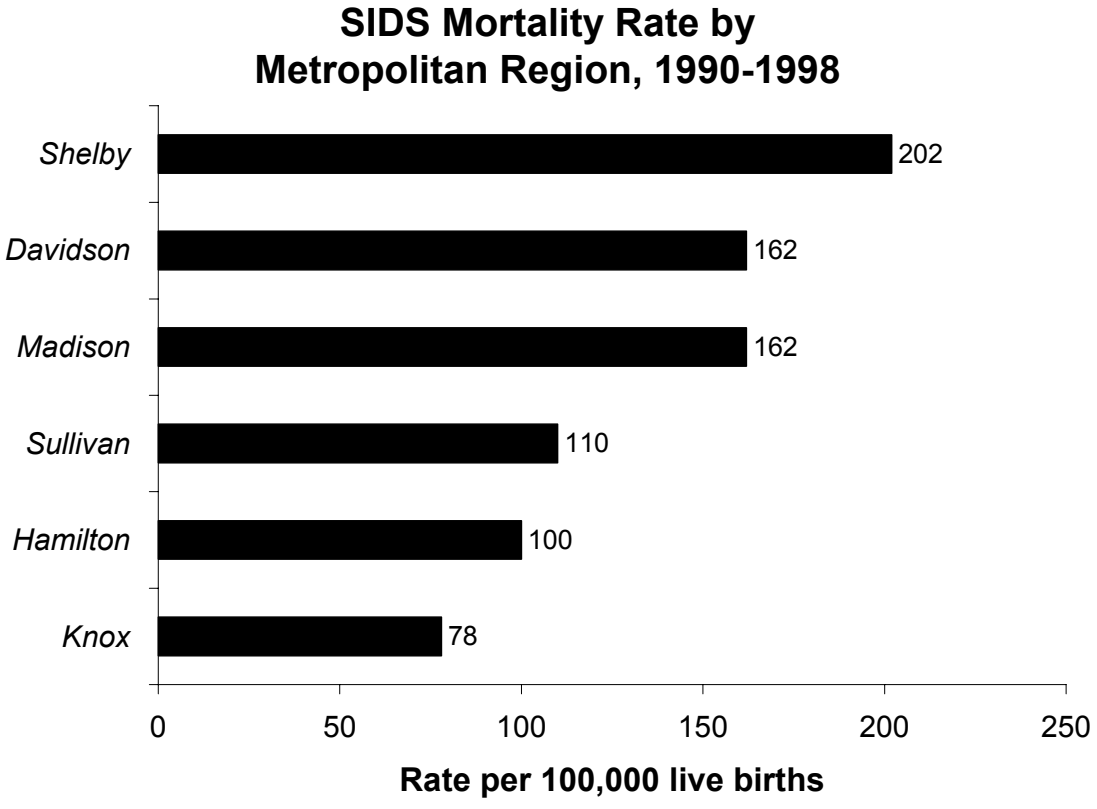
Benton, Carroll, Chester, Crockett, Decatur, Dyer, Fayette, Gibson, Hardeman, Hardin, Haywood, Henderson, Henry, Lake, Lauderdale, Madison, McNairy, Obion, Shelby, Tipton, Weakley.



Tennessee Department of Health Regions

NORTHWEST		MID-CUMBERLAND		SOUTH CENTRAL		SOUTHEAST		UPPER-CUMBERLAND		EAST		NORTHEAST	
#	COUNTY	#	COUNTY	#	COUNTY	#	COUNTY	#	COUNTY	#	COUNTY	#	COUNTY
3	Benton	11	Cheatham	02	Bedford	04	Bledsoe	08	Cannon	01	Anderson	10	Carter
9	Carroll	22	Dickson	16	Coffee	06	Bradley	14	Clay	05	Blount	30	Greene
17	Crockett	42	Houston	28	Giles	26	Franklin	18	Cumberland	07	Campbell	34	Hancock
23	Dyer	43	Humphreys	41	Hickman	31	Grundy	21	DeKalb	13	Claiborne	37	Hawkins
27	Gibson	63	Montgomery	50	Lawrence	54	McMinn	25	Fentress	15	Cocke	46	Johnson
40	Henry	74	Robertson	51	Lewis	58	Marion	44	Jackson	29	Grainger	86	Unicoi
48	Lake	75	Rutherford	52	Lincoln	61	Meigs	56	Macon	32	Hamblen	90	Washington
66	Obion	81	Stewart	59	Marshall	70	Polk	67	Overton	45	Jefferson		
92	Weakley	83	Sumner	60	Maury	72	Rhea	69	Pickett	53	Loudon		
		85	Trousdale	64	Moore	77	Sequatchie	71	Putnam	62	Monroe		**METROS**
SOUTHWEST		94	Williamson	68	Perry			80	Smith	65	Morgan	19	**DAVIDSON**
		95	Wilson	91	Wayne			88	Van Buren	73	Roane	33	**HAMILTON**
12	Chester							89	Warren	76	Scott	47	**KNOX**
20	Decatur							93	White	78	Sevier	57	**MADISON**
24	Fayette									87	Union	79	**SHELBY**
35	Hardeman											82	**SULLIVAN**
36	Hardin												
38	Haywood												
39	Henderson												
49	Lauderdale												
55	McNairy												
84	Tipton												


