

Sleep-Related Infant Deaths in Michigan



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2010-2018 Centers for Disease Control and Prevention
Sudden Unexpected Infant Death Case Registry Data



Report created by the
Center for Child and Family
Health (CCFH) at MPHI.

Published in September 2020

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Sleep-Related Infant Deaths in Michigan (2010-2018)

Introduction

The Centers for Disease Control and Prevention’s Division of Reproductive Health supports Sudden Unexpected Infant Death (SUID) monitoring programs in a number of 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 the 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, data has been gathered on all sleep-related infant deaths in each of the 83 counties in the state. In Michigan, a sleep-related infant death is defined as the death of an infant less than 1 year of age that occurs suddenly and unexpectedly, including:

- 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 select jurisdictions in Michigan can be found on the [Data, Reports & Fact Sheets page on the Keeping Kids Alive website](https://www.keepingkidsalive.org/publications/) (URL: <https://www.keepingkidsalive.org/publications/>).

The following report provides an in-depth look at sleep-related infant deaths in the state of Michigan that occurred from 2010 to 2018. Please contact Katie Hubbard, Senior Project Coordinator at the Michigan Public Health Institute, at khubbard@mphi.org with any questions.

Requested Citation:

Centers for Disease Control and Prevention (CDC) SUID Case Registry – 2010 to 2018, Michigan Public Health Institute, 2020.

Section 1: Sleep-Related Infant Deaths in Michigan

Table 01. Sleep-Related Infant Deaths by Year (2010-2018)

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
2010-2018	1,287	1,017,961	1.3	1.1	1.4
<p>Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>					

Summary:

From 2010 to 2018, the rate of death from sleep-related causes in Michigan remained remarkably stable. 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 (2010-2018)

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

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Table 01 presented the rate of death from sleep-related causes 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 in Selected Jurisdictions (2010-2018)

Jurisdiction [^]	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Allegan Co.	7	12,373	-	-	-
Barry Co.	6	5,788	-	-	-
Bay Co.	9	9,487	-	-	-
Berrien Co.	36	16,206	2.2**	1.6	3.1
Branch Co.	7	4,850	-	-	-
Calhoun Co.	21	14,678	1.4	0.9	2.2
Clare Co.	7	2,920	-	-	-
City of Detroit	301	89,735	3.4**	3.0	3.7
Genesee Co.	87	43,900	2.0**	1.6	2.4
Grand Traverse Co.	8	8,286	-	-	-
Gratiot Co.	6	3,628	-	-	-
Ingham Co.	32	29,050	1.1	0.8	1.6
Ionia Co.	10	6,576	-	-	-
Iosco Co.	8	2,074	-	-	-
Isabella Co.	6	5,947	-	-	-
Jackson Co.	18	16,098	-	-	-
Kalamazoo Co.	40	28,167	1.4	1.0	1.9
Kent Co.	66	78,983	0.8**	0.6	1.1
Lapeer Co.	9	7,359	-	-	-
Lenawee Co.	9	9,357	-	-	-
Livingston Co.	13	16,006	-	-	-
Macomb Co.	47	83,281	0.6**	0.4	0.8
Mecosta Co.	9	3,810	-	-	-
Midland Co.	11	7,740	-	-	-
Monroe Co.	18	13,753	-	-	-
Montcalm Co.	11	6,492	-	-	-
Muskegon Co.	32	19,014	1.7	1.2	2.4
Newaygo Co.	10	4,916	-	-	-
Oakland Co.	85	120,141	0.7**	0.6	0.9

Table 03. Sleep-Related Infant Deaths in Selected Jurisdictions (2010-2018)
Continued

Jurisdiction [^]	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Ogemaw Co.	7	1,720	-	-	-
Ottawa Co.	20	29,899	0.7**	0.4	1.0
Cities of Pontiac/Southfield	29	16,683	1.7	1.2	2.5
Saginaw Co.	37	20,344	1.8	1.3	2.5
Saint Clair Co.	18	14,104	-	-	-
Saint Joseph Co.	11	7,201	-	-	-
Shiawassee Co.	6	6,347	-	-	-
Tuscola Co.	8	4,948	-	-	-
Van Buren Co.	8	7,986	-	-	-
Washtenaw Co.	32	33,238	1.0	0.7	1.4
Wayne Co.	418	210,729	2.0**	1.8	2.2
Out-Wayne Co.*	117	120,994	1.0**	0.8	1.1
Wexford Co.	10	3,612	-	-	-
Michigan	1,287	1,017,961	1.3	1.2	1.4

[^] Jurisdictions with fewer than six deaths are excluded from this analysis; rates are excluded for areas with fewer than 20 deaths due to instability in rates with small numbers of deaths.
* Out-Wayne County excludes the City of Detroit.
** Statistically significant difference from the overall Michigan rate at the 95% confidence level.
Sources: Death data are by county of residence from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

The rate of sleep-related infant death varies by jurisdiction across the state of Michigan. The counties of Berrien, Genesee, and Wayne, as well as the city of Detroit, had rates of sleep-related infant death that were statistically significantly higher than the overall rate of sleep-related infant death for the state of Michigan. The counties of Kent, Macomb, Oakland, Ottawa, and Out-Wayne (Wayne County excluding the city of Detroit) all had rates of sleep-related infant death that were statistically significantly lower than the overall rate of sleep-related infant death for the state of Michigan.

Table 04. Sleep-Related Infant Deaths in Selected Jurisdictions – Three-Year Moving Averages (2010-2018)

Years	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
City of Detroit					
2010-2012	87	31,360	2.8	2.2	3.4
2011-2013	92	30,542	3.0	2.4	3.7
2012-2014	97	30,022	3.2	2.6	3.9
2013-2015	105	29,836	3.5	2.8	4.2
2014-2016	100	29,132	3.4	2.8	4.1
2015-2017	99	28,958	3.4	2.8	4.2
2016-2018	109	28,539	3.8	3.1	4.5
Genesee Co.					
2010-2012	27	15,149	1.8	1.2	2.6
2011-2013	25	14,917	1.7	1.1	2.5
2012-2014	31	14,897	2.1	1.4	3.0
2013-2015	32	14,710	2.2	1.5	3.1
2014-2016	39	14,524	2.7	1.9	3.7
2015-2017	31	14,269	2.2	1.5	3.1
2016-2018	28	14,041	2.0	1.3	2.9
Kent Co.					
2010-2012	25	26,350	0.9	0.6	1.4
2011-2013	21	26,591	0.8	0.5	1.2
2012-2014	21	26,676	0.8	0.5	1.2
2013-2015	21	26,541	0.8	0.5	1.2
2014-2016	25	26,504	0.9	0.6	1.4
2015-2017	23	26,302	0.9	0.6	1.3
2016-2018	20	26,092	0.8	0.5	1.2

Table 04. Sleep-Related Infant Deaths in Selected Jurisdictions – Three-Year Moving Averages (2010-2018) Continued

