SECTION TWO:
Illness/Natural Cause Deaths

All Illness/Natural Cause Deaths Other Than SIDS

"The infant mortality rate has declined steadily during the last decade, due, in part to improved medical technology and public health outreach...Infants are more likely to die before their first birthday if they live in unsafe homes and neighborhoods or have inadequate nutrition, health care or supervision."

-Kids Count Missouri, Citizens for Missouri's Children and Children's Trust Fund

Illness/natural cause, other than SIDS, were responsible for the death of 685 Missouri children in 2002, representing 63% of all Missouri incident fatalities.

Illness/natural cause deaths include prematurity, congenital anomalies, infection and other conditions. Most child deaths are related to illness or other natural cause. The vast majority of natural cause deaths occur before the first year of life and are often related to prematurity or birth defects. Sudden Infant Death Syndrome (SIDS), a natural death, is discussed in the section that follows.

Figure 6. Illness/Natural Cause Deaths by Age

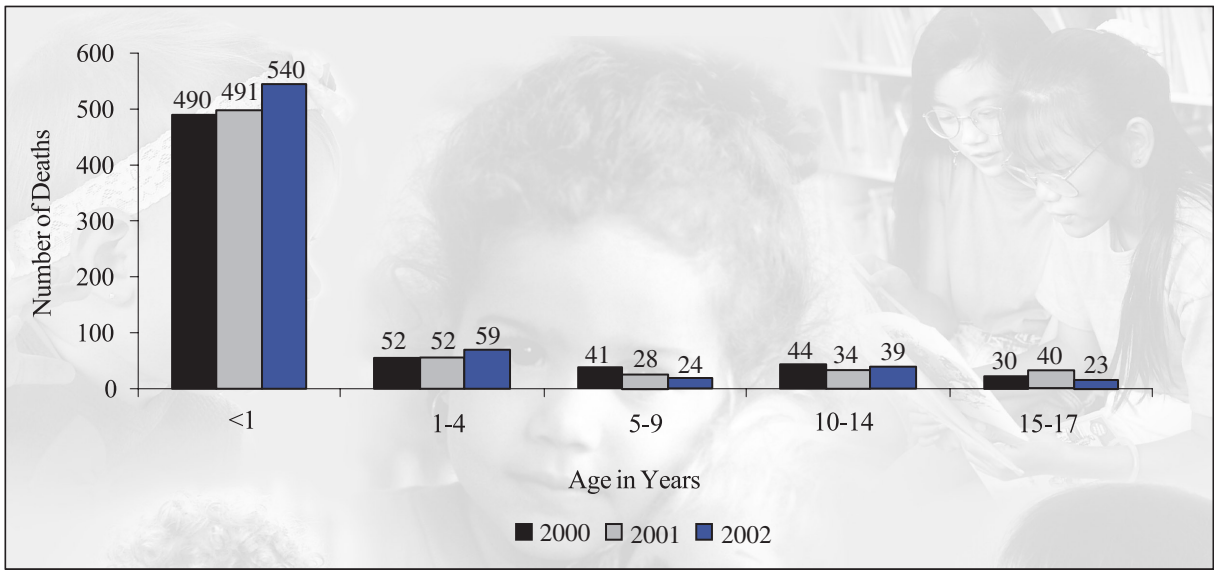


Figure 7. Illness/Natural Cause Deaths by Sex and Race

Sex	2000	2001	2002	Race	2000	2001	2002
Female	307	268	316	White	462	433	471
Male	350	377	369	Black	188	201	202
				Other	7	11	12
	657	645	685		688	657	685

Infants less than one year of age comprised the majority (79%) of illness/natural cause deaths in 2002 with **540**. Of those, **335** occurred within the first three days of life; **249** (74%) of those occurred within 24 hours of birth.