SIDS Mortality Rate by
Rural Region, 1990-1998
Southwest
Upper-Cumberland
Northwest
Mid-Cumberland
South Central
Southeast
East
Northeast
198
161
140
130
111
104
96
69
0
50
100
150
200
250
Rate per 100,000 live births


SIDS Mortality Rate by
Metropolitan Region, 1990-1998
Shelby
Davidson
Madison
Sullivan
Hamilton
Knox
202
162
162
110
100
78
0
50
100
150
200
250
Rate per 100,000 live births

COUNTY DATA

Presented below is information on the number of births, number of SIDS deaths, and SIDS rates from 1990-1998 for individual counties grouped by Tennessee Department of Health Region.

The county-specific SIDS mortality rate was computed by dividing the number of SIDS deaths in a county from 1990-1998 by the number of births to residents of that county over the same time period. This rate was then multiplied by 100,000 to facilitate comparisons and interpretation.

Statistics on the SIDS rate for the counties should be interpreted carefully. Since the number of births in many counties was low, even across a nine-year period, a small increase or decrease in the number of SIDS deaths will have a large effect on the SIDS rate. Birth rates in some counties were so low that the computation of rates for SIDS deaths would be misleading.

Thus, rates were not computed for individual counties with fewer than 3,500 births. Rates that were not computed will be represented by an asterisk (*).

As a reference, the overall SIDS mortality rate in Tennessee for 1990-1998 was 140 per 100,000 live births.

northeast region…

County	Total Births 1990-98	Total SIDS 1990-98	9-year Rate per 100,000
Carter	5,051	5	99
Greene	6,111	6	98
Hancock	695	1	*
Hawkins	5,240	2	38
Johnson	844	0	*
Unicoi	1,709	2	*
Washington	10,760	5	46

Northeast region
9-year rate:

69 per 100,000
live births

east tn region…

County	Total Births 1990-98	Total SIDS 1990-98	9 -year Rate per 100,000
Anderson	7,511	4	53
Blount	10,376	7	67
Campbell	4,110	1	24
Claiborne	2,538	1	*
Cocke	3,585	7	195
Grainger	2,077	0	*
Hamblen	6,524	16	245
Jefferson	3,873	4	103
Loudon	3,875	7	181
Monroe	3,928	4	102
Morgan	2,027	0	*
Roane	5,017	8	159
Scott	2,477	1	*
Sevier	6,921	4	58
Union	1,678	0	*

East Tennessee region
9-year rate:

96 per 100,000
live births

upper cumberland region…

County	Total Births 1990-98	Total SIDS 1990-98	9-year Rate per 100,000
Cannon	1,328	1	*
Clay	664	1	*
Cumberland	4,165	8	192
DeKalb	1,689	6	*
Fentress	1,788	3	*
Jackson	963	3	*
Macon	2,038	3	*
Overton	1,946	6	*
Pickett	416	0	*
Putnam	6,604	6	91
Smith	1,739	1	*
Van Buren	496	0	*
Warren	4,163	5	120
White	2,391	6	*

Upper-Cumberland
region
9-year rate:

161 per 100,000
live births

southeast region…

County	Total Births 1990-98	Total SIDS 1990-98	9-year Rate per 100,000
Bledsoe	1,051	3	*
Bradley	9,644	12	124
Franklin	3,725	10	268
Grundy	1,742	0	*
McMinn	5,071	3	59
Marion	2,927	2	*
Meigs	1,009	1	*
Polk	1,404	0	*
Rhea	3,114	1	*
Sequatchie	1,145	0	*

Southeast region
9-year rate:

104 per 100,000
live births

mid-cumberland region…

County			
Cheatham	4,015	5	125
Dickson	5,003	8	160
Houston	890	2	*
Humphreys	1,768	3	*
Montgomery	19,768	23	116
Robertson	6,121	5	82
Rutherford	20,219	41	203
Stewart	1,109	0	*
Sumner	13,491	13	96
Trousdale	778	4	*
Williamson	11,301	8	71
Wilson	9,153	10	109

Mid-Cumberland
region
9-year rate:

130 per 100,000
live births

south central region…

County	Total Births 1990-98	Total SIDS 1990-98	9-year Rate per 100,000
Bedford	4,203	6	143
Coffee	5,533	7	127
Giles	2,901	4	*
Hickman	2,115	6	*
Lawrence	4,748	5	105
Lewis	1,142	1	*
Lincoln	2,379	2	*
Marshall	2,853	2	*
Maury	7,791	6	77
Moore	440	0	*
Perry	755	0	*
Wayne	1,224	1	*

