

# SUDDEN UNEXPECTED INFANT DEATH REPORT



WISCONSIN  
2016

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WISCONSIN DEPARTMENT  
*of* HEALTH SERVICES



# ••• SUDDEN UNEXPECTED INFANT DEATH REPORT - 2018

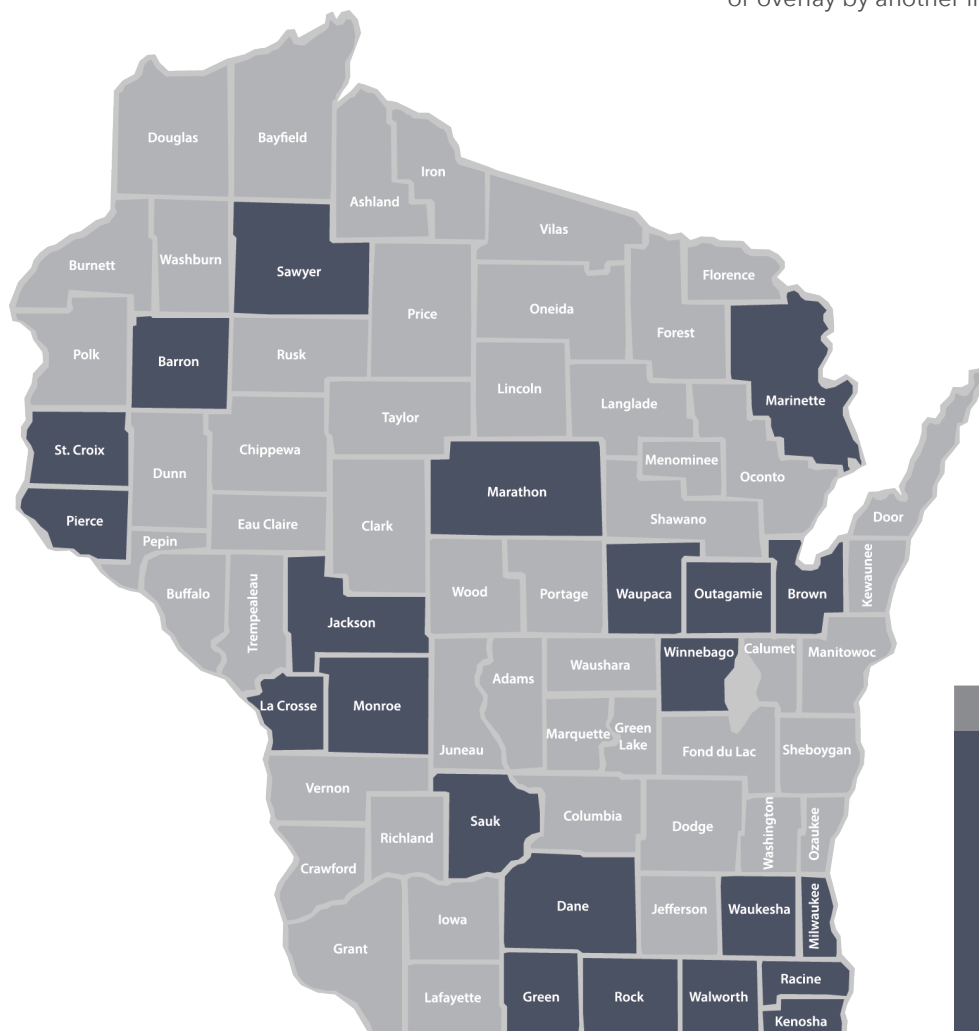
Infant mortality remains a public health concern both nationally and locally. In Wisconsin, the infant mortality rate between 2007 and 2015 was 6.1 deaths for every 1,000 live births, compared to the United States rate of 6.2 deaths for every 1,000 live births (WISH, 2018, CDC, 2018).

Sudden Unexpected Infant Deaths (SUIDs) account for a portion of the infant deaths in Wisconsin each year. In 2016, 15 percent of infant deaths in Wisconsin were SUIDs. The Centers for Disease Control and Prevention (CDC) define a SUID as the death of an infant (less than 365 days of age) that is sudden and unexpected, the cause of which is not immediately clear prior to investigation (CDC, 2018). The CDC maintains a SUID Case Registry to gather population-based data on the risk factors and circumstances


leading to the deaths, to improve the quality of SUID investigations and to count the number of SUIDs based upon standardized definitions across states. Wisconsin has participated in the SUID Case Registry since 2013.

