

Sleep-Related Infant Deaths in Michigan (2010-2020)

The Centers for Disease Control and Prevention's Division of Reproductive Health supports Sudden Unexpected Infant Death (SUID) monitoring programs in 22 states and jurisdictions, covering about 1 in 3 SUID cases in the United States. The SUID Case Registry builds on local child death review programs and uses the National Center for Fatality Review and Prevention's Case Reporting System to compile information about the circumstances associated with SUID cases as well as information about investigations into these deaths. Participating states and jurisdictions use data about SUID trends and circumstances to develop strategies to prevent future fatalities.

The SUID Case Registry first began in Michigan in 2010. Since that time, comprehensive information about the circumstances associated with the deaths of all Michigan resident infants due to sleep-related causes has been compiled. In Michigan, sleep-related infant deaths are defined as deaths to infants less than 1 year of age that occur suddenly and unexpectedly due to:

- Suffocation/Positional Asphyxia;
- Sudden Infant Death Syndrome (SIDS);
- Undetermined/Sudden Unexpected Infant Death (SUID); and
- Other causes when the sleep environment was likely to have contributed to the death.

Additional information about sleep-related infant deaths in Michigan can be found on the Data, Reports & Fact Sheets page on the Michigan Fatality Review and Prevention website (URL: <https://mifrp.org/publications/>).

Sources

Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2023. Birth data are from the Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2023.

Citation

Centers for Disease Control and Prevention (CDC) SUID Case Registry – 2010 to 2020, Michigan Public Health Institute, 2023.

Contact

Please contact Katie Hubbard, Senior Project Coordinator at the Michigan Public Health Institute, at khubbard@mphi.org with any questions.

Date: June 26, 2023

Table 01. Sleep-Related Infant Deaths by Year (2010-2020)

Year	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI (L – U)
2010	140	114,717	1.2	1.0 – 1.4
2011	147	114,159	1.3	1.1 – 1.5
2012	131	112,708	1.2	1.0 – 1.4
2013	142	113,732	1.2	1.0 – 1.5
2014	152	114,460	1.3	1.1 – 1.5
2015	159	113,211	1.4	1.2 – 1.6
2016	142	113,374	1.3	1.0 – 1.5
2017	123	111,507	1.1	0.9 – 1.3
2018	151	110,093	1.4	1.2 – 1.6
2019	149	107,917	1.4	1.2 – 1.6
2020	161	104,149	1.5	1.3 – 1.8
2010-2020	1,597	1,230,027	1.3	1.2 – 1.4

Summary:

From 2010 to 2020, an average of 1.3 Michigan infants died due to sleep-related causes per 1,000 live births. While a minor increase or decrease may appear between years, there was no clear trend showing either an increase or decrease in the state rate.

**Table 02. Sleep-Related Infant Deaths – Three-Year Moving Averages
(2010-2020)**

Years	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI (L – U)
2010 – 2012	418	341,584	1.2	1.1 – 1.3
2011 – 2013	420	340,599	1.2	1.1 – 1.4
2012 – 2014	425	340,900	1.2	1.1 – 1.4
2013 – 2015	453	341,403	1.3	1.2 – 1.4
2014 – 2016	453	341,045	1.3	1.2 – 1.5
2015 – 2017	424	338,092	1.3	1.1 – 1.4
2016 – 2018	416	334,974	1.2	1.1 – 1.4
2017 – 2019	423	329,517	1.3	1.2 – 1.4
2018 – 2020	461	322,159	1.4	1.3 – 1.6

Summary:

Table 01 presented the rate of death from sleep-related causes for Michigan infants by year. Using three-year moving averages, Table 02 also shows that the rate of death has not changed significantly over time.

Table 03. Sleep-Related Infant Deaths by Infant's Residence (2010-2020)

Notes: ^ Jurisdictions with fewer than six deaths are excluded from this analysis. Rates are excluded for jurisdictions with fewer than 20 deaths due to instability in rates with small numbers. Suppressed information is indicated with a caret (^) in the cell.

