
MICHIGAN DEPARTMENT OF COMMUNITY HEALTH

Division for Vital Records and Health Statistics

MICHIGAN INFANT DEATH STATISTICS

January 1 through December 31, 2012

*Michigan Department
of Community Health*



Rick Snyder, Governor
James K. Haveman, Director

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SUMMARY OF 2012 INFANT DEATH STATISTICS

INFANT MORTALITY: For every 1,000 Michigan live births, approximately seven infants die before reaching their first birthday. In 2012, 783 infants under the age of one year died, resulting in an infant mortality rate of 6.9 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 2012 rate of 6.9 may indicate a new drop of the mortality rates from the 7.9 average to a rate of around 7.0 or lower. (See Table 1.)

Both the white and black infant mortality rates have stayed 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 2012 the white infant mortality rate was 5.5 per 1,000 live births while the black rate was 13.5 per 1,000 live births. Between 2005-2012 the white infant mortality rate has remained about the same, while the black rate has declined by 24.5% due to a steady 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.)

The Michigan infant mortality rate continues to be higher than the last reported national rate. The provisional 2011 infant death rate for the United States is 6.1. (See Table 7.)

LIVE BIRTHS: The number of live births has decreased steadily in recent years. In 2012, the number of live births was 112,708, slightly higher than the number of births reported in 1945. Nationally, there were 3,952,841 births in the U.S. in 2012, a decline of 8.4% from the record number reported for 2007.

CHARACTERISTICS OF NEWBORN: Certain newborns are at higher risk of dying. In 2012 infants born with very low birth weight (less than 1,500 grams) experienced an infant death rate of 247.3 per 1,000 live births compared to a rate of 2.0 for those infants weighing 2,500 grams or more. Multiple birth infants had an infant mortality rate of 29.9 per 1,000 live births compared to the rate of 6.1 for single birth infants. The excess male infant mortality normally reported in other years was present in 2012, with the infant mortality for male infants at 7.4 per 1,000 male live births and females at 6.3 per 1,000 female live births. (See Table 6.)

CHARACTERISTICS OF MOTHER: Infant death rates were the lowest for mothers aged 30-39 years old and highest for mothers less than 20 years old. Unmarried mothers had infant mortality rates nearly 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 9.1 per 1,000 live births compared to a rate of 6.1 for mothers who were not exposed to secondhand smoking during pregnancy. (See Table 6.)

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 "Infant Mortality" in the left menu. Those who do not have access to the Internet may request that community level data be mailed to them from the address below.

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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 2011. 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 2011 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 - 2012

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

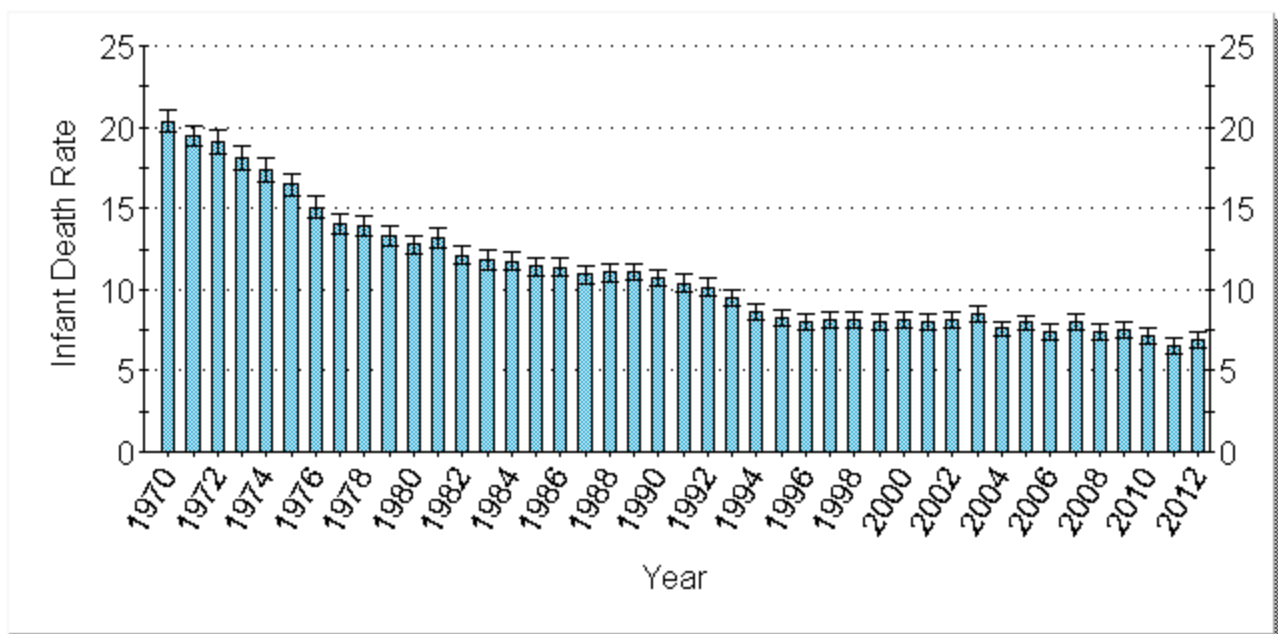
Table 1
Number of Infant Deaths
Live Births and Infant Death Rates
Michigan Residents, 1970 - 2012
(Continued)

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

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 - 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Figure 1
Infant Death Rates, Michigan Residents, 1970-2012



Note: Rates are per 1,000 live births. The range indicated on each bar 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- 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 2
Number of Infant Deaths, Live Births and Infant Death Rates By Race
Michigan Residents, 1970 - 2012

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 - 2012
(Continued)

Year	White			Black			Other		
	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