In 2016, 62 Wisconsin infant deaths were considered SUIDs. The map below indicates the counties of residence of infants experiencing a SUID in 2016. Each of these deaths occurred while the infant was sleeping or was in the sleep environment. These deaths fall into two categories:

- 1. Undetermined (77 percent):** This includes deaths certified as SUID, Sudden Infant Death Syndrome (SIDS) and Undetermined.
- 2. Asphyxia (23 percent):** This includes asphyxia due to the infant's position, other objects in the sleep environment or overlay by another individual.



**PURPOSE STATEMENT**



This report provides information on the circumstances and risk factors leading to SUIDs in order to inform prevention work among partners statewide.



**TABLE 1 - DEMOGRAPHICS**

Characteristics	SUIDs, Wisconsin (N=62)*	All infant deaths, Wisconsin (N=415)	2016 Births, Wisconsin (N=66,593)
<b>Sex, %</b>			
Female	45%	43%	49%
Male	55%	57%	51%
<b>Gestational age, %</b>			
Pre-term (less than 37 weeks)	27%	66%	10%
Term (37 weeks or greater)	73%	33%	90%
<b>Birthweight, %</b>			
Very low birth weight (less than 1500 grams)	6%	48%	1%
Low birth weight (1500 to 2499 grams)	16%	15%	6%
Normal birth weight (2500 grams or greater)	76%	34%	93%
<b>Infant age in months at death, %</b>			
Younger than 1 month	8%	69%	---
1 to 2 months	37%	14%	---
3 to 4 months	35%	9%	---
5 to 6 months	13%	3%	---
7 to 12 months	7%	5%	---
<b>Maternal race/Hispanic ethnicity, %</b>			
Hispanic	6%	7%	10%
Multi-racial, non-Hispanic	3%	2%	2%
Non-Hispanic black	44%	24%	10%
Non-Hispanic white	45%	61%	72%
Other categories combined	---	5%	6%
Missing	2%	1%	<1%
<b>Maternal age, %</b>			
Younger than age 20	5%	7%	4%
20-24 years of age	24%	19%	18%
25-29 years of age	34%	29%	32%
30-34 years of age	20%	29%	31%
35-39 years of age	14%	13%	13%
Age 40 and older	3%	3%	2%

\*For SUIDs maternal age is calculated among infants where biological mother was a primary caregiver (N=59).

Table 1 describes characteristics of SUIDs compared to all infant deaths and all live births in Wisconsin in 2016. Preterm birth and low birth weight are among the leading causes of infant mortality (CDC, 2018). While 10 percent of all live births in 2016 were premature, 27 percent of SUIDs were among infants born prematurely. Additionally, 7 percent of all live births were very low or low birth weight, while 22 percent of infants experiencing a SUID were very low or low birth weight. Comparatively, 66 percent of all infants who died in 2016 were born premature and 63 percent had either very low or low birth weight.



Healthy People 2020 has four overarching goals, one of which is to achieve health equity. Health equity is defined as “the attainment of the highest level of health for all people” (USHHS, 2018) and is achieved when all individuals are given fair opportunities to reach their full health potentials (CDC, 2018). Opportunities for positive health outcomes are influenced by where we live, work and play (WHO, 2018, RWJF, 2010). Healthy People 2020 highlights the influence these factors have on health outcomes for different groups of people.

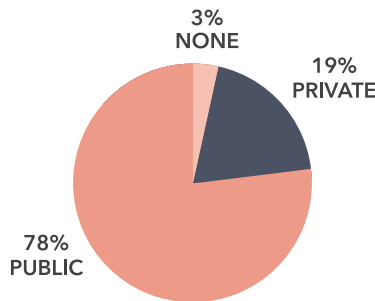
Examination of these factors among women experiencing a SUID reveals that the burden is not evenly distributed among all groups in Wisconsin. For each of the factors listed below, the percentage of SUIDs in each group is shown in the pie graph. By comparison, the bar graph represents the rates among each group. The pie graph does not account for the number of Wisconsin infants born during 2016 in

each group. The bar graph rates allow us to compare the burden of SUID among groups of different sizes. A rate is calculated by dividing the number of infants experiencing a SUID in a given group by the number of infants born in Wisconsin in 2016 in that same group. A comparison of the rates for each factor will be offered in the key takeaway.

