

MICHIGAN INFANT DEATH STATISTICS
January 1 through December 31, 2016

LANSING, MICHIGAN
MARCH 2018



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Acknowledgments

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The Division for Vital Records and Health Statistics gratefully acknowledges the contributions of: Kyle Johnson and Kim Essex.

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SUMMARY OF 2016 INFANT DEATH STATISTICS

March 2018 Release

INFANT MORTALITY: For every 1,000 Michigan live births, almost seven infants die before reaching their first birthday. In 2016, 730 infants under the age of one year died, resulting in an infant mortality rate of 6.4 per 1,000 live births. Michigan experienced a significant decline in infant mortality during the early 1990s; but during the 2000s the infant mortality rates remained around 7.9 deaths per 1,000 births. The 2016 rate indicates a drop of the mortality rates to about 7.0 since 2010, from the 7.9 average in the previous decade. The total number of Michigan infants who died between 2010-2016 was 5,421. (See Table 1.)

The perinatal death rate has not significantly changed in years; the rate has been approximately 9 fetal or hebdomadal deaths per 100,000 live births since around 2011. The perinatal death rate was 8.8 in 2016. (See Table 10.)

The preliminary data suggests that the infant mortality rate will be no lower than 6.5 for 2017; this rate is about the same as the infant death rate in 2016. In this decade, the infant death rate is gradually declining and will probably be about 6.0 by 2020. (See Figure 1.)

Both the white and black infant mortality rates remained about the same in recent years, with a persistent racial disparity of about 2.8 black deaths for every 1 white death. In 2005, the white infant death rate was 5.5, and was comparable to the previous ten-year 1996-2005 average of 6.0 deaths per 1,000 white births. The black infant death rate was 17.9 in 2005, and was also comparable to the previous decade average of 17.6 deaths per 1,000 black births. In 2016 the white infant mortality rate was 4.8 per 1,000 live births while the black rate was 13.3 per 1,000 live births. Between 2006-2016 the white infant mortality rate has remained about the same, while the black rate has declined by 25% due to a reduction of infant deaths since 2005. The decline in the Michigan infant mortality rate is largely due to a reduction in black infant deaths. (See Table 2.)

Between 2000-2013, the Native American infant death rate remained on average 11 deaths per 1,000 live births. Between 2014-2016, the rate increased to 14 deaths per 1,000 births. This is the first time in the last two decades that the Native American infant death rate has exceeded the African American rate. (See Table 8.)

The Michigan infant mortality rate continues to be higher than the last reported national rate. The 2016 infant death rate for the United States is 5.9. (See Table 6.)

LIVE BIRTHS: In 2016, the number of live births increased to 113,374, from the 2015 live birth count of 113,211. However, the 2012-2016 numbers represent historic lows, and Michigan's birth count has gradually decreased since at least 1990. Nationally, there were 3,941,109 births in the U.S. in 2016, a decline of 8.7% from the record number reported for 2007 and a 0.9% decrease from last year.

CAUSES OF DEATH: In 2016, 31.2% of infants died due to conditions related to prematurity and 21% died due to birth defects. In addition, 11.2% infants died due to accidents; 8.2% of all infant deaths were due to accidental suffocation in bed. (See Table 14-A.)

Respiratory Distress Syndrome (RDS) declined from about 15 per 1,000 live births in the early eighties to about 5 per 1,000 by the late nineties. Due to surfactant and other therapies, the number of RDS deaths has continued to decline to less than 2 per 1,000 live births in 2016. In the past few years, the SIDS death rate has remained about 3 per 1,000 live births.

CHARACTERISTICS OF NEWBORN: Certain newborns are at higher risk of dying. In 2016 infants born with very low birth weight (less than 1,500 grams) experienced an infant death rate of 216.0 per 1,000 live births compared to a rate of 2.3 for those infants weighing 2,500 grams or more. Multiple birth infants had an infant mortality rate of 23.5 per 1,000 live births compared to the rate of 5.7 for single birth infants. The excess male infant mortality normally reported in other years was present in 2016, with the infant mortality for male infants at 7.1 per 1,000 male live births and females at 5.7 per 1,000 female live births. (See Table 11.)

CHARACTERISTICS OF MOTHER: Infant death rates were the lowest for mothers aged 30-39 years old and highest for mothers aged under 20 years old. Unmarried mothers had infant mortality rates about twice those of married mothers. Women receiving inadequate prenatal care experienced infant mortality rates three times as high as those women receiving adequate prenatal care. Mothers exposed to secondhand smoking while pregnant had an infant death rate of 8.7 per 1,000 live births compared to a rate of 5.5 for mothers who were not exposed to secondhand smoking during pregnancy. (See Table 11.)

March 2018 Release: Certain mortality records are finalized very late due to forensic enquiries, or for administrative purposes or for other exceptional reasons. In 2015, 5 infant death records were not reported until after the division had released the 2015 Infant Death Report. These infant deaths raised the number of deaths from 765 to 770; and they are reported in the 2016 report. In addition, the DVRHS anticipates that the 2016 infant death count will be revised as well. For purposes of referring to data published in this report, the DVRHS will refer to this data set as the "**March 2018** release."

COMMUNITY LEVEL DATA: Infant mortality data are available for most communities in Michigan. On the Internet, go to Michigan's community health information site at www.michigan.gov/healthstatistics. Data for local health department districts, counties and major cities and townships can be reached by choosing "Vital Statistics" and then "Infant Mortality" button. Those who do not have access to the Internet may request that community level data be mailed to them from the address below.

Questions regarding Infant Death Statistics should be addressed to:

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Residence Determined by Reported Residence and Geocoded Residence in the Michigan Death Certificate Registry

Using a process called geocoding, the Division for Vital Records & Health Statistics (DVRHS) has assigned geographic coordinates to most death certificates reported between 2000 and 2016. While the primary purpose of geocoding mortality data is to map patterns of death and to conduct spatial epidemiology, such records can also be used to improve the accuracy of location-related data recorded on the certificate. In mortality datasets, the division has found that the MCD residence is miscoded in certain areas about 10-20% of the time. Often, the person reporting the residence confuses the township with an adjacent city or village. Such errors then alter the calculation of local area statistics; small errors in coding lead to large errors in rates calculated for MCDs with populations below 70,000.

Therefore, all mortality and natality statistics between 2000 and 2016 in division reports of infant deaths were updated and recalculated using the geocoded data. **Birth and death counts and rates are different from data reported prior to 2011.** Statistics for years before 2000 use the residence reported during the course of registering a vital event. When rates calculated from these data differ substantially from Michigan or county rates, one should study the events as part of a trend of geocoded statistics, and consider whether the data reflects jumps indicative of a longterm trend of residence-miscoding.

Table 1
Number of Infant Deaths
Live Births and Infant Death Rates
Michigan Residents, 1970 - 2016

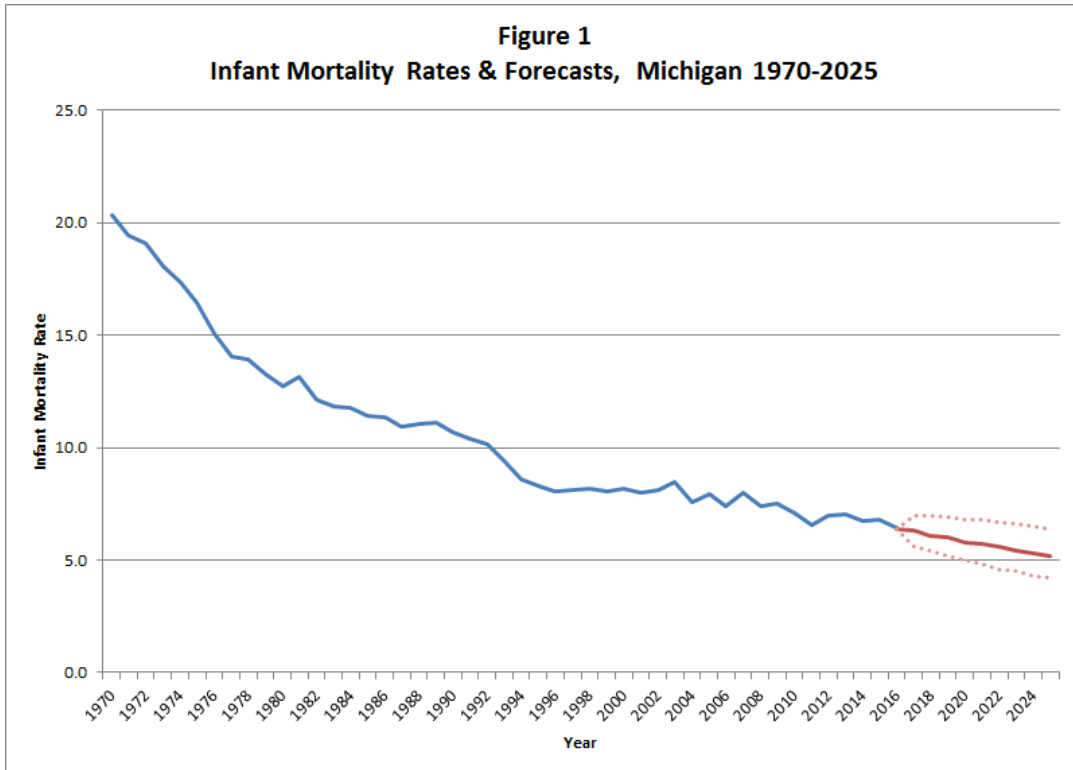
Year	Infant Deaths	Live Births	Infant Death Rate
1970	3,492	171,667	20.3 ±0.7
1971	3,157	162,244	19.5 ±0.7
1972	2,801	146,854	19.1 ±0.7
1973	2,561	141,550	18.1 ±0.7
1974	2,387	137,414	17.4 ±0.7
1975	2,205	133,931	16.5 ±0.7
1976	1,978	131,378	15.1 ±0.7
1977	1,945	138,416	14.1 ±0.6
1978	1,931	138,802	13.9 ±0.6
1979	1,921	144,452	13.3 ±0.6
1980	1,851	145,162	12.8 ±0.6
1981	1,851	140,579	13.2 ±0.6
1982	1,672	137,950	12.1 ±0.6
1983	1,573	133,026	11.8 ±0.6
1984	1,595	135,782	11.7 ±0.6
1985	1,575	138,052	11.4 ±0.6
1986	1,565	137,626	11.4 ±0.6
1987	1,538	140,466	10.9 ±0.5
1988	1,542	139,635	11.0 ±0.5
1989	1,645	148,164	11.1 ±0.5
1990	1,638	153,080	10.7 ±0.5
1991	1,554	149,478	10.4 ±0.5
1992	1,460	143,827	10.2 ±0.5
1993	1,319	139,560	9.5 ±0.5
1994	1,184	137,844	8.6 ±0.5
1995	1,110	134,169	8.3 ±0.5

Table 1
Number of Infant Deaths
Live Births and Infant Death Rates
Michigan Residents, 1970 - 2016
(Continued)

Year	Infant Deaths	Live Births	Infant Death Rate
1996	1,072	133,231	8.0 ±0.5
1997	1,085	133,549	8.1 ±0.5
1998	1,091	133,649	8.2 ±0.5
1999	1,071	133,429	8.0 ±0.5
2000	1,112	136,048	8.2 ±0.5
2001	1,066	133,247	8.0 ±0.5
2002	1,054	129,518	8.1 ±0.5
2003	1,112	130,850	8.5 ±0.5
2004	984	129,710	7.6 ±0.5
2005	1,013	127,518	7.9 ±0.5
2006	940	127,537	7.4 ±0.5
2007	997	125,172	8.0 ±0.5
2008	894	121,231	7.4 ±0.5
2009	881	117,309	7.5 ±0.5
2010	817	114,717	7.1 ±0.5
2011	749	114,159	6.6 ±0.5
2012	783	112,708	6.9 ±0.5
2013	799	113,732	7.0 ±0.5
2014	773	114,460	6.8 ±0.5
2015	770	113,211	6.8 ±0.5
2016	730	113,374	6.4 ±0.5

Note: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Source: 1970 - 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services



Note: Rates are per 1,000 live births. Rates after 2016 are forecasted within an 80% prediction interval indicated by the dotted lines; this means that the future rates fall between the lower and upper bounds of the interval with 80% probability.

Source: 1970- 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 2
Number of Infant Deaths, Live Births and Infant Death Rates By Race
Michigan Residents, 1970 - 2016

Year	White			Black			Other ¹		
	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate
1970	2,661	144,159	18.5 ±0.7	811	26,513	30.6 ±2.1	14	871	16.1 ±8.4
1971	2,293	134,486	17.1 ±0.7	843	26,755	31.5 ±2.1	17	890	19.1 ±9.0
1972	1,957	120,042	16.3 ±0.7	835	25,760	32.4 ±2.2	8	936	8.5 ±5.9
1973	1,749	115,150	15.2 ±0.7	796	25,252	31.5 ±2.2	11	926	11.9 ±7.0
1974	1,673	112,768	14.8 ±0.7	705	22,836	30.9 ±2.2	7	950	7.4 ±5.4
1975	1,574	110,058	14.3 ±0.7	616	22,692	27.1 ±2.1	8	951	8.4 ±5.8
1976	1,383	108,295	12.8 ±0.7	575	21,778	26.4 ±2.1	16	1,100	14.5 ±7.1
1977	1,373	114,511	12.0 ±0.6	559	22,620	24.7 ±2.0	8	1,059	7.6 ±5.2
1978	1,344	114,652	11.7 ±0.6	566	22,423	25.2 ±2.1	13	1,507	8.6 ±4.7
1979	1,352	119,218	11.3 ±0.6	550	23,346	23.6 ±1.9	12	1,622	7.4 ±4.2
1980	1,246	119,698	10.4 ±0.6	582	23,422	24.8 ±2.0	15	1,825	8.2 ±4.1
1981	1,261	116,596	10.8 ±0.6	564	22,002	25.6 ±2.1	18	1,847	9.7 ±4.5
1982	1,110	114,465	9.7 ±0.6	548	21,574	25.4 ±2.1	13	1,797	7.2 ±3.9
1983	1,048	109,892	9.5 ±0.6	506	21,295	23.8 ±2.0	15	1,721	8.7 ±4.4
1984	1,034	111,574	9.3 ±0.6	541	22,322	24.2 ±2.0	15	1,792	8.4 ±4.2
1985	1,053	114,150	9.2 ±0.6	510	21,935	23.3 ±2.0	11	1,820	6.0 ±3.6
1986	999	112,255	8.9 ±0.5	553	23,366	23.7 ±1.9	12	1,927	6.2 ±3.5
1987	953	113,386	8.4 ±0.5	567	24,975	22.7 ±1.8	17	1,992	8.5 ±4.0
1988	952	112,232	8.5 ±0.5	570	25,217	22.6 ±1.8	19	2,093	9.1 ±4.1
1989	946	115,186	8.2 ±0.5	672	29,839	22.5 ±1.7	23	2,525	9.1 ±3.7
1990	930	118,180	7.9 ±0.5	689	31,842	21.6 ±1.6	18	2,623	6.9 ±3.2
1991	857	114,983	7.5 ±0.5	683	31,543	21.7 ±1.6	13	2,522	5.2 ±2.8
1992	781	111,458	7.0 ±0.5	656	29,656	22.1 ±1.7	23	2,223	10.3 ±4.2
1993	770	108,329	7.1 ±0.5	530	28,249	18.8 ±1.6	17	2,418	7.0 ±3.3
1994	670	106,828	6.3 ±0.5	495	27,129	18.2 ±1.6	19	3,137	6.1 ±2.7
1995	655	105,274	6.2 ±0.5	432	24,914	17.3 ±1.6	19	3,124	6.1 ±2.7
1996	627	104,922	6.0 ±0.5	421	24,073	17.5 ±1.7	21	3,307	6.4 ±2.7
1997	640	104,980	6.1 ±0.5	425	24,201	17.6 ±1.7	17	3,628	4.7 ±2.2
1998	660	105,161	6.3 ±0.5	405	24,179	16.8 ±1.6	23	3,833	6.0 ±2.4
1999	616	104,493	5.9 ±0.5	428	23,850	17.9 ±1.7	19	4,210	4.5 ±2.0

Table 2
Number of Infant Deaths, Live Births and Infant Death Rates By Race
Michigan Residents, 1970 - 2016

Year	White			Black			Other ¹		
	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate
2000	637	106,322	6.0 ±0.5	437	24,069	18.2 ±1.7	30	4,525	6.6 ±2.4
2001	635	104,489	6.1 ±0.5	398	23,494	16.9 ±1.7	25	4,752	5.3 ±2.1
2002	611	101,611	6.0 ±0.5	410	22,248	18.4 ±1.8	21	5,056	4.2 ±1.8
2003	680	102,146	6.7 ±0.5	391	22,380	17.5 ±1.7	37	5,508	6.7 ±2.2
2004	527	100,795	5.2 ±0.4	388	22,484	17.3 ±1.7	61	5,719	10.7 ±2.7
2005	549	99,117	5.5 ±0.5	400	22,365	17.9 ±1.7	62	5,461	11.4 ±2.8
2006	534	98,551	5.4 ±0.5	339	22,873	14.8 ±1.6	60	5,636	10.6 ±2.7
2007	549	93,868	5.8 ±0.5	368	22,314	16.5 ±1.7	74	6,932	10.7 ±2.4
2008	496	91,509	5.4 ±0.5	332	22,695	14.6 ±1.6	61	6,691	9.1 ±2.3
2009	470	87,471	5.4 ±0.5	346	22,292	15.5 ±1.6	46	6,980	6.6 ±1.9
2010	462	84,597	5.5 ±0.5	312	22,046	14.2 ±1.6	38	7,425	5.1 ±1.6
2011	411	84,172	4.9 ±0.5	300	21,950	13.7 ±1.5	34	7,529	4.5 ±1.5
2012	455	82,949	5.5 ±0.5	291	21,623	13.5 ±1.5	35	7,696	4.5 ±1.5
2013	473	83,339	5.7 ±0.5	290	22,055	13.1 ±1.5	35	8,081	4.3 ±1.4
2014	452	84,492	5.3 ±0.5	284	21,282	13.3 ±1.5	36	8,574	4.2 ±1.4
2015	423	82,938	5.1 ±0.5	311	21,457	14.5 ±1.6	22	8,583	2.6 ±1.1
2016	397	83,388	4.8 ±0.5	286	21,523	13.3 ±1.5	32	8,182	3.9 ±1.4

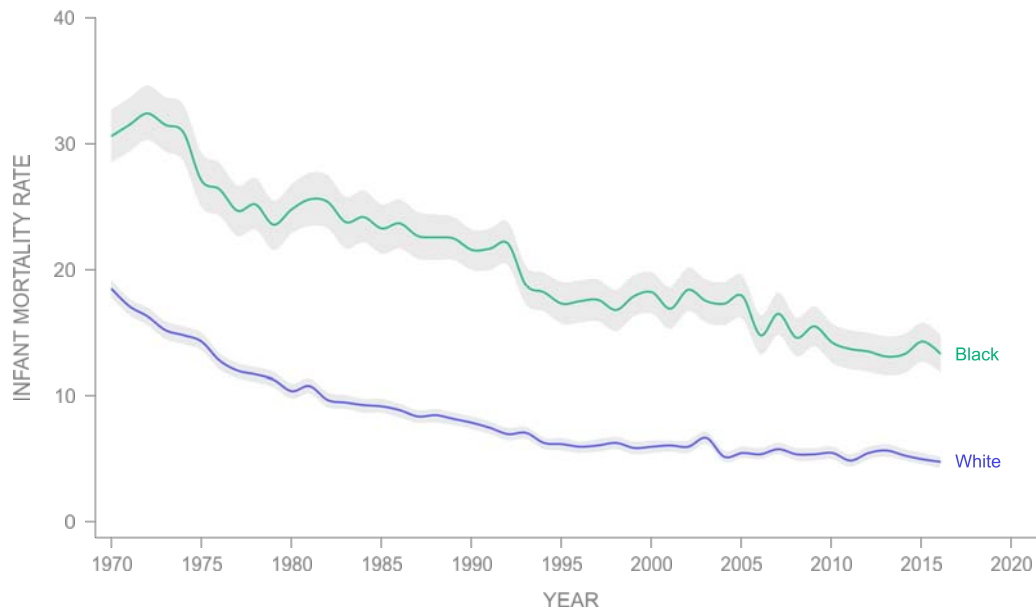
Note: Infant deaths by race of infant; live births used in calculating infant death rates are by race of mother. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Infant deaths of unknown race are not included in this table.