* An asterisk (*) indicates a statistically significant difference from the overall Michigan rate of sleep-related infant death at the 95% confidence level.

+ County of birth was unknown for 24 Michigan infants.

Jurisdiction	Number of Deaths [^]	Number of Live Births ⁺	Rate per 1,000 Live Births [^]	95% CI (L – U)
Alcona County	^	688	^	^
Alger County	0	650	^	^
Allegan County	9	14,913	^	^
Alpena County	0	2,888	^	^
Antrim County	^	2,094	^	^
Arenac County	^	1,398	^	^
Baraga County	^	820	^	^
Barry County	7	7,010	^	^
Bay County	11	11,340	^	^
Benzie County	0	1,680	^	^
Berrien County	42	19,328	2.2*	1.6 – 2.9
Branch County	7	5,961	^	^
Calhoun County	26	17,629	1.5	1.0 – 2.2
Cass County	6	5,289	^	^
Charlevoix County	^	2,565	^	^
Cheboygan County	^	2,217	^	^
Chippewa County	^	3,716	^	^
Clare County	7	3,554	^	^
Clinton County	^	8,778	^	^
Crawford County	^	1,296	^	^
Delta County	^	3,898	^	^
Dickinson County	^	2,722	^	^
Eaton County	8	12,745	^	^
Emmet County	^	3,220	^	^
Genesee County	108	52,780	2.0*	1.7 – 2.4
Gladwin County	6	2,762	^	^
Gogebic County	^	1,350	^	^
Grand Traverse County	9	10,002	^	^

Table 03. Sleep-Related Infant Deaths by Infant's Residence (2010-2020)
Continued

Jurisdiction	Number of Deaths [^]	Number of Live Births ⁺	Rate per 1,000 Live Births [^]	95% CI (L – U)
Gratiot County	6	4,411	^	^
Hillsdale County	^	5,853	^	^
Houghton County	^	4,089	^	^
Huron County	^	3,268	^	^
Ingham County	48	34,919	1.4	1.0 – 1.8
Ionia County	11	7,893	^	^
Iosco County	9	2,519	^	^
Iron County	^	997	^	^
Isabella County	8	7,165	^	^
Jackson County	24	19,451	1.2	0.8 – 1.8
Kalamazoo County	49	33,929	1.4	1.1 – 1.9
Kalkaska County	0	1,924	^	^
Kent County	83	95,325	0.9*	0.7 – 1.1
Keweenaw County	^	180	^	^
Lake County	0	1,070	^	^
Lapeer County	10	8,924	^	^
Leelanau County	^	1,820	^	^
Lenawee County	10	11,278	^	^
Livingston County	14	19,495	^	^
Luce County	^	580	^	^
Mackinac County	0	933	^	^
Macomb County	60	101,252	0.6*	0.5 – 0.8
Manistee County	^	2,131	^	^
Marquette County	7	6,766	^	^
Mason County	0	3,133	^	^
Mecosta County	9	4,607	^	^
Menominee County	^	2,153	^	^
Midland County	12	9,389	^	^
Missaukee County	^	1,919	^	^
Monroe County	28	16,807	1.7	1.1 – 2.4
Montcalm County	12	7,859	^	^
Montmorency County	^	747	^	^
Muskegon County	38	22,854	1.7	1.2 – 2.3

Table 03. Sleep-Related Infant Deaths by Infant's Residence (2010-2020)
Continued