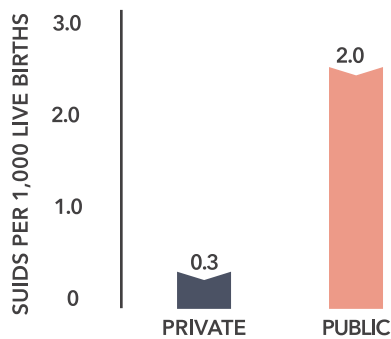
The comparison of rates is intended to guide SUID prevention planning. For example, the rate of SUIDs among women with a high school education is six times higher than women with a college degree (see page 5). This should be considered when planning prevention messages and activities.

Insurance: Insurance type can serve as an indicator of the infant’s socioeconomic position. In 2016, three of every four infants experiencing a SUID had public insurance.

**INFANT INSURANCE AMONG SUID CASES**



**SUID RATE BY INFANT INSURANCE TYPE**



**KEY TAKEAWAY**

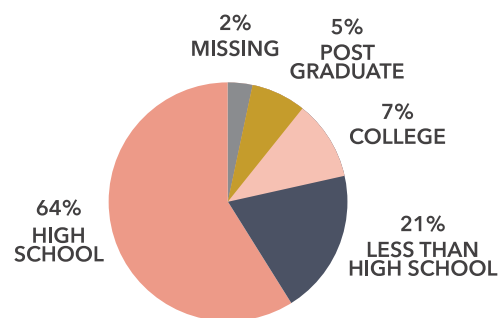
The rate of SUID was 6 times higher among infants with public insurance compared to infants with private insurance.



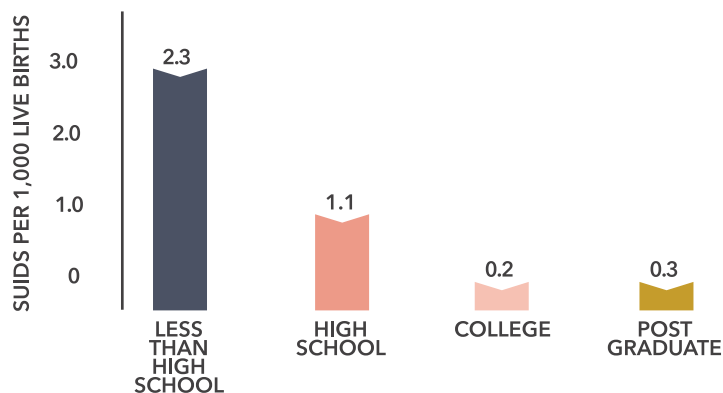
Maternal Educational Attainment: Maternal education also differed among SUIDs. While all mothers were older than 18 years of age at the time of the SUID, not all mothers would have had the opportunity to attend college based upon their ages. Therefore, the information below is restricted to women who were at least 25 years of age at the time of the SUID (N=42). Among mothers at least 25 years of age, more than 60 percent had a high school education or equivalent. When the rates are considered, women at least 25 years of

age with less than a high school education experienced a nearly 12 times higher rate of SUID compared to women with a college degree. Women with a high school degree or equivalent experienced a nearly six times higher rate of SUID compared to women with a college degree.

**MATERNAL EDUCATION AMONG SUID CASES, WOMEN AGE 25 AND OLDER**



**SUID RATE BY MATERNAL EDUCATION, WOMEN AGE 25 AND OLDER**



**KEY TAKEAWAY**



Among infants under the care of a biologic mother at least 25 years of age, the rate of SUID is 6 times higher among women with a high school degree compared to women with a college degree.




**AAP RECOMMENDATION ADHERENCE**

Each of the infants whose death met the SUID criteria was sleeping or in the sleep environment when the incident occurred. The next two pages outline the American Academy of Pediatrics recommendations for a safe infant sleep environment (AAP, 2016). Information about the infant’s sleep environment comes from the scene investigation, caregiver interviews and autopsy findings.

**For each recommendation, the graphic indicates the percentage of SUIDs in which the recommendation was followed at the time of the incident.**


**PRAMS COMPARISON DATA**

The information below includes data from Wisconsin mothers surveyed using the Pregnancy Risk Assessment Monitoring System (PRAMS) in 2016. PRAMS is coordinated by the Wisconsin Department of Health Services and the Centers for Disease Control and Prevention. New mothers are surveyed on a variety of topics related to safe pregnancy and healthy infancy. The survey is designed so the mothers surveyed represent the population of new mothers in Wisconsin during a given year. The PRAMS data are weighted and include a confidence interval (see technical note 1). Where applicable, information from PRAMS is included as a comparison of safe sleep practices among Wisconsin infants born in 2016.