¹Between 2004-2008, multi-racial infants were reported as "other."

Source: 1970 - 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Figure 2
Comparison of White and Black Infant Death Rates for Michigan Residents, 1970-2016



Note: Rates are per 1,000 live births. The range indicated by the grey band represents a 95% confidence interval; this means that the true rate lies between the lower and upper bounds of the interval with 95% statistical confidence.

Source: 1970-2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2016 and 2012 - 2016 Average

County of Residence	2016			2012 - 2016		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
MICHIGAN	730	113,374	6.4 ±0.5	771.0	113,497.0	6.8 ±0.2
Alcona	-	64	-	0.4	60.4	*
Alger	-	59	-	-	60.4	-
Allegan	5	1,402	*	7.4	1,374.6	5.4 ±1.7
Alpena	-	254	-	0.8	264.4	*
Antrim	-	202	-	0.6	195.0	*
Arenac	1	128	*	1.4	125.2	11.2 ±8.2
Baraga	1	62	*	0.8	75.0	*
Barry	2	647	*	2.2	636.0	3.5 ±2.0
Bay	1	1,063	*	5.0	1,044.6	4.8 ±1.9
Benzie	2	162	*	1.0	154.2	*
Berrien	10	1,692	5.9 ±3.7	12.4	1,789.0	6.9 ±1.7
Branch	5	540	*	4.0	531.6	7.5 ±3.3
Calhoun	6	1,663	3.6 ±2.9	10.0	1,670.6	6.0 ±1.7
Cass	3	453	*	3.6	473.0	7.6 ±3.5
Charlevoix	-	233	-	0.8	235.8	*
Cheboygan	1	196	*	0.4	204.6	*
Chippewa	1	331	*	1.4	349.4	4.0 ±3.0
Clare	2	335	*	1.4	324.2	4.3 ±3.2
Clinton	3	854	*	4.0	815.2	4.9 ±2.1
Crawford	3	116	*	1.2	115.4	10.4 ±8.3
Delta	2	338	*	2.2	364.2	6.0 ±3.6
Dickinson	2	287	*	1.4	257.2	5.4 ±4.0
Eaton	9	1,172	7.7 ±5.0	7.8	1,173.0	6.6 ±2.1
Emmet	1	285	*	1.2	299.2	4.0 ±3.2
Genesee	47	4,802	9.8 ±2.8	42.0	4,896.8	8.6 ±1.2
Gladwin	1	269	*	2.0	258.8	7.7 ±4.8
Gogebic	5	128	*	1.2	121.6	9.9 ±7.9
Gd. Traverse	6	939	6.4 ±5.1	5.0	937.6	5.3 ±2.1
Gratiot	1	372	*	1.8	398.6	4.5 ±2.9
Hillsdale	7	567	12.3 ±9.1	3.4	543.6	6.3 ±3.0

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2016 and 2012 - 2016 Average

County of Residence	2016			2012 - 2016		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Houghton	2	360	*	1.6	371.2	4.3 ±3.0
Huron	1	324	*	0.8	299.4	*
Ingham	21	3,331	6.3 ±2.7	22.6	3,289.2	6.9 ±1.3
Ionia	4	720	*	3.2	732.4	4.4 ±2.1
Iosco	1	216	*	1.2	229.8	5.2 ±4.2
Iron	-	101	-	0.2	91.8	*
Isabella	1	634	*	2.8	659.6	4.2 ±2.2
Jackson	17	1,780	9.6 ±4.5	11.4	1,777.8	6.4 ±1.7
Kalamazoo	8	3,174	2.5 ±1.7	17.8	3,169.0	5.6 ±1.2
Kalkaska	2	167	*	2.2	176.0	12.5 ±7.3
Kent	56	8,795	6.4 ±1.7	50.6	8,860.2	5.7 ±0.7
Keweenaw	-	21	-	0.2	18.2	*
Lake	-	103	-	0.4	99.4	*
Lapeer	4	801	*	3.8	814.6	4.7 ±2.1
Leelanau	1	172	*	1.2	170.2	7.1 ±5.6
Lenawee	8	1,056	7.6 ±5.2	8.0	1,048.6	7.6 ±2.4
Livingston	4	1,826	*	7.8	1,778.6	4.4 ±1.4
Luce	1	43	*	0.8	49.4	*
Mackinac	3	86	*	1.0	85.0	*
Macomb	51	9,429	5.4 ±1.5	55.8	9,332.8	6.0 ±0.7
Manistee	1	245	*	0.6	199.6	*
Marquette	2	668	*	2.4	643.6	3.7 ±2.1
Mason	-	281	-	1.0	297.0	*
Mecosta	1	407	*	3.2	425.8	7.5 ±3.7
Menominee	1	199	*	0.8	208.6	*
Midland	1	836	*	4.4	848.2	5.2 ±2.2
Missaukee	1	188	*	0.8	183.0	*
Monroe	7	1,542	4.5 ±3.4	8.6	1,509.8	5.7 ±1.7
Montcalm	4	717	*	3.8	719.8	5.3 ±2.4
Montmorency	-	63	-	0.4	67.2	*

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2016 and 2012 - 2016 Average

County of Residence	2016			2012 - 2016		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Muskegon	18	2,132	8.4 ±3.9	17.4	2,101.0	8.3 ±1.7
Newaygo	3	552	*	3.6	547.0	6.6 ±3.0
Oakland	71	13,627	5.2 ±1.2	81.6	13,487.2	6.1 ±0.6
Oceana	3	303	*	3.2	301.8	10.6 ±5.2
Ogemaw	1	198	*	0.8	189.0	*
Ontonagon	-	34	-	0.2	29.6	*
Osceola	2	236	*	1.0	259.4	*
Oscoda	-	104	-	0.6	92.0	*
Otsego	1	244	*	2.2	244.6	9.0 ±5.3
Ottawa	16	3,414	4.7 ±2.3	18.8	3,351.0	5.6 ±1.1
Presque Isle	1	100	*	1.4	95.4	14.7 ±10.8
Roscommon	1	160	*	0.6	165.6	*
Saginaw	27	2,192	12.3 ±4.6	19.8	2,264.8	8.7 ±1.7
St. Clair	9	1,587	5.7 ±3.7	9.2	1,562.2	5.9 ±1.7
St. Joseph	6	761	7.9 ±6.3	5.2	792.8	6.6 ±2.5
Sanilac	4	433	*	3.4	439.8	7.7 ±3.7
Schoolcraft	-	69	-	-	66.0	-
Shiawasee	6	729	8.2 ±6.6	3.8	715.4	5.3 ±2.4
Tuscola	1	538	*	2.6	556.4	4.7 ±2.5
Van Buren	7	848	8.3 ±6.1	6.0	891.6	6.7 ±2.4
Washtenaw	21	3,700	5.7 ±2.4	20.4	3,700.0	5.5 ±1.1
Wayne	200	23,129	8.6 ±1.2	219.4	23,336.2	9.4 ±0.6
Wexford	1	380	*	3.0	401.4	7.5 ±3.8
Unknown	-	4	-	-	1.8	-

Note: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

Source: 2012 - 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

**Table 4
Number of Infant Deaths, Live Births and Infant Death Rates for
Selected Cities of Residence, 2016 and 2012 - 2016 Average**

City of Residence	2016			2012 - 2016		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Ann Arbor	3	1,082	*	4.4	1,094.0	4.0 ±1.7
Battle Creek	4	753	*	6.6	833.6	7.9 ±2.7
Dearborn	7	1,748	4.0 ±3.0	10.0	1,681.0	5.9 ±1.6
Dearborn Heights	7	825	8.5 ±6.3	5.0	815.6	6.1 ±2.4
Detroit	120	9,419	12.7 ±2.3	135.4	9,853.6	13.7 ±1.0
East Lansing	-	-	-	-	-	-
Farmington Hills	3	933	*	4.8	873.2	5.5 ±2.2
Flint	22	1,446	15.2 ±6.3	19.4	1,591.2	12.2 ±2.4
Grand Rapids	24	3,048	7.9 ±3.1	22.6	3,242.6	7.0 ±1.3
Kalamazoo	3	1,038	*	7.6	1,135.6	6.7 ±2.1
Kentwood	8	839	9.5 ±6.6	5.6	799.0	7.0 ±2.6
Lansing	19	1,777	10.7 ±4.8	16.2	1,837.2	8.8 ±1.9
Livonia	7	889	7.9 ±5.8	4.6	882.8	5.2 ±2.1
Midland	1	443	*	2.8	468.4	6.0 ±3.1
Muskegon	9	549	16.4 ±10.6	8.2	593.4	13.8 ±4.2
Novi	4	618	*	3.4	648.2	5.2 ±2.5
Pontiac	10	1,092	9.2 ±5.6	13.2	1,108.2	11.9 ±2.9
Portage	1	552	*	2.8	572.8	4.9 ±2.6
Rochester Hills	1	775	*	2.6	755.4	3.4 ±1.9
Roseville	7	595	11.8 ±8.7	5.8	598.6	9.7 ±3.5
Royal Oak	1	748	*	3.8	759.0	5.0 ±2.2
Saginaw	14	800	17.5 ±9.1	11.8	841.4	14.0 ±3.6
Southfield	7	819	8.5 ±6.3	7.8	778.4	10.0 ±3.1
St Clair Shores	4	561	*	3.2	577.0	5.5 ±2.7
Sterling Heights	10	1,400	7.1 ±4.4	9.6	1,443.6	6.7 ±1.9
Taylor	5	877	*	6.0	862.0	7.0 ±2.5
Troy	4	804	*	3.2	809.2	4.0 ±1.9
Warren	13	1,705	7.6 ±4.1	10.4	1,682.2	6.2 ±1.7
Westland	7	1,083	6.5 ±4.8	8.0	1,082.4	7.4 ±2.3
Wyoming	8	1,190	6.7 ±4.6	6.4	1,206.8	5.3 ±1.8

Note: This table shows cities with (1) populations greater than 40,000 according to 2007 estimates and (2) three-year average births of greater than 200. City birth and mortality statistics have changed from pre-2011 reports due to geocoding. See [Data Quality Considerations](#) for further details. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

Source: 2012-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2012-2016 Geocoded Michigan Birth Certificate Registries Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 5
Number and Rate of Infant Deaths by Race for
Residents of Michigan, Detroit City, Wayne County (Excluding Detroit City)
and Michigan (Excluding Wayne County), 1990- 2016

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
1990	Total	1,638	10.7 ±0.5	491	20.3 ±1.8	170	10.3 ±1.5	977	8.7 ±0.5
	White	930	7.9 ±0.5	36	8.7 ±2.8	130	8.8 ±1.5	764	7.7 ±0.5
	Black	689	21.6 ±1.6	451	23.0 ±2.1	38	24.8 ±7.8	200	18.7 ±2.6
1991	Total	1,554	10.4 ±0.5	456	19.4 ±1.8	139	8.4 ±1.4	959	8.8 ±0.6
	White	857	7.5 ±0.5	39	10.0 ±3.1	103	7.1 ±1.4	715	7.4 ±0.5
	Black	683	21.7 ±1.6	417	21.6 ±2.1	34	20.3 ±6.7	232	21.9 ±2.8
1992	Total	1,460	10.2 ±0.5	462	21.4 ±1.9	128	8.1 ±1.4	870	8.2 ±0.5
	White	781	7.0 ±0.5	43	12.3 ±3.7	92	6.6 ±1.4	646	6.9 ±0.5
	Black	656	22.1 ±1.7	415	23.3 ±2.2	34	21.8 ±7.2	207	20.1 ±2.7
1993	Total	1,319	9.5 ±0.5	348	17.2 ±1.8	111	7.1 ±1.3	860	8.3 ±0.6
	White	770	7.1 ±0.5	28	9.1 ±3.3	88	6.4 ±1.3	654	7.2 ±0.5
	Black	530	18.8 ±1.6	317	18.7 ±2.0	21	14.4 ±6.1	192	19.4 ±2.7
1994	Total	1,184	8.6 ±0.5	322	16.6 ±1.8	105	6.8 ±1.3	757	7.3 ±0.5
	White	670	6.3 ±0.5	28	9.4 ±3.5	69	5.1 ±1.2	573	6.3 ±0.5
	Black	495	18.2 ±1.6	293	18.2 ±2.1	35	23.7 ±7.7	167	17.5 ±2.6
1995	Total	1,110	8.3 ±0.5	274	15.6 ±1.8	89	5.8 ±1.2	747	7.4 ±0.5
	White	655	6.2 ±0.5	17	6.0 ±2.8	64	4.8 ±1.2	574	6.4 ±0.5
	Black	432	17.3 ±1.6	254	17.6 ±2.1	25	18.2 ±7.1	153	16.8 ±2.6
1996	Total	1,072	8.0 ±0.5	248	15.0 ±1.8	101	6.7 ±1.3	723	7.1 ±0.5
	White	627	6.0 ±0.5	9	3.4 ±2.2	74	5.6 ±1.3	544	6.1 ±0.5
	Black	421	17.5 ±1.7	238	17.5 ±2.2	23	16.2 ±6.6	160	17.7 ±2.7
1997	Total	1,085	8.1 ±0.5	253	15.1 ±1.8	100	6.6 ±1.3	732	7.2 ±0.5
	White	640	6.1 ±0.5	23	8.6 ±3.5	76	5.8 ±1.3	541	6.1 ±0.5
	Black	425	17.6 ±1.7	229	16.7 ±2.1	23	16.5 ±6.7	173	19.1 ±2.8

Table 5
Number and Rate of Infant Deaths by Race for
Residents of Michigan, Detroit City, Wayne County (Excluding Detroit City)
and Michigan (Excluding Wayne County), 1990- 2016

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
1998	Total	1,091	8.2 ±0.5	241	14.7 ±1.8	99	6.6 ±1.3	751	7.4 ±0.5
	White	660	6.3 ±0.5	15	5.8 ±2.9	74	5.7 ±1.3	571	6.4 ±0.5
	Black	405	16.8 ±1.6	219	16.1 ±2.1	22	14.9 ±6.2	164	18.0 ±2.7
1999	Total	1,071	8.0 ±0.5	245	15.5 ±1.9	97	6.4 ±1.3	729	7.1 ±0.5
	White	616	5.9 ±0.5	15	5.6 ±2.8	72	5.6 ±1.3	529	5.9 ±0.5
	Black	428	17.9 ±1.7	228	17.8 ±2.3	23	15.1 ±6.1	177	18.6 ±2.7
2000	Total	1,112	8.2 ±0.5	232	14.7 ±1.9	98	6.4 ±1.3	782	7.4 ±0.5
	White	637	6.0 ±0.5	20	7.5 ±3.3	64	5.0 ±1.2	553	6.1 ±0.5
	Black	437	18.2 ±1.7	206	16.1 ±2.2	33	20.2 ±6.8	198	20.5 ±2.8
2001	Total	1,066	8.0 ±0.5	210	13.9 ±1.9	81	5.3 ±1.2	775	7.5 ±0.5
	White	635	6.1 ±0.5	14	5.3 ±2.8	58	4.5 ±1.2	563	6.3 ±0.5
	Black	398	16.9 ±1.7	195	15.9 ±2.2	21	12.9 ±5.5	182	18.9 ±2.7
2002	Total	1,054	8.1 ±0.5	239	16.8 ±2.1	103	6.9 ±1.3	712	7.1 ±0.5
	White	611	6.0 ±0.5	20	8.0 ±3.5	70	5.7 ±1.3	521	6.0 ±0.5
	Black	410	18.4 ±1.8	217	19.1 ±2.5	28	16.9 ±6.2	165	17.9 ±2.7
2003	Total	1,112	8.5 ±0.5	227	16.2 ±2.1	120	8.1 ±1.4	765	7.5 ±0.5
	White	680	6.7 ±0.5	28	11.7 ±4.3	85	7.1 ±1.5	567	6.5 ±0.5
	Black	391	17.5 ±1.7	199	17.9 ±2.5	29	16.9 ±6.1	163	17.1 ±2.6
2004	Total	984	7.6 ±0.5	211	15.6 ±2.1	89	6.1 ±1.3	684	6.7 ±0.5
	White	527	5.2 ±0.4	12	5.0 ±2.8	54	4.6 ±1.2	461	5.3 ±0.5
	Black	388	17.3 ±1.7	193	17.9 ±2.5	30	16.1 ±5.7	165	16.8 ±2.5
2005	Total	1,013	7.9 ±0.5	210	16.0 ±2.1	93	6.5 ±1.3	710	7.1 ±0.5
	White	549	5.5 ±0.5	13	5.7 ±3.1	58	5.1 ±1.3	478	5.6 ±0.5
	Black	400	17.9 ±1.7	188	17.9 ±2.5	34	17.7 ±5.9	178	17.9 ±2.6

Table 5
Number and Rate of Infant Deaths by Race for
Residents of Michigan, Detroit City, Wayne County (Excluding Detroit City)
and Michigan (Excluding Wayne County), 1990- 2016

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
2006	Total	940	7.4 ±0.5	175	13.5 ±2.0	98	6.8 ±1.4	667	6.7 ±0.5
	White	534	5.4 ±0.5	9	4.0 ±2.6	61	5.5 ±1.4	464	5.4 ±0.5
	Black	339	14.8 ±1.6	153	14.7 ±2.3	31	14.4 ±5.0	155	15.0 ±2.3
2007	Total	997	8.0 ±0.5	179	14.8 ±2.1	95	6.7 ±1.3	723	7.3 ±0.5
	White	549	5.8 ±0.5	13	7.1 ±3.8	59	5.5 ±1.4	477	5.9 ±0.5
	Black	368	16.5 ±1.7	155	16.1 ±2.5	25	11.4 ±4.5	188	17.9 ±2.5
2008	Total	894	7.4 ±0.5	175	14.8 ±2.2	100	7.2 ±1.4	619	6.5 ±0.5
	White	496	5.4 ±0.5	8	4.7 ±3.3	63	5.9 ±1.5	425	5.4 ±0.5
	Black	332	14.6 ±1.6	159	16.7 ±2.6	27	12.3 ±4.6	146	13.3 ±2.1
2009	Total	881	7.5 ±0.5	166	14.8 ±2.2	82	6.1 ±1.3	633	6.8 ±0.5
	White	470	5.4 ±0.5	6	4.3 ±3.5	54	5.4 ±1.4	410	5.4 ±0.5
	Black	346	15.5 ±1.6	152	16.7 ±2.6	19	7.9 ±3.5	175	16.2 ±2.4
2010	Total	817	7.1 ±0.5	146	13.3 ±2.2	87	6.6 ±1.4	584	6.4 ±0.5
	White	462	5.5 ±0.5	10	9.6 ±5.9	44	4.6 ±1.4	408	5.5 ±0.5
	Black	312	14.2 ±1.6	128	14.3 ±2.5	37	15.0 ±4.8	147	13.8 ±2.2
2011	Total	749	6.6 ±0.5	130	12.6 ±2.1	100	7.5 ±1.5	519	5.7 ±0.5
	White	411	4.9 ±0.5	5	*	58	6.0 ±1.5	348	4.7 ±0.5
	Black	300	13.7 ±1.5	119	14.0 ±2.5	37	14.6 ±4.7	144	13.2 ±2.1
2012	Total	783	6.9 ±0.5	151	15.0 ±2.4	87	6.7 ±1.4	545	6.1 ±0.5
	White	455	5.5 ±0.5	12	15.7 ±8.8	56	5.9 ±1.6	387	5.3 ±0.5
	Black	291	13.5 ±1.5	133	16.0 ±2.7	27	11.2 ±4.2	131	12.0 ±2.0
2013	Total	799	7.0 ±0.5	132	13.1 ±2.2	84	6.2 ±1.3	583	6.5 ±0.5
	White	473	5.7 ±0.5	7	8.8 ±6.5	57	6.0 ±1.6	409	5.6 ±0.5
	Black	290	13.1 ±1.5	119	14.4 ±2.6	22	8.2 ±3.4	149	13.5 ±2.1

Table 5
Number and Rate of Infant Deaths by Race for
Residents of Michigan, Detroit City, Wayne County (Excluding Detroit City)
and Michigan (Excluding Wayne County), 1990- 2016