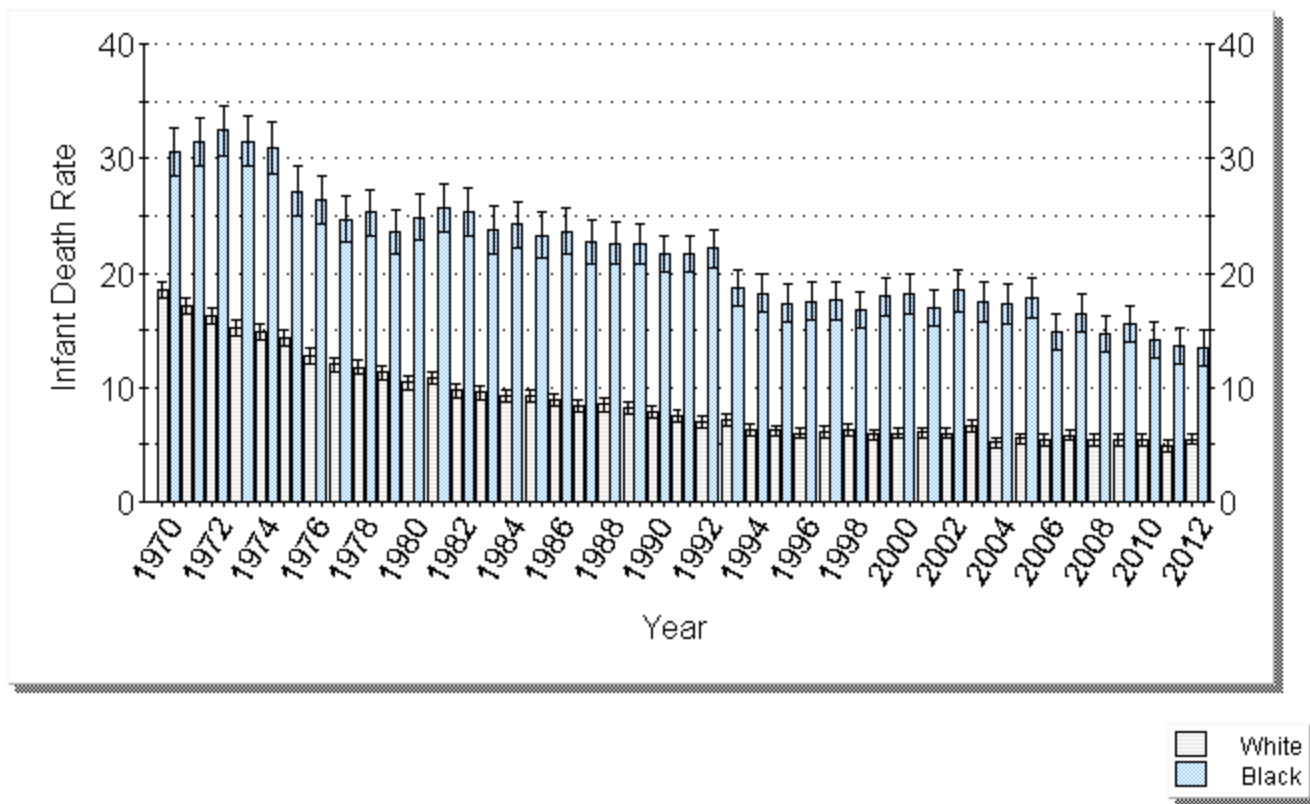
Note: Infant deaths by race of infant; live births used in calculating infant death rates are by race of mother. Rates are per 1,000 live births. Adding and subtracting the number shown after the ± symbol from the rate creates a confidence interval indicating that the true rate lies between the lower 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 - 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Figure 2
Comparison of White and Black Infant Death Rates for Michigan Residents, 1970-2012



Note: Rates are per 1,000 live births. The range indicated on each bar 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- 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2012 and 2008 - 2012 Average

County of Residence	2012			2008 - 2012		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
MICHIGAN	783	112,708	6.9 ±0.5	824.8	116,024.8	7.1 ±0.2
Alcona	1	65	*	0.8	64.8	*
Alger	-	55	-	0.8	63.2	*
Allegan	4	1,351	*	5.8	1,404.4	4.1 ±1.5
Alpena	-	255	-	1.4	272.4	5.1 ±3.8
Antrim	-	173	-	1.8	204.8	8.8 ±5.7
Arenac	1	120	*	1.2	131.4	9.1 ±7.3
Baraga	-	81	-	0.2	80.6	*
Barry	3	646	*	4.6	654.4	7.0 ±2.9
Bay	5	1,057	*	8.4	1,149.8	7.3 ±2.2
Benzie	-	148	-	0.2	153.0	*
Berrien	14	1,763	7.9 ±4.1	15.8	1,938.2	8.2 ±1.8
Branch	4	490	*	3.2	525.8	6.1 ±3.0
Calhoun	10	1,681	5.9 ±3.7	15.4	1,680.6	9.2 ±2.0
Cass	4	395	*	3.8	485.8	7.8 ±3.5
Charlevoix	-	263	-	0.8	247.2	*
Cheboygan	-	193	-	0.6	210.2	*
Chippewa	2	347	*	1.8	364.8	4.9 ±3.2
Clare	2	320	*	1.4	329.6	4.2 ±3.1
Clinton	2	826	*	2.8	774.2	3.6 ±1.9
Crawford	-	103	-	0.6	123.8	*
Delta	4	361	*	2.0	369.2	5.4 ±3.3
Dickinson	-	250	-	1.2	244.2	4.9 ±3.9
Eaton	5	1,145	*	6.4	1,179.0	5.4 ±1.9
Emmet	2	299	*	1.6	315.4	5.1 ±3.5
Genesee	38	4,941	7.7 ±2.4	41.0	5,238.2	7.8 ±1.1
Gladwin	-	224	-	1.2	235.6	5.1 ±4.1
Gogebic	-	117	-	0.4	135.6	*
Gd. Traverse	4	910	*	4.2	929.4	4.5 ±1.9
Gratiot	-	409	-	2.8	444.2	6.3 ±3.3
Hillsdale	2	499	*	2.2	542.0	4.1 ±2.4

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2012 and 2008 - 2012 Average
(Continued)

County of Residence	2012			2008 - 2012		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Houghton	2	389	*	2.2	397.6	5.5 ±3.3
Huron	3	290	*	1.8	307.4	5.9 ±3.8
Ingham	22	3,299	6.7 ±2.8	20.4	3,308.8	6.2 ±1.2
Ionia	1	726	*	2.2	764.4	2.9 ±1.7
Iosco	1	221	*	2.0	210.2	9.5 ±5.9
Iron	-	92	-	0.8	98.8	*
Isabella	4	616	*	3.8	690.4	5.5 ±2.5
Jackson	7	1,787	3.9 ±2.9	11.0	1,854.8	5.9 ±1.6
Kalamazoo	19	3,142	6.0 ±2.7	22.2	3,111.2	7.1 ±1.3
Kalkaska	4	198	*	1.4	185.2	7.6 ±5.6
Kent	50	8,958	5.6 ±1.5	57.6	8,845.4	6.5 ±0.7
Keweenaw	-	17	-	-	17.8	-
Lake	1	99	*	0.8	97.2	*
Lapeer	2	823	*	4.8	842.8	5.7 ±2.3
Leelanau	-	165	-	0.8	170.2	*
Lenawee	8	1,012	7.9 ±5.5	9.8	1,075.4	9.1 ±2.5
Livingston	8	1,739	4.6 ±3.2	10.6	1,746.4	6.1 ±1.6
Luce	-	55	-	0.4	61.4	*
Mackinac	-	69	-	0.6	79.2	*
Macomb	52	9,089	5.7 ±1.6	58.6	9,252.2	6.3 ±0.7
Manistee	-	204	-	1.2	197.4	6.1 ±4.8
Marquette	2	695	*	2.8	661.4	4.2 ±2.2
Mason	-	307	-	1.4	301.6	4.6 ±3.4
Mecosta	4	450	*	4.4	436.4	10.1 ±4.2
Menominee	1	195	*	1.0	205.4	*
Midland	6	828	7.2 ±5.8	4.0	856.4	4.7 ±2.0
Missaukee	1	199	*	0.4	172.6	*
Monroe	9	1,530	5.9 ±3.8	8.2	1,645.6	5.0 ±1.5
Montcalm	5	728	*	4.4	740.4	5.9 ±2.5
Montmorency	2	74	*	0.6	66.8	*