**Recommendation 1: Back to sleep for every sleep.**  
Among SUID cases, 60 percent of infants were placed on their backs to sleep. By comparison, 39 percent were placed on their sides or stomachs to sleep.


PRAMS Comparison: 86 percent of all Wisconsin infants born in 2016 were placed on their backs most often when laid to sleep. (95% Confidence Interval: 82.7, 88.5)



**Recommendation 2: Use a firm sleep surface.**  
In 2016, 29 percent of SUID infants were placed on a recommended surface for sleep, such as a crib, portable crib or bassinet. The most common non-recommended sleep surfaces were an adult bed (34 percent) or a couch or chair (16 percent). A safe sleep surface was available for the majority of SUID infants (77 percent), not present for 16 percent of SUID infants and unknown for 6 percent of SUID


infants. Importantly, not all incidents occurred in the infant’s home. Among SUID cases occurring in the infants’ homes, 81 percent were confirmed to have a recommended sleep surface. Among SUID cases occurring outside the infants’ homes, 67 percent of the locations were confirmed to have a recommended sleep surface.

2016 PRAMS Comparison: 93 percent of Wisconsin infants were usually placed in a crib (portable or non-portable), bassinet or play yard to sleep. (95% Confidence Interval: 90.5, 94.8)



**Recommendation 3: Breastfeeding is recommended.**  
Among SUID cases, 60 percent of infants were fed breast milk at some time since delivery. The regularity of breastfeeding is unknown, but 13 percent of the SUID infants were last fed breast milk before the incident leading to their death.

2016 PRAMS Comparison: 87 percent of Wisconsin infants were breastfed or fed pumped breast milk at some time since delivery. (95% Confidence Interval: 84.0, 89.6)



**Recommendation 4: It is recommended that infants sleep in the parents’ room, close to the parents’ bed, but on a separate surface designed for infants, ideally for the first year of life, but at least for the first 6 months.**  
In 2016, 21 percent of SUID infants were sleeping in the same room as their caregivers, and on a separate surface. Comparatively, 48 percent of SUID infants were sharing both a room and a sleep surface.

2016 PRAMS Comparison: 72 percent of Wisconsin mothers slept the infant in the same room when the infant slept on a separate surface. (95% Confidence Interval: 68.2, 76.1)



**Recommendation 5: Keep soft objects and loose bedding away from the infant's sleep area to reduce the risk of SIDS, suffocation, entrapment and strangulation.**

Among SUID cases, 19 percent of SUID infants were placed in their sleep environment without soft objects or loose bedding. Among SUID infants with soft objects or loose bedding in their sleep environment, an average of two items were present at the time of the incident. A thin blanket or sheet was most common (55 percent), followed by a comforter or quilt (42 percent) and a pillow (35 percent).

19%

2016 PRAMS Comparison: 50 percent of Wisconsin infants were placed in a sleep environment without any soft bedding or loose objects including toys, cushions, pillows, bumper pads or blankets. (95% Confidence Interval: 45.8, 54.7). Among infants who slept with soft objects or loose bedding, a blanket was the most common item (46 percent; 95% Confidence Interval: 42.1, 50.5).

**Recommendation 6: Consider offering a pacifier at naptime and bedtime.**

Use of a pacifier is recommended following establishment of breastfeeding, typically two to three weeks after birth (AAP, 2012). For this recommendation, neonatal SUID infants (less than 28 days of age) were excluded (N=5). Among the remaining SUID cases (N=57), 12 percent of infants were placed to sleep with a pacifier at the time of the incident. Pacifier use was unknown among 21 percent of the SUID infants older than 28 days.

12%

2016 PRAMS Comparison: A comparable survey question was not available.

**Recommendation 7: Avoid smoke exposure during pregnancy and after birth.**

In 2016, slightly more than half (51 percent) of infants were not exposed to smoke prenatally and 52 percent of infants were not exposed to smoke after birth. Absence of prenatal or postnatal smoke exposure was confirmed for 39 percent of SUID cases. Either prenatal or postnatal smoke exposure is unknown for 11 percent of cases.

39%

When the prenatal period is assessed by trimester, 68 percent of SUID infants were not exposed to smoke in the third trimester.