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
2014	Total	773	6.8 ±0.5	130	13.2 ±2.3	88	6.5 ±1.4	555	6.1 ±0.5
	White	452	5.3 ±0.5	8	9.6 ±6.6	55	5.9 ±1.6	389	5.2 ±0.5
	Black	284	13.3 ±1.5	120	14.7 ±2.6	25	9.7 ±3.8	139	13.2 ±2.2
2015	Total	770	6.8 ±0.5	142	14.4 ±2.3	83	6.1 ±1.3	545	6.1 ±0.5
	White	423	5.1 ±0.5	9	10.1 ±6.6	60	6.4 ±1.6	354	4.9 ±0.5
	Black	311	14.5 ±1.6	125	15.4 ±2.7	17	6.4 ±3.1	169	15.8 ±2.4
2016	Total	730	6.4 ±0.5	120	12.7 ±2.3	80	5.8 ±1.3	530	5.9 ±0.5
	White	397	4.8 ±0.5	6	6.8 ±5.4	49	5.1 ±1.4	342	4.7 ±0.5
	Black	286	13.3 ±1.5	103	13.3 ±2.6	31	11.2 ±3.9	152	13.8 ±2.2

Note: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Source: 1990- 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 6
Number and Rate of Infant Deaths by Race,
Michigan and United States Residents, 1989 - 2016

Year	United States						Michigan					
	All Races		White		Black		All Races		White		Black	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate	Number	Rate
1989	39,655	9.8	25,794	8.0	12,527	18.6	1,645	11.1	946	8.2	672	22.5
1990	38,351	9.2	24,883	7.6	12,290	18.0	1,638	10.7	930	7.9	689	21.6
1991	36,766	8.9	23,657	7.3	11,994	17.6	1,554	10.4	857	7.5	683	21.7
1992	34,628	8.5	22,164	6.9	11,348	16.8	1,460	10.2	781	7.0	656	22.1
1993	33,466	8.4	21,497	6.8	10,887	16.5	1,319	9.5	770	7.1	530	18.8
1994	31,710	8.0	20,504	6.6	10,072	15.8	1,184	8.6	670	6.3	495	18.2
1995	29,583	7.6	19,490	6.3	9,118	15.1	1,110	8.3	655	6.2	432	17.3
1996	28,487	7.3	18,761	6.1	8,730	14.7	1,072	8.0	627	6.0	421	17.5
1997	28,045	7.2	18,539	6.0	8,496	14.2	1,085	8.1	640	6.1	425	17.6
1998	28,371	7.2	18,561	6.0	8,726	14.3	1,091	8.2	660	6.3	405	16.8
1999	27,953	7.1	18,069	5.8	8,832	14.6	1,071	8.0	616	5.9	428	17.9
2000	28,035	6.9	18,144	5.7	8,771	14.0	1,112	8.2	637	6.0	437	18.2
2001	27,568	6.8	17,955	5.7	8,498	14.0	1,066	8.0	635	6.1	398	16.9
2002	28,034	7.0	18,369	5.8	8,524	14.4	1,054	8.1	611	6.0	410	18.4
2003	28,025	6.9	18,440	5.7	8,402	14.0	1,112	8.5	680	6.7	391	17.5
2004	27,936	6.8	18,231	5.7	8,494	13.3	984	7.6	527	5.2	388	17.3
2005	28,440	6.9	18,514	5.7	8,695	13.7	1,013	7.9	549	5.5	400	17.9
2006	28,527	6.7	18,403	5.6	8,858	13.3	940	7.4	534	5.4	339	14.8
2007	29,138	6.8	18,807	5.6	8,944	13.2	997	8.0	549	5.8	368	16.5
2008	28,059	6.6	18,164	5.6	8,543	12.7	894	7.4	496	5.4	332	14.6
2009	26,412	6.4	16,817	5.3	8,312	12.6	881	7.5	470	5.4	346	15.5
2010	24,548	6.1	15,933	5.2	7,388	11.6	817	7.1	462	5.5	312	14.2
2011	23,910	6.1	15,453	5.1	7,058	11.2	749	6.6	411	4.9	300	13.7
2012	23,654	6.0	15,264	5.1	6,896	10.9	783	6.9	455	5.5	291	13.5
2013	23,440	6.0	15,125	5.0	7,123	11.2	799	7.0	473	5.7	290	13.1
2014	23,215	5.8	14,883	5.1	7,076	10.4	773	6.8	452	5.3	284	13.3
2015	23,455	5.9	14,834	5.0	7,289	10.6	770	6.8	423	5.1	311	14.5
2016	23,161	5.9	14,568	4.9	7,229	10.6	730	6.4	397	4.8	286	13.3

Note: Rates are per 1,000 live births.

Source: 1989 - 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.
 2007-2012 NCHS, Linked Birth / Infant Death Records 2007-2015 on CDC WONDER On-line Database. Accessed at <http://wonder.cdc.gov/lbd-current.html> on Mar 7, 2017. "Deaths: Final Data for 2006", Vol 57, No. 14, April 2009; and [National Center for Health Statistics, historical data](#).

Table 7-A
Number of Hispanic and Middle Easterner Infant Deaths by Selected County and Michigan
Michigan Residents, 2006 - 2016

Hispanic Infant Deaths

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	94	90	74	74	57	44	74	80	61	77	68
Hispanic Infant Death Rates	11.0	10.3	8.5	9.0	7.0	5.6	9.7	10.3	8.0	9.9	8.8
Allegan	2	-	2	1	-	1	-	3	-	-	1
Genesee	5	5	1	1	1	2	-	-	1	2	4
Ingham	2	3	2	8	1	1	2	4	2	1	2
Kalamazoo	2	4	3	-	4	-	2	2	1	4	1
Kent	27	13	16	6	8	12	10	6	7	13	10
Lenawee	1	2	-	2	1	1	2	5	2	-	1
Macomb	3	6	2	4	-	-	1	3	-	5	2
Muskegon	1	2	2	3	-	1	1	5	-	2	2
Oakland	7	5	9	9	6	7	8	8	4	9	1
Ottawa	4	3	3	4	1	2	4	8	2	4	4
Saginaw	3	8	4	5	2	2	5	4	4	2	8
Van Buren	-	2	2	-	1	-	2	1	2	3	1
Washtenaw	2	-	3	4	2	-	2	1	-	-	1
Wayne	15	19	15	13	15	8	16	17	13	21	13
All Other Counties	20	18	10	14	15	7	19	13	23	11	17

**Table 7-B
Number of Hispanic and Middle Easterner Infant Deaths by Selected County and Michigan
Michigan Residents, 2006 - 2016 (Continued)**

Middle Easterner Infant Deaths

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	31	32	34	22	24	24	26	36	21	26	29
Arabic Infant Death Rates	7.6	8.0	8.5	5.8	5.7	5.9	6.2	7.8	4.4	5.3	5.8
Macomb	5	3	7	6	5	2	5	6	3	2	6
Oakland	3	4	8	2	6	3	5	7	3	4	5
Wayne	22	23	16	10	10	15	14	17	9	16	12
All Other Counties	1	2	3	4	3	4	2	6	6	4	6

Note: The increase in hispanic mortality incidence reflects a change in death certificate reporting. Michigan's death certificate was revised in 2003 to comply with a change in the National Standard death certificate and a separate indicator of hispanic ancestry was introduced. In 2005, the hispanic ancestry indicator was used in tabulations for the first time, resulting in the identification of hispanic deaths that might otherwise have been missed. The increase in hispanic death cases between 2004 and 2005 should not be considered as a change in trend.

Caution: Care should be taken drawing inferences from rates based on small numbers of events or small population base. These rates tend to exhibit considerable variation which may negate their usefulness for comparative purpose

Source: 2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

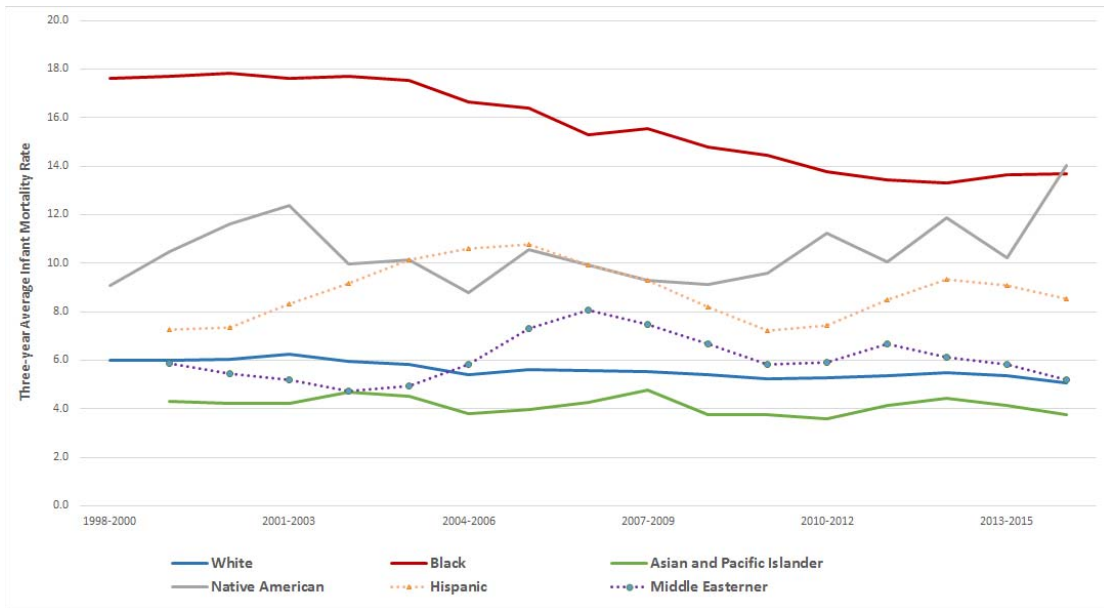
Table 8
Three-year Average Infant Death Rates by Race and Ancestry,
Michigan Residents, 1999 - 2016

Trends	Race				Ancestry	
	White	Black	Native American	Asian and Pacific Islander	Hispanic	Middle Easterner
1999-2001	6.0	17.7	10.5	4.3	7.3	5.9
2000-2002	6.0	17.8	11.6	4.2	7.4	5.4
2001-2003	6.2	17.6	12.4	4.2	8.3	5.2
2002-2004	6.0	17.7	10.0	4.7	9.2	4.7
2003-2005	5.8	17.5	10.1	4.5	10.1	4.9
2004-2006	5.4	16.6	8.8	3.8	10.6	5.8
2005-2007	5.6	16.4	10.6	4.0	10.8	7.3
2006-2008	5.6	15.3	9.9	4.2	9.9	8.1
2007-2009	5.6	15.5	9.3	4.8	9.3	7.5
2008-2010	5.4	14.8	9.1	3.8	8.2	6.7
2009-2011	5.2	14.5	9.6	3.8	7.2	5.8
2010-2012	5.3	13.8	11.2	3.6	7.4	5.9
2011-2013	5.3	13.4	10.1	4.1	8.5	6.7
2012-2014	5.5	13.3	11.9	4.4	9.4	6.1
2013-2015	5.4	13.6	10.2	4.1	9.1	5.8
2014-2016	5.1	13.7	14.0	3.7	8.6	5.2

Note: Rates are per 1,000 live births.

Source: 1970 - 2016 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Figure 3
Three-year Average Infant Mortality Rates by Race and Ancestry,
Michigan Residents, 1998-2016



Note: Rates are infant deaths per 1,000 live births.

Source: 1980-2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 9
Infant, Hebdomadal, Fetal and Perinatal Death Rates
by Specified Race and Ancestry
Michigan Residents, 2016

Race/Ancestry	Live Births	Infant Deaths		Hebdomadal Deaths		Fetal Deaths		Perinatal Deaths	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
All Races	113,374	730	6.4 ±0.5	378	3.3 ±0.3	618	5.4 ±0.4	996	8.7 ±0.5
White	83,388	397	4.8 ±0.5	210	2.5 ±0.3	397	4.7 ±0.5	607	7.2 ±0.6
Black	21,523	286	13.3 ±1.5	145	6.7 ±1.1	176	8.1 ±1.2	321	14.8 ±1.6
American Indian	694	12	17.3 ±9.7	5	*	2	*	7	10.1 ±7.4
Asian and Pacific Islander	4,548	14	3.1 ±1.6	9	2.0 ±1.3	21	4.6 ±2.0	30	6.6 ±2.3
Middle Easterner	5,007	29	5.8 ±2.1	21	4.2 ±1.8	16	3.2 ±1.6	37	7.4 ±2.4
Hispanic	7,759	68	8.8 ±2.1	27	3.5 ±1.3	43	5.5 ±1.6	70	9.0 ±2.1

Note: Hebdomadal deaths are deaths to infants ages zero to six days. Perinatal deaths are hebdomadal plus fetal deaths.

Infant death and hebdomadal rates are per 1,000 live births. Fetal death and perinatal death rates are per 1,000 live births plus fetal deaths.

Rates are calculated using live births by race/ancestry of mother as denominator. Live births are by the race/ancestry of the mother on the birth certificate. Infant and hebdomadal deaths are by the race on the death certificate. Fetal deaths are by the race of the mother on the fetal death certificate. Perinatal deaths are by mother's race/ancestry on the fetal death certificate or the infant's race/ancestry on the death certificate.

Asterisk (*) indicates that data do not meet standards of precision or reliability.

Caution: Care should be taken drawing inferences from rates based on small numbers of events or small population base. These rates tend to exhibit considerable variation which may negate their usefulness for comparative purposes.

Source: 2016 Michigan Resident Infant Death File, 2016 Michigan Fetal Death Registry
 Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 10
Infant, Hebdomadal, Fetal and Perinatal Death Rates
Michigan Residents, 2007-2016 and Preliminary 2017

Year	Live Births	Infant Deaths		Hebdomadal Deaths		Fetal Deaths		Perinatal Deaths	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
2007	125,172	997	8.0	553	4.4	731	5.8	1,284	10.2
2008	121,231	894	7.4	501	4.1	762	6.2	1,263	10.4
2009	117,309	881	7.5	478	4.1	692	5.9	1,170	9.9
2010	114,717	817	7.1	475	4.1	650	5.6	1,125	9.8
2011	114,159	749	6.6	414	3.6	633	5.5	1,047	9.1
2012	112,708	783	6.9	459	4.1	591	5.2	1,050	9.3
2013	113,732	799	7.0	431	3.8	580	5.1	1,011	8.8
2014	114,460	773	6.8	417	3.6	625	5.4	1,042	9.1
2015	113,211	770	6.8	400	3.5	547	4.8	941	8.4
2016	113,374	730	6.4	378	3.3	618	5.4	996	8.8
2017 ^{PREM}	110,934	722	6.5	415	3.7	636	5.7	1,051	9.4

Note: Hebdomadal deaths are deaths to infants ages zero to six days. Perinatal deaths are hebdomadal plus fetal deaths.

Infant death and hebdomadal rates are per 1,000 live births. Fetal death and perinatal death rates are per 1,000 live births plus fetal deaths.

2017 live birth and infant deaths are **Preliminary** and the counts are considered incomplete.

In 2017, hospital audits found additional fetal deaths. The number of fetal deaths between 2007-2015 will not match what was reported in the past.

Source: 2016 Michigan Resident Infant Death File, 2016 Michigan Fetal Death Registry Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 11
Number of Infant Deaths, Live Births and Infant Death Rates
by Selected Characteristics of Newborn and of Mother
for Michigan Residents, 2016

Characteristics of Newborn	Infant Deaths	Live Births	Infant Death Rate
Sex of Infant	730	113,374	6.4 ±0.5
Male	413	58,031	7.1 ±0.7
Female	313	55,337	5.7 ±0.6
Birthweight	730	113,374	6.4 ±0.5
1,499 Grams or Less	367	1,699	216.0 ±19.8
1,500 - 2,499 Grams	115	8,009	14.4 ±2.6
2,500 Grams or More	238	103,637	2.3 ±0.3
Plurality	730	113,374	6.4 ±0.5
Single Birth	622	108,997	5.7 ±0.4
Multiple Birth	103	4,376	23.5 ±4.5
Characteristics of Mother	Infant Deaths	Live Births	Infant Death Rate
Age of Mother	730	113,374	6.4 ±0.5
< 20	59	5,836	10.1 ±2.6
20 - 29	408	59,880	6.8 ±0.7
30 - 39	242	44,938	5.4 ±0.7
40 +	16	2,718	5.9 ±2.9
Marital Status	730	113,374	6.4 ±0.5
Married	274	66,312	4.1 ±0.5
Unmarried	451	47,062	9.6 ±0.9
Level of Prenatal Care	730	113,374	6.4 ±0.5
Adequate	340	77,709	4.4 ±0.5
Intermediate	210	25,040	8.4 ±1.1
Inadequate	174	10,613	16.4 ±2.4

Table 11
Number of Infant Deaths, Live Births and Infant Death Rates
by Selected Characteristics of Newborn and of Mother
for Michigan Residents, 2016

Exposure to Tobacco	Infant Deaths	Live Births	Infant Death Rate
Smoked During Pregnancy	730	113,374	6.4 ±0.5
No	547	96,283	5.7 ±0.5
Yes	183	17,091	10.7 ±1.5
Secondhand Smoke During Pregnancy	730	113,374	6.4 ±0.5
No	525	94,628	5.5 ±0.5
Yes	126	14,520	8.7 ±1.5
Smoked or Secondhand Smoke During Pregnancy	730	113,374	6.4 ±0.5
No	440	86,770	5.1 ±0.5
Yes	228	23,064	9.9 ±1.3
History of smoking	730	113,374	6.4 ±0.5
No	511	91,876	5.6 ±0.5
Yes	188	20,860	9.0 ±1.3

Note: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence. Records with selected characteristics unknown are included in total only. Level of prenatal care is according to the Kessner Index which is a classification of prenatal care based on the month of pregnancy in which prenatal care began, the number of prenatal visits and the length of pregnancy (i.e. for shorter pregnancies, fewer prenatal visits constitute adequate care.)

Source: 2016 Michigan Resident Birth-Death Matched File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 12
Number of Infant Deaths by Cause of Death,
1980-2016, Michigan Residents

Causes of Death	1980	1985	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	2016
All Causes	2,280	1,575	1,638	1,110	1,112	1,013	817	749	783	799	773	770	730
Certain gastrointestinal diseases	7	6	6	6	10	12	9	13	7	5	6	7	3
Septicemia	8	6	17	2	5	10	4	1	8	2	8	3	4
Remainder of infectious and parasitic diseases	5	11	18	12	7	6	3	2	2	3	5	4	4
Meningitis	13	7	11	2	3	3	5	1	2	1	1	-	3
Pneumonia and Influenza	27	11	26	20	20	6	8	6	5	7	7	5	2
Congenital anomalies	321	330	300	204	192	197	184	125	127	160	139	152	149
Newborn affected by maternal complications of pregnancy	72	52	108	47	45	67	40	49	68	52	42	45	34
Newborn affected by complications of placenta, cord and membranes	50	34	24	33	36	28	26	18	28	30	28	31	26
Disorders relating to short gestation and unspecified low birthweight	145	150	251	219	262	219	198	188	188	176	174	149	161
Birth trauma	45	14	16	8	2	1	-	1	-	-	-	-	1
Intrauterine hypoxia and birth asphyxia	69	43	25	11	24	19	20	7	14	8	7	11	5
Respiratory distress syndrome	206	176	164	82	65	57	23	14	26	20	19	14	18
Other respiratory conditions	199	132	120	63	65	52	27	28	27	20	22	17	21
Infections specific to the perinatal period	35	32	33	23	35	42	27	22	21	22	24	21	23
Neonatal hemorrhage	38	10	8	13	28	23	12	11	12	9	18	16	9
All other and ill-define conditions originating in the perinatal period	169	168	73	47	39	46	27	39	34	47	28	39	31
Sudden infant death syndrome	260	228	257	148	99	47	44	33	15	31	35	33	43
Accidents and adverse effects	39	35	38	40	55	68	66	83	93	90	89	97	82
Homicides	7	8	17	12	13	15	13	11	14	5	13	6	9
All other causes	136	122	126	118	107	95	81	97	92	111	108	120	102

Note: Causes of death are coded using the 9th and 10th revisions to the International Classification of Diseases. The ICD-9 and ICD-10 codes are grouped into broader categories for the causes listed in this table in order to classify these selected causes of death. See [Selected Causes of Groups for Infant Mortality](#) for details of grouping and comparability.