Figure 8. Children Age Three Days or Less That Died of Illness/Natural Causes

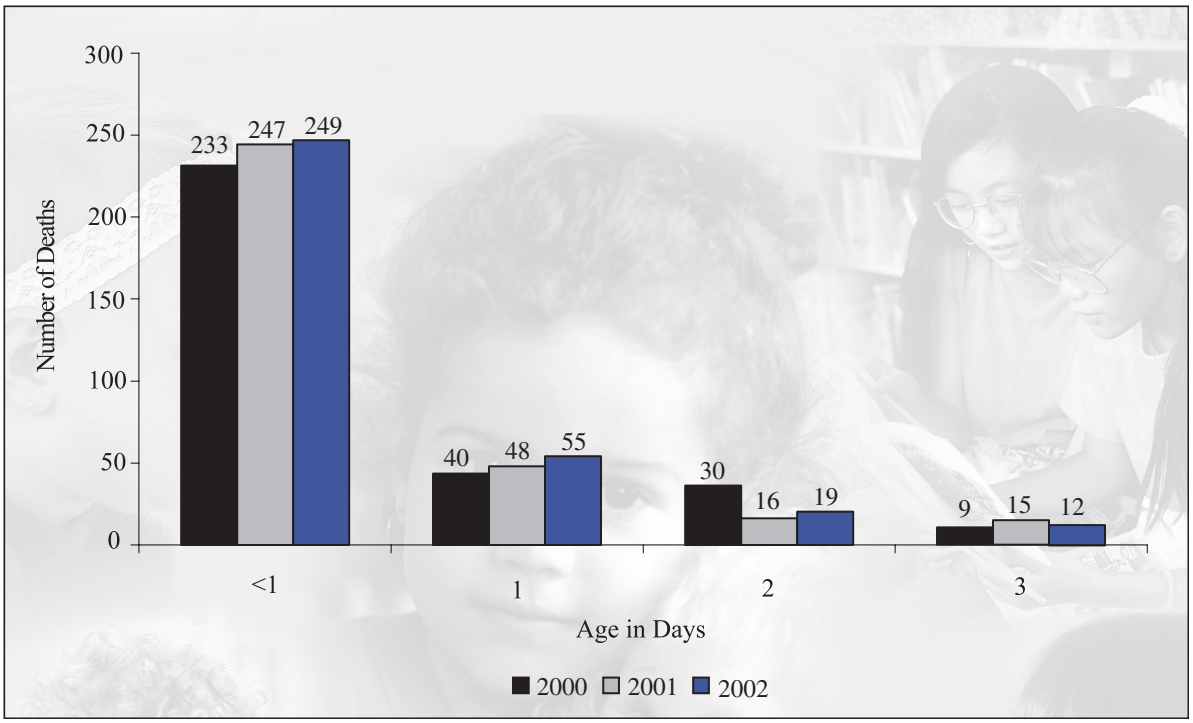


Figure 9. Children Less Than One Year That Died of Illness/Natural Causes by Sex and Race

Sex	2000	2001	2002	Race	2000	2001	2002
Female	226	200	248	White	331	305	371
Male	264	291	292	Black	152	177	157
				Other	7	9	12
	490	491	540		490	491	540

Natural Cause Deaths in Infants Less Than One Year as Reported on CFRP Data Forms

Age at death		Gestational age at birth	
0 - 24 hours	295	<25 weeks	221
24 - 48 hours	18	25 - 30 weeks	87
48 hours - 6 weeks	128	30 - 37 weeks	60
6 weeks - 6 months	49	>37 weeks	58
6 months - 1 year	20	Unknown	79
Not Answered	30	Not Answered	35

Note: Of the 221 listed as less than 25 weeks gestation, 89 (40%) of them were 20 weeks or less.

Birth weight in grams (approximate lbs/oz)		Multiple births	
<750 (<1 lb 10 oz)	223	Yes	87
750 - 1,499 (1 lb 10 oz - 3 lbs 5 oz)	62	No	392
1,500 - 2,499 (3 lbs 5 oz - 5 lbs 5 oz)	38	Not Answered	61
>2,500 (>5 lbs 5 oz)	65		
Unknown	102		
Not Answered	50		

Medical complications during pregnancy		Smoking during pregnancy		Drug use during pregnancy		Alcohol use during pregnancy	
Yes	23	Yes	18	Yes	10	Yes	1
No	12	No	11	No	18	No	14
Unknown	15	Unknown	22	Unknown	23	Unknown	36

Fetal and Infant Mortality Review in Missouri

The death of a child, especially the youngest, most vulnerable infant, is viewed as a sentinel event that is a measure of a community's overall social and economic well being as well as its health. During the last decade, two methods for examining these sentinel deaths at the local level have emerged: child fatality review (CFR) and fetal and infant mortality review (FIMR).