South Central region 9-year rate:

111 per 100,000 live births

northwest region…

County			
Benton	1,524	1	*
Carroll	3,234	6	*
Crockett	1,575	2	*
Dyer	4,662	8	172
Gibson	5,384	8	149
Henry	2,428	4	*
Lake	764	0	*
Obion	3,560	4	112
Weakley	3,274	4	*

Northwest region 9-year rate:

140 per 100,000 live births

southwest region…

County	Total Births 1990-98	Total SIDS 1990-98	9-year Rate per 100,000
Chester	1,497	2	*
Decatur	1,161	1	*
Fayette	3,428	4	*
Hardeman	3,149	6	*
Hardin	2,341	2	*
Haywood	2,731	8	*
Henderson	2,758	4	*
Lauderdale	3,381	7	*
McNairy	2,241	3	*
Tipton	6,056	20	330

Southwest region
9-year rate:

198 per 100,000
live births

metropolitan regions…

County			
Sullivan	15,507	17	110
Knox	42,113	33	78
Hamilton	35,125	35	100
Davidson	75,430	122	162
Madison	11,094	18	162
Shelby	136,325	276	202

REFERENCES

[1]Willinger M., James LS, Catz C. Defining the sudden infant death syndrome (SIDS):deliberations of an expert panel convened by the National Institute of Child Health and Human Development. *Pediatr Pathol*. 1991;11:677-84.

[2]Saraiya M, Serbanescu F, Rochat R, Berg CJ, Iyasu S, Gargiullo PM. Trends and predictors of infant sleep positions in Georgia, 1990-1995. *Pediatrics.* 1998;102:e33.

[3]Taylor JA, Davis RL. Risk factors for the infant prone sleep position. *Arch Pediatr Adolesc Med.* 1996;150:834-7.

[4]CDC. Seasonality in sudden infant death syndrome—United States, 1980-1987. *MMWR*. 1990;39:891-5.

[5]Beal S, Porter C. Sudden infant death syndrome related to climate. *Acta Paediatr Scand.* 1991; 80:278-87.

[6]Kemp JS. Rebreathing of exhaled gases: importance as a mechanism for the causal association between prone sleep and sudden infant death syndrome. *Sleep*. 1996; 19: S263-6.

[7]Scheers NJ, Dayton CM, Kemp JS. Sudden infant death with external airways covered: case-comparison study of 206 deaths in the United States. *Arch Pediatr Adolesc Med.* 1998;152:540-7.

[8]Gibson E, Cullen JA, Spinner S, Rankin K, Spitzer AR. Infant sleep position following new AAP guidelines. *Pediatrics*. 1995;96:69-72.

[9]Elders J. Reducing the risk of sudden infant death syndrome. *JAMA.* 1994;272:1646.

[10]American Academy of Pediatrics. Positioning and sudden infant death syndrome (SIDS): update. American Academy of Pediatrics Task Force on Infant Positioning and SIDS. *Pediatrics*. 1997;98:1216-8.

[11]Willinger M, Hoffman HJ, Wu K, Hou JR, Kessler RC, Ward SL, Keens TG, Corwin MJ. Factors associated with transition to nonprone sleep positions of infants in the United States. *JAMA.* 1998; 280:341-6.

[12]Henderson-Smart DJ, Ponsonby AL, Murphy E. Reducing the risk of sudden infant death syndrome: A review of the scientific literature. *J Paediatr Child Health.* 1998;34:213-9.

[13]Leach CEA, Blair PS, Fleming PJ, Smith IJ, Platt MW, Berry PJ, Golding J. Epidemiology of SIDS and explained sudden infant deaths. *Pediatrics.* 1999;104:e43.

[14]Mitchell EA, Tuohy PG, Brunt JM, Thompson JMD, Clements MS, Stewart AW, Ford RPK, Taylor BJ. Risk factors for sudden infant death syndrome following the prevention campaign in New Zealand: A prospective study. *Pediatrics.* 1997;100:835-840.

[15]Constantine E, Waters KA, Morielli A, Brouillette RT. Head turning and face-down positioning in prone-sleeping premature infants. *J Pediatr.* 1999;134:558-62.

[16]Hack M, Klein MK, Taylor HG. Long-term developmental outcome of low birth weight infants. *Future Child.* 1995;5:176-96.

[17]Rantikillo P. Social background of mothers who smoke during pregnancy and influence of these factors on the offspring. *Soc Sci Med*. 1979;13A:423-9.

[18]MacDorman MF, Cnattingius S, Hoffman HJ, Kramer MS, & Haglund B. Sudden infant death syndrome and smoking in the United States and Sweden. *Am J Epidemiol.* 1997;146:249-57.

[19]Alexander GR, Korenbrot CC. The role of prenatal care in preventing low birth weight. *Future Child.* 1995;5:103-20.

[20]Chomitz VR, Cheung LWY, Lieberman E. The role of lifestyle in preventing low birth weight. *Future Child.* 1995;5:122.