Source: 1980-2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 13
Three-year Moving Average Infant Deaths Rates per 10,000 Live Births, by Cause of Death,
1980-2016, Michigan Residents

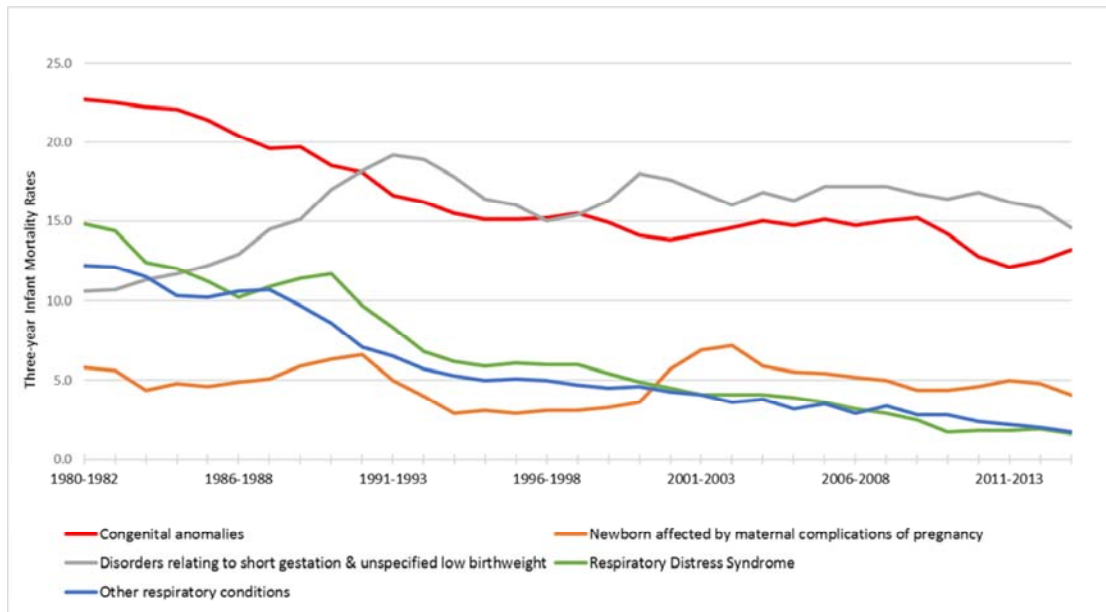
Causes of Death	1980 to 1982	1985 to 1987	1990 to 1992	1995 to 1997	2000 to 2002	2005 to 2007	2009 to 2011	2010 to 2012	2011 to 2013	2012 to 2014	2013 to 2015	2014 to 2016
Total Infant Deaths	126.8	112.4	104.2	81.5	81.0	77.6	70.7	68.8	68.4	69.1	68.6	66.6
Certain gastrointestinal diseases	.6	.6	.6	.6	.6	.9	1.0	.8	.7	.5	.5	.5
Septicemia	.4	.5	.9	.4	.5	.6	.4	.4	.3	.5	.4	.4
Remainder of infectious and parasitic diseases	.4	.8	1.1	.6	.5	.5	.2	.2	.2	.3	.4	.4
Meningitis	.9	.4	.4	*	*	.3	.2	.2	*	*	*	*
Pneumonia and Influenza	1.4	1.1	1.8	1.1	1.1	.5	.6	.6	.5	.6	.6	.4
Congenital anomalies	22.7	21.4	18.1	15.1	13.8	15.1	14.2	12.8	12.1	12.5	13.2	12.9
Newborn affected by maternal complications of pregnancy	5.8	4.6	6.6	2.9	5.7	5.4	4.4	4.6	5.0	4.8	4.1	3.5
Newborn affected by complications of placenta, cord and membranes	3.2	2.6	2.1	2.9	2.4	2.1	2.0	2.1	2.2	2.5	2.6	2.5
Disorders relating to short gestation and unspecified low birthweight	10.6	12.2	18.2	16.0	17.6	17.2	16.4	16.8	16.2	15.8	14.6	14.2
Birth trauma	2.5	.7	.7	.4	.2	*	*	*	*	-	-	*
Intrauterine hypoxia and birth asphyxia	4.5	2.4	1.6	1.2	1.6	.9	1.0	1.2	.9	.9	.8	.7
Respiratory distress syndrome	14.8	11.2	9.7	6.1	4.5	3.6	1.7	1.8	1.8	1.9	1.6	1.5
Other respiratory conditions	12.2	10.2	7.1	5.1	4.3	3.5	2.8	2.4	2.2	2.0	1.7	1.8
Infections specific to the perinatal period	2.2	2.3	2.2	2.1	3.0	2.9	2.2	2.0	1.9	2.0	2.0	2.0
Neonatal hemorrhage	2.0	.7	.6	.8	1.3	1.3	1.2	1.0	.9	1.1	1.3	1.3
All other and ill-define conditions originating in the perinatal period	13.3	12.1	5.1	3.7	3.1	4.3	3.7	2.9	3.5	3.2	3.3	2.9
Sudden infant death syndrome	16.6	17.1	16.6	10.8	4.3	3.8	3.5	2.7	2.3	2.4	2.9	3.3
Accidents and adverse effects	2.8	2.1	2.4	2.7	4.6	5.7	6.4	7.1	7.8	8.0	8.1	7.9
Homicides	.4	.9	.9	.9	.8	.8	1.0	1.1	.9	.9	.7	.8
All other causes	9.7	8.6	7.6	7.9	8.3	8.3	7.9	7.9	8.8	9.1	9.9	9.7

Note: For purposes of comparing small values, these rates are calculated at deaths per **10,000** live births; in most Michigan Community Health infant death reports, infant deaths are per **1,000**. **Causes of death** are coded using the 9th and 10th revisions to the International Classification of Diseases. The ICD-9 and ICD-10 codes are grouped into broader categories for the causes listed in this table in order to classify these selected causes of death. See [Selected Causes of Groups for Infant Mortality](#) for details of grouping and comparability.

An asterisk (*) indicates the rate does not meet standards of reliability or precision. A dash (-) indicates quantity zero.

Source: 1980-2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Figure 4
Infant Mortality Rates by Leading Causes of Infant Deaths,
Michigan Residents, 1980-2016



Note: For purposes of comparing small values, these rates are calculated at deaths per **10,000** live births; in most Michigan Community Health infant death reports, infant deaths are per **1,000**.

Causes of death are coded using the 9th and 10th revisions to the International Classification of Diseases. The ICD-9 and ICD-10 codes are grouped into broader categories for the causes listed in this table in order to classify these selected causes of death. See [Selected Causes of Groups for Infant Mortality](#) for details of grouping and comparability.

An asterisk (*) indicates the rate does not meet standards of reliability or precision. A dash (-) indicates quantity zero.

Source: 1980-2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

**Table 14-A
Number of Infant Deaths by Cause of Death,
2014-2016, Michigan Residents**

Dollfus Primary Cause of Death Group

Cause of Death Group	Number of Deaths			Percent of Deaths		
	2014	2015	2016	2014	2015	2016
Total	773	770	730	100.0	100.0	100.0
Prematurity & related conditions	247	223	228	32.0	29.0	31.2
Congenital anomalies	139	152	150	18.0	19.7	20.5
Sudden Infant Death Syndrome (SIDS)	35	33	43	4.5	4.3	5.9
Obstetric conditions	47	52	37	6.1	6.8	5.1
Birth asphyxia	7	11	5	0.9	1.4	0.7
Perinatal infections	40	36	36	5.2	4.7	4.9
Other infections	29	25	17	3.8	3.2	2.3
External causes	105	104	98	13.6	13.5	13.4
Other causes	124	134	116	16.0	17.4	15.9

Table 14-A Dollfus Subcategory Cause of Death Group

Dollfus Subcategory	Number of Deaths			Percent of Deaths		
	2014	2015	2016	2014	2015	2016
Total	773	770	730	100.0%	100.0%	100.0%
Short gestation & low birthweight	174	149	161	22.5%	19.4%	22.1%
Birth trauma, neonatal hemorrhage, & hematological disorders	18	15	10	2.3%	1.9%	1.4%
RDS, interstitial emphysema, pulmonary hemorrhage, & atelectasis	35	26	29	4.5%	3.4%	4.0%
Chronic respiratory distress syndrome, & respiratory diseases originating in the perinatal period	1	3	5	0.1%	0.4%	0.7%
Necrotizing enterocolitis	11	17	14	1.4%	2.2%	1.9%
Neonatal cardiac failure & other cardiovascular disorders originating in the perinatal period	8	13	9	1.0%	1.7%	1.2%
Congenital malformations, deformations, & chromosomal anomalies, congenital disorders	139	152	150	18.0%	19.7%	20.5%
Sudden Infant Death Syndrome	35	33	43	4.5%	4.3%	5.9%
Incompetent cervix, premature rupture of membranes	20	26	26	2.6%	3.4%	3.6%
Multiple pregnancy	13	12	3	1.7%	1.6%	0.4%
Placental previa, separation and placental abnormalities	14	14	8	1.8%	1.8%	1.1%
Intrauterine hypoxia, birth asphyxia	7	11	5	0.9%	1.4%	0.7%
Streptococcal meningitis	1	–	1	0.1%	0.0%	0.1%
Maternal renal and urinary tract diseases, maternal infections, and parasitic diseases	1	–	–	0.1%	0.0%	0.0%
Chorioamnionitis	12	13	9	1.6%	1.7%	1.2%
Bacterial Sepsis, congenital pneumonia, and other infections specific to the perinatal period	26	23	26	3.4%	3.0%	3.6%
Other infectious and parasitic diseases	18	13	11	2.3%	1.7%	1.5%
Bacterial haemophilus and pneumococcal meningitis	1	–	2	0.1%	0.0%	0.3%
Influenza and pneumonia and other respiratory infections	10	12	4	1.3%	1.6%	0.5%
Accidents involving transportation	2	2	3	0.3%	0.3%	0.4%
Accidents involving falls	–	–	–	0.0%	0.0%	0.0%
Accidental drowning or ingestion causing obstruction to the airways	1	1	3	0.1%	0.1%	0.4%
Accidents involving suffocation or strangulation in bed	75	73	60	9.7%	9.5%	8.2%
Assault and other other intentional injuries	13	6	9	1.7%	0.8%	1.2%
Injuries with undetermined intent or unspecified cause	3	1	7	0.4%	0.1%	1.0%
Other unintentional injuries	11	21	16	1.4%	2.7%	2.2%
Neoplasms, anemias, and other conditions not otherwise specified	124	134	116	16.0%	17.4%	15.9%

Note: The categories listed in this table conform to "[Infant Mortality: Development of a Proposed Update to the Dollfus Classification of Infant Deaths](#)" (Nakamura, et. al.), with the exception of certain external causes. Due to the high number of accidental suffocations of infants in bed, the DVRHS lists "Accidents involving suffocation or strangulation in bed" as a separate category.

Source: 2014-2016 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services.

Table 15-A
Sudden Infant Death Syndrome (SIDS), Accidental Suffocation & Strangulation in Bed (ASSB)
and
Sudden Unexpected Infant Deaths (SUID),
Michigan Residents 1989-2016

Year	Number				Rate Per 10,000 Live Births		
	SIDS	ASSB	Unknown & unspecified cause	SUID	SIDS	ASSB	SUID
1989	254	10	1	265	17.1	0.7	17.9
1990	256	11	2	269	16.7	0.7	17.6
1991	240	13	3	256	16.1	0.9	17.1
1992	243	7	4	254	16.9	0.5	17.7
1993	210	10	10	230	15.0	0.7	16.5
1994	167	10	8	185	12.1	0.7	13.4
1995	148	15	5	168	11.0	1.1	12.5
1996	149	8	5	162	11.2	0.6	12.2
1997	138	9	13	160	10.3	0.7	12.0
1998	148	11	13	172	11.1	0.8	12.9
1999	114	12	9	135	8.5	0.9	10.1
2000	99	28	6	133	7.3	2.1	9.8
2001	96	39	1	136	7.2	2.9	10.2
2002	85	32	10	127	6.6	2.5	9.8
2003	49	33	14	96	3.7	2.5	7.3
2004	51	49	10	110	3.9	3.8	8.5
2005	47	52	10	109	3.7	4.1	8.5
2006	51	52	9	112	4.0	4.1	8.8
2007	46	56	8	110	3.7	4.5	8.8
2008	48	52	2	102	4.0	4.3	8.4
2009	45	63	4	112	3.8	5.4	9.5
2010	44	52	7	103	3.8	4.5	9.0
2011	33	69	13	115	2.9	6.0	10.1
2012	15	75	16	106	1.3	6.7	9.4
2013	31	72	14	117	2.7	6.3	10.3
2014	35	76	14	125	3.1	6.6	10.9
2015	33	73	24	125	2.9	6.5	11.0
2016	43	60	1	104	3.8	5.3	9.2

Table 15-B
Accidental Suffocation & Strangulation in Bed and Total Accidents,
Michigan Residents, 1989-2016

Year	ASSB	Other Accidents & adverse effects	Total Accidents	ASSB Percent of Accidents
1989	10	37	47	21.3%
1990	11	27	38	28.9%
1991	13	25	38	34.2%
1992	7	22	29	24.1%
1993	10	35	45	22.2%
1994	10	27	37	27.0%
1995	15	25	40	37.5%
1996	8	28	36	22.2%
1997	9	24	33	27.3%
1998	11	24	35	31.4%
1999	12	24	36	33.3%
2000	28	27	55	50.9%
2001	39	18	57	68.4%
2002	32	40	72	44.4%
2003	33	31	64	51.6%
2004	49	21	70	70.0%
2005	52	16	68	76.5%
2006	52	19	71	73.2%
2007	56	21	77	72.7%
2008	52	10	62	83.9%
2009	63	11	74	85.1%
2010	52	13	65	80.0%
2011	69	14	83	83.1%
2012	75	17	92	81.5%
2013	72	18	90	80.0%
2014	76	14	90	84.4%
2015	73	24	97	75.3%
2016	60	22	82	73.2%

Notes: Causes of death are coded using the 9th and 10th revisions to the International Classification of Diseases. The ICD-9 and ICD-10 codes are grouped into broader categories for the causes listed in this table in order to classify these selected causes of death. Before 1999, causes of death were classified according to the following ICD-9 codes: SIDS: 798.0, ASSB: E913.0, Unknown: 799.9. On or after 1999, deaths were classified according to the following ICD-10 codes: SIDS: R95, ASSB: W75 and Unknown: R99.

After 1996, SUID death-scene guidelines and subsequent reporting instructions have shifted how SIDS and ASSB deaths were coded. As a result, some deaths that may have been attributed to SIDS before 1999 were classified as ASSB after 1999.

For further information on sudden unexplained infant deaths, see the [Sudden Unexpected Infant Death Case Registry](#).

Source: 1989 - 2016 Michigan Resident Death Files and Michigan Resident Birth Files, Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 16
Three-year Average Mortality Rates by Race
Sudden Infant Death Syndrome (SIDS), Accidental Suffocation & Strangulation in Bed (ASSB)
and Sudden Unexpected Infant Deaths (SUID),
Michigan Residents 1989-2016

Trend	All			White			Black		
	SIDS	ASSB	SUIDS	SIDS	ASSB	SUIDS	SIDS	ASSB	SUIDS
1989-1991	16.6	0.8	17.5	13.4	0.5	14.1	27.1	1.7	29.0
1990-1992	16.6	0.7	17.5	13.3	0.6	14.1	28.1	1.1	29.3
1991-1993	16.0	0.7	17.1	12.8	0.7	13.8	28.2	0.8	29.5
1992-1994	14.7	0.6	15.9	11.6	0.6	12.7	27.3	0.8	28.7
1993-1995	12.8	0.9	14.2	9.7	0.6	10.9	25.9	1.7	28.3
1994-1996	11.4	0.8	12.7	8.2	0.6	9.3	26.1	1.6	28.1
1995-1997	10.8	0.8	12.2	7.7	0.7	9.0	24.9	1.2	26.6
1996-1998	10.9	0.7	12.3	7.7	0.6	9.0	24.3	1.1	26.4
1997-1999	10.0	0.8	11.7	7.3	0.6	8.5	21.7	1.7	24.9
1998-2000	9.0	1.3	10.9	6.4	0.9	7.7	19.7	3.1	24.1
1999-2001	7.7	2.0	10.0	5.3	1.6	7.2	18.3	3.8	22.8
2000-2002	7.0	2.5	9.9	5.0	1.9	7.3	16.3	5.6	22.5
2001-2003	5.8	2.6	9.1	4.5	2.2	7.2	12.8	5.3	19.4
2002-2004	4.7	2.9	8.5	3.9	2.2	6.9	9.2	7.0	17.9
2003-2005	3.8	3.5	8.1	3.1	2.9	6.7	7.3	6.7	15.6
2004-2006	3.9	4.0	8.6	3.0	3.0	6.7	7.7	8.9	18.0
2005-2007	3.8	4.2	8.7	3.2	3.1	6.7	6.4	10.1	18.2
2006-2008	3.9	4.3	8.7	3.5	2.9	6.7	5.3	10.8	17.4
2007-2009	3.8	4.7	8.9	3.6	3.0	6.8	4.9	11.9	18.1
2008-2010	3.9	4.7	9.0	3.6	3.1	7.0	4.9	11.0	17.0
2009-2011	3.5	5.3	9.5	3.2	3.5	7.1	5.1	12.8	19.5
2010-2012	2.7	5.7	9.5	2.5	3.9	7.3	3.7	13.7	18.6
2011-2013	2.3	6.3	9.9	2.2	4.3	7.6	2.9	15.7	20.6
2012-2014	2.4	5.8	9.4	2.4	3.7	6.9	2.5	15.1	19.2
2013-2015	2.9	5.7	10.1	2.9	4.0	8.0	3.4	13.3	20.2
2014-2016	3.3	6.1	10.5	3.0	4.5	8.3	4.7	13.8	21.0

Notes: Rates are per 10,000 live births. Causes of death are coded using the 9th and 10th revisions to the International Classification of Diseases. The ICD-9 and ICD-10 codes are grouped into broader categories for the causes listed in this table in order to classify these selected causes of death. Before 1999, causes of death were classified according to the following ICD-9 codes: SIDS: 798.0, ASSB: E913.0, Unknown: 799.9. On or after 1999, deaths were classified according to the following ICD-10 codes: SIDS: R95, ASSB: W75 and Unknown: R99.

After 1996, SUID death-scene guidelines and subsequent reporting instructions have shifted how SIDS and ASSB deaths were coded. As a result, some deaths that may have been attributed to SIDS before 1999 were classified as ASSB after 1999.