Jurisdiction	Number of Deaths [^]	Number of Live Births ⁺	Rate per 1,000 Live Births [^]	95% CI (L – U)
Newaygo County	14	5,984	^	^
Oakland County	106	145,338	0.7*	0.6 – 0.9
Oceana County	^	3,256	^	^
Ogemaw County	7	2,077	^	^
Ontonagon County	0	324	^	^
Osceola County	^	2,881	^	^
Oscoda County	^	950	^	^
Otsego County	^	2,728	^	^
Ottawa County	25	36,212	0.7*	0.4 – 1.0
Presque Isle County	0	1,030	^	^
Roscommon County	^	1,796	^	^
Saginaw County	47	24,457	1.9*	1.4 – 2.6
St. Clair County	25	17,128	1.5	0.9 – 2.2
St. Joseph County	13	8,631	^	^
Sanilac County	^	4,776	^	^
Schoolcraft County	0	740	^	^
Shiawassee County	6	7,697	^	^
Tuscola County	11	5,976	^	^
Van Buren County	8	9,671	^	^
Washtenaw County	39	40,053	1.0	0.7 – 1.3
Wayne County	521	255,009	2.0*	1.9 – 2.2
<i>City of Detroit</i>	<i>370</i>	<i>107,885</i>	<i>3.4*</i>	<i>3.1 – 3.8</i>
<i>Out-Wayne County</i>	<i>151</i>	<i>147,124</i>	<i>1.0*</i>	<i>0.9 – 1.2</i>
Wexford County	10	4,356	^	^
Michigan	1,597	1,230,027	1.3	1.2 – 1.4

Summary:

The rate of sleep-related infant death varies by jurisdiction across the state of Michigan. The following jurisdictions had statistically significantly higher rates of sleep-related infant death than the overall rate of sleep-related infant death for the state of Michigan: Berrien County, Genesee County, Saginaw County, Wayne County, and the City of Detroit. The following jurisdictions had statistically significantly lower rates of sleep-related infant death than the overall rate of sleep-related infant death for the state of Michigan: Kent County, Macomb County, Oakland County, Ottawa County, and Out-Wayne County (excluding the City of Detroit).

Table 04. Sleep-Related Infant Deaths by Prosperity Region (2010-2020)

Notes: ^ The total number of sleep-related infant deaths for Prosperity Regions 5, 7, and 9 have been suppressed as reporting the number of deaths for each of these Prosperity Regions would inadvertently release the number of sleep-related infant deaths for an individual county with a count fewer than 6. Suppressed information is indicated with a caret (^) in the cell.

* An asterisk (*) indicates a statistically significant difference from the overall Michigan rate of sleep-related infant death at the 95% confidence level.

+ The sum of the number of live births reported for all 10 Prosperity Regions does not equal the total number of live births reported for Michigan as county of birth was unknown for 24 Michigan infants.

Prosperity Region	Number of Deaths [^]	Number of Live Births ⁺	Rate per 1,000 Live Births [^]	95% CI (L – U)
Region 1	35	29,918	1.2	0.8 – 1.6
Region 2	31	31,711	1.0	0.7 – 1.4
Region 3	38	18,936	2.0*	1.4 – 2.8
Region 4	213	212,997	1.0*	0.9 – 1.1
Region 5	^	64,476	^	^
Region 6	164	100,549	1.6*	1.4 – 1.9
Region 7	^	56,442	^	^
Region 8	151	100,438	1.5	1.3 – 1.7
Region 9	^	112,937	^	^
Region 10	687	501,599	1.4	1.3 – 1.5
Michigan	1,597	1,230,027	1.3	1.2 – 1.4

Summary:

The rate of sleep-related infant death varies by jurisdiction across the state of Michigan. From 2010 to 2020, Prosperity Regions 3 and 6 each had a rate of sleep-related infant death that was statistically significantly higher than the overall rate of sleep-related infant death for the state of Michigan. During this same time period, Prosperity Region 4 had a rate of sleep-related infant death that was statistically significantly lower than the overall rate of sleep-related infant death for the state of Michigan. Please note that Prosperity Region 3 had the widest confidence interval out of all 10 Prosperity Regions.

Table 05. Infant's Race (2010-2020)

Notes: ^ Rates are not calculated for groups with fewer than 20 deaths due to instability in rates with small numbers. Suppressed information is indicated with a caret (^) in the cell.

* An asterisk (*) indicates a statistically significant difference from the overall Michigan rate of sleep-related infant death at the 95% confidence level.