In 1991, Missouri initiated the most comprehensive child fatality review system in the nation. While the Missouri Child Fatality Review Program (CFRP) has evolved and adapted to meet new challenges, the objectives have remained the same-identifying potentially fatal risks to infants and children, and responding with multi-level prevention strategies, following a public health prevention model. In Missouri, all child fatality data is collected by means of standardized forms and entered into a database. What is learned can be used immediately by the community where the death occurred. The sum of statewide data is used to identify trends and patterns requiring systemic solutions.

The Missouri Department of Health and Senior Services (DHSS) has been a key partner in the development and implementation of statewide prevention initiatives that protect and improve the lives of Missouri children. DHSS is now collaborating with the March of Dimes, lead agency for the St. Louis Maternal, Child and Family Health Coalition, and SIDS Resources, Inc. doing business as Bootheel Healthy Start, to develop fetal and infant mortality review (FIMR) in limited Missouri sites. Initial sites include selected zip codes in the St. Louis region and five counties in the Bootheel region; a Kansas City site is also under development.

Fetal and Infant Mortality Review (FIMR)

Fetal mortality is defined as the death of a fetus in utero at 20 weeks or more gestation. It is viewed as an important indicator of overall perinatal health. The health of the mother plays a significant role in maintaining a healthy pregnancy. Conversely, maternal medical complications of pregnancy are adversely associated with fetal deaths.

Infant mortality is defined as the death of a child before one year of age. The infant mortality rate is associated with a variety of social and economic factors, as well as medical/health conditions. Nationally, two-thirds of these deaths occur during the first 28 days of life, the neonatal period.

The FIMR process in our state conforms to the principles and guidelines set by the National Fetal and Infant Mortality Review Program, which is a collaborative effort between the American College of Obstetricians and Gynecologists and the Maternal and Child Health Bureau, Health Resources and Service Administration. The overall goal of Fetal and Infant Mortality Review (FIMR) is to enhance the health and well being of women, infants and families by improving the community resources and service delivery systems available to them.

Many sources provide information for FIMR reviews. A maternal interview is sought from the family. Medical records, including hospital and physician records, as well as any existing medical examiner records are abstracted. All identifying information; i.e., families, providers, and institutions, is removed. A summary of the case is prepared and presented to the case review team. Members of the FIMR case review team represent a broad range of professional organizations and public and private agencies (health, welfare, education and advocacy) that provides services and resources for women, infants and families. The reviews produce findings and recommendations that, typically, are presented to a community action team, comprised of other members of the community with the political will and fiscal resources to create large-scale system changes.

The rate of death among infants in Missouri has shown a steady decline during the last decade, from 9.6 to 7.5 per 1,000 live births (DHSS). In most communities, infant deaths due to natural causes such as prematurity, congenital anomalies, SIDS, infection, and other disease processes have traditionally been viewed as medically complicated and not preventable. Indeed, they are medically complicated, but research and experience have demonstrated that improvements in resources and systems that serve the needs of infants, mothers and families can produce significant improvements in outcomes. The emergence of FIMR in our state has the potential to bring about significant improvements in maternal and infant outcomes, and further reduce infant deaths.

While there are many similarities between CFRP and FIMR, there are distinct and important differences, including basic human concern and advocacy. In Missouri, FIMR and CFRP will be distinct, but complementary systems, sharing a common mission and some promising opportunities for collaboration. It is anticipated that, when appropriate, the two systems will be able to collaborate in significant ways, such as joint reporting of aggregate findings, sharing recommendations with media and the public, and improving systems and resources for children, mothers and families.