Years	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Oakland Co.					
2010-2012	36	39,732	0.9	0.6	1.3
2011-2013	38	40,098	0.9	0.7	1.3
2012-2014	29	40,206	0.7	0.5	1.0
2013-2015	25	40,446	0.6	0.4	0.9
2014-2016	18	40,628	0.4	0.3	0.7
2015-2017	24	40,358	0.6	0.4	0.9
2016-2018	24	39,963	0.6	0.4	0.9
Wayne Co.					
2010-2012	121	71,004	1.7	1.4	2.0
2011-2013	122	70,447	1.7	1.4	2.0
2012-2014	129	70,087	1.8	1.5	2.2
2013-2015	146	70,447	2.1	1.7	2.4
2014-2016	144	69,964	2.1	1.7	2.4
2015-2017	142	69,855	2.0	1.7	2.4
2016-2018	151	69,278	2.2	1.8	2.5
Out-Wayne Co.*					
2010-2012	34	39,644	0.9	0.6	1.2
2011-2013	30	39,905	0.8	0.5	1.1
2012-2014	32	40,065	0.8	0.5	1.1
2013-2015	41	40,611	1.0	0.7	1.4
2014-2016	44	40,832	1.1	0.8	1.4
2015-2017	43	40,897	1.1	0.8	1.4
2016-2018	42	40,739	1.0	0.7	1.4
* Out-Wayne County excludes the City of Detroit.					
Sources: Death data are by county of residence from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.					

Summary:

Three-year moving averages are presented for selected jurisdictions in order to identify any increase or decrease in the rate of sleep-related infant death over time in those jurisdictions. Although not statistically significant, the average rate of sleep-related infant death in the city of Detroit increased from 2.8 deaths per 1,000 live births in 2010-2012 to 3.8 deaths per 1,000 live births in 2016-2018 and, similarly, the average rate of sleep-related infant death in Wayne County (which includes the city of Detroit) increased from 1.7 deaths per 1,000 live births in 2010-2012 to 2.2 deaths per 1,000 live births in 2016-2018. In Genesee County, the average rate of sleep-related infant death increased from 1.8 deaths per 1,000 live births in 2010-2012 to 2.0 deaths per 1,000 live births in 2016-2018. As with the city of Detroit and Wayne County, this increase was not statistically significant. In Oakland County, the average rate of sleep-related infant death decreased from 0.9 deaths per 1,000 live births in 2010-2012 to 0.6 deaths per 1,000 live births in 2016-2018. This decrease was not statistically significant. Since 2010, the average rate of sleep-related infant death per 1,000 live births has remained steady in Kent County and in Out-Wayne County (Wayne County excluding the city of Detroit).

Table 05. Sleep-Related Infant Deaths by Year of Death in Selected Jurisdictions (2010-2018)

Jurisdiction	2010	2011	2012	2013	2014	2015	2016	2017	2018	Total (2010-2018)	Average
Berrien Co.	-	9	-	-	-	-	-	-	-	36	4.0
Genesee Co.	8	9	10	6	15	11	13	7	8	87	9.7
Ingham Co.	-	-	-	7	-	6	-	-	-	32	3.6
Kalamazoo Co.	8	-	-	7	-	8	0	6	-	40	4.4
Kent Co. ⁺	See Table 4 for Three-Year Moving Averages									66	7.3
Macomb Co.	-	6	-	-	6	8	-	-	8	47	5.2
Muskegon Co.	6	-	-	-	-	7	-	-	-	32	3.6
Oakland Co. ⁺	See Table 4 for Three-Year Moving Averages									85	9.4
Saginaw Co.	-	-	-	-	8	6	-	-	-	37	4.1
Washtenaw Co.	-	-	-	-	-	-	8	-	-	32	3.6
Wayne Co.	41	44	36	42	51	53	40	49	62	418	46.4
<i>City of Detroit</i>	30	28	29	35	33	37	30	32	47	301	33.4
<i>Out-Wayne Co.*</i>	11	16	7	7	18	16	10	17	15	117	13.0
Michigan	140	147	131	142	152	159	142	123	151	1,287	143
<p>+ Some counts greater than five were suppressed to protect confidentiality. * Out-Wayne County excludes the city of Detroit. Sources: Death data are by county of residence from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>											

Summary:

Overall, there was an average of 143 sleep-related infant deaths in Michigan each year from 2010 to 2018. Within selected jurisdictions, the average number of sleep-related infant deaths per year ranged from 3.6 to 46.4 over the nine-year period.

Section 2: Sleep-Related Infant Deaths in Michigan by Infant Characteristics

Table 06. Infant's Race (2010-2018)

Race	No. of Deaths [^]	No. of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
White	602	746,845	0.8	0.7	0.9
Black	548	195,476	2.8**	2.6	3.0
Other*	135	72,391	1.9**	1.6	2.2

[^] Race was unknown/missing for two infants.
^{*} Sleep-related infant deaths among other races include American Indian (n=10), Asian or Pacific Islander (n=9), and multi-racial infants (n=116). Of the multi-racial infants, 74 indicated a combination of White and Black; 33 indicated American Indian along with another race or races; and nine indicated some other combination of races.
^{**} Statistically significant difference from the rate for White infants at the 95% confidence level.
Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Significant racial disparities exist among sleep-related infant deaths. In Michigan, Black infants were 3.5 times more likely to die of sleep-related causes than White infants (2.8 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, infants whose race was categorized as Other (including American Indian, Asian, Pacific Islander, and multi-racial infants) were almost 2.4 times more likely to die of sleep-related causes (1.9 sleep-related infant deaths per 1,000 live births when “Other” was listed was the race compared to 0.8 sleep-related infant deaths per 1,000 live births for White infants).

Table 07. Infant's Race – Three-Year Moving Averages (2010-2018)

Years	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Total (All Races)^					
2010-2012	418	339,987	1.2	1.1	1.3
2011-2013	420	339,394	1.2	1.1	1.4
2012-2014	425	340,091	1.2	1.1	1.4
2013-2015	453	340,801	1.3	1.2	1.4
2014-2016	453	340,419	1.3	1.2	1.5
2015-2017	424	338,081	1.3	1.1	1.4
2016-2018	416	334,966	1.2	1.1	1.4
White					
2010-2012	197	251,718	0.8	0.7	0.9
2011-2013	195	250,460	0.8	0.7	0.9
2012-2014	201	250,780	0.8	0.7	0.9
2013-2015	212	250,769	0.8	0.7	1.0
2014-2016	215	250,818	0.9	0.7	1.0
2015-2017	199	247,293	0.8	0.7	0.9
2016-2018	193	244,358	0.8	0.7	0.9
Black					
2010-2012	167	65,619	2.5	2.2	2.9
2011-2013	169	65,628	2.6	2.2	3.0
2012-2014	173	64,960	2.7	2.3	3.1
2013-2015	197	64,794	3.0	2.6	3.5
2014-2016	196	64,262	3.1	2.6	3.5
2015-2017	188	64,877	2.9	2.5	3.3
2016-2018	184	65,063	2.8	2.4	3.2

Table 07. Infant's Race – Three-Year Moving Averages (2010-2018) Continued

Years	Number of Deaths	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Other*					
2010-2012	53	22,650	2.3	1.8	3.1
2011-2013	55	23,306	2.4	1.8	3.1
2012-2014	49	24,351	2.0	1.5	2.7
2013-2015	43	25,238	1.7	1.2	2.3
2014-2016	41	25,339	1.6	1.2	2.2
2015-2017	37	24,987	1.5	1.0	2.0
2016-2018	39	24,503	1.6	1.1	2.2