+ American Indian race includes infants who were identified as American Indian alone or in combination with one or more additional races. Additional Groups includes infants of all other races as well as those of multiple races, excluding infants who were identified as American Indian alone or in combination with one or more additional races.

Race ⁺	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births [^]	95% CI (L – U)
American Indian	112	55,452	2.0*	1.6 – 2.4
Asian or Pacific Islander Only	10	38,418	^	^
Black Only	694	223,917	3.1*	2.9 – 3.3
White Only	672	825,819	0.8*	0.8 – 0.9
Additional Groups	104	75,519	1.4	1.1 – 1.6
Unknown	5	10,902	^	^

Summary:

Significant racial disparities exist among all child deaths, including infant deaths due to sleep-related causes, due to inequities rooted in systemic and structural racism, including historical trauma, that unfairly disadvantage some individuals and communities.

Although racial identity is unique to every individual, and no single term can encompass the experiences of a diverse group of people, in this report we use the term "Black" to maintain consistency with how race data are recorded in the National Fatality Review-Case Reporting System. In alignment with the language presented in the Urban Institute's brief, *What Happens When People Face Unfair Treatment or Judgment When Applying for Public Assistance or Social Services?*, we have also "capitalized Black to denote the unique Black experience as one characteristic of a diverse group of people, ethnicities, and cultures ... (and) have not capitalized white, a term and label for a range of historically grouped ethnicities used to delineate a contrast with people of color."

The data presented in Table 04 should not be compared to any previous iterations of this table as methodological changes were made to better identify American Indian infants. Prevailing data collection and analysis practices often misclassify American Indian and Alaska Native (AIAN) populations, leading to an underestimation and suppression of data due to small numbers. Not being counted is consistent with historical attempts to eliminate or assimilate AIAN people. In accordance with recommendations made by the Urban Indian Health Institute, in this report, American Indian infants are those who were identified as American Indian, alone or in combination with one or more additional races, on the infant's death certificate. This definition is inclusive of ancestry and Tribal affiliation identified on the death record. Similarly, American Indian live births are births to childbearing and/or non-childbearing parents who were identified

as American Indian, alone or in combination with one or more additional races, on the infant's birth abstract. This definition is also inclusive of ancestry.

In Michigan, Black infants were 3.8 times more likely to die due to sleep-related causes than white infants (3.1 sleep-related infant deaths per 1,000 live births for Black infants compared to 0.8 sleep-related infant deaths per 1,000 live births for white infants). Compared to white infants, American Indian infants were 2.5 times more likely to die due to sleep-related causes (2.0 sleep-related infant deaths per 1,000 live births for American Indian infants compared to 0.8 sleep-related infant deaths per 1,000 live births for white infants).

Table 06. Infant's Ethnicity (2010-2020)

Ethnicity	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Hispanic or Latinx	119	7.5	84,297	6.9
Not Hispanic or Latinx	1,465	91.7	1,142,069	92.8
Unknown	13	0.8	3,661	0.3

Summary:

The rate of death from sleep-related causes for Hispanic/Latinx infants was not different from the rate of death from sleep-related causes for infants who are not Hispanic/Latinx.

Table 07. Infant's Age at Time of Death (2010-2020)

Infant's Age	Number	%
Less than 1 Month	184	11.5
1 Month	320	20.0
2 Months	299	18.7
3 Months	224	14.0
4 Months	165	10.3
5 Months	131	8.2
6 Months	89	5.6
7 Months	66	4.1
8 Months	43	2.7
9 Months	30	1.9
10 Months	27	1.7
11 Months	19	1.2

Summary:

Three out of four (74.6%) sleep-related infant deaths occurred before the infant was five months old.