Sudden Infant Death Syndrome (SIDS)

Sudden Infant Death Syndrome (SIDS) was the cause of death of 69 Missouri infants in 2002, representing 13% of all natural cause deaths of infants less than 1 year of age.

Representative Cases:

- **Infants should be placed on their backs to sleep.**

  A 6-month-old male infant was placed on his side in a playpen for a nap. Several hours later, he was found face down and unresponsive.

  A 3-month-old infant girl was put to bed on her stomach on top of a comforter. When her mother checked on her the next morning, she was lifeless.

  A father placed his 2-month-old son in his crib on his stomach with his face turned to the side. Two hours later, he discovered the baby cold and not breathing.

- **The safest place for infants to sleep is in a standard crib with a firm mattress and no soft bedding.**

  An 8-month-old infant girl was placed face down in her portable playpen with an adult-sized pillow, a blanket, small doll and bottle. She was found unresponsive in the same position several hours later.

  A 4-month-old infant boy became fussy during the night because of teething problems. He was put in bed with his mother, sister and cousin. He was found unresponsive the next morning with his face down in the mattress.

  An 8-day-old infant girl was found unresponsive and blue on the family room floor. She had been put to sleep the night before on several blankets, with her four other siblings.

Sudden Infant Death Syndrome (SIDS) is the sudden, unexpected death of an apparently healthy infant under one year of age, which remains unexplained after the performance of a complete post-mortem evaluation/investigation that includes an autopsy, investigation of the scene of death and review of the case history. SIDS is characterized by the sudden death of an infant during a sleep period. SIDS is a diagnosis of exclusion; there are no pathological markers that distinguish SIDS from other causes of sudden infant death. There are no known warning signs or symptoms. Ninety percent of SIDS deaths occur in the first six months of life, with a peak at 2-4 months. While there are several known risk factors, the cause or causes of SIDS are unknown at this time.

The Triple Risk Model for SIDS is often used to describe the confluence of events that may lead to the sudden death of an infant. This model involves a vulnerable infant, (one with a subtle defect involving brainstem arousal responses) at a critical developmental period (less than six months of age), exposed to environmental challenges to which he/she does not respond (such as overheating, tobacco smoke, or prone sleeping).

SIDS is generally considered a natural manner of death. SIDS is not caused by spitting up, choking or minor illnesses, such as a cold. SIDS is not caused by immunizations; it is not contagious; SIDS is not child abuse. SIDS is not the cause of every sudden or unexpected infant death. In fact, of the **130** sudden unexpected deaths of infants under the age of one year reported to the Child Fatality Review Program in 2002, **69** were diagnosed as SIDS following autopsy, investigation and panel review. The cause of death for the remaining **61** infants included **20** illness/natural cause, **3** homicides, **22** unintentional suffocations, **15** undetermined, and **1** pending further investigation.