^ The number of sleep-related infant deaths for White, Black, and Other do not sum to the total number of sleep-related infant deaths as race was missing/unknown for two infants.
 * Sleep-related infant deaths among other races include American Indian (n=10), Asian or Pacific Islander (n=9), and multi-racial infants (n=116). Of the multi-racial infants, 74 indicated a combination of White and Black; 33 indicated American Indian along with another race or races; and nine indicated some other combination of races.
Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Three-year moving averages are presented by race to identify increases or decreases in rates of sleep-related infant death over time. Since 2010, average rates of sleep-related infant death have remained steady for White infants. For Black infants, the average rate of sleep-related infant death increased from 2.5 deaths per 1,000 live births in 2010-2012 to 2.8 deaths per 1,000 live births in 2016-2018. This increase is not statistically significant. For infants included in other race categories, the average rate of sleep-related infant death decreased from 2.3 deaths per 1,000 live births in 2010-2012 to 1.6 deaths per 1,000 live births in 2016-2018. This decrease is not statistically significant.

Table 08. Infant’s Ethnicity (2010-2018)

Ethnicity	Number of Deaths [^]	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Hispanic or Latinx	94	69,577	1.4	1.1	1.7
Not Hispanic or Latinx	1,181	948,384	1.2	1.1	1.3

[^] Ethnicity was unknown/missing for 12 infants.
Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

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 09. Infant's Ethnicity – Three-Year Moving Averages (2010-2018)

Years	Number of Deaths [^]	Number of Live Births	Rate per 1,000 Live Births	95% CI	
				L	U
Hispanic or Latinx					
2010-2012	23	23,602	1.0	0.6	1.5
2011-2013	25	23,268	1.1	0.7	1.6
2012-2014	28	22,985	1.2	0.8	1.8
2013-2015	32	23,156	1.4	0.9	2.0
2014-2016	37	23,152	1.6	1.1	2.2
2015-2017	38	23,166	1.6	1.2	2.3
2016-2018	39	22,819	1.7	1.2	2.3
Not Hispanic or Latinx					
2010-2012	390	317,982	1.2	1.1	1.3
2011-2013	394	317,331	1.2	1.1	1.4
2012-2014	394	317,915	1.2	1.1	1.4
2013-2015	415	318,247	1.3	1.2	1.4
2014-2016	410	317,893	1.3	1.2	1.4
2015-2017	381	314,926	1.2	1.1	1.3
2016-2018	376	312,155	1.2	1.1	1.3
[^] Ethnicity was unknown/missing for 12 infants. Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.					

Summary:

Three-year moving averages are presented by ethnicity to identify increases or decreases in rates of sleep-related infant death over time. For Hispanic infants, the average rate of sleep-related infant death increased from 1.0 death per 1,000 live births in 2010-2012 to 1.7 deaths per 1,000 live births in 2016-2018. This increase is not statistically significant. The average rate of sleep-related infant death among non-Hispanic/Latinx infants remained steady.

Table 10. Infant's Sex (2010-2018)

Sex	Sleep-Related Infant Deaths		Infant Mortality – All Causes		All Live Births	
	Number	%	Number	%	Number	%
Male	761	59	3,859	56	521,081	51
Female	526	41	3,017	44	496,853	49

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Males are overrepresented among all infants who die before their first birthday from any cause, as well as among all infants who die of sleep-related causes. In Michigan, 51% of all live births were male; however, males accounted for 56% of all infant deaths from any cause, and 59% of deaths from sleep-related causes.

Table 11. Infant’s Age at Time of Death (2010-2018)

Infant’s Age	Number	%
Less than 1 Month	148	11
1 Month	264	21
2 Months	237	18
3 Months	179	14
4 Months	134	10
5 Months	110	9
6 Months	72	6
7 Months	56	4
8 Months	34	3
9 Months	22	2
10 Months	20	2
11 Months	11	1
<p>Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.</p>		

Summary:

Approximately 3 out of 4 sleep-related infant deaths occurred before the infant was five months old. The average age of the infant was 108 days, or approximately 3.6 months.

Table 12. Infant’s Age at Time of Death – Three-Year Moving Averages (2010-2018)

	Number ⁺	%	Number ⁺	%	Number ⁺	%
Years	< 1 Month		1 Month		2 Months	
2010-2012	43	10	76	18	77	18
2011-2013	47	11	82	20	77	18
2012-2014	49	12	83	20	76	18
2013-2015	45	10	95	21	83	18
2014-2016	57	13	96	21	88	19
2015-2017	49	12	100	24	74	17
2016-2018	60	14	93	22	77	19
Years	3 Months		4 Months		5 Months	
2010-2012	64	15	56	13	36	9
2011-2013	53	13	46	11	50	12
2012-2014	50	12	47	11	48	11
2013-2015	61	13	43	9	46	10
2014-2016	57	13	43	9	40	9
2015-2017	59	14	39	9	35	8
2016-2018	54	13	35	8	28	7
Years	6 Months		7 Months		8 Months	
2010-2012	21	5	15	4	8	2
2011-2013	21	5	17	4	9	2
2012-2014	22	5	24	6	10	2
2013-2015	27	6	26	6	12	3
2014-2016	24	5	22	5	11	2
2015-2017	22	5	16	4	14	3
2016-2018	24	6	15	4	14	3

Table 12. Infant’s Age at Time of Death – Three-Year Moving Averages (2010-2018) Continued

	Number ⁺	%	Number ⁺	%	Number ⁺	%
Years	9 Months		10 Months		11 Months	
2010-2012	8	2	9	2	-	-
2011-2013	8	2	7	2	-	-
2012-2014	6	1	7	2	-	-
2013-2015	7	2	-	-	-	-
2014-2016	-	-	7	2	-	-
2015-2017	8	2	6	1	-	-
2016-2018	7	2	6	1	-	-

+ Case counts with fewer than six deaths are excluded from this analysis.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Since 2010, there has been a minor shift in the distribution of sleep-related infant deaths by age group. The youngest infants have accounted for a slightly greater percentage of sleep-related infant deaths since then.

Table 13. Infant’s Gestational Age (2010-2018)

Gestational Age	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Less Than 37 Weeks	281	22	101,735	10
37 Weeks or More	992	77	915,755	90
Unknown	14	1	471	<1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

From 2010 to 2018, 10% of live births in Michigan were born before 37 weeks gestation. During that same time period, 22% of infants who died of 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 2.5 times more likely to die in a sleep environment than infants who were born at or greater than 37 weeks gestation.

Table 14. Infant's Birthweight (2010-2018)

Birthweight	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Less Than 2,500 Grams	275	21	86,300	8
2,500 Grams or More	989	77	931,288	91
Unknown	23	2	373	<1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

From 2010 to 2018, babies born weighing less than 2,500 grams accounted for 8% of all live births in Michigan. During that same time period, 21% of infants who died of 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 3.2 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 2.9 times more likely to die in a sleep environment than infants who were born weighing greater than or equal to 2,500 grams.