Table 3
Number of Infant Deaths, Live Births and Infant Death Rates by
Michigan and Michigan County of Residence,
2012 and 2008 - 2012 Average
(Continued)

County of Residence	2012			2008 - 2012		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Muskegon	18	2,075	8.7 ±4.0	17.4	2,214.6	7.9 ±1.6
Newaygo	2	545	*	3.6	560.6	6.4 ±3.0
Oakland	93	13,307	7.0 ±1.4	82.4	13,369.6	6.2 ±0.6
Oceana	5	323	*	2.8	345.4	8.1 ±4.2
Ogemaw	2	196	*	1.4	198.8	7.0 ±5.2
Ontonagon	-	30	-	-	36.6	-
Osceola	-	287	-	1.0	284.2	*
Oscoda	2	101	*	1.0	84.0	*
Otsego	3	230	*	2.2	258.4	8.5 ±5.0
Ottawa	18	3,316	5.4 ±2.5	19.4	3,353.2	5.8 ±1.1
Presque Isle	3	95	*	1.4	92.4	15.2 ±11.1
Roscommon	-	171	-	0.6	175.8	*
Saginaw	13	2,341	5.6 ±3.0	18.6	2,357.8	7.9 ±1.6
St. Clair	13	1,555	8.4 ±4.5	10.6	1,687.8	6.3 ±1.7
St. Joseph	7	728	9.6 ±7.1	7.6	831.0	9.1 ±2.9
Sanilac	4	438	*	1.8	462.8	3.9 ±2.5
Schoolcraft	-	76	-	-	71.2	-
Shiawasee	3	706	*	2.2	720.6	3.1 ±1.8
Tuscola	4	553	*	3.2	551.8	5.8 ±2.8
Van Buren	8	948	8.4 ±5.8	6.2	961.4	6.4 ±2.3
Washtenaw	20	3,730	5.4 ±2.3	18.6	3,816.8	4.9 ±1.0
Wayne	238	23,109	10.3 ±1.3	244.8	24,255.0	10.1 ±0.6
Wexford	6	365	16.4 ±13.0	3.4	414.2	8.2 ±3.9
Unknown	-	-	-	-	28.2	-

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.

*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: 2008 - 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 4
Number of Infant Deaths, Live Births and Infant Death Rates for
Selected Cities of Residence, 2012 and 2008 - 2012 Average

City of Residence	2012			2008 - 2012		
	Infant Deaths	Live Births	Infant Death Rate	Average Infant Deaths	Average Live Births	Average Infant Death Rate
Ann Arbor	5	1,109	*	3.8	1,092.4	3.5 ±1.6
Battle Creek	7	787	8.9 ±6.6	8.2	779.8	10.5 ±3.2
Dearborn	13	1,674	7.8 ±4.2	11.8	1,664.6	7.1 ±1.8
Dearborn Heights	5	758	*	4.4	775.2	5.7 ±2.4
Detroit	151	10,081	15.0 ±2.4	153.6	10,866.2	14.1 ±1.0
East Lansing	-	-	-	-	132.6	-
Farmington Hills	5	830	*	5.2	831.8	6.3 ±2.4
Flint	22	1,540	14.3 ±5.9	21.2	1,704.2	12.4 ±2.4
Grand Rapids	31	3,330	9.3 ±3.3	29.6	3,301.4	9.0 ±1.4
Kalamazoo	7	976	7.2 ±5.3	9.6	1,027.4	9.3 ±2.6
Kentwood	6	829	7.2 ±5.8	3.6	791.4	4.5 ±2.1
Lansing	13	1,824	7.1 ±3.9	14.8	1,897.0	7.8 ±1.8
Livonia	3	816	*	3.4	834.8	4.1 ±1.9
Midland	2	464	*	1.6	466.2	3.4 ±2.4
Muskegon	7	557	12.6 ±9.3	5.0	585.6	8.5 ±3.3
Novi	3	641	*	3.0	615.8	4.9 ±2.5
Pontiac	9	1,082	8.3 ±5.4	12.2	1,081.4	11.3 ±2.8
Portage	4	575	*	3.8	575.8	6.6 ±3.0
Rochester Hills	3	759	*	3.8	762.2	5.0 ±2.2
Roseville	8	570	14.0 ±9.7	4.2	596.0	7.0 ±3.0
Royal Oak	9	781	11.5 ±7.5	5.0	773.2	6.5 ±2.5
Saginaw	7	889	7.9 ±5.8	11.2	923.4	12.1 ±3.2
Southfield	11	738	14.9 ±8.7	7.8	759.6	10.3 ±3.2
St Clair Shores	2	544	*	2.4	570.8	4.2 ±2.4
Sterling Heights	10	1,454	6.9 ±4.2	9.2	1,438.2	6.4 ±1.8
Taylor	9	844	10.7 ±6.9	8.2	846.8	9.7 ±2.9
Troy	2	799	*	3.6	775.2	4.6 ±2.1
Warren	12	1,666	7.2 ±4.1	13.6	1,622.6	8.4 ±2.0
Westland	9	1,067	8.4 ±5.5	10.0	1,085.6	9.2 ±2.5
Wyoming	2	1,195	*	8.0	1,227.8	6.5 ±2.0

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: 2008-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2008-2012 Geocoded Michigan Birth Certificate Registries Division for Vital Records & Health Statistics, Michigan Department of Community Health

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- 2012

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
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

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- 2012
(Continued)

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
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
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

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- 2012
(Continued)

Year	Race	Michigan		Detroit City		Wayne County (excluding Detroit)		Michigan (excluding Wayne County)	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
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

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- 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Table 6
Number of Infant Deaths, Live Births and Infant Death Rates
by Selected Characteristics of Newborn and of Mother
for Michigan Residents, 2012

Characteristics of Newborn	Infant Deaths	Live Births	Infant Death Rate
Sex of Infant	783	112,708	6.9 ±0.5
Male	428	57,740	7.4 ±0.7
Female	348	54,961	6.3 ±0.7
Birthweight	783	112,708	6.9 ±0.5
1,499 Grams or Less	439	1,775	247.3 ±20.4
1,500 - 2,499 Grams	122	7,760	15.7 ±2.8
2,500 Grams or More	211	103,141	2.0 ±0.3
Plurality	783	112,708	6.9 ±0.5
Single Birth	658	108,593	6.1 ±0.5
Multiple Birth	123	4,114	29.9 ±5.2
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Characteristics of Mother	Infant Deaths	Live Births	Infant Death Rate
Age of Mother	783	112,708	6.9 ±0.5
< 20	94	8,998	10.4 ±2.1
20 - 29	422	60,915	6.9 ±0.7
30 - 39	242	40,014	6.0 ±0.8
40 +	23	2,772	8.3 ±3.4
Marital Status	783	112,708	6.9 ±0.5
Married	323	64,613	5.0 ±0.5
Unmarried	458	48,095	9.5 ±0.9
Level of Prenatal Care	783	112,708	6.9 ±0.5
Adequate	419	77,565	5.4 ±0.5
Intermediate	180	23,497	7.7 ±1.1
Inadequate	138	9,408	14.7 ±2.4