Figure 10. SIDS Fatalities by Age

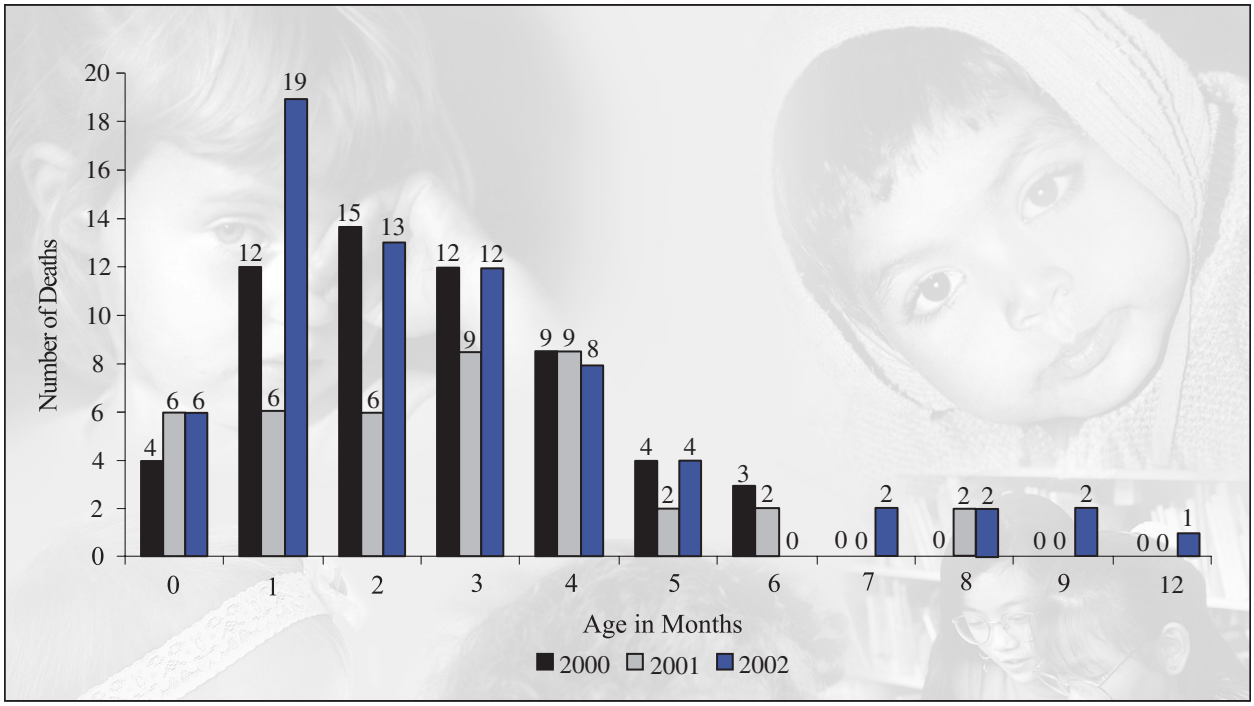


Figure 11. SIDS Fatalities by Sex and Race

Sex	2000	2001	2002
Female	25	24	24
Male	34	18	45
	59	42	69

Race	2000	2001	2002
White	41	31	45
Black	18	10	24