Table 15. Infant's Insurance Type (2010-2018)

Insurance Type	Sleep-Related Infant Deaths		All Live Births [^]	
	Number	%	Number	%
Private Insurance	206	16	548,203	54
Medicaid or State Plan	988	77	442,955	44
Other*	21	2	22,311	2
Unknown/Missing	72	6	4,492	<1

* Other includes multiple types of insurance coverage, no insurance coverage, and other types of insurance.
[^] Live births to Michigan residents by source of payment for the birth.
Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

More than 3 out of 4 infants who died of sleep-related causes from 2010 to 2018 in Michigan had publicly-funded healthcare coverage. During this same time period, less than half of all live births were paid for with publicly-funded healthcare coverage.

Table 16. Infant's Insurance Type – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births [^]	
	Number ⁺	%	Number	%
Private Insurance				
2010-2012	47	11	179,935	53
2011-2013	50	12	181,421	53
2012-2014	59	14	182,290	53
2013-2015	65	14	182,726	54
2014-2016	66	15	183,794	54
2015-2017	75	18	184,399	55
2016-2018	94	23	185,542	55
Medicaid or State Plan				
2010-2012	316	76	153,008	45
2011-2013	326	78	150,996	44
2012-2014	336	79	148,555	44
2013-2015	363	80	148,204	43
2014-2016	366	81	146,971	43
2015-2017	335	79	145,625	43
2016-2018	309	74	141,743	42
Other*				
2010-2012	-	-	6,553	2
2011-2013	-	-	6,260	2
2012-2014	-	-	8,539	3
2013-2015	9	2	9,036	3
2014-2016	12	3	9,287	3
2015-2017	11	3	7,061	2
2016-2018	7	2	6,722	2

Table 16. Infant’s Insurance Type – Three-Year Moving Averages (2010-2018)
Continued

Years	Sleep-Related Infant Deaths		All Live Births [^]	
	Number ⁺	%	Number	%
Unknown				
2010-2012	50	12	2,088	1
2011-2013	40	10	1,922	1
2012-2014	26	6	1,516	<1
2013-2015	16	4	1,437	<1
2014-2016	9	2	993	<1
2015-2017	-	-	1,007	<1
2016-2018	6	1	967	<1

* Other includes multiple types of insurance coverage, no insurance coverage, and other types of insurance.
[^] Live births to Michigan residents by source of payment for the birth.
⁺ Case counts with fewer than six deaths are excluded from this analysis.
Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Since 2010, the proportion of infants who died of sleep-related causes with private insurance increased as the proportion of infants who died of sleep-related causes with an unknown insurance type decreased. This change is likely due to improved data quality and completeness over time. The proportion of infants who died of sleep-related causes with Medicaid or State Plan insurance has fluctuated over time, but has not changed substantially. From 2010 to 2018, a slightly greater proportion of all live births were paid for with private insurance and a slightly smaller proportion of all live births were paid for with Medicaid or State Plan insurance.

Table 17. Infant Had Disorder Confirmed Through Newborn Screening Panel (2010-2018)

Disorder Confirmed	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	11	0.9	20,398	0.2
No	1,251	97.2	982,875	99.8
Unknown	25	1.9	N/A	N/A

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from the Newborn Screening Section, Michigan Department of Health and Human Services, 2020.

Summary:

Almost all of the infants who died of sleep-related causes (99.8%) had newborn screening results that did not confirm a disorder. Although the sample size is small, infants who died of sleep-related causes were more likely to have had a disorder confirmed through the newborn screening panel compared to all live births.

Table 18. Infant Had Prior Disability or Chronic Illness (2010-2018)

Prior Disability or Chronic Illness	Number	%
Yes	106	8
No	1,142	89
Unknown	39	3

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Nine out of 10 infants who died of sleep-related causes did not have a prior disability or chronic illness.

Section 3: Sleep-Related Infant Deaths in Michigan by Maternal Characteristics

Table 19. Age of Infant's Mother (2010-2018)

Age of Infant's Mother	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
19 Years Old or Younger	142	11	67,371	7
20-24 Years Old	446	35	232,598	23
25-29 Years Old	347	27	311,196	31
30-34 Years Old	183	14	267,655	26
35-39 Years Old	72	6	113,876	11
40 Years Old or Older	11	1	25,197	2
Unknown	86	7	68	<1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

The average age of a mother who had an infant die of sleep-related causes was 25 years old. For these infants, the age of the mother ranged from a minimum of 14 years to a maximum of 44 years old.

Table 20. Age of Infant’s Mother – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
19 Years Old or Younger				
2010-2012	53	13	29,691	9
2011-2013	51	12	26,691	8
2012-2014	54	13	23,979	7
2013-2015	50	11	21,393	6
2014-2016	44	10	19,285	6
2015-2017	36	8	17,612	5
2016-2018	39	9	16,287	5
20-24 Years Old				
2010-2012	154	37	83,337	24
2011-2013	150	36	83,189	24
2012-2014	157	37	82,416	24
2013-2015	166	37	80,527	24
2014-2016	159	35	77,223	23
2015-2017	135	32	72,840	22
2016-2018	126	30	68,734	21
25-29 Years Old				
2010-2012	102	24	100,682	29
2011-2013	105	25	100,884	30
2012-2014	102	24	102,065	30
2013-2015	112	25	103,870	30
2014-2016	124	27	105,506	31
2015-2017	129	30	106,516	32
2016-2018	133	32	106,644	32

Table 20. Age of Infant’s Mother – Three-Year Moving Averages (2010-2018)
Continued

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
30-34 Years Old				
2010-2012	53	13	84,088	25
2011-2013	61	15	85,882	25
2012-2014	59	14	87,872	26
2013-2015	57	13	89,877	26
2014-2016	54	12	91,961	27
2015-2017	62	15	92,641	27
2016-2018	73	18	93,690	28
35-39 Years Old				
2010-2012	17	4	35,273	10
2011-2013	21	5	35,441	10
2012-2014	18	4	36,197	11
2013-2015	21	5	37,470	11
2014-2016	29	6	38,909	11
2015-2017	36	8	40,185	12
2016-2018	34	8	41,133	12
40 Years Old or Older				
2010-2012	7	2	8,485	2
2011-2013	-	-	8,482	2
2012-2014	-	-	8,349	2
2013-2015	-	-	8,250	2
2014-2016	-	-	8,148	2
2015-2017	-	-	8,291	2
2016-2018	-	-	8,462	3

Table 20. Age of Infant’s Mother – Three-Year Moving Averages (2010-2018)
Continued

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
Unknown Age				
2010-2012	32	8	28	<1
2011-2013	28	7	30	<1
2012-2014	34	8	22	<1
2013-2015	45	10	16	<1
2014-2016	40	9	13	<1
2015-2017	22	5	7	<1
2016-2018	9	2	24	<1
<p>+ Case counts with fewer than six deaths are excluded from this analysis. Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>				

Summary:

Since 2010, there has been a decrease in the proportion of mothers who are less than 25 years old who had an infant die due to sleep-related causes. It should be noted that during that same time period there was a corresponding decrease in the proportion of mothers under the age of 25 who had a live birth.