Table 6
Number of Infant Deaths, Live Births and Infant Death Rates
by Selected Characteristics of Newborn and of Mother
for Michigan Residents, 2009
(Continued)

Exposure to Tobacco	Infant Deaths	Live Births	Infant Death Rate
Smoked During Pregnancy	783	112,708	6.9 ±0.5
No	623	91,170	6.8 ±0.5
Yes	158	21,538	7.3 ±1.1
Secondhand Smoke During Pregnancy	783	112,708	6.9 ±0.5
No	543	88,182	6.2 ±0.5
Yes	172	20,004	8.6 ±1.3
Smoked or Secondhand Smoke During Pregnancy	783	112,708	6.9 ±0.5
No	483	78,890	6.1 ±0.5
Yes	239	30,005	8.0 ±1.0
History of smoking	783	112,708	6.9 ±0.5
No	536	87,879	6.1 ±0.5
Yes	223	24,416	9.1 ±1.2

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. 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: 2012 Michigan Resident Birth-Death Matched File, Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 7
Number and Rate of Infant Deaths by Race,
Michigan and United States Residents, 1989 - 2012

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	15,438	5.1	7,234	11.4	749	6.6	411	4.9	300	13.7
2012	---	---	---	---	---	---	783	6.9	455	5.5	291	13.5

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.

The United States data for 2010 is provisional.

---: Data not available.

Source: 1989 - 2012 Michigan Resident Birth and Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health. [National Vital Statistics Reports \(NVSr\)](#), "Deaths: Preliminary Data for 2011". October 10, 2012. Vol 61, No 6; NVSR. 2007-2009 NCHS, Linked Birth / Infant Death Records 2007-2009 on CDC WONDER On-line Database. Accessed at <http://wonder.cdc.gov/lbd-current.html> on Sep 16, 2013. "Deaths: Final Data for 2006", Vol 57, No. 14, April 2009; and [National Center for Health Statistics, historical data.](#)

Table 8-A
Number of Hispanic and Arabic Infant Deaths by Selected County and Michigan
Michigan Residents, 2002 - 2012

Hispanic Infant Deaths

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	59	73	76	92	94	90	74	74	57	44	74
Hispanic Infant Death Rates	8.2	9.6	9.8	11.0	11.0	10.3	8.5	9.0	7.0	5.6	9.7
Allegan	-	2	1	2	2	-	2	1	-	1	-
Genesee	4	3	4	3	5	5	1	1	1	2	-
Ingham	5	5	4	4	2	3	2	8	1	1	2
Kalamazoo	1	1	-	4	2	4	3	-	4	-	2
Kent	14	13	13	14	27	13	16	6	8	12	10
Lenawee	-	-	1	-	1	2	-	2	1	1	2
Macomb	-	3	1	1	3	6	2	4	-	-	1
Muskegon	1	1	3	1	1	2	2	3	-	1	1
Oakland	3	5	7	13	7	5	9	9	6	7	8
Ottawa	4	2	3	4	4	3	3	4	1	2	4
Saginaw	-	2	1	3	3	8	4	5	2	2	5
Van Buren	1	1	2	7	-	2	2	-	1	-	2
Washtenaw	-	1	1	2	2	-	3	4	2	-	2
Wayne	13	22	17	12	15	19	15	13	15	8	16
All Other Counties	13	12	18	22	20	18	10	14	15	7	19

Table 8-A
Number of Hispanic and Arabic Infant Deaths by Selected County and Michigan
Michigan Residents, 2002 - 2012 (Continued)

Arabic Infant Deaths

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	22	19	12	24	31	32	34	22	24	24	26
Arabic Infant Death Rates	5.7	5.1	3.3	6.3	7.6	8.0	8.5	5.8	5.7	5.9	6.2
Macomb	7	3	2	2	5	3	7	6	5	2	5
Oakland	1	2	1	5	3	4	8	2	6	3	5
Wayne	13	13	5	13	22	23	16	10	10	15	14
All Other Counties	1	1	4	4	1	2	3	4	3	4	2

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: 2012 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Table 9
Infant, Hebdomadal, Fetal and Perinatal Death Rates
by Specified Race and Ancestry
Michigan Residents, 2012

Race/Ancestry	Live Births	Infant Deaths		Hebdomadal Deaths		Fetal Deaths		Perinatal Deaths	
		Number	Rate	Number	Rate	Number	Rate	Number	Rate
All Races	112,708	783	6.9 ±0.5	459	4.1 ±0.4	562	5.0 ±0.4	1,021	9.0 ±0.6
White	82,949	455	5.5 ±0.5	268	3.2 ±0.4	360	4.3 ±0.4	628	7.5 ±0.6
Black	21,623	291	13.5 ±1.5	167	7.7 ±1.2	163	7.5 ±1.1	330	15.1 ±1.6
American Indian	710	10	14.1 ±8.7	6	8.5 ±6.7	2	*	8	11.2 ±7.7
Asian and Pacific Islander	4,017	17	4.2 ±2.0	11	2.7 ±1.6	10	2.5 ±1.5	21	5.2 ±2.2
Arabic	4,217	26	6.2 ±2.4	20	4.7 ±2.1	16	3.8 ±1.8	36	8.5 ±2.8
Hispanic	7,597	74	9.7 ±2.2	47	6.2 ±1.8	34	4.5 ±1.5	81	10.6 ±2.3

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: 2012 Michigan Resident Infant Death File, 2012 Michigan Fetal Death Registry Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Table 10
Number of Infant Deaths by Cause of Death,
1980-2012, Michigan Residents

Causes of Death	1980	1985	1990	1995	2000	2005	2006	2007	2008	2009	2010	2011	2012
All Causes	2,280	1,575	1,638	1,110	1,112	1,013	940	997	894	881	817	749	783
Certain gastrointestinal diseases	7	6	6	6	10	12	11	12	11	12	9	13	7
Septicemia	8	6	17	2	5	10	3	9	9	8	4	1	8
Remainder of infectious and parasitic diseases	5	11	18	12	7	6	10	3	6	2	3	2	2
Meningitis	13	7	11	2	3	3	4	3	1	1	5	1	2
Pneumonia and Influenza	27	11	26	20	20	6	8	4	9	6	8	6	5
Congenital anomalies	321	330	300	204	192	197	185	194	172	181	184	125	127
Newborn affected by maternal complications of pregnancy	72	52	108	47	45	67	72	67	54	62	40	49	68
Newborn affected by complications of placenta, cord and membranes	50	34	24	33	36	28	26	25	26	24	26	18	28
Disorders relating to short gestation and unspecified low birthweight	145	150	251	219	262	219	201	234	209	183	198	188	188
Birth trauma	45	14	16	8	2	1	-	-	-	-	-	1	-
Intrauterine hypoxia and birth asphyxia	69	43	25	11	24	19	7	7	15	7	20	7	14
Respiratory distress syndrome	206	176	164	82	65	57	36	42	41	23	23	14	26
Other respiratory conditions	199	132	120	63	65	52	28	52	29	42	27	28	27
Infections specific to the perinatal period	35	32	33	23	35	42	29	40	39	26	27	22	21
Neonatal hemorrhage	38	10	8	13	28	23	16	9	9	17	12	11	12
All other and ill-define conditions originating in the perinatal period	169	168	73	47	39	46	67	50	46	62	27	39	34
Sudden infant death syndrome	260	228	257	148	99	47	51	46	48	45	44	33	15
Accidents and adverse effects	39	35	38	40	55	68	71	77	62	74	66	83	93
Homicides	7	8	17	12	13	15	9	7	10	10	13	11	14
All other causes	136	122	126	118	107	95	106	116	98	96	81	97	92