Other	0	1	0
	59	42	69

Figure 12. SIDS Rate 2000-2002

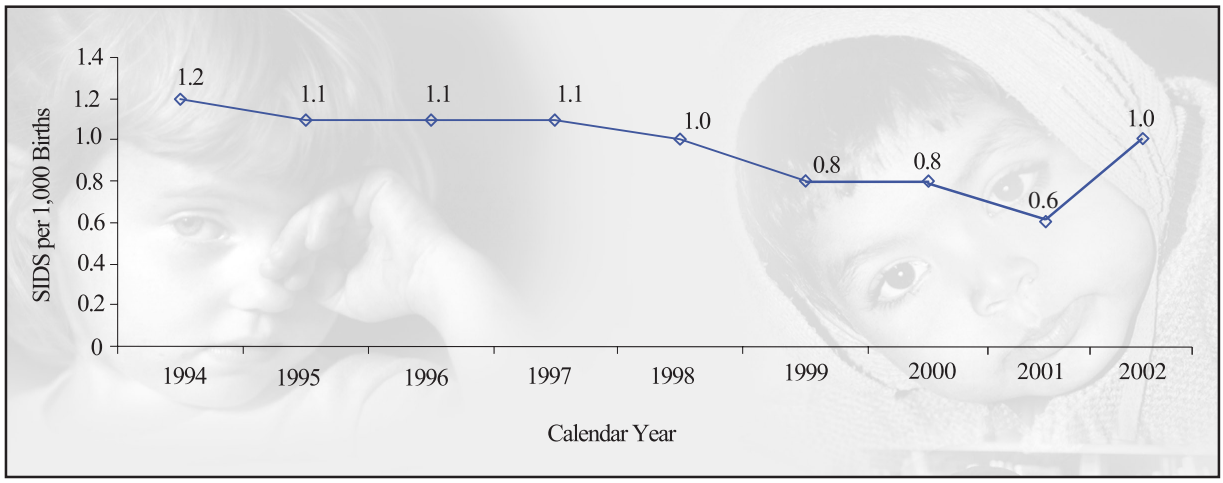
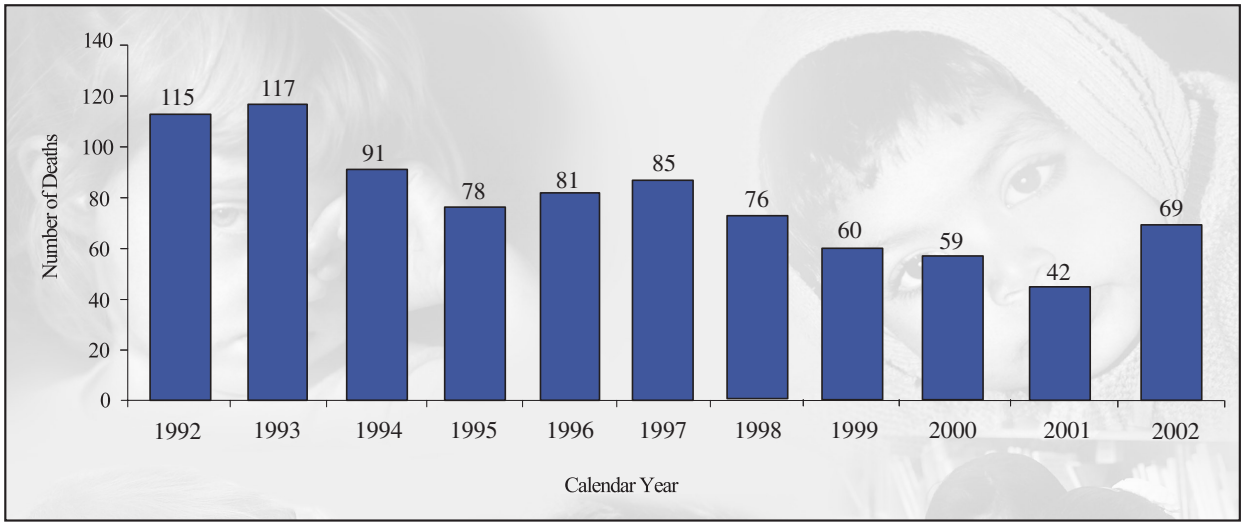


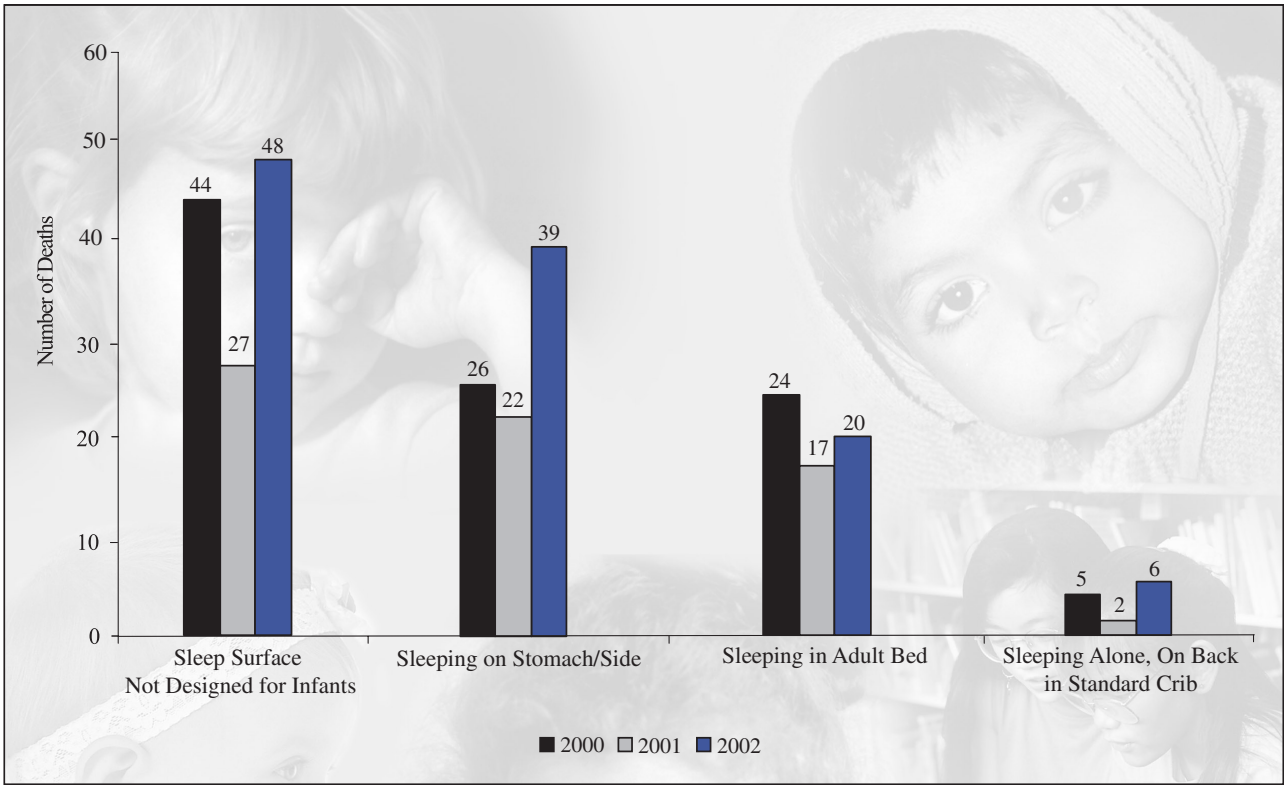
Figure 13. Missouri SIDS Deaths 1992-2002