Table 21. No Previous Live Births to Infant’s Mother (2010-2018)

Mother	% with No Previous Live Births
Mothers Whose Infant Died of Sleep-Related Causes	28
All Michigan Mothers	38
<p>Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>	

Summary:

Using an average in Michigan from 2010 to 2018, 38% of all live births represented the mother's first live birth. In comparison, only 28% of mothers in Michigan who had an infant die of sleep-related causes had no previous live births prior to the decedent's birth.

Table 22. Education Level of Infant’s Mother (2010-2018)

Education Level	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Less than High School	346	27	129,815	13
High School Diploma/GED	605	47	505,327	50
College	147	11	272,078	27
Postgraduate	15	1	103,275	10
Unknown	174	14	7,466	1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

From 2010 to 2018, for all mothers who had an infant die of sleep-related causes and whose education level was known, 69% had at least a high school diploma or GED. In comparison, for all live births from 2010 to 2018, 87% of mothers whose education level was known had at least a high school diploma or GED. It is important to note that education level was not adjusted by the mother’s age and some mothers were not of an age at the time of the infant’s birth/death where it would be expected that they could have completed high school, college, or a graduate degree.

Table 23. Education Level of Infant’s Mother – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
Less than High School				
2010-2012	111	27	49,640	15
2011-2013	123	29	47,048	14
2012-2014	123	29	44,706	13
2013-2015	123	27	42,787	13
2014-2016	119	26	40,616	12
2015-2017	113	27	39,164	12
2016-2018	112	27	37,388	11
High School Diploma/GED				
2010-2012	170	41	172,413	50
2011-2013	174	41	172,836	51
2012-2014	190	45	172,239	51
2013-2015	202	45	170,860	50
2014-2016	223	49	168,410	49
2015-2017	225	53	165,282	49
2016-2018	233	56	162,054	48
College				
2010-2012	35	8	85,430	25
2011-2013	46	11	86,217	25
2012-2014	52	12	88,447	26
2013-2015	68	15	91,179	27
2014-2016	63	14	93,794	28
2015-2017	53	13	94,260	28
2016-2018	44	11	95,469	29

Table 23. Education Level of Infant’s Mother – Three-Year Moving Averages (2010-2018) Continued

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
Postgraduate				
2010-2012	-	-	32,170	9
2011-2013	-	-	32,654	10
2012-2014	-	-	33,645	10
2013-2015	-	-	34,378	10
2014-2016	-	-	35,544	10
2015-2017	7	2	35,848	11
2016-2018	9	2	36,727	11
Unknown				
2010-2012	100	24	1,931	1
2011-2013	75	18	1,844	1
2012-2014	58	14	1,863	1
2013-2015	56	12	2,199	1
2014-2016	44	10	2,861	1
2015-2017	26	6	3,178	1
2016-2018	18	4	3,336	1
+ Case counts with fewer than six deaths are excluded from this analysis. Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.				

Summary:

From 2010 to 2018, there was an increase in the proportion of mothers who had an infant die of sleep-related causes who had received a high school diploma/GED. Although, the proportion of mothers who had an infant die of sleep-related causes with an unknown education level decreased, so this change may be due to improved data quality and completeness. The proportion of mothers who had an infant die of sleep-related causes who had not received a high school diploma/GED remained steady. During this same time period, there was an increase in the proportion of all mothers who had a live birth with a college or postgraduate degree.

Table 24. Prenatal Care Received during Pregnancy by Infant’s Mother (2010-2018)

Prenatal Care Received	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	1,202	93	1,004,417	99
No	51	4	13,544	1
Unknown	34	3	-	-

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.
 Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Overall, few mothers are reported to receive no prenatal care during pregnancy.

Table 25. Number of Prenatal Care Visits Received by Infant’s Mother (2010-2018)

Number of Prenatal Care Visits Received	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
1 to 5	149	13	43,323	4
6 to 10	489	42	294,494	29
11 to 16	477	41	534,462	53
More than 16	59	5	132,060	13
Total	1,174		1,004,339	

+ The mean and median number of prenatal care visits were 10. The number of reported prenatal care visits ranged from 1 to 45 visits.

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Of the mothers who received prenatal care and had a known number of prenatal care visits, all Michigan mothers were more likely to receive a greater number of prenatal care visits than mothers who had an infant die of sleep-related causes. Mothers who had an infant die of sleep-related causes were three times more likely than all Michigan mothers to receive fewer than six prenatal care visits.

Table 26. Month of First Prenatal Care Visit for Infant’s Mother (2010-2018)

Month of First Prenatal Care Visit	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
1st or 2nd Month	371	31	411,712	41
3rd or 4th Month	495	41	449,893	45
5th or 6th Month	211	18	73,263	7
7th, 8th, or 9th Month	93	8	38,139	4
Unknown	32	3	31,410	3
Total	1,202		1,004,417	

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

Of the mothers who received prenatal care, all Michigan mothers were more likely to enter prenatal care prior to the fifth month of pregnancy than were mothers who had an infant die of sleep-related causes. Mothers who had an infant die of sleep-related causes were more than twice as likely to enter prenatal care in the fifth or later month of pregnancy compared to all Michigan mothers.

Table 27. Month of First Prenatal Care Visit for Infant’s Mother – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
1st or 2nd Month				
2010-2012	151	39	144,262	42
2011-2013	156	40	141,212	42
2012-2014	151	38	139,168	41
2013-2015	141	33	137,016	40
2014-2016	122	29	135,044	40
2015-2017	100	25	133,779	40
2016-2018	79	20	130,434	39
3rd or 4th Month				
2010-2012	149	39	146,145	43
2011-2013	147	38	146,209	43
2012-2014	161	41	148,201	43
2013-2015	171	40	150,686	44
2014-2016	175	42	152,716	45
2015-2017	165	42	152,499	45
2016-2018	175	45	153,062	46
5th or 6th Month				
2010-2012	55	14	23,820	7
2011-2013	60	15	24,094	7
2012-2014	56	14	24,934	7
2013-2015	68	16	25,362	7
2014-2016	75	18	25,568	7
2015-2017	88	22	24,508	7
2016-2018	88	23	24,081	7

Table 27. Month of First Prenatal Care Visit for Infant’s Mother – Three-Year Moving Averages (2010-2018) Continued

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
7th, 8th, or 9th Month				
2010-2012	28	7	11,164	3
2011-2013	22	6	12,017	4
2012-2014	25	6	12,883	4
2013-2015	36	8	13,566	4
2014-2016	36	9	13,696	4
2015-2017	30	8	13,277	4
2016-2018	29	7	13,409	4
Unknown				
2010-2012	-	-	12,136	4
2011-2013	-	-	11,880	3
2012-2014	-	-	11,340	3
2013-2015	8	2	10,114	3
2014-2016	13	3	9,394	3
2015-2017	14	4	11,868	4
2016-2018	20	5	9,160	3
+ Case counts with fewer than six deaths are excluded from this analysis. Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.				