Table 17-A
Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3	6.8±0.3	6.9±0.3	6.9±0.3	6.7±0.3
Alcona	*	*	*	*	*	*	*	*	*	*
Alger	-	*	*	*	*	-	-	-	-	-
Allegan	8.4±2.6	6.9±2.4	6.7±2.4	4.2±1.9	4.5±2.0	4.2±2.0	5.0±2.2	5.4±2.3	6.8±2.5	5.7±2.3
Alpena	*	6.7±5.3	*	*	7.3±5.8	*	*	*	*	*
Antrim	*	8.7±6.9	*	11.1±8.2	10.9±8.0	10.0±8.0	*	*	*	-
Arenac	*	*	*	*	*	*	16.2±12.9	16.5±13.1	*	*
Baraga	*	*	*	*	-	-	*	*	*	*
Barry	6.5±3.4	7.8±3.7	7.4±3.7	8.9±4.1	7.9±4.0	6.8±3.7	4.9±3.2	4.8±3.1	3.2±2.5	*
Bay	8.0±2.8	7.5±2.8	6.6±2.6	7.9±2.9	8.3±3.0	7.7±3.0	5.3±2.5	5.7±2.6	6.1±2.7	5.4±2.6
Benzie	11.7±8.6	*	*	*	*	*	*	*	*	*
Berrien	9.4±2.4	8.8±2.3	8.9±2.4	7.8±2.2	8.3±2.3	8.1±2.3	8.3±2.4	7.8±2.3	6.9±2.2	6.4±2.2
Branch	5.3±3.3	3.3±2.6	3.5±2.8	4.9±3.4	6.3±3.9	7.8±4.4	7.0±4.1	6.9±4.1	6.8±4.0	8.1±4.4
Calhoun	11.2±2.8	10.8±2.7	11.5±2.9	10.2±2.8	10.7±2.9	8.7±2.6	7.2±2.3	6.0±2.1	6.8±2.3	5.8±2.1
Cass	8.3±4.3	5.9±3.6	7.8±4.2	7.8±4.4	7.3±4.3	6.6±4.3	7.4±4.6	8.5±4.8	7.3±4.3	7.3±4.3
Charlevoix	*	*	*	*	*	*	*	*	*	*
Cheboygan	*	*	*	*	*	-	-	-	*	*
Chippewa	8.6±5.3	5.4±4.3	*	*	5.3±4.2	7.5±5.2	7.5±5.2	5.6±4.5	*	*
Clare	5.6±4.5	6.6±4.9	5.8±4.7	*	*	*	*	*	*	*
Clinton	4.7±2.7	4.8±2.7	4.7±2.8	4.4±2.7	4.0±2.6	3.8±2.5	2.5±2.0	3.8±2.5	6.3±3.2	6.5±3.2
Crawford	16.8±12.3	19.1±13.1	17.5±12.9	*	*	*	*	*	*	*
Delta	4.9±3.9	*	6.1±4.5	*	5.3±4.2	6.4±4.7	5.4±4.3	7.1±4.9	*	5.4±4.3
Dickinson	7.6±6.0	7.6±6.0	*	8.3±6.6	*	*	*	*	*	*
Eaton	4.4±2.2	5.3±2.4	5.3±2.4	5.9±2.5	5.6±2.5	5.4±2.4	6.1±2.6	6.0±2.6	7.0±2.8	6.7±2.7
Emmet	*	*	*	6.3±5.0	*	*	*	*	*	*
Genesee	9.5±1.4	9.3±1.4	9.0±1.4	7.8±1.4	7.8±1.4	7.1±1.3	8.0±1.4	8.0±1.4	8.5±1.5	9.0±1.5
Gladwin	*	*	*	*	*	*	*	*	11.2±7.3	9.7±6.7
Gogebic	*	*	*	*	*	*	-	*	*	16.1±12.8
Grand Traverse	6.1±2.8	7.0±3.0	6.9±3.0	5.6±2.8	3.3±2.1	2.9±2.0	*	3.5±2.2	5.3±2.7	7.5±3.2
Gratiot	7.0±4.3	8.7±4.9	7.1±4.4	8.1±4.7	8.1±4.8	6.3±4.3	4.8±3.8	5.8±4.2	6.6±4.6	5.1±4.0
Hillsdale	6.8±3.8	9.2±4.5	5.9±3.6	4.2±3.1	*	3.7±3.0	4.3±3.2	*	4.8±3.3	7.3±4.1

Table 17-A
Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Houghton	5.0±4.0	7.3±4.8	6.6±4.5	6.5±4.5	*	5.1±4.0	5.3±4.3	5.4±4.3	*	*
Huron	*	*	*	*	6.3±5.1	6.5±5.2	*	*	-	*
Ingham	7.0±1.6	6.6±1.6	7.0±1.6	5.9±1.5	5.6±1.5	5.8±1.5	7.2±1.7	7.1±1.7	7.1±1.7	6.4±1.6
Ionia	4.8±2.7	3.9±2.4	3.3±2.3	3.0±2.2	4.0±2.6	4.0±2.6	4.1±2.6	4.1±2.7	5.0±2.9	4.6±2.8
Iosco	*	*	*	11.7±8.6	12.6±8.6	9.2±7.4	*	*	*	*
Iron	*	*	*	*	*	*	*	*	*	*
Isabella	9.9±4.1	6.2±3.2	5.4±3.1	4.2±2.7	6.8±3.5	7.1±3.7	6.2±3.5	4.0±2.8	4.4±2.9	4.0±2.7
Jackson	9.4±2.4	7.7±2.2	7.1±2.2	6.5±2.1	6.1±2.1	5.3±1.9	6.2±2.1	5.6±2.0	6.2±2.1	6.5±2.1
Kalamazoo	7.2±1.7	7.1±1.7	8.4±1.8	8.6±1.9	7.6±1.8	6.4±1.6	6.0±1.6	6.4±1.6	6.5±1.6	4.6±1.4
Kalkaska	*	-	*	*	*	11.3±9.0	11.6±9.2	17.0±11.0	*	*
Kent	7.6±1.0	7.8±1.0	6.9±1.0	6.8±1.0	6.4±1.0	6.2±0.9	5.6±0.9	5.3±0.9	5.5±0.9	6.2±0.9
Keweenaw	*	*	-	-	-	-	*	*	*	-
Lake	*	*	*	*	*	*	*	*	*	*
Lapeer	4.8±2.5	5.4±2.7	7.4±3.2	8.6±3.6	7.1±3.3	3.6±2.4	2.4±1.9	4.4±2.6	5.3±2.9	5.3±2.9
Leelanau	*	*	*	*	*	*	*	*	*	*
Lenawee	6.7±2.6	8.3±3.0	8.5±3.1	10.8±3.5	9.4±3.3	9.2±3.3	7.2±2.9	8.2±3.1	7.6±3.0	7.3±3.0
Livingston	5.3±1.9	5.5±1.9	6.7±2.2	6.3±2.1	6.7±2.2	5.9±2.1	5.2±2.0	5.4±2.0	5.1±1.9	4.4±1.7
Luce	*	*	*	*	-	-	-	*	*	*
Mackinac	*	*	*	*	*	-	-	-	*	*
Macomb	6.0±0.9	6.1±0.9	7.3±1.0	6.7±1.0	6.5±1.0	5.6±0.9	6.3±0.9	6.0±0.9	6.3±0.9	5.6±0.9
Manistee	*	*	*	*	*	*	*	*	*	*
Marquette	4.6±3.0	4.0±2.8	3.9±2.7	4.1±2.8	5.1±3.1	4.1±2.8	4.1±2.9	*	4.3±3.0	4.2±2.9
Mason	6.1±4.8	7.0±5.2	*	6.4±5.1	*	*	*	*	*	*
Mecosta	4.4±3.5	9.7±5.2	8.2±4.8	9.0±5.1	7.0±4.5	10.2±5.5	11.8±6.0	9.3±5.2	8.6±5.1	5.5±4.1
Menominee	*	*	*	*	*	*	*	*	*	*
Midland	7.0±3.1	5.3±2.8	4.2±2.5	3.9±2.4	4.2±2.5	4.6±2.6	6.6±3.1	7.1±3.3	5.8±2.9	3.5±2.3
Missaukee	*	-	*	*	*	*	*	*	*	*
Monroe	6.8±2.2	6.7±2.2	5.7±2.0	5.7±2.1	4.3±1.8	4.4±1.9	5.8±2.2	5.9±2.2	6.0±2.3	4.2±1.9
Montcalm	2.9±2.1	3.7±2.4	3.9±2.6	5.8±3.1	6.4±3.3	6.8±3.4	6.4±3.3	5.5±3.1	4.6±2.9	4.3±2.8
Montmorency	*	*	-	*	*	*	*	*	-	-

**Table 17-A
Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016**

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Muskegon	6.3±1.8	6.7±1.9	7.1±2.0	7.9±2.1	8.0±2.1	8.7±2.3	8.0±2.2	8.1±2.2	8.1±2.2	8.1±2.2
Newaygo	9.7±4.4	8.4±4.1	8.2±4.1	5.3±3.5	7.8±4.2	7.3±4.1	7.3±4.1	7.2±4.1	7.9±4.3	7.9±4.3
Oakland	6.6±0.8	6.4±0.8	6.2±0.8	6.2±0.8	5.8±0.7	6.2±0.8	6.3±0.8	6.6±0.8	6.0±0.8	5.5±0.7
Oceana	8.7±5.4	6.0±4.5	6.3±4.6	8.3±5.4	5.9±4.7	9.0±5.9	*	12.3±7.2	9.1±6.2	12.1±7.1
Ogemaw	*	*	*	*	*	*	*	*	*	*
Ontonagon	*	*	*	-	-	-	-	*	*	*
Osceola	9.4±6.5	*	*	*	*	*	*	*	*	*
Oscoda	-	*	*	*	*	*	*	*	*	*
Otsego	8.2±6.1	9.3±6.4	8.6±6.3	*	9.0±6.6	11.9±7.7	13.9±8.6	12.6±8.2	9.3±6.9	*
Ottawa	5.2±1.4	5.9±1.5	5.4±1.4	5.7±1.5	5.6±1.5	5.9±1.5	6.6±1.6	5.7±1.5	6.0±1.5	4.9±1.4
Presque Isle	*	*	*	*	*	21.7±17.1	*	*	*	*
Roscommon	*	*	10.9±8.7	*	*	*	*	*	*	*
Saginaw	9.5±2.2	9.4±2.2	10.5±2.3	8.8±2.2	7.9±2.1	6.1±1.8	7.1±2.0	7.7±2.1	8.7±2.2	10.0±2.4
St. Clair	6.6±2.1	5.8±2.0	6.4±2.1	5.6±2.0	6.3±2.2	6.2±2.2	6.3±2.2	6.0±2.2	5.1±2.1	5.7±2.2
St. Joseph	8.6±3.4	10.3±3.7	11.2±4.0	10.6±4.0	8.3±3.5	7.4±3.4	7.3±3.4	7.9±3.5	5.3±2.8	5.1±2.9
Sanilac	7.7±4.3	7.5±4.4	6.8±4.2	*	*	*	4.6±3.6	6.8±4.4	6.8±4.4	8.4±4.9
Schoolcraft	*	*	*	-	-	-	-	-	-	-
Shiawassee	8.8±3.7	5.4±2.9	5.7±3.1	3.2±2.4	3.3±2.4	3.8±2.6	3.2±2.4	4.2±2.7	4.7±2.9	6.1±3.3
Tuscola	6.2±3.5	3.8±2.8	3.9±2.9	6.0±3.7	6.8±4.0	6.8±4.0	4.9±3.4	4.7±3.3	4.7±3.3	4.2±3.1
Van Buren	6.7±2.8	5.5±2.6	6.9±2.9	6.5±2.9	4.5±2.4	5.6±2.8	6.5±3.0	6.2±3.0	5.6±2.8	6.1±3.0
Washtenaw	5.7±1.3	5.2±1.3	5.3±1.3	5.1±1.3	4.9±1.3	4.7±1.3	4.6±1.3	5.9±1.4	5.5±1.4	5.8±1.4
Wayne	10.5±0.7	10.4±0.7	10.4±0.7	10.2±0.7	9.8±0.7	9.9±0.7	9.7±0.7	9.6±0.7	9.4±0.7	9.2±0.7
Wexford	9.2±5.2	6.8±4.4	7.7±4.8	6.3±4.3	6.4±4.4	9.8±5.5	9.8±5.5	10.8±5.8	6.3±4.4	5.0±4.0

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 17-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3	5.3±0.3	5.5±0.3	5.4±0.3	5.1±0.3
Alcona	*	*	*	*	*	*	*	*	*	*
Alger	-	*	*	*	*	-	-	-	-	-
Allegan	7.6±2.5	5.9±2.3	5.6±2.2	3.4±1.8	4.0±2.0	4.1±2.0	5.0±2.2	5.4±2.3	6.8±2.6	5.4±2.3
Alpena	*	6.9±5.5	*	*	*	*	*	*	*	*
Antrim	*	8.9±7.1	*	11.7±8.6	11.7±8.6	10.7±8.5	*	*	*	-
Arenac	*	*	*	*	*	*	16.6±13.2	16.8±13.3	*	*
Baraga	*	-	-	-	-	-	-	*	*	*
Barry	6.1±3.3	8.0±3.8	7.5±3.8	9.1±4.2	8.0±4.0	6.9±3.7	5.0±3.3	4.9±3.2	3.2±2.6	*
Bay	7.5±2.8	7.1±2.8	6.1±2.6	7.4±2.9	7.9±3.0	7.6±3.0	5.3±2.6	5.5±2.7	5.9±2.8	5.1±2.6
Benzie	10.3±8.2	*	*	*	*	*	*	*	*	*
Berrien	5.9±2.3	5.9±2.3	4.8±2.1	4.0±1.9	3.6±1.8	4.6±2.1	4.9±2.2	4.9±2.2	4.7±2.1	5.1±2.3
Branch	4.9±3.2	3.4±2.7	3.6±2.9	5.0±3.5	6.5±4.0	6.7±4.1	5.2±3.6	5.2±3.6	6.5±4.0	8.6±4.6
Calhoun	8.5±2.6	7.9±2.6	9.3±2.9	7.4±2.6	7.9±2.8	6.4±2.5	5.9±2.4	5.1±2.2	5.2±2.3	4.4±2.1
Cass	6.1±4.0	5.5±3.8	5.6±3.9	5.9±4.1	5.3±3.9	6.8±4.7	7.6±5.0	9.6±5.4	8.1±4.8	8.1±4.8
Charlevoix	*	*	*	*	*	*	*	*	*	*
Cheboygan	*	*	*	*	*	-	-	-	*	*
Chippewa	8.4±6.2	*	*	*	*	*	*	*	*	*
Clare	5.7±4.6	6.8±5.0	6.0±4.8	*	*	*	*	*	*	*
Clinton	3.8±2.4	4.7±2.8	4.5±2.8	4.6±2.8	4.2±2.7	4.1±2.7	2.7±2.2	4.1±2.7	5.9±3.2	6.3±3.3
Crawford	14.7±11.7	17.0±12.5	15.7±12.5	*	*	*	*	-	*	*
Delta	*	*	*	*	*	5.8±4.7	*	6.5±4.8	*	*
Dickinson	7.9±6.3	8.0±6.4	*	*	*	*	*	*	*	*
Eaton	4.8±2.4	5.1±2.5	3.8±2.1	4.2±2.3	3.9±2.2	4.8±2.5	4.8±2.5	4.8±2.5	5.1±2.6	5.1±2.6
Emmet	*	*	*	6.8±5.4	*	*	*	*	*	*
Genesee	6.4±1.4	6.0±1.4	5.4±1.3	5.1±1.3	5.1±1.4	4.8±1.3	5.2±1.4	5.3±1.4	5.7±1.5	6.2±1.6
Gladwin	*	*	*	*	*	*	*	*	11.4±7.4	9.9±6.8
Gogebic	*	*	*	*	*	*	-	-	-	*
Grand Traverse	6.4±2.9	7.4±3.2	7.3±3.2	6.0±3.0	3.5±2.3	3.1±2.2	*	3.7±2.3	5.6±2.8	7.8±3.3
Gratiot	6.7±4.3	7.7±4.8	6.0±4.2	7.0±4.5	7.8±4.8	5.8±4.3	*	5.2±4.2	6.2±4.6	5.4±4.3
Hillsdale	7.0±4.0	9.6±4.7	6.2±3.8	4.3±3.2	*	3.8±3.1	4.4±3.2	*	4.9±3.4	7.5±4.2

Table 17-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Houghton	5.3±4.2	7.0±4.8	6.1±4.5	6.0±4.4	*	5.4±4.3	5.7±4.6	5.7±4.6	*	*
Huron	*	*	*	*	6.5±5.2	6.7±5.3	*	*	-	*
Ingham	4.6±1.5	4.1±1.4	4.7±1.5	3.6±1.4	4.6±1.6	5.3±1.7	7.5±2.1	7.1±2.0	6.4±1.9	4.6±1.6
Ionia	4.9±2.8	4.1±2.5	3.4±2.4	3.1±2.3	3.6±2.5	3.7±2.6	3.7±2.6	4.2±2.8	5.1±3.0	4.8±2.9
Iosco	*	*	*	12.2±9.0	13.1±9.0	9.6±7.6	*	*	*	*
Iron	*	*	*	*	*	*	*	*	*	*
Isabella	8.3±4.0	5.0±3.1	3.1±2.5	*	5.6±3.4	6.5±3.8	5.9±3.7	3.5±2.8	4.0±3.0	4.0±3.0
Jackson	6.8±2.2	6.4±2.2	6.2±2.2	5.7±2.1	5.5±2.1	4.1±1.8	4.6±2.0	3.9±1.8	5.1±2.1	4.8±2.0
Kalamazoo	5.0±1.6	4.8±1.6	5.5±1.7	5.7±1.7	4.8±1.6	3.9±1.4	3.9±1.4	4.7±1.6	4.7±1.6	3.2±1.3
Kalkaska	*	-	*	*	*	11.7±9.3	11.9±9.5	17.4±11.3	*	*
Kent	5.2±0.9	5.6±1.0	5.0±0.9	5.0±0.9	4.4±0.9	4.4±0.9	4.1±0.9	4.5±0.9	4.9±0.9	5.1±1.0
Keweenaw	*	*	-	-	-	-	*	*	*	-
Lake	*	*	*	*	*	*	*	*	*	*
Lapeer	4.9±2.6	5.5±2.8	7.3±3.3	7.8±3.5	6.3±3.2	3.0±2.2	2.6±2.1	4.7±2.8	5.6±3.0	5.6±3.0
Leelanau	*	*	*	*	*	*	*	*	*	*
Lenawee	6.8±2.8	9.0±3.3	8.4±3.3	10.6±3.7	8.7±3.4	9.6±3.6	7.6±3.2	8.4±3.3	7.6±3.2	7.0±3.1
Livingston	5.1±1.8	5.3±1.9	6.6±2.2	6.1±2.2	6.6±2.2	5.8±2.1	5.0±2.0	5.1±2.0	4.7±1.9	4.2±1.7
Luce	*	*	*	*	-	-	-	*	*	*
Mackinac	*	*	*	*	*	-	-	-	*	*
Macomb	5.1±0.9	5.2±0.9	6.2±1.0	5.9±1.0	5.6±1.0	4.8±0.9	5.5±1.0	5.3±1.0	5.4±1.0	4.6±0.9
Manistee	*	*	*	*	*	*	*	*	*	*
Marquette	4.9±3.2	4.2±2.9	3.6±2.7	3.7±2.8	4.8±3.1	4.2±2.9	4.3±3.0	*	4.5±3.1	4.4±3.0
Mason	*	6.2±4.9	*	6.6±5.3	*	*	*	*	*	*
Mecosta	*	9.4±5.3	7.9±4.9	8.8±5.2	6.6±4.5	10.0±5.6	11.7±6.1	9.9±5.6	9.1±5.4	5.8±4.3
Menominee	*	*	*	*	*	*	*	*	*	*
Midland	7.3±3.3	5.6±2.9	4.0±2.5	3.7±2.4	4.0±2.5	4.9±2.8	5.8±3.0	6.3±3.2	4.9±2.8	3.7±2.4
Missaukee	*	-	*	*	*	*	*	*	*	*
Monroe	6.8±2.4	6.4±2.3	4.8±2.0	4.7±1.9	3.5±1.7	3.6±1.8	5.1±2.1	5.3±2.2	6.0±2.3	4.1±1.9
Montcalm	3.0±2.2	3.8±2.5	4.0±2.6	5.9±3.2	6.1±3.3	6.5±3.4	6.0±3.3	5.6±3.2	4.7±2.9	4.4±2.8
Montmorency	*	*	-	*	*	*	*	*	-	-

Table 17-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Muskegon	5.0±1.9	5.7±2.0	6.4±2.2	6.5±2.2	6.3±2.2	7.1±2.4	6.6±2.3	5.8±2.2	4.6±1.9	4.1±1.8
Newaygo	8.9±4.2	8.0±4.0	8.4±4.2	5.4±3.5	7.4±4.2	6.9±4.1	7.0±4.1	7.6±4.3	8.4±4.6	8.4±4.5
Oakland	4.9±0.8	4.9±0.8	4.8±0.8	5.3±0.8	5.1±0.8	5.7±0.9	5.6±0.9	5.4±0.8	4.5±0.8	4.0±0.7
Oceana	7.4±5.1	*	*	5.9±4.7	*	9.6±6.3	*	13.5±7.9	8.7±6.4	10.7±7.0
Ogemaw	*	*	*	*	*	*	*	*	*	*
Ontonagon	*	*	*	-	-	-	-	*	*	*
Osceola	9.5±6.6	*	*	*	*	*	*	*	*	*
Oscoda	-	*	*	*	*	*	*	*	*	*
Otsego	8.3±6.1	9.4±6.5	8.6±6.4	*	9.2±6.8	12.2±7.9	14.4±8.9	11.5±8.0	8.3±6.6	*
Ottawa	5.0±1.4	5.3±1.4	4.6±1.4	4.9±1.4	5.3±1.5	5.6±1.5	6.3±1.6	5.3±1.5	5.6±1.5	4.7±1.4
Presque Isle	*	*	*	*	*	22.1±17.5	*	*	*	*
Roscommon	*	*	11.2±8.9	*	*	*	*	*	*	*
Saginaw	5.7±2.0	6.6±2.2	6.4±2.2	4.7±1.9	2.9±1.5	2.9±1.5	4.2±1.8	6.2±2.2	6.3±2.2	7.5±2.5
St. Clair	5.8±2.0	5.0±1.9	6.2±2.1	5.4±2.1	6.3±2.3	6.2±2.3	6.3±2.3	5.9±2.3	4.3±1.9	4.5±2.0
St. Joseph	7.6±3.2	9.3±3.6	10.2±3.9	9.9±3.9	7.9±3.6	6.9±3.4	6.4±3.2	6.6±3.3	4.3±2.7	4.5±2.8
Sanilac	7.2±4.2	7.0±4.3	6.3±4.1	*	*	*	4.6±3.7	6.9±4.5	6.1±4.2	7.7±4.8
Schoolcraft	*	*	*	-	-	-	-	-	-	-
Shiawassee	9.0±3.8	5.5±3.0	5.9±3.2	3.3±2.4	3.4±2.5	3.9±2.7	3.3±2.5	4.3±2.8	4.3±2.8	5.8±3.3
Tuscola	6.3±3.6	3.9±2.9	4.0±3.0	6.1±3.8	6.9±4.1	7.0±4.1	5.0±3.5	4.9±3.4	4.8±3.3	4.3±3.2
Van Buren	3.6±2.2	4.8±2.6	6.1±3.0	6.0±3.0	4.1±2.5	5.4±2.9	6.2±3.1	5.8±3.0	5.3±2.9	6.2±3.1
Washtenaw	3.5±1.2	3.5±1.3	4.3±1.4	4.4±1.5	4.5±1.5	3.9±1.4	4.2±1.5	5.4±1.7	5.0±1.6	4.3±1.5
Wayne	5.4±0.7	5.6±0.7	5.6±0.8	5.4±0.8	5.5±0.8	5.9±0.9	6.3±0.9	6.4±0.9	6.4±0.9	6.0±0.9
Wexford	9.5±5.3	7.0±4.6	8.0±5.0	6.5±4.5	6.6±4.5	10.1±5.7	9.3±5.4	10.3±5.8	5.7±4.2	5.1±4.1