2016 PRAMS Comparison: 88 percent of Wisconsin infants were not exposed to smoke in the third trimester of the pregnancy (95% Confidence Interval: 84.9, 90.9). 86 percent of Wisconsin mothers did not smoke following the birth of their infants (95% Confidence Interval: 82.7, 89.0).

**Recommendation 8: Avoid alcohol and illicit drug use during pregnancy and after birth.**

Among SUID cases, 79 percent of infants were not exposed to alcohol or illicit drug use in the prenatal period and 92 percent of the individuals supervising the infants at the time of the incidents were not impaired by alcohol or illicit drugs.

79%

2016 PRAMS Comparison: 96 percent of Wisconsin mothers did not use any illicit drugs during their pregnancies (95% Confidence Interval: 94.5, 97.7). A comparable survey question on alcohol use was not available.

**Recommendation 9: Avoid overheating and head covering in infants.**

In 2016, 84 percent of SUID cases did not involve overheating and an additional 5 percent of case reports did not specify whether overheating was a factor. The case report does not include a variable on head covering.

84%

2016 PRAMS Comparison: A comparable survey question was not available.

**Recommendation 10: Pregnant women should obtain regular prenatal care.**

Among SUID cases, 79 percent of mothers initiated prenatal care in the first trimester. All mothers received prenatal care, but the number of visits and the month care was initiated are unknown for 19 percent and 15 percent of mothers, respectively. Among the mothers with a known number of visits, the median number of prenatal visits was 10 and the range was 2 to 23 visits. Among mothers with a known date for initiation of prenatal care, the median month of initiation was 2 months and the range was 1 to 7 months. The regularity of prenatal care visits cannot be determined from the available data.

79%

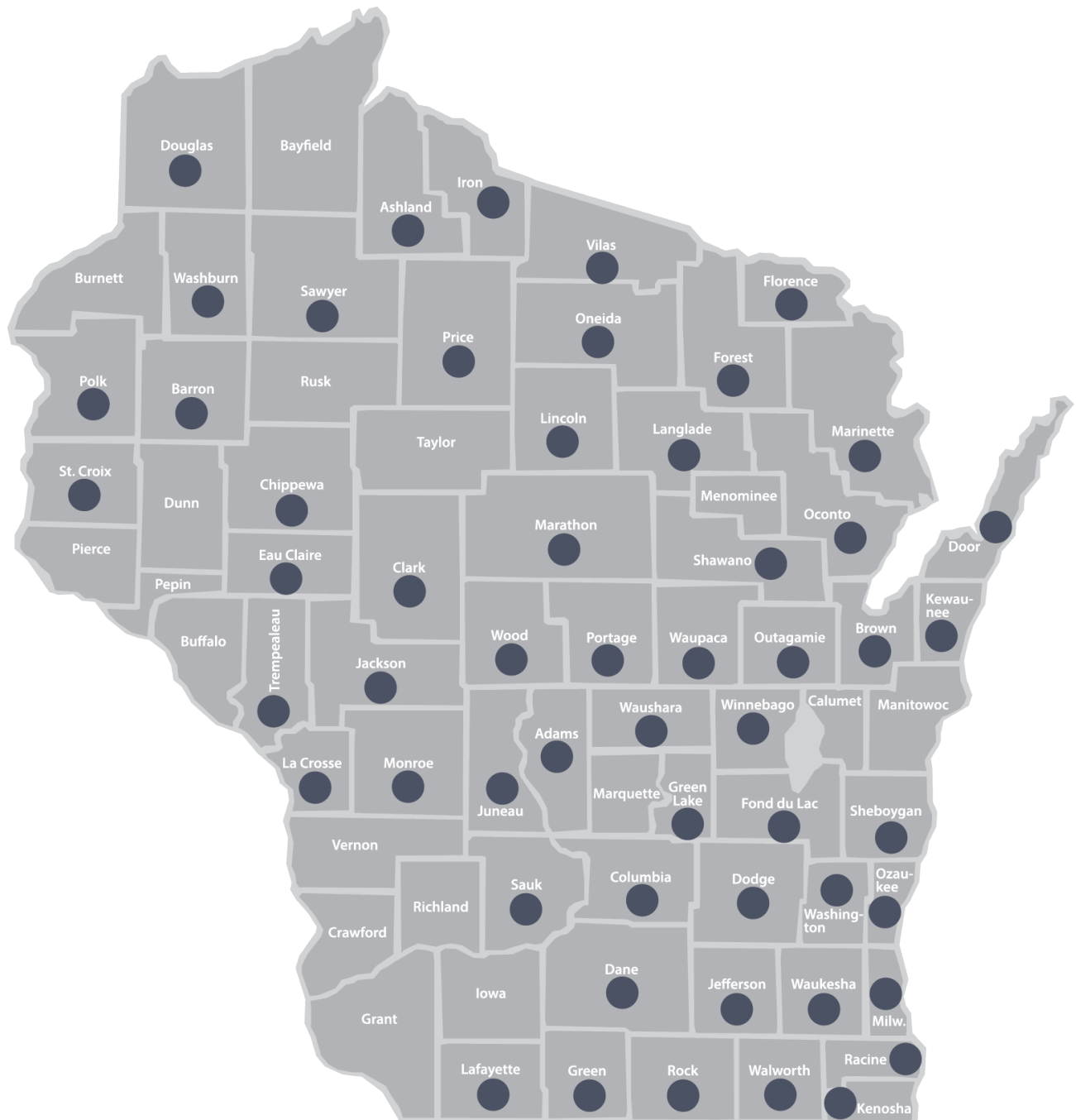
2016 PRAMS Comparison: 89 percent of Wisconsin mothers started prenatal care in the first trimester. (95% Confidence Interval: 86.5, 91.2).