Recent research findings have resulted in accelerated progress in the understanding of sudden unexpected infant death. Unsafe sleep arrangements are now known to be a highly significant risk factor occurring in the large majority of cases of sudden infant death diagnosed as SIDS, unintentional suffocation and cause undetermined. Unsafe sleep arrangements include any sleep surface not designed for infants, sleeping with head or face covered, and sharing a sleep surface.

In Missouri, of the **69** sudden unexpected infant deaths reviewed by county panels and diagnosed as SIDS in 2002, **39** (57%) were known to be sleeping on their stomach or side. **Forty-eight** (70%) of those infants were not sleeping in a standard crib on a firm mattress. **Twenty** (29%) were sleeping in an adult bed. *Only **6** (9%) sudden infant deaths diagnosed as SIDS, were known to be sleeping alone on their backs in a standard crib with head and face uncovered.*

Figure 14. Missouri SIDS Deaths, 2000-2002: Sleep Environment



"Infant mortality is the most sensitive index we possess in social welfare."

-Julia Lathrop
Children's Bureau, 1913

A SAFE SLEEPING ENVIRONMENT FOR YOUR BABY

The American Academy of Pediatrics, the Consumer Product Safety Commission and the National Institute of Child Health and Human Development have revised their recommendations on safe bedding practices when putting infants down to sleep. Here are the revised recommendations to follow for infants under 12 months:

Safe Bedding Practices For Infants

- Place baby on his/her back on a firm tight-fitting mattress in a crib that meets current safety standards.
- Remove pillows, quilts, comforters, sheepskins, stuffed toys and other soft products from the crib.
- Consider using a sleeper or other sleep clothing as an alternative to blankets, with no other covering.
- If using a blanket, put baby with feet at the foot of the crib. Tuck a thin blanket around the crib mattress, reaching only so far as the baby's chest.
- Make sure your baby's head remains uncovered during sleep.
- Do not place baby on a waterbed, sofa, soft mattress, pillow or other soft surface to sleep.

Placing babies to sleep on their backs instead of their stomachs, has been associated with a dramatic decrease in deaths from Sudden Infant Death Syndrome (SIDS). Babies have been found dead on their stomachs with their faces, noses and mouths covered by soft bedding, such as pillows, quilts, comforters and sheepskins. However, some babies have been found dead with their heads covered by soft bedding, even while sleeping on their backs.