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: 1980-2012 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Table 11
Three-year Moving Average Infant Deaths Rates per 10,000 Live Births, by Cause of Death,
1980-2012, Michigan Residents

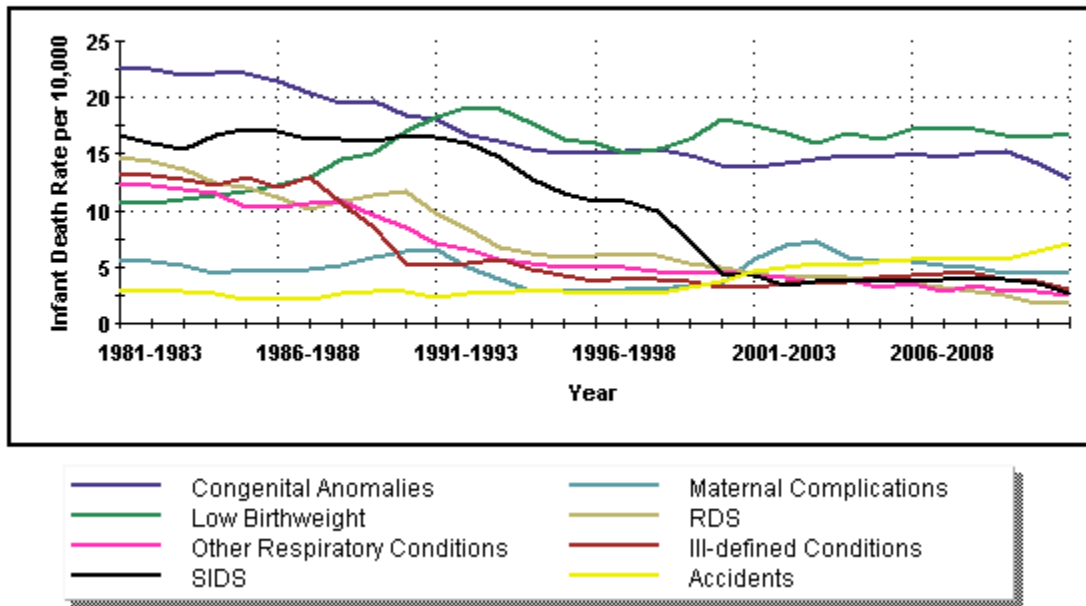
Causes of Death	1980 to 1982	1985 to 1987	1990 to 1992	1995 to 1997	2000 to 2002	2001 to 2003	2002 to 2004	2003 to 2005	2004 to 2006	2005 to 2007	2006 to 2008	2007 to 2009	2008 to 2010	2009 to 2011	2010 to 2012
Total Infant Deaths	126.8	112.4	104.2	81.5	81.0	82.1	80.8	80.1	76.3	77.6	75.7	76.2	73.4	70.7	68.8
Certain gastrointestinal diseases	.6	.6	.6	.6	.6	.8	.9	1.0	.9	.9	.9	1.0	.9	1.0	.8
Septicemia	.4	.5	.9	.4	.5	.6	.5	.6	.4	.6	.6	.7	.6	.4	.4
Remainder of infectious and parasitic diseases	.4	.8	1.1	.6	.5	.5	.4	.4	.5	.5	.5	.3	.3	.2	.2
Meningitis	.9	.4	.4	*	*	.2	.2	.2	.2	.3	.2	*	.2	.2	.2
Pneumonia and Influenza	1.4	1.1	1.8	1.1	1.1	.8	.7	.7	.6	.5	.6	.5	.6	.6	.6
Congenital anomalies	22.7	21.4	18.1	15.1	13.8	14.2	14.6	15.0	14.7	15.1	14.7	15.0	15.2	14.2	12.8
Newborn affected by maternal complications of pregnancy	5.8	4.6	6.6	2.9	5.7	6.9	7.2	5.9	5.5	5.4	5.2	5.0	4.4	4.4	4.6
Newborn affected by complications of placenta, cord and membranes	3.2	2.6	2.1	2.9	2.4	2.2	1.8	2.0	1.9	2.1	2.1	2.1	2.2	2.0	2.1
Disorders relating to short gestation and unspecified low birthweight	10.6	12.2	18.2	16.0	17.6	16.8	16.0	16.8	16.3	17.2	17.2	17.2	16.7	16.4	16.8
Birth trauma	2.5	.7	.7	.4	.2	.2	*	*	*	*	-	-	-	*	*
Intrauterine hypoxia and birth asphyxia	4.5	2.4	1.6	1.2	1.6	1.7	1.8	1.8	1.2	.9	.8	.8	1.2	1.0	1.2
Respiratory distress syndrome	14.8	11.2	9.7	6.1	4.5	4.1	4.1	4.1	3.9	3.6	3.2	2.9	2.5	1.7	1.8
Other respiratory conditions	12.2	10.2	7.1	5.1	4.3	4.1	3.6	3.8	3.2	3.5	2.9	3.4	2.8	2.8	2.4
Infections specific to the perinatal period	2.2	2.3	2.2	2.1	3.0	3.0	3.0	3.1	3.0	2.9	2.9	2.9	2.6	2.2	2.0
Neonatal hemorrhage	2.0	.7	.6	.8	1.3	1.3	1.6	2.0	1.7	1.3	.9	1.0	1.1	1.2	1.0
All other and ill-define conditions originating in the perinatal period	13.3	12.1	5.1	3.7	3.1	3.6	3.6	3.8	4.1	4.3	4.4	4.3	3.8	3.7	2.9
Sudden infant death syndrome	16.6	17.1	16.6	10.8	4.3	3.4	3.7	3.8	3.7	3.8	3.9	3.8	3.9	3.5	2.7
Accidents and adverse effects	2.8	2.1	2.4	2.7	4.6	4.9	5.3	5.2	5.4	5.7	5.6	5.9	5.7	6.4	7.1
Homicides	.4	.9	.9	.9	.8	.7	.6	.8	.8	.8	.7	.7	.9	1.0	1.1
All other causes	9.7	8.6	7.6	7.9	8.3	9.8	9.9	9.3	7.9	8.3	8.6	8.5	7.8	7.9	7.9

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: 1980-2012 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Figure 3
Three-year Average Infant Death Rates by Cause,
Michigan Residents, 1980-2012



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: 1980-2012 Michigan Resident Infant Death File, Division for Vital Records & Health Statistics, Michigan Department of Community Health.