## KEEPING KIDS ALIVE IN WISCONSIN

Keeping Kids Alive in Wisconsin is a program comprised of local child death review and fetal infant mortality review teams. Wisconsin has local review teams in more than 50 counties as indicated on the map below. These teams are multidisciplinary and prevention focused, working to improve the health and safety of children in their

communities. Our understanding of the risk factors and circumstances surrounding these SUIDs comes from review of the deaths by local review teams (see technical note 3). For more information on starting a local review team in your county, please contact Karen Nash, program manager, at [knash@chw.org](mailto:knash@chw.org).





## SLEEP BABY SAFE

Children’s Health Alliance of Wisconsin has partnered with the Wisconsin Department of Health Services Maternal and Child Health Title V program to support tribal and local health departments in addressing infant safe sleep. Sleep Baby Safe is a suite of trainings and resources designed for professionals working with families to take safe sleep messaging from a campaign to a conversation. These resources are available to enhance local efforts to promote a consistent, clear and concise message on infant safe sleep.

Using a train-the-trainer format, Alliance staff can help local health departments and tribal agencies to plan safe sleep trainings for professionals, such as home visitors, medical professionals and child care providers. The Sleep Baby Safe trainings provide research-based information about the importance of safe sleep messaging, share the American Academy of Pediatrics (AAP) recommendations and provide a framework for having conversations on the topic. In addition to the in-person trainings, the Alliance provides online modules which can be used for refresher training.

The Alliance also manages Newborn Nest, a baby box program developed from Sleep Baby Safe and funded

through Children’s Hospital of Wisconsin Foundation. Baby boxes can be used as a temporary resource for families who need an additional safe sleep environment for their newborn. The program emphasizes the importance of securing a long-term safe sleep area such as a crib or Pack ‘n Play. The Newborn Nest program includes comprehensive training, follow-up and evaluation for agencies who choose to participate.

Find these and other resources on the Sleep Baby Safe page of the Alliance website: [www.chawisconsin.org/sbs/](http://www.chawisconsin.org/sbs/):

- Safe sleep video for families
- Sleep Baby Safe table talk handouts
- ABCs of safe sleep handout
- Sleep Baby Safe refresher notebook



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## TECHNICAL NOTES

1. Wisconsin PRAMS data are weighted by the CDC to approximate representation of the entire state population of women who recently gave birth. All percentages are based on weighted survey responses. The confidence limits given reflect the probable range of true population percentages.
2. The count of cases from ICD-10 codes of R95 (sudden infant death syndrome), R99 (other ill-defined and unspecified causes) and W75 (accidental suffocation and strangulation in bed) statewide was 48 in 2014, 48 in 2015 and 54 in 2016 (CDC NCHS, 2018).
3. For deaths occurring in counties without a child death review team, the death was reviewed as a de-identified case by the Child Death Review State Advisory Council.



## TECHNICAL ASSISTANCE

This report was prepared by Amy Parry, MPH, Data Project Manager at Children’s Health Alliance of Wisconsin, with contributions from Angela Kempf Rohan, PhD, and Fiona Weeks, MSPH, at Wisconsin Department of Health Services. The Alliance Injury Prevention and Death Review technical assistance team listed below also contributed to this report.

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