Risk Reduction Recommendations:

The following risk reduction recommendations are from SIDS Resources, Inc., the SIDS Alliance and the American Academy of Pediatrics.

For parents:

- *Sleep position:* Infants should be placed on their backs to sleep throughout the first year of life.
- *Bedding:* Avoid soft bedding. Place baby on a firm tight-fitting mattress in a crib that meets current safety standards. Avoid placing the baby on soft quilts or comforters, sofas, pillows, waterbeds or sheepskins. Stuffed animals should not be placed in the crib with the baby. Avoid using bumper pads.
- *Temperature:* To avoid overheating, do not overdress the baby or over-bundle the baby.
- *Smoking:* Avoid smoking during pregnancy. Create a smoke-free environment around the baby after birth.
- *Breastfeeding:* Mothers should be encouraged to breastfeed. Some researchers have found that breastfeeding is a protective factor for SIDS.
- *Prenatal care and well-baby care.*

For community leaders and policy makers:

- *Support Safe-Sleep campaigns.*

For professionals:

- Newborn nursery personnel, physicians, nurses and public health officials should instruct all new parents and child care personnel in safe sleeping practices and other strategies to reduce the risk of SIDS.

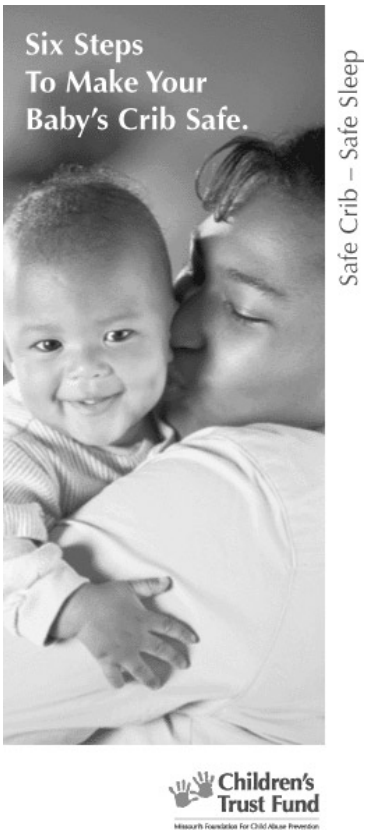
For Child Fatality Review Panels:

- All sudden, unexplained deaths of infants <1 year of age require autopsy by a child death pathologist and review by a county CFRP panel. The data pertaining to infant deaths is critical in identifying risk factors for SIDS and providing targeted prevention messages for parents.

Something We Can Do: The Safe Crib-Safe Sleep Campaign

The safest place for an infant to sleep is in a standard crib, on his or her back without soft bedding or toys of any kind. The American Academy of Pediatrics, the Consumer Product Safety Commission and the National Institute of Child Health and Human Development have revised their recommendations on safe bedding practices when putting infants down to sleep to incorporate this new information. Unfortunately, many parents have not received this information and, for a variety of reasons, are unable to provide a safe crib for their infant.

The Safe Crib Project provides a safe, new crib to families in need, along with critical parent education about safe sleep arrangements for infants. In communities throughout Missouri, social service agencies, community health agencies, hospitals and similar organizations have collaborated to implement the Safe Crib Project, using funding from Children's Trust Fund. The goal of this innovative project is to save infant lives and support families. For additional information about Children's Trust Fund, active Safe Crib Projects or funding opportunities, please contact Children's Trust Fund at 573-751-5147 or visit www.ctf4kids.org.



Resources and Links:

Safe Bedding Practices for Infants:	
Consumer Product Safety Commission	www.cpsc.gov
American Academy of Pediatrics	www.aap.org
SIDS Resources, Inc., 143 Grand, St. Louis, MO 63122 Counseling and support, research, training and education throughout Missouri.	www.sidsresources.org 800-421-3511
Children's Trust Fund "Safe Crib-Safe Sleep" Campaign	www.ctf4kids.org 573-751-5147
Sudden Unexpected Infant Death: A Guide for Missouri Coroners and Medical Examiners	www.dss.mo.gov/stat/suid.pdf