Summary:

Since 2010, an increased proportion of mothers who had an infant die of sleep-related causes received the first prenatal care visit during the third or fourth month or during the fifth or sixth month of pregnancy. The proportion of mothers who had an infant die of sleep-related causes who received the first prenatal care visit during the first or second month of pregnancy decreased. During this same time period, the month of pregnancy in which all Michigan mothers who had a live birth received the first prenatal care visit did not substantially change.

Table 28. Maternal Smoking During Pregnancy (2010-2018)

Maternal Smoking	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	610	47	178,191	18
No	648	50	828,561	81
Unknown	29	2	11,209	1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

From 2010 to 2018, 18% of all live births in Michigan were born to a mother who smoked during pregnancy. During that same time period, 47% of infants who died of sleep-related causes were born to a mother who smoked during pregnancy. Of the infants born to a mother who smoked during pregnancy, the rate of sleep-related death was 3.4 per 1,000 live births. Of the infants born to a mother 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 mother who smoked during pregnancy are at an increased risk of dying due to sleep-related causes. In Michigan, infants born to a mother who smoked during pregnancy were 4.4 times more likely to die in a sleep environment than infants who were born to a mother who did not smoke during pregnancy.

Table 29. Maternal Smoking During Pregnancy – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes				
2010-2012	226	54	64,654	19
2011-2013	220	52	66,754	20
2012-2014	219	52	65,324	19
2013-2015	221	49	62,594	18
2014-2016	209	46	58,328	17
2015-2017	186	44	54,786	16
2016-2018	163	39	50,944	15
No				
2010-2012	181	43	273,044	80
2011-2013	190	45	271,001	80
2012-2014	199	47	273,644	80
2013-2015	225	50	275,744	81
2014-2016	233	51	278,975	82
2015-2017	227	54	278,235	82
2016-2018	242	58	279,773	84
Unknown				
2010-2012	11	3	3,886	1
2011-2013	10	2	2,844	1
2012-2014	7	2	1,932	1
2013-2015	7	2	3,066	1
2014-2016	11	2	3,742	1
2015-2017	11	3	5,072	1
2016-2018	11	3	4,257	1
<p>Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>				

Summary:

Since 2010, the proportion of mothers who had an infant die of sleep-related causes who smoked during pregnancy decreased. During that same time period, there was a corresponding, but smaller, decrease in the proportion of mothers who had a live birth who smoked during pregnancy. Mothers who had an infant die of sleep-related causes were still more likely to have smoked during pregnancy than all mothers who had a live birth.

Table 30. Infant’s Mother Planned to or Initiated Breastfeeding (2010-2018)

Planned to or Initiated Breastfeeding	Sleep-Related Infant Deaths		All Live Births	
	Number	%	Number	%
Yes	676	53	801,243	79
No	582	45	203,232	20
Unknown	29	2	13,486	1

Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.

Summary:

From 2010 to 2018, 79% of all live births in Michigan were born to a mother who planned to or initiated breastfeeding. During that same time period, only 53% of infants who died of sleep-related causes were born to a mother who planned to or initiated breastfeeding. Of the infants born to a mother who planned to or initiated breastfeeding, the rate of sleep-related death was 0.8 per 1,000 live births. Of the infants born to a mother 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 mother who did not initiate breastfeeding are at an increased risk of dying due to sleep-related causes. In Michigan, infants born to a mother who did not initiate breastfeeding were 3.4 times more likely to die in a sleep environment than infants who were born to a mother 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 31. Infant’s Mother Planned to or Initiated Breastfeeding – Three-Year Moving Averages (2010-2018)

Years	Sleep-Related Infant Deaths		All Live Births	
	Number ⁺	%	Number	%
Yes				
2010-2012	177	42	253,296	74
2011-2013	192	46	259,299	76
2012-2014	217	51	265,131	78
2013-2015	239	53	270,610	79
2014-2016	248	55	275,320	81
2015-2017	242	57	277,107	82
2016-2018	260	63	277,337	83
No				
2010-2012	230	55	82,466	24
2011-2013	220	52	76,525	22
2012-2014	203	48	72,247	21
2013-2015	210	46	66,927	20
2014-2016	197	43	62,090	18
2015-2017	174	41	57,039	17
2016-2018	142	34	53,839	16
Unknown				
2010-2012	11	3	5,822	2
2011-2013	8	2	4,776	1
2012-2014	-	-	3,522	1
2013-2015	-	-	3,866	1
2014-2016	8	2	3,635	1
2015-2017	8	2	3,946	1
2016-2018	14	3	3,798	1
<p>+ Case counts with fewer than six deaths are excluded from this analysis. Sources: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020. Birth data are from Michigan Resident Birth Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services, 2020.</p>				

Summary:

Since 2010, an increased proportion of mothers who had an infant die of sleep-related causes planned to or initiated breastfeeding. During that same time period, there was a similar increase in the proportion of mothers who had a live birth who planned to or initiated breastfeeding. Mothers who had an infant die of sleep-related causes were still less likely to plan to or initiate breastfeeding.

Table 32. Maternal Smoking During Pregnancy by Breastfeeding Status for Mothers Whose Infant Died of Sleep-Related Causes (2010-2018)

Breastfeeding Status	Mother Smoked During Pregnancy (%)	Mother Did Not Smoke During Pregnancy (%)
Ever Breastfed	44	62
Not Breastfed	55	37

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Infants who died of sleep-related causes who had a mother who smoked during pregnancy were less likely to have ever been breastfed than infants who died of sleep-related causes who did not have a mother who smoked during pregnancy.

Table 33. Type of Last Feeding for Infants who Died in an Adult Bed (2010-2018)

Feeding Type	Number	%
Formula Only	373	60
Breastmilk Only	96	16
Other*	32	5
Unknown	117	19

* Other includes infants who were fed other combinations of food, including breastmilk, formula, cereal, and/or baby food.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Of the 618 infants who died in an adult bed, the greatest proportion were fed formula only (60%) for their last meal.

Table 34. Sleep Surface Sharing by Maternal Smoking and Breastfeeding Status for Mothers Whose Infant Died of Sleep-Related Causes (2010-2018)

Infant Shared Sleep Surface with Person or Animals	Mother Smoked During Pregnancy		Mother Planned to or Initiated Breastfeeding	
	Number	%	Number	%
Yes	391	64	383	57
No	185	30	257	38
Unknown	34	6	36	5

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Of the infants who died of sleep-related causes who had a mother who smoked during pregnancy, 64% were sharing a sleep surface with other people or animal(s) at the time of the incident. Of the infants who died of sleep-related causes who had a mother who planned to or initiated breastfeeding, 57% were sharing a sleep surface with other people or animal(s) at the time of the incident.

Table 35. Caregiver or Supervisor Fell Asleep While Feeding Infant (2010-2018)

Caregiver or Supervisor Fell Asleep While Feeding Infant	Number	%
Yes	94	7
No	1,099	85
Unknown	94	7
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

Most infants who died of sleep-related causes (85%) did not have a caregiver or supervisor who fell asleep while feeding them at the time of the incident.

