Sudden Unexpected Infant Death: What We Are Learning and What We Can Do

Tina Ferguson, Emily Ferrell

September 10, 2019

Dr. Jeffrey D. Howard, Commissioner
Objectives

Participants will be able to:

1. Explain the impact of SUID on infant mortality in Kentucky.
2. Describe interventions related to SUID that have been implemented in Kentucky.
3. Identify risk factors for SUID cases.
4. Recommend future interventions based on risk factors.
SIDS and SUID

Origins,
Definitions, and
Prevalence
• Sudden Unexpected Infant Death (SUID): a death that occurs in the first year of life, in which the cause of death is not immediately obvious before investigation.

• The SUID designation includes: undetermined causes, Sudden Infant Death Syndrome (SIDS), and accidental suffocation and strangulation in bed (ASSB).

https://www.cdc.gov/sids/data.htm
National History of SIDS and SUID

1963
Congress passes the Sudden Infant Death Syndrome Act (PL 93-270) directing the research within the U.S. on SIDS.

1974
1st international conference on sudden infant death (SIDS) held in Seattle, Washington.

1992
The AAP recommends that U.S. babies be placed on their backs or sides to sleep to help reduce the risk of SIDS.

2000
The AAP recommends that the back sleep position is best. The side position confers risk.

2011
The AAP expands recommendations to encompass the infants’ entire sleep environment.

2013
NICHD expands the campaign and calls it Safe to Sleep.
National Historical SIDS and SUID rates

Data source: CDC Wonder Online Database compressed mortality files.
CDC SUID Case Registry

• Differing practices in the investigation and reporting of SUID impact the ability to consistently and accurately monitor trends and characteristics.

• Purpose:
  • Bring together detailed, population-based data about the circumstances for all SUID cases;
  • Improve the completeness and quality of SUID investigations;
  • Identify common characteristics and risk factors in SUID cases; and
  • Inform data-driven practices and policies to reduce future deaths.

https://www.cdc.gov/sids/case-registry
Current Prevalence

• Around 3,500 SUIDs occur in the United States each year
  • Nearly 1 in every 1,000 live births

• Around 93 SUIDs occur in Kentucky each year*
  • Nearly 2 in every 1,000 live births

• In both the United States and Kentucky, SUID is a leading cause of infant mortality
  • Accounting for 15-25% of all infant deaths

*Average since the inception of the SUID Case Registry in 2016
https://www.cdc.gov/reproductivehealth/maternalinfanthealth/infantmortality.htm
https://www.cdc.gov/sids/data.htm
SUID rates in Kentucky compared to the U.S.

KY and U.S. SUID rates (per 100,000 live births) compared

Data sources: CDC Online Database compressed mortality files and SUID case registry reports
March 27, 2019
Data Source: Sudden Unexpected Infant Death Case Registry.
Note: 2018 data are preliminary and numbers may change.
Shapefiles from Kentucky Geography Network.
Prepared by Emily Ferrell, MPH CPH
n=243 (excludes 6 cases that died out of state)
SIDS and SUID

Prevention Strategies
Kentucky Safe Sleep

The Safe Sleep Campaign is the primary prevention strategy in Kentucky for the reduction of sudden unexpected infant death, and it is built on the ABCDs of Safe Sleep:

**A** - ALONE: Stay Close, Sleep Apart

**B** - BACK: On their Back for Nights and Naps

**C** - CRIB: Clean, Clear Crib

**D** - DANGER: Be Aware, Not Impaired
Alone- Stay close, Sleep apart

- Babies should always sleep alone, and every sleep time counts.
- There should never be anything else in the baby’s sleep space except the baby.
- A pacifier is permissible but should not be attached to a string, cord, stuffed animal, or anything else.
• Infants should be placed on their back for both night time sleep as well as naps.
Crib- Clean, clear crib

• The safest crib contains nothing but a baby, sleeping on his or her back, on a firm mattress with a tightly fitted crib sheet.

• Infants who are swaddled should always be placed in the supine position. Caregivers should also stop swaddling once an infant begins to try to roll over.
Danger- Impairment and Distraction

• Infants born to mothers who smoked during pregnancy are twice as likely to die of SIDS.
• Exposure to passive smoke in the household doubles a baby’s risk for SIDS.
• Drinking, drug use and hand-held technology:
  • takes away from adequate supervision and can lead to safety issues; and
  • reduces face-to-face interaction that is vital to children's emotional and intellectual development.

Media Campaign

Traditional Media

Radio
• 1,512,880 impressions

TV
• 1,833,370 impressions

Patient TV
• 620,934 impressions

Out of home
• 10,625 impressions

Print for Spanish speakers
• 50,000 estimated circulation

Digital Media

Facebook videos
• 11,312,653 impressions
• 4,257,353 video views
• 2,584,792 post engagements

Digital banners
• 7,225,349 impressions
• 5,591 clicks

Webpage: Safesleepky.com
Collaboration with Partners

• Provided training and resources for coroners and their deputies.

• Developed Maternal and Child Health Packages through the use of Title V funds for use at the local level.

• Health Access Nurturing Development Services (HANDS) home visiting program staff provide the book Sleep Baby, Safe and Snug, distribute safe sleep materials and discuss safe sleep with parents during service delivery.

• Child Protective Service (CPS) is developing a protocol for CPS workers to evaluate safe sleep practices, distribute materials and discuss safe sleep with parents and caregivers during their work with the family.
SIDS and SUID

Understanding the Risks
Triple Risk Model

- Vulnerable Infant
- Outside Stressor(s)
- Critical Period of Development
Study Question

• Are there differences between SUID and non-SUID cases in
  • maternal demographics,
  • maternal health behaviors,
  • birth characteristics,
  • and enrollment in services?