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 18-C
Black Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2005-2016

County	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9	13.4±0.9	13.3±0.9	13.7±0.9	13.7±0.9
Berrien	16.9±6.5	14.9±6.0	16.7±6.4	16.0±6.2	19.5±6.9	18.6±6.9	17.3±6.7	16.5±6.7	13.3±6.1	10.4±5.6
Calhoun	25.3±10.7	24.2±10.5	20.5±9.6	22.1±10.4	25.4±11.3	20.2±10.1	13.8±8.1	9.9±6.8	14.6±8.2	11.3±7.3
Cass	*	*	*	*	*	*	*	-	-	-
Genesee	17.1±3.6	17.1±3.6	17.9±3.7	14.6±3.4	14.2±3.4	12.4±3.3	14.2±3.5	14.6±3.6	15.6±3.7	16.5±3.9
Ingham	19.4±6.8	17.8±6.3	16.5±6.0	16.7±5.9	13.1±5.3	11.4±5.0	10.1±4.7	10.1±4.7	12.9±5.2	14.2±5.5
Jackson	28.7±13.4	16.8±10.3	15.6±10.1	13.2±9.1	11.6±8.6	13.0±9.0	18.5±10.8	16.2±10.0	15.0±9.7	20.2±11.3
Kalamazoo	16.8±6.2	16.8±6.2	19.2±6.5	19.5±6.5	18.3±6.4	17.6±6.3	15.5±5.9	14.2±5.7	15.3±5.9	11.0±4.9
Kent	16.8±4.2	14.4±3.8	13.4±3.7	13.9±3.8	16.6±4.2	14.6±3.9	12.9±3.6	9.9±3.2	10.7±3.3	13.0±3.7
Macomb	13.5±4.3	13.4±4.0	15.1±4.0	13.8±3.8	13.1±3.6	11.4±3.2	11.1±3.1	9.9±2.9	10.7±2.9	10.4±2.8
Muskegon	9.8±5.1	9.0±4.9	8.2±4.6	13.2±5.9	14.9±6.3	16.4±6.8	12.8±6.0	14.9±6.7	19.7±7.7	21.5±8.0
Oakland	17.4±3.4	15.4±3.1	14.7±3.0	11.9±2.7	10.8±2.5	10.6±2.4	11.1±2.5	13.7±2.8	14.7±2.9	14.2±2.9
Saginaw	19.0±5.8	15.3±5.2	19.2±5.8	17.4±5.6	19.2±6.1	13.4±5.1	14.3±5.2	12.2±5.0	15.9±5.7	17.3±5.9
St. Clair	*	*	*	*	*	*	*	*	*	34.3±25.0
Van Buren	*	*	*	*	*	*	*	*	*	*
Washtenaw	13.4±4.9	13.2±4.9	11.6±4.6	10.5±4.4	8.7±4.0	8.9±4.1	8.3±4.1	10.9±4.7	12.1±5.2	16.4±5.9
Wayne	15.9±1.3	15.3±1.3	15.3±1.3	15.1±1.3	14.5±1.3	14.5±1.3	14.0±1.3	13.7±1.3	13.2±1.2	13.2±1.2

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 18-A
Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2005-2016

Health Department	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3	6.8±0.3	6.9±0.3	6.9±0.3	6.7±0.3
Allegan County	8.4±2.6	6.9±2.4	6.7±2.4	4.2±1.9	4.5±2.0	4.2±2.0	5.0±2.2	5.4±2.3	6.8±2.5	5.7±2.3
Barry-Eaton District	5.2±1.9	6.2±2.0	6.0±2.0	7.0±2.2	6.4±2.1	5.9±2.0	5.7±2.0	5.6±2.0	5.7±2.0	5.0±1.9
Bay County	8.0±2.8	7.5±2.8	6.6±2.6	7.9±2.9	8.3±3.0	7.7±3.0	5.3±2.5	5.7±2.6	6.1±2.7	5.4±2.6
Benzie-Leelanau District	7.7±5.0	*	*	*	*	*	*	6.2±5.0	8.2±5.7	8.2±5.7
Berrien County	9.4±2.4	8.8±2.3	8.9±2.4	7.8±2.2	8.3±2.3	8.1±2.3	8.3±2.4	7.8±2.3	6.9±2.2	6.4±2.2
Branch-Hillsdale-St. Joseph	7.2±2.1	8.0±2.2	7.5±2.2	7.2±2.2	6.3±2.0	6.4±2.1	6.3±2.1	6.2±2.0	5.6±1.9	6.6±2.1
Calhoun County	11.2±2.8	10.8±2.7	11.5±2.9	10.2±2.8	10.7±2.9	8.7±2.6	7.2±2.3	6.0±2.1	6.8±2.3	5.8±2.1
Central Michigan District	7.9±2.2	5.6±1.9	5.7±1.9	4.6±1.8	6.3±2.1	5.6±2.0	5.4±2.0	4.6±1.8	5.7±2.0	5.5±2.0
Chippewa County	8.6±5.3	5.4±4.3	*	*	5.3±4.2	7.5±5.2	7.5±5.2	5.6±4.5	*	*
City Of Detroit	14.7±1.2	14.3±1.2	14.8±1.3	14.4±1.3	13.6±1.3	13.6±1.3	13.6±1.3	13.8±1.3	13.6±1.3	13.5±1.3
Dickinson-Iron District	6.6±4.9	6.5±4.8	5.6±4.5	8.7±5.7	8.0±5.5	*	*	5.8±4.6	5.9±4.7	*
District #10	7.8±1.8	6.8±1.7	6.7±1.7	6.7±1.7	6.6±1.7	7.6±1.9	7.0±1.8	8.2±1.9	7.1±1.8	7.0±1.8
District #2	4.7±3.3	5.9±3.6	8.4±4.4	9.8±4.8	9.1±4.6	8.9±4.5	6.5±3.8	7.0±3.9	4.1±3.1	4.6±3.2
District #4	5.3±3.0	6.3±3.3	6.1±3.3	6.1±3.4	6.8±3.7	6.5±3.7	4.9±3.2	4.8±3.1	4.1±2.9	4.6±3.0
Genesee County	9.5±1.4	9.3±1.4	9.0±1.4	7.8±1.4	7.8±1.4	7.1±1.3	8.0±1.4	8.0±1.4	8.5±1.5	9.0±1.5
Grand Traverse County	6.1±2.8	7.0±3.0	6.9±3.0	5.6±2.8	3.3±2.1	2.9±2.0	*	3.5±2.2	5.3±2.7	7.5±3.2
Huron County	*	*	*	*	6.3±5.1	6.5±5.2	*	*	-	*
Ingham County	7.0±1.6	6.6±1.6	7.0±1.6	5.9±1.5	5.6±1.5	5.8±1.5	7.2±1.7	7.1±1.7	7.1±1.7	6.4±1.6
Ionia County	4.8±2.7	3.9±2.4	3.3±2.3	3.0±2.2	4.0±2.6	4.0±2.6	4.1±2.6	4.1±2.7	5.0±2.9	4.6±2.8
Jackson County	9.4±2.4	7.7±2.2	7.1±2.2	6.5±2.1	6.1±2.1	5.3±1.9	6.2±2.1	5.6±2.0	6.2±2.1	6.5±2.1
Kalamazoo County	7.2±1.7	7.1±1.7	8.4±1.8	8.6±1.9	7.6±1.8	6.4±1.6	6.0±1.6	6.4±1.6	6.5±1.6	4.6±1.4
Kent County	7.6±1.0	7.8±1.0	6.9±1.0	6.8±1.0	6.4±1.0	6.2±0.9	5.6±0.9	5.3±0.9	5.5±0.9	6.2±0.9
Lapeer County	4.8±2.5	5.4±2.7	7.4±3.2	8.6±3.6	7.1±3.3	3.6±2.4	2.4±1.9	4.4±2.6	5.3±2.9	5.3±2.9
Lenawee County	6.7±2.6	8.3±3.0	8.5±3.1	10.8±3.5	9.4±3.3	9.2±3.3	7.2±2.9	8.2±3.1	7.6±3.0	7.3±3.0
Livingston County	5.3±1.9	5.5±1.9	6.7±2.2	6.3±2.1	6.7±2.2	5.9±2.1	5.2±2.0	5.4±2.0	5.1±1.9	4.4±1.7
Luce-Mackinac-Alger-Schoolcraft	8.5±5.9	13.2±7.4	11.2±6.9	10.4±6.8	*	-	-	*	*	11.6±7.6
Macomb County	6.0±0.9	6.1±0.9	7.3±1.0	6.7±1.0	6.5±1.0	5.6±0.9	6.3±0.9	6.0±0.9	6.3±0.9	5.6±0.9
Marquette County	4.6±3.0	4.0±2.8	3.9±2.7	4.1±2.8	5.1±3.1	4.1±2.8	4.1±2.9	*	4.3±3.0	4.2±2.9
Midland County	7.0±3.1	5.3±2.8	4.2±2.5	3.9±2.4	4.2±2.5	4.6±2.6	6.6±3.1	7.1±3.3	5.8±2.9	3.5±2.3

Table 18-A
Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2005-2016

Health Department	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Mid-Michigan District	4.5±1.6	5.3±1.8	5.0±1.8	5.8±1.9	5.9±2.0	5.5±1.9	4.4±1.7	4.8±1.8	5.7±1.9	5.4±1.9
Monroe County	6.8±2.2	6.7±2.2	5.7±2.0	5.7±2.1	4.3±1.8	4.4±1.9	5.8±2.2	5.9±2.2	6.0±2.3	4.2±1.9
Muskegon County	6.3±1.8	6.7±1.9	7.1±2.0	7.9±2.1	8.0±2.1	8.7±2.3	8.0±2.2	8.1±2.2	8.1±2.2	8.1±2.2
Northwest Michigan Community Health	5.4±2.4	6.1±2.6	6.5±2.8	6.4±2.8	6.8±2.9	6.9±2.9	6.7±2.9	6.2±2.8	5.8±2.7	3.7±2.2
Oakland County	6.6±0.8	6.4±0.8	6.2±0.8	6.2±0.8	5.8±0.7	6.2±0.8	6.3±0.8	6.6±0.8	6.0±0.8	5.5±0.7
Ottawa County	5.2±1.4	5.9±1.5	5.4±1.4	5.7±1.5	5.6±1.5	5.9±1.5	6.6±1.6	5.7±1.5	6.0±1.5	4.9±1.4
Delta & Menominee	4.6±3.0	4.3±3.0	6.0±3.5	4.6±3.2	4.6±3.2	5.4±3.5	4.7±3.2	5.7±3.5	4.0±2.9	5.2±3.4
Saginaw County	9.5±2.2	9.4±2.2	10.5±2.3	8.8±2.2	7.9±2.1	6.1±1.8	7.1±2.0	7.7±2.1	8.7±2.2	10.0±2.4
Sanilac County	7.7±4.3	7.5±4.4	6.8±4.2	*	*	*	4.6±3.6	6.8±4.4	6.8±4.4	8.4±4.9
Shiawassee County	8.8±3.7	5.4±2.9	5.7±3.1	3.2±2.4	3.3±2.4	3.8±2.6	3.2±2.4	4.2±2.7	4.7±2.9	6.1±3.3
St Clair County	6.6±2.1	5.8±2.0	6.4±2.1	5.6±2.0	6.3±2.2	6.2±2.2	6.3±2.2	6.0±2.2	5.1±2.1	5.7±2.2
Tuscola County	6.2±3.5	3.8±2.8	3.9±2.9	6.0±3.7	6.8±4.0	6.8±4.0	4.9±3.4	4.7±3.3	4.7±3.3	4.2±3.1
Van Buren-Cass County	7.2±2.4	5.6±2.1	7.2±2.4	6.9±2.4	5.5±2.2	6.0±2.3	6.8±2.5	7.0±2.5	6.2±2.4	6.6±2.5
Washtenaw County	5.7±1.3	5.2±1.3	5.3±1.3	5.1±1.3	4.9±1.3	4.7±1.3	4.6±1.3	5.9±1.4	5.5±1.4	5.8±1.4
Wayne County	6.7±0.8	6.9±0.8	6.7±0.8	6.6±0.8	6.7±0.8	6.9±0.8	6.8±0.8	6.5±0.8	6.3±0.8	6.1±0.8
Western Upper Peninsula District	6.6±3.4	7.5±3.7	5.2±3.1	5.3±3.1	3.5±2.6	4.1±2.8	4.3±2.9	6.0±3.5	5.4±3.4	7.1±3.8

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 19-B
White Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2005-2016

Health Department	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3	5.3±0.3	5.5±0.3	5.4±0.3	5.1±0.3
Allegan County	7.6±2.5	5.9±2.3	5.6±2.2	3.4±1.8	4.0±2.0	4.1±2.0	5.0±2.2	5.4±2.3	6.8±2.6	5.4±2.3
Barry-Eaton District	5.3±2.0	6.3±2.1	5.2±2.0	6.1±2.1	5.5±2.1	5.6±2.1	4.9±2.0	4.9±2.0	4.4±1.9	3.9±1.8
Bay County	7.5±2.8	7.1±2.8	6.1±2.6	7.4±2.9	7.9±3.0	7.6±3.0	5.3±2.6	5.5±2.7	5.9±2.8	5.1±2.6
Benzie-Leelanau District	7.3±5.1	*	*	*	*	*	*	*	6.8±5.4	6.7±5.3
Berrien County	5.9±2.3	5.9±2.3	4.8±2.1	4.0±1.9	3.6±1.8	4.6±2.1	4.9±2.2	4.9±2.2	4.7±2.1	5.1±2.3
Branch-Hillsdale-St. Joseph	6.7±2.0	7.7±2.2	7.2±2.2	6.9±2.2	6.2±2.1	6.0±2.1	5.5±2.0	5.2±1.9	5.1±1.9	6.6±2.2
Calhoun County	8.5±2.6	7.9±2.6	9.3±2.9	7.4±2.6	7.9±2.8	6.4±2.5	5.9±2.4	5.1±2.2	5.2±2.3	4.4±2.1
Central Michigan District	7.3±2.2	5.2±1.9	4.8±1.8	4.0±1.7	5.8±2.1	5.3±2.0	5.4±2.0	4.5±1.9	5.5±2.0	5.3±2.0
Chippewa County	8.4±6.2	*	*	*	*	*	*	*	*	*
City Of Detroit	5.5±1.8	5.2±1.9	5.5±2.1	5.8±2.3	6.5±2.8	10.3±3.9	10.1±4.0	11.3±4.2	9.5±3.8	8.8±3.6
Dickinson-Iron District	6.9±5.1	6.9±5.1	*	8.2±5.6	7.2±5.3	*	*	5.9±4.7	6.1±4.9	*
District #10	7.4±1.8	6.4±1.6	6.3±1.7	6.4±1.7	6.3±1.7	7.7±1.9	6.8±1.8	8.2±2.0	7.0±1.8	6.9±1.8
District #2	4.2±3.1	5.5±3.6	8.0±4.3	10.1±4.9	9.3±4.7	9.2±4.6	6.7±3.9	7.2±4.0	4.2±3.1	4.7±3.2
District #4	5.5±3.1	6.6±3.4	6.4±3.4	6.3±3.6	6.5±3.7	6.2±3.7	4.5±3.1	4.4±3.1	3.8±2.8	4.3±3.0
Genesee County	6.4±1.4	6.0±1.4	5.4±1.3	5.1±1.3	5.1±1.4	4.8±1.3	5.2±1.4	5.3±1.4	5.7±1.5	6.2±1.6
Grand Traverse County	6.4±2.9	7.4±3.2	7.3±3.2	6.0±3.0	3.5±2.3	3.1±2.2	*	3.7±2.3	5.6±2.8	7.8±3.3
Huron County	*	*	*	*	6.5±5.2	6.7±5.3	*	*	-	*
Ingham County	4.6±1.5	4.1±1.4	4.7±1.5	3.6±1.4	4.6±1.6	5.3±1.7	7.5±2.1	7.1±2.0	6.4±1.9	4.6±1.6
Ionia County	4.9±2.8	4.1±2.5	3.4±2.4	3.1±2.3	3.6±2.5	3.7±2.6	3.7±2.6	4.2±2.8	5.1±3.0	4.8±2.9
Jackson County	6.8±2.2	6.4±2.2	6.2±2.2	5.7±2.1	5.5±2.1	4.1±1.8	4.6±2.0	3.9±1.8	5.1±2.1	4.8±2.0
Kalamazoo County	5.0±1.6	4.8±1.6	5.5±1.7	5.7±1.7	4.8±1.6	3.9±1.4	3.9±1.4	4.7±1.6	4.7±1.6	3.2±1.3
Kent County	5.2±0.9	5.6±1.0	5.0±0.9	5.0±0.9	4.4±0.9	4.4±0.9	4.1±0.9	4.5±0.9	4.9±0.9	5.1±1.0
Lapeer County	4.9±2.6	5.5±2.8	7.3±3.3	7.8±3.5	6.3±3.2	3.0±2.2	2.6±2.1	4.7±2.8	5.6±3.0	5.6±3.0
Lenawee County	6.8±2.8	9.0±3.3	8.4±3.3	10.6±3.7	8.7±3.4	9.6±3.6	7.6±3.2	8.4±3.3	7.6±3.2	7.0±3.1
Livingston County	5.1±1.8	5.3±1.9	6.6±2.2	6.1±2.2	6.6±2.2	5.8±2.1	5.0±2.0	5.1±2.0	4.7±1.9	4.2±1.7
Luce-Mackinac-Alger-Schoolcraft	8.8±6.5	11.7±7.6	10.5±7.2	9.5±7.0	*	-	-	*	*	11.0±8.1
Macomb County	5.1±0.9	5.2±0.9	6.2±1.0	5.9±1.0	5.6±1.0	4.8±0.9	5.5±1.0	5.3±1.0	5.4±1.0	4.6±0.9
Marquette County	4.9±3.2	4.2±2.9	3.6±2.7	3.7±2.8	4.8±3.1	4.2±2.9	4.3±3.0	*	4.5±3.1	4.4±3.0
Midland County	7.3±3.3	5.6±2.9	4.0±2.5	3.7±2.4	4.0±2.5	4.9±2.8	5.8±3.0	6.3±3.2	4.9±2.8	3.7±2.4