Table 36. Caregiver or Supervisor Fell Asleep While Feeding Infant by Feeding Type (2010-2018)

Feeding Type	Number	%
Bottle	26	28
Breast	61	65
Unknown	7	7
Total	94	
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

When the infant's caregiver or supervisor did fall asleep while feeding the infant at the time of the incident (n=94), there were 2.3 times more infants that were breastfed than bottle fed.

Section 4: Sleep-Related Infant Deaths in Michigan by Incident Details

Table 37. Incident Location (2010-2018)

Incident Location [^]	Number ⁺	%
Child's Home	1,001	76
Relative's Home	189	14
Friend's Home	38	3
Licensed Daycare	24	2
Foster Care	11	1
Unlicensed Daycare Home	14	1
Other*	42	3
Unknown	-	-

[^] Multiple responses were allowed for incident location, therefore the sum is greater than the total number of infants who died of sleep-related causes.
⁺ Counts with fewer than six deaths are excluded from this analysis.
* Other includes hotel/motel/motor lodge, shelter/homeless/couch, hospital, and other responses.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Three in four infants who died of sleep-related causes were found unresponsive in their own home. Another 14% of infants were found unresponsive in a relative's home.

Table 38. Position Infant was Found (2010-2018)

Found Position	Number	%
Back	407	32
Stomach	529	41
Side	148	11
Unknown	203	16
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

More than half of the infants (52%) who died of sleep-related causes were found in an unsafe sleeping position. Infants were most often found in the prone (stomach) sleeping position. Fewer than one-third of infants were found in a safe sleeping position (on their back). When a baby is on his or her back, the air tube (trachea) is on top of the food tube (esophagus). If a baby spits up while on his or her back, the food or fluid runs back into the stomach and not to the lungs. When a baby is on his or her stomach, the esophagus is on top of the trachea and any food/fluid that is spit up can more easily pool at the opening of the trachea, making it possible for the baby to choke.

Table 39. Incident Sleep Place (2010-2018)

Incident Sleep Place	Number	%
Crib/Bassinet	274	21
Adult Bed [^]	618	48
Couch/Chair	191	15
Other Unsafe Place*	162	13
Unknown	42	3

[^] Adult bed includes both futons and waterbeds.
^{*} Other includes playpen (not portable crib); the floor; car seat; air mattress; Rock ‘n Play; swing; bouncy chair; and other responses.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

About half (48%) of the infants who died of sleep-related causes were found unresponsive in an adult bed. In total, three in four (76%) of the infants were found in an unsafe sleep place. Only 21% of infants who died of sleep-related causes were found in a crib or bassinet.

Table 40. Incident Sleep Place – Three-Year Moving Averages (2010-2018)

Years	Number	%	Years	Number	%
Crib or Bassinet			Adult Bed[^]		
2010-2012	106	25	2010-2012	191	46
2011-2013	99	24	2011-2013	198	47
2012-2014	89	21	2012-2014	196	46
2013-2015	85	19	2013-2015	223	49
2014-2016	72	16	2014-2016	219	48
2015-2017	74	17	2015-2017	223	53
2016-2018	83	20	2016-2018	204	49
Couch or Chair			Other Unsafe Place[*]		
2010-2012	67	16	2010-2012	45	11
2011-2013	61	15	2011-2013	50	12
2012-2014	66	16	2012-2014	51	12
2013-2015	63	14	2013-2015	57	13
2014-2016	70	15	2014-2016	71	16
2015-2017	61	14	2015-2017	57	13
2016-2018	61	15	2016-2018	60	14
Unknown					
2010-2012	9	2			
2011-2013	12	3			
2012-2014	23	5			
2013-2015	25	6			
2014-2016	21	5			
2015-2017	9	2			
2016-2018	8	2			
[^] Adult bed includes both futons and waterbeds. [*] Other includes playpen (not portable crib); the floor; car seat; air mattress; Rock ‘n Play; swing; bouncy chair; and other responses. Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.					

Summary:

Since 2010, the proportion of infants who were found in a safe sleep place (e.g., a crib or bassinet) decreased.

Table 41. Sleep Surface Sharing with People or Animals (2010-2018)

Infant Shared Sleep Surface with People or Animals	Number	%
Yes	749	58
No	472	37
Unknown	66	5

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Almost six out of ten (58%) infants who died of sleep-related causes shared a sleep surface with other people 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 42. Sleep Surface Sharing with People or Animals – Three-Year Moving Averages (2010-2018)

Years	Number	%
Yes		
2010-2012	235	56
2011-2013	243	58
2012-2014	243	57
2013-2015	263	58
2014-2016	263	58
2015-2017	257	61
2016-2018	251	60
No		
2010-2012	164	39
2011-2013	157	37
2012-2014	148	35
2013-2015	154	34
2014-2016	156	34
2015-2017	151	36
2016-2018	154	37
Unknown		
2010-2012	19	5
2011-2013	20	5
2012-2014	34	8
2013-2015	36	8
2014-2016	34	8
2015-2017	16	4
2016-2018	11	3
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

Since 2010, there has been a slight increase in the proportion of infants who died from sleep-related causes who shared a sleep surface with other people or animals at the time of the incident.

Table 43. Sleep Surface Sharing with People or Animals by Type (2010-2018)

Type	Number	%
Adult(s) Only	507	68
Other Child(ren) Only	60	8
Adult(s) and Other Child(ren)	158	21
Other Combinations of People with Pet(s)	9	1
Sleep Surface Sharing, Unknown Type	15	2
Total	749	

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Of the 749 infants who were sharing a sleep surface with people or animals at the time of the incident, over two-thirds (68%) were sharing a sleep surface with one or more adults. An additional 21% were sharing a sleep surface with one or more adults and one or more other children.

Table 44. Objects in the Sleep Environment [Excluding People or Animals] (2010-2018)

Number of Objects Present	Number	%
One	406	46
Two	285	32
Three	157	18
More than Three	37	4
Total	885	

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

An object was present in the sleep environment in 885 of the 1,287 sleep-related infant deaths (69%) that occurred from 2010 to 2018. "Object" excludes adults and/or other children as well as animals. "Object" also excludes the sleep environment itself (e.g., couch, chair, or mattress) as well as other items that are sometimes listed as an object present in the sleep environment (e.g., wall or crib rail) even if these items likely contributed to the infant's death (e.g., being found face down on a couch or found wedged between the wall and a mattress). Examples of included objects are blankets, pillows, comforters, and stuffed animals -- extra items added to the sleep environment/surface. *Please note that the selection criteria for "objects" reported in this table has changed from the previous version of this report that included the 2010-2017 SUID Case Registry data. As a result, the percent of infants reported to have one or more objects in the sleep environment can't be compared to the percent reported in earlier versions of this table.*

Table 45. Objects in the Sleep Environment [Excluding People or Animals] – Three-Year Moving Averages (2010-2018)

Years	Number	%	Years	Number	%
One Object			Two Objects		
2010-2012	118	50	2010-2012	77	32
2011-2013	124	46	2011-2013	83	31
2012-2014	128	46	2012-2014	83	30
2013-2015	155	47	2013-2015	93	28
2014-2016	161	49	2014-2016	97	30
2015-2017	154	46	2015-2017	112	33
2016-2018	133	42	2016-2018	115	36
Three Objects			More than Three Objects		
2010-2012	33	14	2010-2012	10	4
2011-2013	47	18	2011-2013	13	5
2012-2014	49	18	2012-2014	17	6
2013-2015	67	20	2013-2015	15	5
2014-2016	59	18	2014-2016	11	3
2015-2017	61	18	2015-2017	8	2
2016-2018	57	18	2016-2018	12	4
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.					