Table 08. Infant's Gestational Age (2010-2020)

Gestational Age	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Less Than 37 Weeks	351	22.0	123,423	10.0
37 Weeks or More	1,231	77.1	1,105,693	89.9
Unknown	15	0.9	911	0.1

Summary:

From 2010 to 2020, 10% of live births in Michigan were born before 37 weeks gestation. During that same time period, 22% of infants who died due to sleep-related causes were born before 37 weeks gestation. Of the infants born prior to 37 weeks gestation, the rate of sleep-related death was 2.8 per 1,000 live births. Of the infants born at 37 weeks or greater gestation, the rate of sleep-related death was 1.1 per 1,000 live births.

Infants who are born prior to 37 weeks gestation are at an increased risk of dying due to sleep-related causes. In Michigan, infants born prior to 37 weeks gestation were 2.6 times more likely to die in a sleep environment than infants who were born at or greater than 37 weeks gestation.

Table 09. Infant's Birthweight (2010-2020)

Birthweight	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Less Than 2,500 Grams	349	21.9	105,109	8.5
2,500 Grams or More	1,225	76.8	1,124,478	9.4
Unknown	23	1.4	440	<0.1

Summary:

From 2010 to 2020, babies born weighing less than 2,500 grams accounted for 8.5% of all live births in Michigan. During that same time period, 21.9% of infants who died due to sleep-related causes were born weighing less than 2,500 grams. Of the infants born weighing less than 2,500 grams, the rate of sleep-related death was 3.3 per 1,000 live births. Of the infants born weighing 2,500 grams or more, the rate of sleep-related death was 1.1 per 1,000 live births.

Infants who are born weighing less than 2,500 grams are at an increased risk of dying due to sleep-related causes. In Michigan, infants born weighing less than 2,500 grams were 3.0 times more likely to die in a sleep environment than infants who were born weighing greater than or equal to 2,500 grams.

Table 10. Infant's Insurance Type (2010-2020)

Notes: + Other insurance type includes multiple types of insurance coverage as well as other types of insurance, such as TRICARE or the Indian Health Service.

~ Live births to Michigan residents by source of payment for the birth.

Insurance Type	Sleep-Related Infant Deaths		All Live Births~	
	Number	%	Number	%
Private Insurance	272	17.0	667,446	54.3
Medicaid or State Plan	1,221	76.5	528,985	43.0
Other Insurance Type+	23	1.4	9,762	0.8
No Insurance or Self-Pay	8	0.5	18,595	1.5
Unknown	73	4.6	5,239	0.4

Summary:

More than 3 out of 4 Michigan infants who died due to sleep-related causes from 2010 to 2020 had publicly-funded healthcare coverage. During this same time period, 43% of all live births were paid for with publicly-funded healthcare coverage.

Table 11. NICU Admission (2010-2020)

NICU Admission	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	286	17.9	90,768	7.4
No	1,257	78.7	1,133,454	92.1
Unknown	54	3.4	5,805	0.5

Summary:

From 2010 to 2020, 7.4% of all live births in Michigan had been admitted to the NICU. During that same time period, 17.9% of infants who died due to sleep-related causes had been admitted to the NICU. Of the infants who had been admitted to the NICU, the rate of sleep-related death was 3.2 per 1,000 live births. Of the infants who had not been admitted to the NICU, the rate of sleep-related death was 1.1 per 1,000 live births.

Infants who had been admitted to the NICU are at an increased risk of dying due to sleep-related causes. In Michigan, infants who had been admitted to the NICU were 2.8 times more likely to die in a sleep environment than infants who were not admitted to the NICU.

Table 12. Childbearing Parent Smoked During Pregnancy (2010-2020)

Childbearing Parent Smoked During Pregnancy	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	723	45.3	208,533	17.0
No	820	51.3	1,009,435	82.1
Unknown	54	3.4	12,059	1.0

Summary:

From 2010 to 2020, 17% of all live births in Michigan were born to a childbearing parent who smoked during pregnancy. During that same time period, 45.3% of infants who died due to sleep-related causes were born to a childbearing parent who smoked during pregnancy. Of the infants born to a childbearing parent who smoked during pregnancy, the rate of sleep-related death was 3.5 per 1,000 live births. Of the infants born to a childbearing parent who did not smoke during pregnancy, the rate of sleep-related death was 0.8 per 1,000 live births.