Table 19-B
White Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2005-2016

Health Department	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Mid-Michigan District	4.1±1.6	5.0±1.8	4.7±1.8	5.6±1.9	5.8±2.0	5.4±1.9	4.3±1.7	4.9±1.8	5.5±2.0	5.4±1.9
Monroe County	6.8±2.4	6.4±2.3	4.8±2.0	4.7±1.9	3.5±1.7	3.6±1.8	5.1±2.1	5.3±2.2	6.0±2.3	4.1±1.9
Muskegon County	5.0±1.9	5.7±2.0	6.4±2.2	6.5±2.2	6.3±2.2	7.1±2.4	6.6±2.3	5.8±2.2	4.6±1.9	4.1±1.8
Northwest Michigan Community Health	5.6±2.5	6.4±2.7	6.5±2.8	6.4±2.9	6.8±3.0	6.9±3.0	6.8±3.0	5.8±2.8	5.7±2.8	3.5±2.2
Oakland County	4.9±0.8	4.9±0.8	4.8±0.8	5.3±0.8	5.1±0.8	5.7±0.9	5.6±0.9	5.4±0.8	4.5±0.8	4.0±0.7
Ottawa County	5.0±1.4	5.3±1.4	4.6±1.4	4.9±1.4	5.3±1.5	5.6±1.5	6.3±1.6	5.3±1.5	5.6±1.5	4.7±1.4
Delta & Menominee	4.8±3.3	3.8±3.0	4.3±3.4	*	*	4.5±3.3	3.8±3.0	4.9±3.4	*	*
Saginaw County	5.7±2.0	6.6±2.2	6.4±2.2	4.7±1.9	2.9±1.5	2.9±1.5	4.2±1.8	6.2±2.2	6.3±2.2	7.5±2.5
Sanilac County	7.2±4.2	7.0±4.3	6.3±4.1	*	*	*	4.6±3.7	6.9±4.5	6.1±4.2	7.7±4.8
Shiawassee County	9.0±3.8	5.5±3.0	5.9±3.2	3.3±2.4	3.4±2.5	3.9±2.7	3.3±2.5	4.3±2.8	4.3±2.8	5.8±3.3
St Clair County	5.8±2.0	5.0±1.9	6.2±2.1	5.4±2.1	6.3±2.3	6.2±2.3	6.3±2.3	5.9±2.3	4.3±1.9	4.5±2.0
Tuscola County	6.3±3.6	3.9±2.9	4.0±3.0	6.1±3.8	6.9±4.1	7.0±4.1	5.0±3.5	4.9±3.4	4.8±3.3	4.3±3.2
Van Buren-Cass County	4.4±2.0	5.0±2.2	5.9±2.4	6.0±2.4	4.5±2.1	5.8±2.5	6.7±2.7	7.1±2.7	6.3±2.5	6.9±2.6
Washtenaw County	3.5±1.2	3.5±1.3	4.3±1.4	4.4±1.5	4.5±1.5	3.9±1.4	4.2±1.5	5.4±1.7	5.0±1.6	4.3±1.5
Wayne County	5.3±0.8	5.6±0.8	5.6±0.8	5.4±0.8	5.4±0.8	5.5±0.9	6.0±0.9	6.0±0.9	6.1±0.9	5.8±0.9
Western Upper Peninsula District	6.8±3.7	7.3±3.8	4.8±3.1	4.7±3.1	3.8±2.8	4.4±3.1	4.1±3.0	5.3±3.5	4.8±3.3	5.9±3.7

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 19-C
Black Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2005-2016

Health Department	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9	13.4±0.9	13.3±0.9	13.7±0.9	13.7±0.9
Barry-Eaton District	*	*	25.2±18.4	28.0±19.1	26.9±18.4	*	22.7±16.6	22.4±16.4	29.0±17.7	24.0±15.5
Berrien County	16.9±6.5	14.9±6.0	16.7±6.4	16.0±6.2	19.5±6.9	18.6±6.9	17.3±6.7	16.5±6.7	13.3±6.1	10.4±5.6
Calhoun County	25.3±10.7	24.2±10.5	20.5±9.6	22.1±10.4	25.4±11.3	20.2±10.1	13.8±8.1	9.9±6.8	14.6±8.2	11.3±7.3
City Of Detroit	16.2±1.4	15.8±1.4	16.5±1.5	16.0±1.5	15.0±1.5	14.7±1.5	14.8±1.5	15.0±1.5	14.8±1.5	14.5±1.5
District #10	*	*	*	*	*	*	*	*	*	-
Genesee County	17.1±3.6	17.1±3.6	17.9±3.7	14.6±3.4	14.2±3.4	12.4±3.3	14.2±3.5	14.6±3.6	15.6±3.7	16.5±3.9
Ingham County	19.4±6.8	17.8±6.3	16.5±6.0	16.7±5.9	13.1±5.3	11.4±5.0	10.1±4.7	10.1±4.7	12.9±5.2	14.2±5.5
Jackson County	28.7±13.4	16.8±10.3	15.6±10.1	13.2±9.1	11.6±8.6	13.0±9.0	18.5±10.8	16.2±10.0	15.0±9.7	20.2±11.3
Kalamazoo County	16.8±6.2	16.8±6.2	19.2±6.5	19.5±6.5	18.3±6.4	17.6±6.3	15.5±5.9	14.2±5.7	15.3±5.9	11.0±4.9
Kent County	16.8±4.2	14.4±3.8	13.4±3.7	13.9±3.8	16.6±4.2	14.6±3.9	12.9±3.6	9.9±3.2	10.7±3.3	13.0±3.7
Macomb County	13.5±4.3	13.4±4.0	15.1±4.0	13.8±3.8	13.1±3.6	11.4±3.2	11.1±3.1	9.9±2.9	10.7±2.9	10.4±2.8
Mid-Michigan District	*	-	-	-	*	*	*	-	*	*
Muskegon County	9.8±5.1	9.0±4.9	8.2±4.6	13.2±5.9	14.9±6.3	16.4±6.8	12.8±6.0	14.9±6.7	19.7±7.7	21.5±8.0
Oakland County	17.4±3.4	15.4±3.1	14.7±3.0	11.9±2.7	10.8±2.5	10.6±2.4	11.1±2.5	13.7±2.8	14.7±2.9	14.2±2.9
Ottawa County	-	*	*	*	*	*	*	*	*	*
Saginaw County	19.0±5.8	15.3±5.2	19.2±5.8	17.4±5.6	19.2±6.1	13.4±5.1	14.3±5.2	12.2±5.0	15.9±5.7	17.3±5.9
St Clair County	*	*	*	*	*	*	*	*	*	34.3±25.0
Van Buren-Cass County	33.3±22.7	*	*	*	*	*	*	*	*	*
Washtenaw County	13.4±4.9	13.2±4.9	11.6±4.6	10.5±4.4	8.7±4.0	8.9±4.1	8.3±4.1	10.9±4.7	12.1±5.2	16.4±5.9
Wayne County	14.4±3.0	12.7±2.7	10.4±2.4	11.7±2.5	12.6±2.5	13.6±2.6	11.3±2.4	9.6±2.2	8.1±2.0	9.1±2.1

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

-: A dash indicates that there were either no births or no infant deaths from this category.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 20-A
Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2005-2016

City	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3	6.8±0.3	6.9±0.3	6.9±0.3	6.7±0.3
Ann Arbor	5.4±2.5	3.9±2.1	4.3±2.2	3.7±2.1	3.1±1.9	2.7±1.8	3.6±2.0	5.1±2.4	4.3±2.2	3.7±2.1
Battle Creek	11.3±4.0	12.4±4.3	11.0±4.1	10.6±4.1	11.3±4.3	11.0±4.3	9.9±3.8	7.9±3.4	8.4±3.5	7.0±3.4
Dearborn	5.6±2.0	7.7±2.3	6.9±2.3	7.0±2.3	6.3±2.2	7.4±2.4	7.5±2.4	6.4±2.2	6.0±2.1	4.7±1.9
Dearborn Heights	7.6±3.5	5.8±3.0	5.8±3.0	3.8±2.5	5.2±2.9	5.7±3.1	6.9±3.4	5.5±3.0	5.2±2.8	6.7±3.2
Detroit	14.7±1.2	14.3±1.2	14.8±1.3	14.4±1.3	13.6±1.3	13.6±1.3	13.6±1.3	13.9±1.3	13.6±1.3	13.5±1.3
Farmington Hills	7.7±3.4	7.4±3.3	7.0±3.2	6.4±3.1	6.4±3.1	6.9±3.3	6.7±3.2	6.7±3.2	6.1±3.0	4.5±2.5
Flint	12.2±2.7	11.6±2.7	12.6±2.9	12.6±3.0	12.1±3.0	11.6±3.0	11.0±2.8	10.9±2.8	10.7±2.9	12.9±3.3
Grand Rapids	8.3±1.7	10.0±1.9	8.3±1.8	8.6±1.8	8.5±1.8	9.4±1.9	8.0±1.7	6.6±1.6	5.9±1.5	6.8±1.7
Kalamazoo	9.5±3.4	9.2±3.3	10.5±3.5	11.0±3.6	10.3±3.6	9.7±3.5	6.0±2.5	6.0±2.5	7.6±2.8	7.3±3.0
Kentwood	6.8±3.3	4.2±2.6	3.9±2.6	3.4±2.4	3.4±2.4	4.5±2.7	5.2±2.9	5.1±2.9	6.0±3.1	8.1±3.5
Lansing	8.0±2.3	8.5±2.3	8.9±2.4	8.7±2.4	7.1±2.2	6.5±2.1	7.4±2.2	8.5±2.4	8.8±2.4	9.2±2.5
Livonia	3.0±2.1	5.4±2.8	5.2±2.8	4.8±2.7	2.4±1.9	2.8±2.1	5.5±2.9	5.4±2.8	4.8±2.6	4.0±2.4
Midland	7.4±4.6	5.9±4.1	5.1±3.8	*	*	*	6.3±4.1	7.7±4.5	7.7±4.5	4.2±3.4
Muskegon	6.7±3.6	7.5±3.9	7.5±3.9	7.2±3.9	7.8±4.1	10.5±4.8	12.6±5.0	12.6±5.0	13.4±5.2	13.6±5.7
Novi	*	5.3±3.3	5.3±3.3	6.6±3.7	3.3±2.7	3.8±2.8	4.3±3.0	6.1±3.5	5.0±3.1	4.5±2.9
Pontiac	12.9±3.7	12.5±3.7	14.4±4.1	13.8±4.0	11.9±3.8	8.5±3.2	9.4±3.3	11.4±3.6	14.0±4.0	12.6±3.8
Portage	7.7±4.0	4.4±3.1	9.2±4.5	8.6±4.3	7.5±4.1	4.1±3.0	5.8±3.6	5.8±3.6	5.2±3.4	*
Rochester Hills	4.1±2.5	6.2±3.1	5.0±2.8	4.8±2.8	3.5±2.5	4.0±2.6	5.2±3.0	4.4±2.7	4.0±2.6	2.7±2.1
Roseville	9.9±4.6	9.7±4.4	10.0±4.6	5.5±3.4	5.7±3.5	7.4±4.0	7.8±4.1	7.8±4.0	7.7±4.0	10.1±4.7
Royal Oak	3.7±2.6	4.0±2.6	4.4±2.7	5.6±3.0	6.4±3.2	8.2±3.7	7.1±3.5	7.6±3.6	4.0±2.6	2.6±2.1
Saginaw	13.0±4.0	11.5±3.8	14.6±4.3	13.2±4.2	13.7±4.4	9.6±3.7	12.1±4.2	12.7±4.3	15.1±4.8	15.8±5.0
Southfield	13.5±4.6	12.4±4.5	13.1±4.6	11.2±4.4	10.0±4.1	10.9±4.3	8.5±3.7	11.7±4.4	9.0±3.8	9.3±3.9
St Clair Shores	4.2±2.9	3.7±2.7	5.4±3.4	4.0±3.0	4.7±3.3	*	4.7±3.2	4.6±3.2	5.6±3.5	6.3±3.7
Sterling Heights	6.2±2.3	7.0±2.4	7.5±2.5	7.0±2.5	6.2±2.4	6.6±2.4	5.7±2.3	6.7±2.4	6.4±2.4	6.7±2.4
Taylor	10.2±3.9	8.5±3.5	6.3±3.1	6.8±3.2	9.9±3.9	11.8±4.2	10.8±4.0	7.4±3.3	6.2±3.0	6.5±3.1
Troy	4.9±2.8	5.8±3.0	5.5±3.0	6.2±3.2	4.4±2.7	3.8±2.5	3.3±2.3	3.8±2.4	4.1±2.5	4.1±2.5
Warren	7.2±2.3	6.4±2.2	8.1±2.5	7.9±2.5	9.1±2.7	7.6±2.4	8.7±2.6	6.6±2.2	5.4±2.0	5.3±2.0
Westland	6.3±2.7	7.5±2.9	7.4±2.9	8.2±3.1	9.6±3.4	10.4±3.5	9.3±3.3	8.3±3.1	7.4±2.9	7.3±2.9
Wyoming	10.9±3.2	12.1±3.4	11.0±3.3	8.4±3.0	6.7±2.6	4.6±2.2	4.1±2.1	4.4±2.1	6.0±2.5	6.6±2.6

Notes: This table shows cities with (1) populations greater than 40,000 according to 2007 estimates and (2) three-year average births of greater than 200. City birth and mortality statistics have changed from pre-2011 reports due to geocoding. See Data Quality Considerations for further details. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 20-B
White Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2005-2016

City	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3	5.3±0.3	5.5±0.3	5.4±0.3	5.1±0.3
Ann Arbor	3.2±2.3	*	3.7±2.5	3.2±2.4	3.7±2.6	*	3.2±2.3	4.5±2.8	4.0±2.6	2.8±2.2
Battle Creek	9.1±4.2	9.5±4.4	7.2±3.9	4.8±3.3	5.5±3.6	8.1±4.4	8.1±4.1	7.0±3.8	5.5±3.4	4.6±3.4
Dearborn	5.4±2.1	7.4±2.4	6.4±2.3	6.2±2.3	6.0±2.3	6.5±2.4	7.0±2.5	5.9±2.4	7.0±2.6	5.6±2.3
Dearborn Heights	7.2±3.6	5.2±3.1	4.3±2.8	3.0±2.4	3.1±2.5	3.7±2.7	5.3±3.2	6.0±3.5	6.9±3.8	8.7±4.1
Detroit	5.5±1.8	5.2±1.9	5.5±2.1	5.8±2.3	6.5±2.8	9.9±3.8	10.1±4.0	11.3±4.2	9.9±3.9	8.8±3.6
Farmington Hills	6.8±4.0	7.2±4.3	6.1±4.0	5.6±3.9	6.5±4.2	8.0±4.7	6.5±4.2	5.0±3.7	4.9±3.6	4.1±3.3
Flint	6.5±3.2	5.7±3.1	6.7±3.5	9.6±4.3	7.1±3.8	7.6±4.1	5.5±3.4	5.9±3.5	4.5±3.1	6.4±4.0
Grand Rapids	3.4±1.3	5.5±1.7	4.7±1.6	5.1±1.7	4.4±1.6	5.7±1.8	5.3±1.7	4.6±1.6	4.4±1.6	4.5±1.7
Kalamazoo	4.6±3.0	3.6±2.7	*	3.6±2.7	4.8±3.1	6.1±3.6	3.5±2.4	2.6±2.0	3.0±2.2	*
Kentwood	4.7±3.2	*	*	*	*	*	4.5±3.3	5.2±3.6	5.4±3.7	7.0±4.1
Lansing	3.8±1.9	4.5±2.1	5.2±2.3	4.6±2.2	5.2±2.4	5.3±2.5	7.4±2.9	7.9±3.1	7.6±3.1	6.3±2.9
Livonia	3.3±2.3	5.6±3.0	5.4±3.0	5.0±2.9	*	*	4.9±2.9	5.3±3.0	5.1±2.9	3.8±2.5
Midland	7.9±4.9	6.4±4.4	5.5±4.1	*	*	*	4.7±3.7	6.1±4.2	6.1±4.2	4.6±3.6
Muskegon	6.8±4.7	7.2±4.9	6.7±4.9	*	*	7.1±5.2	8.6±5.3	6.0±4.4	5.3±4.2	*
Novi	*	*	*	5.1±4.1	*	*	*	5.1±4.1	*	*
Pontiac	5.4±3.3	5.7±3.5	8.5±4.6	7.7±4.6	6.3±4.4	*	4.9±3.9	4.8±3.8	6.2±4.3	6.4±4.4
Portage	5.6±3.7	3.8±3.0	6.8±4.2	7.4±4.4	6.1±4.0	4.1±3.3	5.4±3.7	5.4±3.7	4.7±3.5	*
Rochester Hills	3.1±2.5	7.0±3.8	5.5±3.4	5.6±3.5	3.4±2.7	3.4±2.7	3.9±2.9	*	3.5±2.8	*
Roseville	8.5±4.6	9.8±4.9	10.3±5.2	6.3±4.1	5.3±3.9	5.6±4.1	4.7±3.8	6.3±4.3	5.5±4.1	9.0±5.3
Royal Oak	*	3.0±2.4	3.4±2.5	5.8±3.3	6.8±3.5	8.3±3.9	6.5±3.5	6.9±3.6	3.9±2.7	2.9±2.3
Saginaw	5.3±3.6	6.2±4.0	6.3±4.1	4.3±3.5	*	*	5.7±4.2	9.7±5.4	11.4±5.9	13.0±6.5
Southfield	*	*	*	11.6±9.2	11.9±9.5	12.0±9.5	*	*	-	*
St Clair Shores	4.0±2.9	4.1±3.0	6.0±3.7	4.5±3.4	5.3±3.6	*	*	*	4.9±3.4	6.3±3.9
Sterling Heights	5.7±2.4	6.1±2.5	6.9±2.7	7.7±2.9	6.9±2.8	7.6±3.0	6.0±2.6	6.5±2.7	5.4±2.4	5.7±2.5
Taylor	7.9±4.0	7.0±3.8	5.6±3.5	5.3±3.5	6.7±4.0	8.2±4.4	8.0±4.3	6.8±4.0	6.1±3.8	6.2±3.8
Troy	4.9±3.4	5.1±3.5	5.3±3.6	6.1±4.0	5.4±3.7	5.9±3.9	4.6±3.4	4.7±3.4	3.9±3.1	*
Warren	7.1±2.6	5.9±2.5	6.8±2.7	6.3±2.7	6.9±2.9	5.9±2.7	8.0±3.2	6.7±2.9	5.7±2.7	4.7±2.5
Westland	4.4±2.6	4.9±2.8	5.9±3.1	5.7±3.1	7.8±3.7	8.6±3.9	8.5±3.9	9.0±4.0	8.0±3.8	7.2±3.6
Wyoming	9.1±3.2	9.3±3.2	8.6±3.2	6.7±2.8	5.3±2.5	3.8±2.1	3.2±2.0	4.2±2.3	5.7±2.7	5.5±2.7

Notes: This table shows cities with (1) populations greater than 40,000 according to 2007 estimates and (2) three-year average births of greater than 200. City birth and mortality statistics have changed from pre-2011 reports due to geocoding. See Data Quality Considerations for further details. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 20-C
Black Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2005-2016

City	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14	2013-15	2014-16
Michigan	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9	13.4±0.9	13.3±0.9	13.7±0.9	13.7±0.9
Battle Creek	19.1±11.2	20.9±11.7	21.0±11.7	23.0±12.9	21.5±12.6	11.9±9.5	12.1±8.9	11.6±8.5	16.0±9.9	10.2±8.1
Detroit	16.2±1.4	15.8±1.4	16.5±1.5	15.9±1.5	15.0±1.5	14.7±1.5	14.8±1.5	15.0±1.5	14.8±1.5	14.4±1.5
Flint	15.8±4.1	15.5±4.1	16.6±4.2	14.7±4.1	15.3±4.3	14.1±4.2	14.7±4.2	14.4±4.2	14.8±4.3	16.4±4.8
Grand Rapids	17.7±5.1	17.6±5.1	16.8±5.0	16.0±5.0	18.8±5.4	16.7±5.1	14.9±4.8	11.5±4.2	12.0±4.4	13.9±4.9
Kalamazoo	17.4±7.7	18.5±8.0	22.4±8.7	21.6±8.5	17.7±7.9	12.7±6.9	9.7±5.7	11.5±6.2	17.0±7.6	14.6±7.3
Lansing	20.0±7.1	19.0±6.7	17.9±6.4	18.3±6.5	13.5±5.7	11.0±5.2	8.9±4.7	10.7±5.1	13.6±5.6	16.2±6.2
Muskegon	*	*	*	12.0±8.3	13.1±8.5	17.4±10.2	18.1±10.1	20.1±10.8	21.6±11.2	25.9±12.5
Pontiac	21.6±7.1	19.6±6.7	19.9±6.8	19.1±6.7	16.5±6.2	12.5±5.3	12.6±5.2	16.4±5.9	19.4±6.5	17.9±6.2
Saginaw	20.2±7.0	16.0±6.2	20.1±7.0	18.4±6.9	20.5±7.5	14.1±6.3	15.8±6.5	14.2±6.3	17.5±7.2	18.1±7.5
Southfield	15.4±5.9	14.8±5.8	15.0±5.8	11.6±5.2	10.0±4.7	11.2±5.0	10.3±4.7	14.9±5.8	12.4±5.3	12.6±5.3
Taylor	19.9±11.6	14.9±9.7	9.3±7.4	11.9±8.2	18.8±9.8	21.6±10.2	18.7±9.4	10.2±7.0	7.6±6.0	7.2±5.7
Warren	9.8±7.3	11.8±7.2	14.8±7.7	14.6±7.3	14.1±6.9	11.9±6.0	9.4±5.1	7.8±4.6	5.6±3.9	6.8±4.2
Westland	10.6±8.5	12.3±8.5	11.0±7.6	14.0±8.2	12.1±7.5	14.7±8.3	11.7±7.2	9.1±6.3	6.6±5.3	8.6±5.9

Notes: This table shows cities with (1) populations greater than 40,000 according to 2007 estimates and (2) three-year average births of greater than 200. City birth and mortality statistics have changed from pre-2011 reports due to geocoding. See Data Quality Considerations for further details. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

*: A rate is not calculated when there are fewer than 6 events, because the width of the confidence interval would negate any usefulness for comparative purposes.