Table 14-A
Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	8.2±0.3	8.1±0.3	8.0±0.3	7.6±0.3	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3
Alcona	*	*	*	*	*	*	*	*	*	*
Alger	*	*	*	-	-	*	*	*	*	-
Allegan	8.4±2.7	6.9±2.4	7.8±2.6	6.3±2.3	8.4±2.6	6.9±2.4	6.7±2.4	4.2±1.9	4.5±2.0	4.2±2.0
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	*	*	*	*	*	*	*	*	*	*
Baraga	*	*	*	*	*	*	*	*	-	-
Barry	3.6±2.5	4.1±2.7	4.6±2.8	5.9±3.2	6.5±3.4	7.8±3.7	7.4±3.7	8.9±4.1	7.9±4.0	6.8±3.7
Bay	6.7±2.6	4.8±2.2	5.6±2.4	6.6±2.6	8.0±2.8	7.5±2.8	6.6±2.6	7.9±2.9	8.3±3.0	7.7±3.0
Benzie	*	*	10.4±8.3	*	11.7±8.6	*	*	*	*	*
Berrien	9.3±2.4	7.1±2.1	7.6±2.2	7.3±2.1	9.4±2.4	8.8±2.3	8.9±2.4	7.8±2.2	8.3±2.3	8.1±2.3
Branch	10.2±4.7	10.1±4.6	10.9±4.7	8.7±4.2	5.3±3.3	3.3±2.6	3.5±2.8	4.9±3.4	6.3±3.9	7.8±4.4
Calhoun	10.2±2.6	8.9±2.5	9.3±2.5	9.6±2.6	11.2±2.8	10.8±2.7	11.5±2.9	10.2±2.8	10.7±2.9	8.7±2.6
Cass	7.7±4.2	8.9±4.5	9.1±4.6	8.6±4.5	8.3±4.3	5.9±3.6	7.8±4.2	7.8±4.4	7.3±4.3	6.6±4.3
Charlevoix	*	*	*	*	*	*	*	*	*	*
Cheboygan	7.1±5.6	*	*	*	*	*	*	*	*	-
Chippewa	5.3±4.3	*	6.8±4.7	7.4±4.8	8.6±5.3	5.4±4.3	*	*	5.3±4.2	7.5±5.2
Clare	8.8±5.8	13.0±7.0	12.1±6.8	7.8±5.4	5.6±4.5	6.6±4.9	5.8±4.7	*	*	*
Clinton	7.2±3.3	6.1±3.0	5.4±2.8	3.4±2.2	4.7±2.7	4.8±2.7	4.7±2.8	4.4±2.7	4.0±2.6	3.8±2.5
Crawford	16.8±12.3	*	*	*	16.8±12.3	19.1±13.1	17.5±12.9	*	*	*
Delta	11.1±5.8	9.1±5.4	9.9±5.5	4.9±3.9	4.9±3.9	*	6.1±4.5	*	5.3±4.2	6.4±4.7
Dickinson	*	*	*	7.3±5.9	7.6±6.0	7.6±6.0	*	8.3±6.6	*	*
Eaton	4.6±2.1	5.8±2.4	4.3±2.1	4.4±2.2	4.4±2.2	5.3±2.4	5.3±2.4	5.9±2.5	5.6±2.5	5.4±2.4
Emmet	6.1±4.5	5.3±4.2	5.5±4.4	*	*	*	*	6.3±5.0	*	*
Genesee	11.4±1.5	12.5±1.6	11.0±1.5	10.5±1.5	9.5±1.4	9.3±1.4	9.0±1.4	7.8±1.4	7.8±1.4	7.1±1.3
Gladwin	10.8±7.0	10.2±7.0	11.4±7.4	9.0±6.7	*	*	*	*	*	*
Gogebic	*	*	-	*	*	*	*	*	*	*
Grand Traverse	6.8±3.0	5.9±2.8	5.5±2.7	5.8±2.7	6.1±2.8	7.0±3.0	6.9±3.0	5.6±2.8	3.3±2.1	2.9±2.0
Gratiot	4.2±3.4	7.0±4.3	5.4±3.7	7.4±4.4	7.0±4.3	8.7±4.9	7.1±4.4	8.1±4.7	8.1±4.8	6.3±4.3
Hillsdale	5.5±3.4	3.4±2.7	*	4.0±2.9	6.8±3.8	9.2±4.5	5.9±3.6	4.2±3.1	*	3.7±3.0

Table 14-A
All Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012
(Continued)

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Houghton	6.1±4.5	8.7±5.4	5.9±4.4	5.1±4.1	5.0±4.0	7.3±4.8	6.6±4.5	6.5±4.5	*	5.1±4.0
Huron	*	*	*	*	*	*	*	*	6.3±5.1	6.5±5.2
Ingham	6.7±1.5	7.2±1.6	7.7±1.7	7.2±1.6	7.0±1.6	6.6±1.6	7.0±1.6	5.9±1.5	5.6±1.5	5.8±1.5
Ionia	6.5±3.2	4.7±2.7	4.4±2.6	3.5±2.3	4.8±2.7	3.9±2.4	3.3±2.3	3.0±2.2	4.0±2.6	4.0±2.6
Iosco	9.8±7.2	*	*	*	*	*	*	11.7±8.6	12.6±8.6	9.2±7.4
Iron	-	*	*	*	*	*	*	*	*	*
Isabella	10.8±4.4	7.4±3.6	8.7±3.9	8.1±3.7	9.9±4.1	6.2±3.2	5.4±3.1	4.2±2.7	6.8±3.5	7.1±3.7
Jackson	8.1±2.3	7.0±2.1	9.3±2.4	9.0±2.3	9.4±2.4	7.7±2.2	7.1±2.2	6.5±2.1	6.1±2.1	5.3±1.9
Kalamazoo	10.2±2.0	8.8±1.9	7.3±1.7	6.4±1.6	7.2±1.7	7.1±1.7	8.4±1.8	8.6±1.9	7.6±1.8	6.4±1.6
Kalkaska	*	*	8.6±6.9	*	*	-	*	*	*	11.3±9.0
Kent	8.5±1.1	8.6±1.1	8.2±1.1	8.0±1.0	7.6±1.0	7.8±1.0	6.9±1.0	6.8±1.0	6.4±1.0	6.2±0.9
Keweenaw	-	-	-	*	*	*	-	-	-	-
Lake	*	*	20.9±15.3	*	*	*	*	*	*	*
Lapeer	5.6±2.6	4.1±2.2	3.2±2.0	3.3±2.1	4.8±2.5	5.4±2.7	7.4±3.2	8.6±3.6	7.1±3.3	3.6±2.4
Leelanau	10.7±8.5	14.1±9.7	11.7±8.6	*	*	*	*	*	*	*
Lenawee	4.3±2.1	3.5±1.9	4.3±2.1	5.6±2.4	6.7±2.6	8.3±3.0	8.5±3.1	10.8±3.5	9.4±3.3	9.2±3.3
Livingston	5.5±1.8	4.6±1.7	5.2±1.8	3.8±1.5	5.3±1.9	5.5±1.9	6.7±2.2	6.3±2.1	6.7±2.2	5.9±2.1
Luce	*	*	*	*	*	*	*	*	-	-
Mackinac	*	*	*	*	*	*	*	*	*	-
Macomb	5.8±0.9	5.6±0.8	5.9±0.9	5.6±0.8	6.0±0.9	6.1±0.9	7.3±1.0	6.7±1.0	6.5±1.0	5.6±0.9
Manistee	12.8±7.9	13.3±8.2	15.5±8.7	9.8±7.2	*	*	*	*	*	*
Marquette	4.3±3.0	*	*	3.8±2.8	4.6±3.0	4.0±2.8	3.9±2.7	4.1±2.8	5.1±3.1	4.1±2.8
Mason	8.7±6.0	*	*	*	6.1±4.8	7.0±5.2	*	6.4±5.1	*	*
Mecosta	8.4±4.7	8.6±4.8	7.3±4.5	6.5±4.2	4.4±3.5	9.7±5.2	8.2±4.8	9.0±5.1	7.0±4.5	10.2±5.5
Menominee	*	*	*	*	*	*	*	*	*	*
Midland	6.4±2.8	6.8±3.0	7.1±3.1	8.7±3.5	7.0±3.1	5.3±2.8	4.2±2.5	3.9±2.4	4.2±2.5	4.6±2.6
Missaukee	*	*	*	*	*	-	*	*	*	*
Monroe	6.2±2.2	6.2±2.1	5.2±1.9	7.3±2.3	6.8±2.2	6.7±2.2	5.7±2.0	5.7±2.1	4.3±1.8	4.4±1.9
Montcalm	8.6±3.7	8.2±3.6	6.1±3.1	3.7±2.4	2.9±2.1	3.7±2.4	3.9±2.6	5.8±3.1	6.4±3.3	6.8±3.4
Montmorency	-	-	-	*	*	*	-	*	*	*