Summary:

Since 2010, when one or more objects was reported to be present in the infant’s sleep environment at the time of the incident, the proportion of infants who had one object present in their sleep environment decreased while the proportion of infants who had more than one object present in their sleep environment increased slightly.

Table 46. Crib, Bassinet, or Portable Crib in Home at Time of Incident (2010-2018)

Crib, Bassinet, or Portable Crib in Home	Number	%
Yes	892	69
No	186	14
Unknown	209	16
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

The majority (69%) of infants who died of sleep-related causes had a crib, bassinet, or portable crib available in the home at the time of the incident. A crib, bassinet, or portable crib was not present in the home in only 14% of deaths.

Table 47. Crib, Bassinet, or Portable Crib in Home at Time of Incident – Three-Year Moving Averages (2010-2018)

Years	Number	%
Yes		
2010-2012	285	68
2011-2013	311	74
2012-2014	306	72
2013-2015	322	71
2014-2016	305	67
2015-2017	306	72
2016-2018	285	69
No		
2010-2012	82	20
2011-2013	62	15
2012-2014	53	12
2013-2015	50	11
2014-2016	57	13
2015-2017	53	13
2016-2018	54	13
Unknown		
2010-2012	51	12
2011-2013	47	11
2012-2014	66	16
2013-2015	81	18
2014-2016	91	20
2015-2017	65	15
2016-2018	77	19
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

Since 2010, the proportion of infants who died of sleep-related causes who had a crib, bassinet, or portable crib in the home at the time of the incident has fluctuated, but has not changed

significantly. The proportion of infants who died of sleep-related causes who did not have a crib, bassinet, or portable crib in the home at the time of the incident has decreased. The proportion of infants who died of sleep-related causes with unknown crib availability in the home at the time of the incident has increased.

Table 48. Availability of Crib in Home by Incident Sleep Place (2010-2018)

Availability of Crib in Home	Incident Sleep Place					
	Adult Bed [^]		Couch/Chair		Other Unsafe Place [*]	
	Number	%	Number	%	Number	%
Crib in Home	415	67	113	59	89	55
No Crib in Home	104	17	37	19	41	25
Unknown	99	16	41	21	32	20

[^] Adult bed includes both futons and waterbeds.
^{*} Other includes playpen (not portable crib); the floor; car seat; air mattress; Rock ‘n Play; swing; bouncy chair; and other responses.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Infants who were found unresponsive in other types of unsafe sleep places were less likely to have a crib, bassinet, or portable crib available in the home at the time of the incident than were infants who were found unresponsive in an adult bed or on a couch or chair.

Table 49. Infant Was in New or Different Sleep Environment (2010-2018)

New or Different Sleep Environment	Number	%
Yes	216	17
No	942	73
Unknown	129	10

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Almost three-quarters of the infants who died of sleep-related causes were not in a new or different sleep environment at the time of the incident. A new or different sleep environment is defined as a sleep environment that is not part of the child’s normal routine (e.g., the child recently started attending a new daycare, the child was temporarily staying in a hotel due to travel, the child was moved from their usual sleep place for soothing).

Table 50. Crib Availability in Home by New or Different Sleep Environment (2010-2018)

Crib Availability	New or Different Sleep Environment		Not a New or Different Sleep Environment	
	Number	%	Number	%
Crib in Home	105	49	746	79
No Crib in Home	88	41	89	9
Unknown	23	11	107	11
Total	216		942	

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Infants who were not in a new sleep environment (79%) were more likely to have a crib, bassinet, or portable crib available in the home than were infants who were in a new or different sleep environment (49%).

Table 51. Incident Sleep Place for Infants in a New or Different Sleep Environment (2010-2018)

Incident Sleep Place	Infant in New Sleep Environment	
	Number	%
Crib/Bassinet	20	9
Adult Bed [^]	95	44
Couch/Chair	63	29
Other Unsafe Place [*]	37	17
Total	215	

[^] Adult bed includes both futons and waterbeds.
^{*} Other includes playpen (not portable crib); the floor; car seat; air mattress; Rock 'n Play; swing; bouncy chair; and other responses.
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

Of the infants who were in a new or different sleep environment at the time of the incident, the infant was most likely to be in an adult bed (44%) followed by on a couch/chair (29%).

Table 52. Incident Location when Infant was in New or Different Sleep Environment (2010-2018)

Incident Location	Infant in New or Different Sleep Environment	
	Number	%
Relative's Home	92	41
Child's Home	79	35
Friend's Home	24	11
Unlicensed Daycare	7	3
Licensed Daycare (Home or Center)	6	3
Other*	16	7
Total [^]	224	

* Other locations include motel, home of non-custodial parent, homeless shelter, women's shelter, home where parents were squatting, home of a church member, rented cottage, grandmother's work, foster care home, and group home for teen moms.

[^] The total does not sum to the number of infants who were in a new or different sleep environment (n=216), as multiple responses were allowed.

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

More than three-quarters of the infants (76%) who were in a new or different sleep environment at the time of the incident were in a relative's home or in the child's own home.

Table 53. Person Supervising Infant at Time of Incident (2010-2018)

Supervisor	Number	%
Biological Parent	1,096	85
Grandparent	44	3
Other Relative	34	3
Licensed Child Care Worker	23	2
Babysitter	21	2
Friend	13	1
Mother's Partner	11	1
Foster Parent	10	1
Other	8	1
Unknown	27	2

Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.

Summary:

A biological parent was most likely to be supervising the infant at the time of the incident.

Table 54. Supervisor Impairment (2010-2018)

Supervisor Impaired	Number	%
Yes	336	26
No	774	60
Unknown	177	14
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

The majority (60%) of those supervising infants who died of sleep-related causes were not impaired at the time of the incident.

Table 55. Supervisor Impairment by Type (2010-2018)

Impairment Type	Number	%
Alcohol Impaired	144	35
Drug Impaired	125	30
Distracted	109	26
Absent	11	3
Other	23	6
Total [^]	412	
[^] The total does not sum to the number of supervisors who were impaired (n=336) as multiple responses were allowed.		
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

The majority (60%) of those supervising infants who died of sleep-related causes were not impaired at the time of the incident. When it was determined that the supervisor was impaired, the supervisor was most likely to be impaired by alcohol, drugs, or distraction.

Table 56. Prevention Determination by Child Death Review Teams (2010-2018)

Prevention Determination	Number	%
Death Could Have Been Prevented	1,141	89
Death Probably Could Not Have Been Prevented	22	2
Team Could Not Determine	122	9
Unknown/Missing	2	<1
Source: Death data are from the CDC SUID Case Registry, Michigan Public Health Institute, 2020.		

Summary:

Local Child Death Review Teams determined that almost nine in ten (89%) sleep-related infant deaths in Michigan could have been prevented.