Source: 2005-2014 Geocoded Michigan Death Certificate Registries; 2015-2016 Michigan Death Certificate Registries. 2005-2016 Geocoded Michigan Birth Certificate Registries. Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

Table 21-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	660	697	608	600	549	501	540	544	513	498	474
Alcona	-	-	1	1	-	-	1	-	1	-	-
Alger	-	-	3	-	-	-	-	-	-	-	-
Allegan	4	13	4	4	6	5	3	3	4	9	3
Alpena	3	-	1	-	-	1	-	1	1	1	-
Antrim	1	-	2	-	4	2	-	3	-	-	-
Arenac	1	-	-	2	-	1	1	4	2	-	-
Baraga	-	-	1	-	-	-	-	1	1	1	-
Barry	6	3	2	3	4	2	2	3	1	-	2
Bay	8	5	3	7	9	6	4	-	5	4	1
Benzie	2	2	-	-	-	-	-	2	-	1	2
Berrien	12	13	10	10	8	8	11	8	9	6	2
Branch	2	2	1	2	2	3	3	2	3	2	4
Calhoun	11	18	13	13	10	9	7	8	5	8	4
Cass	1	2	2	5	1	2	2	-	5	-	3
Charlevoix	-	2	1	2	-	-	-	-	-	2	-
Cheboygan	-	1	-	-	-	-	-	-	-	-	-
Chippewa	2	-	1	-	-	3	2	1	1	-	1
Clare	2	3	-	1	-	1	2	1	1	-	1
Clinton	2	6	1	1	3	2	2	1	3	5	1
Crawford	2	4	1	1	-	-	-	1	-	-	3
Delta	-	2	-	2	2	-	4	1	3	-	-
Dickinson	1	-	2	2	1	-	-	4	1	-	-
Eaton	4	4	3	3	7	5	2	6	3	7	7
Emmet	-	1	2	-	3	-	1	2	1	-	1
Genesee	44	40	27	34	19	22	19	25	23	29	30

Table 21-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gladwin	-	1	1	1	1	1	-	1	1	2	1
Gogebic	1	1	-	-	2	-	-	-	1	-	3
Grand Traverse	4	5	7	3	3	-	3	-	1	7	4
Gratiot	4	4	2	3	3	3	-	3	2	-	-
Hillsdale	6	4	3	1	1	2	1	3	-	3	4
Houghton	2	2	3	1	3	1	2	2	-	-	2
Huron	2	-	-	3	1	1	-	-	-	-	1
Ingham	13	17	22	14	12	16	16	20	15	11	5
Ionia	3	2	-	1	2	1	-	2	2	2	2
Iosco	1	-	-	1	1	1	-	-	2	1	-
Iron	-	1	-	-	1	-	-	-	-	-	-
Isabella	3	5	1	1	-	6	2	-	2	4	-
Jackson	11	12	11	7	9	8	3	10	5	7	12
Kalamazoo	14	22	13	20	17	8	17	11	11	11	5
Kalkaska	-	-	-	1	1	-	3	1	3	-	2
Kent	59	47	48	42	32	40	38	28	37	38	45
Keweenaw	1	-	-	-	-	-	-	-	-	-	-
Lake	-	-	-	1	-	-	1	-	-	1	-
Lapeer	5	4	3	6	4	-	1	4	3	1	4
Leelanau	-	-	-	-	3	-	-	-	1	-	1
Lenawee	8	5	9	8	11	3	6	4	5	4	5
Livingston	5	11	6	9	6	9	7	3	9	5	3
Luce	1	-	1	-	-	-	-	-	1	-	-
Mackinac	1	-	1	1	-	-	-	-	-	2	3
Macomb	30	48	40	52	39	43	40	52	34	43	36

**Table 21-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016**

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Manistee	1	-	1	1	1	-	-	-	1	-	-
Marquette	2	2	2	2	1	3	-	2	-	1	1
Mason	3	-	1	1	2	1	-	-	1	2	-
Mecosta	2	1	4	-	1	4	4	4	2	3	-
Menominee	-	1	1	1	-	1	-	-	1	1	-
Midland	7	3	1	3	2	2	3	4	3	-	1
Missaukee	-	-	-	1	-	-	1	-	2	-	-
Monroe	11	6	5	3	4	2	6	10	2	8	3
Montcalm	1	2	1	2	5	3	3	4	1	2	3
Montmorency	1	-	-	-	1	-	-	-	-	-	-
Muskegon	9	13	9	9	16	11	11	14	9	7	13
Newaygo	1	6	3	1	2	6	2	2	3	-	3
Oakland	72	71	62	60	63	45	61	69	66	53	54
Oceana	1	1	2	2	3	-	2	1	3	1	3
Ogemaw	-	1	-	-	1	1	1	-	-	-	-
Ontonagon	1	1	-	-	-	-	-	1	1	-	-
Osceola	2	1	-	1	1	-	-	1	-	2	2
Oscoda	-	-	1	1	-	-	1	-	1	-	-
Otsego	-	3	1	-	2	3	1	-	1	1	1
Ottawa	18	16	19	10	17	17	14	20	10	12	9
Presque Isle	1	2	-	-	1	1	3	-	1	2	1
Roscommon	-	3	1	1	-	1	-	-	1	1	-
Saginaw	9	16	10	15	10	8	8	13	11	12	16
St. Clair	9	10	4	6	4	6	10	2	3	6	5
St. Joseph	7	6	8	9	2	3	1	5	3	1	5

Table 21-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sanilac	4	4	1	2	-	-	1	1	3	3	4
Schoolcraft	-	1	-	-	-	-	-	-	-	-	-
Shiawassee	-	8	-	2	2	1	2	2	1	1	2
Tuscola	3	1	-	2	4	1	4	1	-	3	-
Van Buren	-	5	6	4	2	3	4	4	3	3	5
Washtenaw	15	17	14	18	11	10	14	12	23	10	14
Wayne	198	180	197	172	158	151	172	147	147	144	124
Detroit City	121	120	123	114	98	80	104	87	80	81	72
Wayne County Excluding Detroit City	77	60	74	58	60	71	68	60	67	63	52
Wexford	-	4	2	2	2	2	5	3	2	1	1
Unknown	-	-	-	-	-	-	-	1	-	1	1

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Neonatal Death: Deaths occurring to individuals less than 28 days of age.
 -: A dash indicates quantity zero.

Source: 2006-2016 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

**Table 21-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016**

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	280	300	286	281	268	248	243	255	260	267	256
Alcona	1	-	-	-	-	1	-	-	-	-	-
Alger	-	-	-	1	-	-	-	-	-	-	-
Allegan	4	5	2	2	-	2	1	6	5	1	2
Alpena	1	1	-	3	1	1	-	-	1	-	-
Antrim	1	2	-	1	-	-	-	-	-	-	-
Arenac	-	-	-	-	1	1	-	-	-	-	1
Baraga	-	-	-	-	-	-	-	-	-	-	1
Barry	1	2	3	2	4	-	1	1	1	-	-
Bay	4	3	5	1	3	3	1	2	5	2	-
Benzie	-	-	-	-	1	-	-	-	-	-	-
Berrien	5	8	6	7	6	10	3	6	6	3	8
Branch	-	-	1	-	2	1	1	1	1	1	1
Calhoun	6	10	1	7	8	6	3	3	4	6	2
Cass	2	1	2	1	1	1	2	3	-	3	-
Charlevoix	1	-	-	-	-	1	-	-	1	1	-
Cheboygan	1	1	1	2	-	-	-	-	-	1	1
Chippewa	2	1	-	-	2	1	-	1	1	-	-
Clare	1	-	1	1	1	-	-	-	-	1	1
Clinton	1	-	2	1	2	-	-	1	2	3	2
Crawford	-	1	-	-	-	1	-	-	-	2	-
Delta	1	2	-	1	-	1	-	-	-	1	2
Dickinson	3	-	-	-	1	-	-	-	-	-	2
Eaton	2	2	4	3	1	1	3	4	3	2	2
Emmet	-	-	-	1	-	-	1	-	-	-	-
Genesee	17	17	19	17	11	18	19	15	18	14	17

**Table 21-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016**

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Gladwin	-	-	-	1	1	-	-	1	2	2	-
Gogebic	1	-	-	-	-	-	-	-	-	-	2
Grand Traverse	2	2	1	2	-	1	1	-	5	2	2
Gratiot	1	-	1	-	2	-	-	-	2	1	1
Hillsdale	1	1	1	-	1	-	1	-	-	2	3
Houghton	-	1	1	-	-	-	-	1	1	-	-
Huron	1	-	-	-	-	1	3	-	-	-	-
Ingham	5	9	3	6	2	5	6	8	6	10	16
Ionia	-	4	1	-	3	2	1	3	1	1	2
Iosco	-	1	1	2	2	1	1	1	-	-	1
Iron	-	-	-	1	1	1	-	-	1	-	-
Isabella	3	2	-	3	4	-	2	2	-	1	1
Jackson	6	3	3	5	2	3	4	5	3	3	5
Kalamazoo	3	7	9	9	13	3	2	15	5	9	3
Kalkaska	-	-	-	-	1	-	1	1	-	-	-
Kent	26	18	21	14	22	19	12	11	15	18	11
Keweenaw	-	-	-	-	-	-	-	-	-	-	-
Lake	1	-	-	1	1	-	-	-	-	-	-
Lapeer	1	1	1	5	3	-	1	-	2	3	-
Leelanau	-	1	-	-	-	1	-	1	2	1	-
Lenawee	2	4	2	1	4	3	2	5	4	2	3
Livingston	2	3	4	3	5	3	1	4	4	2	1
Luce	1	-	1	-	-	-	-	-	1	1	1
Mackinac	-	-	1	-	-	-	-	-	-	-	-
Macomb	21	21	22	26	9	10	12	15	14	17	15

**Table 21-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016**

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Manistee	-	-	-	1	1	1	-	-	1	-	1
Marquette	2	-	-	2	1	1	2	-	1	4	1
Mason	1	1	1	-	1	-	-	-	1	-	-
Mecosta	-	1	5	-	2	2	-	1	1	-	1
Menominee	-	-	1	-	-	-	1	-	-	-	1
Midland	1	-	2	2	-	2	3	3	2	3	-
Missaukee	-	-	-	-	-	-	-	-	-	-	1
Monroe	4	4	6	6	5	1	3	5	1	1	4
Montcalm	3	-	2	2	1	1	2	1	1	1	1
Montmorency	-	-	-	-	-	-	2	-	-	-	-
Muskegon	4	6	7	6	7	4	7	5	6	11	5
Newaygo	3	3	-	2	1	1	-	1	4	3	-
Oakland	19	21	26	17	21	25	32	21	17	18	17
Oceana	1	1	1	-	1	-	3	-	3	1	-
Ogemaw	-	1	1	1	1	-	1	-	1	-	1
Ontonagon	-	-	-	-	-	-	-	-	-	-	-
Osceola	-	1	-	-	1	2	-	-	-	-	-
Oscoda	-	-	1	-	-	-	1	-	-	-	-
Otsego	2	2	-	1	-	1	2	3	2	-	-
Ottawa	4	1	4	5	3	4	4	6	2	9	7
Presque Isle	-	-	-	1	1	-	-	-	-	-	-
Roscommon	-	1	-	-	-	-	-	-	-	-	1
Saginaw	10	10	15	11	2	9	5	6	10	7	11
St. Clair	4	2	4	9	2	5	3	4	6	3	4
St. Joseph	2	4	2	1	5	1	6	2	2	-	1

Table 21-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2006-2016

County	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Sanilac	-	2	-	1	1	-	3	1	-	1	-
Schoolcraft	1	-	-	-	-	-	-	-	-	-	-
Shiawassee	2	2	1	-	2	-	1	1	2	3	4
Tuscola	1	1	1	2	1	1	-	1	2	1	1
Van Buren	1	1	4	1	2	1	4	2	-	3	2
Washtenaw	8	6	3	4	9	4	6	6	5	4	7
Wayne	75	94	78	76	75	79	66	70	71	78	76
Detroit City	54	59	52	52	48	50	47	47	50	58	48
Wayne County Excluding Detroit City	21	35	26	24	27	29	19	23	21	20	28
Wexford	1	1	1	-	1	1	1	-	2	-	-
Unknown	-	-	-	-	-	-	-	-	1	-	-

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Postneonatal Death: Deaths occurring to individuals 28–364 days of age.
 -: A dash indicates quantity zero.

Source: 2006-2016 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

**Table 22-A
Number of Neonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2006-2016**

Health Department	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	660	697	608	600	549	501	540	544	513	498	474
Allegan County	4	13	4	4	6	5	3	3	4	9	3
Barry-Eaton District	10	7	5	6	11	7	4	9	4	7	9
Berrien County	12	13	10	10	8	8	11	8	9	6	2
Branch-Hillsdale-St. Joseph	15	12	12	12	5	8	5	10	6	6	13
Calhoun County	11	18	13	13	10	9	7	8	5	8	4
Central Michigan District	8	13	3	7	2	10	5	7	7	9	4
Chippewa County	2	-	1	-	-	3	2	1	1	-	1
City Of Detroit	121	120	123	114	98	80	104	87	80	81	72
Delta & Menominee	-	3	1	3	2	1	4	1	4	1	-
Dickinson-Iron District	1	1	2	2	2	-	-	4	1	-	-
District #10	10	16	14	11	12	13	18	12	17	8	12
District #2	1	1	2	3	2	2	3	-	4	1	-
District #4	5	3	1	-	2	2	3	1	2	3	1
Genesee County	44	40	27	34	19	22	19	25	23	29	30
Grand Traverse County	4	5	7	3	3	-	3	-	1	7	4
Ingham County	13	17	22	14	12	16	16	20	15	11	5
Ionia County	3	2	-	1	2	1	-	2	2	2	2
Jackson County	11	12	11	7	9	8	3	10	5	7	12
Kalamazoo County	14	22	13	20	17	8	17	11	11	11	5
Kent County	59	47	48	42	32	40	38	28	37	38	45
Lapeer County	5	4	3	6	4	-	1	4	3	1	4
Lenawee County	8	5	9	8	11	3	6	4	5	4	5
Livingston County	5	11	6	9	6	9	7	3	9	5	3
Luce-Mackinac-Alger-Schoolcraft	2	1	5	1	-	-	-	-	1	2	3
Macomb County	30	48	40	52	39	43	40	52	34	43	36

Table 22-A
Number of Neonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2006-2016

Health Department	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Marquette County	2	2	2	2	1	3	-	2	-	1	1
Mid-Michigan District	7	12	4	6	11	8	5	8	6	7	4
Midland County	7	3	1	3	2	2	3	4	3	-	1
Monroe County	11	6	5	3	4	2	6	10	2	8	3
Muskegon County	9	13	9	9	16	11	11	14	9	7	13
Oakland County	72	71	62	60	63	45	61	69	66	53	54
Ottawa County	18	16	19	10	17	17	14	20	10	12	9
Bay County	8	5	3	7	9	6	4	-	5	4	1
Saginaw County	9	16	10	15	10	8	8	13	11	12	16
Shiawassee County	-	8	-	2	2	1	2	2	1	1	2
St Clair County	9	10	4	6	4	6	10	2	3	6	5
Van Buren-Cass County	1	7	8	9	3	5	6	4	8	3	8
Washtenaw County	15	17	14	18	11	10	14	12	23	10	14
Wayne County	77	60	74	58	60	71	68	60	67	63	52
Benzie-Leelanau District	2	2	-	-	3	-	-	2	1	1	3
Northwest Michigan Community Health	1	6	6	2	9	5	2	5	2	3	2
Western Upper Peninsula District	5	4	4	1	5	1	2	4	3	1	5
Tuscola County	3	1	-	2	4	1	4	1	-	3	-
Huron County	2	-	-	3	1	1	-	-	-	-	1
Sanilac County	4	4	1	2	-	-	1	1	3	3	4
Unknown	-	-	-	-	-	-	-	1	-	1	1

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Neonatal Death: Deaths occurring to individuals less than 28 days of age.
 -: A dash indicates quantity zero.

Source: 2006-2016 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services

**Table 22-B
Number of Postneonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2006-2016**

Health Department	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Michigan	280	300	286	281	268	248	243	255	260	267	256
Allegan County	4	5	2	2	-	2	1	6	5	1	2
Barry-Eaton District	3	4	7	5	5	1	4	5	4	2	2
Berrien County	5	8	6	7	6	10	3	6	6	3	8
Branch-Hillsdale-St. Joseph	3	5	4	1	8	2	8	3	3	3	5
Calhoun County	6	10	1	7	8	6	3	3	4	6	2
Central Michigan District	4	4	1	5	8	3	2	3	2	4	4
Chippewa County	2	1	-	-	2	1	-	1	1	-	-
City Of Detroit	54	59	52	52	48	50	47	47	50	58	48
Delta & Menominee	1	2	1	1	-	1	1	-	-	1	3
Dickinson-Iron District	3	-	-	1	2	1	-	-	1	-	2
District #10	7	8	8	4	9	6	5	3	12	6	3
District #2	1	2	3	3	3	2	3	1	1	-	2
District #4	2	2	1	6	2	1	2	-	1	1	1
Genesee County	17	17	19	17	11	18	19	15	18	14	17
Grand Traverse County	2	2	1	2	-	1	1	-	5	2	2
Ingham County	5	9	3	6	2	5	6	8	6	10	16
Ionia County	-	4	1	-	3	2	1	3	1	1	2
Jackson County	6	3	3	5	2	3	4	5	3	3	5
Kalamazoo County	3	7	9	9	13	3	2	15	5	9	3
Kent County	26	18	21	14	22	19	12	11	15	18	11
Lapeer County	1	1	1	5	3	-	1	-	2	3	-
Lenawee County	2	4	2	1	4	3	2	5	4	2	3
Livingston County	2	3	4	3	5	3	1	4	4	2	1
Luce-Mackinac-Alger-Schoolcraft	2	-	2	1	-	-	-	-	1	1	1
Macomb County	21	21	22	26	9	10	12	15	14	17	15

Table 22-B
Number of Postneonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2006-2016

Health Department	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Marquette County	2	-	-	2	1	1	2	-	1	4	1
Mid-Michigan District	5	-	5	3	5	1	2	2	5	5	4
Midland County	1	-	2	2	-	2	3	3	2	3	-
Monroe County	4	4	6	6	5	1	3	5	1	1	4
Muskegon County	4	6	7	6	7	4	7	5	6	11	5
Oakland County	19	21	26	17	21	25	32	21	17	18	17
Ottawa County	4	1	4	5	3	4	4	6	2	9	7
Bay County	4	3	5	1	3	3	1	2	5	2	-
Saginaw County	10	10	15	11	2	9	5	6	10	7	11
Shiawassee County	2	2	1	-	2	-	1	1	2	3	4
St Clair County	4	2	4	9	2	5	3	4	6	3	4
Van Buren-Cass County	3	2	6	2	3	2	6	5	-	6	2
Washtenaw County	8	6	3	4	9	4	6	6	5	4	7
Wayne County	21	35	26	24	27	29	19	23	21	20	28
Benzie-Leelanau District	-	1	-	-	1	1	-	1	2	1	-
Northwest Michigan Community Health	4	4	-	3	-	2	3	3	3	1	-
Western Upper Peninsula District	1	1	1	-	-	-	-	1	1	-	3
Tuscola County	1	1	1	2	1	1	-	1	2	1	1
Huron County	1	-	-	-	-	1	3	-	-	-	-
Sanilac County	-	2	-	1	1	-	3	1	-	1	-
Unknown	-	-	-	-	-	-	-	-	1	-	-

Notes: Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower and upper bounds of this interval with 95 % statistical confidence.

Postneonatal Death: Deaths occurring to individuals 28-364 days of age.
 -: A dash indicates quantity zero.

Source: 2006-2016 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Health & Human Services