Table 14-A
All Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012
(Continued)

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Muskegon	9.0±2.2	8.6±2.2	8.4±2.1	6.7±1.9	6.3±1.8	6.7±1.9	7.1±2.0	7.9±2.1	8.0±2.1	8.7±2.3
Newaygo	4.3±3.0	4.3±3.0	5.9±3.5	6.8±3.7	9.7±4.4	8.4±4.1	8.2±4.1	5.3±3.5	7.8±4.2	7.3±4.1
Oakland	6.3±0.7	6.4±0.7	6.7±0.8	6.6±0.8	6.6±0.8	6.4±0.8	6.2±0.8	6.2±0.8	5.8±0.7	6.2±0.8
Oceana	8.2±5.3	8.9±5.5	10.5±5.9	10.3±5.8	8.7±5.4	6.0±4.5	6.3±4.6	8.3±5.4	5.9±4.7	9.0±5.9
Ogemaw	*	*	*	*	*	*	*	*	*	*
Ontonagon	-	-	-	*	*	*	*	-	-	-
Osceola	7.4±5.5	6.3±5.0	8.6±6.0	8.8±6.1	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
Ottawa	6.8±1.6	6.0±1.5	5.3±1.4	5.3±1.4	5.2±1.4	5.9±1.5	5.4±1.4	5.7±1.5	5.6±1.5	5.9±1.5
Presque Isle	*	*	*	*	*	*	*	*	*	21.7±17.1
Roscommon	*	11.8±8.7	9.9±7.9	*	*	*	10.9±8.7	*	*	*
Saginaw	9.3±2.1	8.7±2.0	9.2±2.1	8.7±2.0	9.5±2.2	9.4±2.2	10.5±2.3	8.8±2.2	7.9±2.1	6.1±1.8
St. Clair	7.2±2.1	7.9±2.2	8.0±2.2	7.7±2.2	6.6±2.1	5.8±2.0	6.4±2.1	5.6±2.0	6.3±2.2	6.2±2.2
St. Joseph	9.4±3.6	7.6±3.2	7.0±3.0	8.1±3.3	8.6±3.4	10.3±3.7	11.2±4.0	10.6±4.0	8.3±3.5	7.4±3.4
Sanilac	4.9±3.4	3.8±3.0	4.3±3.2	5.8±3.8	7.7±4.3	7.5±4.4	6.8±4.2	*	*	*
Schoolcraft	*	*	*	*	*	*	*	-	-	-
Shiawassee	8.6±3.5	9.7±3.7	9.2±3.7	7.7±3.3	8.8±3.7	5.4±2.9	5.7±3.1	3.2±2.4	3.3±2.4	3.8±2.6
Tuscola	8.2±3.9	8.8±4.0	7.4±3.7	7.7±3.9	6.2±3.5	3.8±2.8	3.9±2.9	6.0±3.7	6.8±4.0	6.8±4.0
Van Buren	7.0±3.0	6.7±2.9	9.5±3.4	7.7±3.1	6.7±2.8	5.5±2.6	6.9±2.9	6.5±2.9	4.5±2.4	5.6±2.8
Washtenaw	6.8±1.4	6.3±1.4	6.3±1.4	6.0±1.3	5.7±1.3	5.2±1.3	5.3±1.3	5.1±1.3	4.9±1.3	4.7±1.3
Wayne	11.1±0.7	11.5±0.7	11.3±0.7	10.6±0.7	10.5±0.7	10.4±0.7	10.4±0.7	10.2±0.7	9.8±0.7	9.9±0.7
Wexford	*	*	6.5±4.5	6.3±4.4	9.2±5.2	6.8±4.4	7.7±4.8	6.3±4.3	6.4±4.4	9.8±5.5