Infants who are born to a childbearing parent who smoked during pregnancy are at an increased risk of dying due to sleep-related causes. In Michigan, infants born to a childbearing parent who smoked during pregnancy were 4.3 times more likely to die in a sleep environment than infants who were born to a childbearing parent who did not smoke during pregnancy.

Table 13. Infant's Childbearing Parent Planned to or Initiated Breastfeeding (2010-2020)

Childbearing Parent Planned to or Initiated Breastfeeding	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	886	55.5	977,255	79.4
No	679	42.5	236,535	19.2
Unknown	32	2.0	16,237	1.3

Summary:

From 2010 to 2020, 79.4% of all live births in Michigan were born to a childbearing parent who planned to or initiated breastfeeding. During that same time period, only 55.5% of infants who died due to sleep-related causes were born to a childbearing parent who planned to or initiated breastfeeding. Of the infants born to a childbearing parent who planned to or initiated breastfeeding, the rate of sleep-related death was 0.9 per 1,000 live births. Of the infants born to a childbearing parent who did not initiate breastfeeding, the rate of sleep-related death was 2.9 per 1,000 live births.

Infants who are born to a childbearing parent who did not initiate breastfeeding are at an increased risk of dying due to sleep-related causes. In Michigan, infants born to a childbearing parent who did not initiate breastfeeding were 3.2 times more likely to die in a sleep environment than infants who were born to a childbearing parent who planned to or initiated breastfeeding. The protective effect of breastfeeding increases with exclusivity. However, any breastfeeding has been shown to be more protective against deaths from sleep-related causes than no breastfeeding.

Table 14. Incident Sleep Place (2010-2020)

Notes: + Examples of other unsafe places include child/toddler beds and couch cushions that were used as a sleep place, but were not on the couch.

Incident Sleep Place	Number	%
Crib/Bassinet (including portable cribs)	350	21.9
Adult Bed (including air mattresses, futons, and waterbeds)	792	49.6
Couch/Chair	230	14.4
Rocking Inclined Sleeper/Swing/Bouncy Chair	42	2.6
Playpen (not a portable crib)	22	1.4
Floor	39	2.4
Car Seat	49	3.1
Other Unsafe Place ⁺	23	1.4
Unknown	50	3.1

Summary:

About half (49.6%) of the infants who died due to sleep-related causes were found unresponsive in an adult bed. In total, three in four (75%) of the infants were found in an unsafe sleep place. Only 21.9% of infants who died due to sleep-related causes were found in a crib or bassinet.

Table 15. Sleep Surface Sharing with People and/or Animals (2010-2020)

Infant Shared Sleep Surface with People and/or Animals	Number	%
Yes	919	57.5
No	596	37.3
Unknown	82	5.1

Summary:

Almost six out of ten (57.5%) infants who died due to sleep-related causes shared a sleep surface with other people and/or animals at the time of the incident. These numbers do not account for the presence of other objects, such as pillows or blankets, in the sleep environment.

Table 16. Objects in the Sleep Environment [Excluding People or Animals] (2010-2020)

Number of Objects Present	Number	%
One	499	45.2
Two	354	32.1
Three	185	16.8
More Than Three	65	5.9
Total	1,103	100

Summary:

An object was documented to be present in the sleep environment in 1,103 of the 1,597 sleep-related infant deaths (69%) that occurred from 2010 to 2020.

"Object" excludes adults and/or other children as well as animals. "Object" also excludes the incident sleep place itself (e.g., a mattress or couch cushions) as well as other items that are sometimes listed as an object present in the sleep environment (e.g., the wall or crib railing) even if these items likely contributed to the infant's death (e.g., being found wedged between the wall and a mattress). Examples of included objects are comforters, quilts, thin blankets, flat sheets, pillows, nursing or U-shaped pillows, sleep positioners, bumper pads, clothing, bottles, and toys or stuffed animals.