• How can data be used to target interventions to prevent SUID?
Characteristics of Interest

Maternal Demographics
• *age at delivery*
• race
• ethnicity
• *education*
• *marital status*
• *previous live births*
• rural/urban residency

Maternal Health Behaviors
• *smoking during pregnancy*
• drinking during pregnancy
• *breastfeeding*
Characteristics of Interest

Birth Characteristics
• *gestational age*
• *NICU admission*
• *birth weight*
• perinatal Hepatitis C exposure
• *sex*

Enrollment in Services
• *insurance type*
• *WIC*
• *adequacy of prenatal care*
Increased Odds of SUID

• Smoking:  
  • 2.5x

• Previous live births:  
  • 1 or 2: 2x
  • 3 or more: 2.5x

• Male sex:  
  • 1.5x

• Medicaid or no insurance:  
  • 2x

Even when accounting for other risk factors
Decreased Odds of SUID

• Maternal age:
  • 35% decrease for every 5 years
• Gestational age:
  • 10% decrease for every 1 week
• Planning to breastfeed:
  • 35% decrease

Even when accounting for other risk factors
Additional Risk and Protective Factors

- 33% had a history of maltreatment or violence
- 25% had a history of substance use
- 31% had other situational risk factors
- 15% were enrolled in HANDS
Frequency of Additional Risk Factors

- History of Family Violence: 9%
- Previous Law Enforcement Involvement: 4%
- Previous DCBS Involvement: 27%

Maltreatment or Violence
Frequency of Additional Risk Factors

- Substance Use in Home: 23%
- Substance Use by Caregiver: 12%
- Child Diagnosed with NAS: 15%
Frequency of Additional Risk Factors

- Young Children in Home: 11%
- Impaired or Absent Supervisor: 12%
- Caregiver Mental Health Issues: 8%
- Substitute Caregiver: 8%

Situational factors
KY SUID Cases 2016-2017
N=186

- Born pre-term- 25%
- Pre- or post-natal cigarette smoke exposure- 63%
- Died before their 4th month of life- 63%
- Non-supine position- 53%
- Objects in sleep area- 68%
- Surface not designed for infant sleep- 63%
- Sharing a sleep surface- 49%
SUID Categorization

• 186 cases in the 2016-2017 cohort
  • 3 excluded from case registry
  • 20 had incomplete case information
  • 5 had no unsafe sleep factors
  • 72 had unsafe sleep factors
  • 39 were (possible) suffocation
SUID Categorization

Excluded
- 2% of cases
- Determination based on multidisciplinary review

(Possible) Suffocation 43%
Excluded 2%
Insufficient Information 11%
No Unsafe Sleep Factors 3%
Unsafe Sleep Factors 41%
SUID Categorization

- **Excluded**: 2%
- **Insufficient Information**: 11%
- **No Unsafe Sleep Factors**: 3%
- **Unsafe Sleep Factors**: 41%
- **(Possible) Suffocation**: 43%

**Insufficient Information**
- 11% of cases
- No autopsy
- No death scene investigation (DSI)
- DSI did not have adequate information
SUID Categorization

No Unsafe Sleep Factors
- 3% of cases
- Meets the ABCs of safe sleep
- Includes cases that were not asleep

- 43% (Possible) Suffocation
- 41% Unsafe Sleep Factors
- 11% Insufficient Information
- 2% Excluded
SUID Categorization

Unsafe Sleep Factors
- 41% of cases
- At least one unsafe sleep factor
- No known factors for suffocation
SUID Categorization

(Possible) Suffocation

- 43% of cases
- Airway obstruction is known or likely
- Team can explain how suffocation occurred
- Mechanisms:
  - Soft bedding
  - Wedging
  - Overlay
  - Other
SIDS and SUID

Beyond Safe Sleep
Beyond Safe Sleep

• Although overall SIDS rates have declined by more than 60% since 1994, SIDS still remains a leading cause of death among U.S. infants.

• The triple risk theory suggests that SIDS may result from the convergence of:
  • a vulnerable infant,
  • a critical developmental period, and
  • exposure to an outside stressor,
    • such as stomach sleeping,
    • loose bedding, or
    • exposure to tobacco smoke.
Beyond Safe Sleep

• States with a holistic focus on prenatal, perinatal, and infant wellbeing
  • including social determinants of health
• had greater reductions in SUID compared to states that only focused on safe sleep.
• Culturally-appropriate interventions are key.


Existing Interventions

- Breastfeeding promotion
- Preterm birth prevention
- Smoking cessation
- Teen pregnancy prevention
- Parenting support
Other Partnerships

• Programs that serve
  • Victims of domestic violence
  • Homeless or transient populations
  • Refugees
  • Families in their home environment
  • Grandparents or other alternate caregivers

• Allied health fields
  • Pharmacists
  • Mental health providers
  • Behavioral health providers
Possible Future Interventions

• Work with the state Medicaid program to reach a high-risk population

• Ensure that safe sleep education is being provided during all pregnancies, not just to first-time mothers.

• Consider populations with multiple risk factors, such as
  • Teenage mothers with tobacco use, or
  • Mothers who have had multiple previous preterm births
Acknowledgements

• Kentucky Office of Vital Statistics
• Kentucky SUID State Review Team
• Kentucky Child Fatality Review Team
• Centers for Disease Control and Prevention
• National Center for Fatality Review and Prevention
Thank you!

Tina Ferguson  
SUID Case Registry PI  
502-564-4830 x 4401  
tinaf@ky.gov

Emily Ferrell  
Epidemiologist  
502-564-3756 x 2489  
emily.ferrell@ky.gov

chfs.ky.gov  
Safesleepky.com