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

**Table 14-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012**

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	6.2±0.3	6.0±0.3	5.8±0.3	5.4±0.3	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3
Alcona	*	*	*	*	*	*	*	*	*	*
Alger	*	*	*	-	-	*	*	*	*	-
Allegan	7.7±2.6	6.7±2.4	7.3±2.5	5.6±2.2	7.6±2.5	5.9±2.3	5.6±2.2	3.4±1.8	4.0±2.0	4.1±2.0
Alpena	*	*	*	*	*	6.9±5.5	*	*	*	*
Antrim	*	*	*	*	*	8.9±7.1	*	11.7±8.6	11.7±8.6	10.7±8.5
Arenac	*	*	*	*	*	*	*	*	*	*
Baraga	*	*	*	*	*	-	-	-	-	-
Barry	3.6±2.5	4.1±2.7	4.2±2.7	5.5±3.1	6.1±3.3	8.0±3.8	7.5±3.8	9.1±4.2	8.0±4.0	6.9±3.7
Bay	6.7±2.6	4.9±2.3	5.6±2.4	6.4±2.6	7.5±2.8	7.1±2.8	6.1±2.6	7.4±2.9	7.9±3.0	7.6±3.0
Benzie	*	*	*	*	10.3±8.2	*	*	*	*	*
Berrien	7.2±2.5	6.1±2.3	6.0±2.2	5.3±2.1	5.9±2.3	5.9±2.3	4.8±2.1	4.0±1.9	3.6±1.8	4.6±2.1
Branch	9.7±4.6	9.7±4.6	9.9±4.6	8.2±4.2	4.9±3.2	3.4±2.7	3.6±2.9	5.0±3.5	6.5±4.0	6.7±4.1
Calhoun	10.1±2.8	8.4±2.6	7.9±2.5	7.3±2.5	8.5±2.6	7.9±2.6	9.3±2.9	7.4±2.6	7.9±2.8	6.4±2.5
Cass	8.5±4.6	9.6±4.8	7.3±4.3	6.6±4.1	6.1±4.0	5.5±3.8	5.6±3.9	5.9±4.1	5.3±3.9	6.8±4.7
Charlevoix	*	*	*	*	*	*	*	*	*	*
Cheboygan	7.3±5.8	*	*	*	*	*	*	*	*	-
Chippewa	*	*	*	6.8±5.4	8.4±6.2	*	*	*	*	*
Clare	9.0±5.9	12.2±6.9	11.2±6.6	6.9±5.1	5.7±4.6	6.8±5.0	6.0±4.8	*	*	*
Clinton	6.5±3.2	5.9±3.0	4.4±2.6	2.8±2.1	3.8±2.4	4.7±2.8	4.5±2.8	4.6±2.8	4.2±2.7	4.1±2.7
Crawford	14.9±11.8	*	*	*	14.7±11.7	17.0±12.5	15.7±12.5	*	*	*
Delta	10.7±5.8	8.7±5.3	9.4±5.6	5.1±4.1	*	*	*	*	*	5.8±4.7
Dickinson	*	*	*	7.5±6.0	7.9±6.3	8.0±6.4	*	*	*	*
Eaton	4.3±2.2	5.3±2.5	3.7±2.1	4.4±2.3	4.8±2.4	5.1±2.5	3.8±2.1	4.2±2.3	3.9±2.2	4.8±2.5
Emmet	6.6±4.8	5.6±4.5	5.9±4.7	*	*	*	*	6.8±5.4	*	*
Genesee	7.7±1.5	8.8±1.6	7.6±1.5	7.3±1.5	6.4±1.4	6.0±1.4	5.4±1.3	5.1±1.3	5.1±1.4	4.8±1.3
Gladwin	11.0±7.1	10.3±7.1	11.5±7.5	9.1±6.7	*	*	*	*	*	*
Gogebic	*	*	-	*	*	*	*	*	*	*
Grand Traverse	6.6±3.1	5.0±2.6	5.0±2.6	5.3±2.7	6.4±2.9	7.4±3.2	7.3±3.2	6.0±3.0	3.5±2.3	3.1±2.2
Gratiot	*	5.9±4.1	4.3±3.4	7.1±4.4	6.7±4.3	7.7±4.8	6.0±4.2	7.0±4.5	7.8±4.8	5.8±4.3
Hillsdale	5.6±3.5	3.4±2.7	*	4.0±3.0	7.0±4.0	9.6±4.7	6.2±3.8	4.3±3.2	*	3.8±3.1

Table 14-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012
(Continued)

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Houghton	5.4±4.3	8.2±5.4	6.3±4.6	5.4±4.3	5.3±4.2	7.0±4.8	6.1±4.5	6.0±4.4	*	5.4±4.3
Huron	*	*	*	*	*	*	*	*	6.5±5.2	6.7±5.3
Ingham	5.0±1.5	5.4±1.6	5.4±1.6	4.4±1.4	4.6±1.5	4.1±1.4	4.7±1.5	3.6±1.4	4.6±1.6	5.3±1.7
Ionia	6.6±3.2	4.8±2.7	4.5±2.7	3.6±2.3	4.9±2.8	4.1±2.5	3.4±2.4	3.1±2.3	3.6±2.5	3.7±2.6
Iosco	*	*	*	*	*	*	*	12.2±9.0	13.1±9.0	9.6±7.6
Iron	-	*	*	*	*	*	*	*	*	*
Isabella	10.4±4.5	7.3±3.8	8.4±4.1	8.2±4.0	8.3±4.0	5.0±3.1	3.1±2.5	*	5.6±3.4	6.5±3.8
Jackson	7.2±2.3	5.9±2.0	6.5±2.1	6.2±2.1	6.8±2.2	6.4±2.2	6.2±2.2	5.7±2.1	5.5±2.1	4.1±1.8
Kalamazoo	8.4±2.1	6.4±1.8	5.2±1.6	4.6±1.5	5.0±1.6	4.8±1.6	5.5±1.7	5.7±1.7	4.8±1.6	3.9±1.4
Kalkaska	*	*	*	*	*	-	*	*	*	11.7±9.3
Kent	7.0±1.1	6.6±1.0	6.2±1.0	5.4±0.9	5.2±0.9	5.6±1.0	5.0±0.9	5.0±0.9	4.4±0.9	4.4±0.9
Keweenaw	-	-	-	*	*	*	-	-	-	-
Lake	*	*	23.6±17.3	*	*	*	*	*	*	*
Lapeer	5.4±2.6	3.8±2.1	2.9±1.9	3.4±2.1	4.9±2.6	5.5±2.8	7.3±3.3	7.8±3.5	6.3±3.2	3.0±2.2
Leelanau	11.9±9.4	15.5±10.7	12.9±9.5	*	*	*	*	*	*	*
Lenawee	4.2±2.1	3.7±2.0	4.2±2.1	5.6±2.4	6.8±2.8	9.0±3.3	8.4±3.3	10.6±3.7	8.7±3.4	9.6±3.6
Livingston	5.2±1.8	4.4±1.7	5.0±1.8	3.7±1.6	5.1±1.8	5.3±1.9	6.6±2.2	6.1±2.2	6.6±2.2	5.8±2.1
Luce	*	*	*	*	*	*	*	*	-	-
Mackinac	*	*	*	*	*	*	*	*	*	-
Macomb	5.2±0.9	5.0±0.8	5.1±0.9	4.8±0.8	5.1±0.9	5.2±0.9	6.2±1.0	5.9±1.0	5.6±1.0	4.8±0.9
Manistee	12.0±7.8	12.5±8.1	14.9±8.7	10.3±7.6	*	*	*	*	*	*
Marquette	3.9±2.9	*	*	4.0±2.9	4.9±3.2	4.2±2.9	3.6±2.7	3.7±2.8	4.8±3.1	4.2±2.9
Mason	6.7±5.3	*	*	*	*	6.2±4.9	*	6.6±5.3	*	*
Mecosta	8.9±5.0	9.0±5.1	6.9±4.5	6.1±4.2	*	9.4±5.3	7.9±4.9	8.8±5.2	6.6±4.5	10.0±5.6
Menominee	*	*	*	*	*	*	*	*	*	*
Midland	6.2±2.9	6.0±2.9	6.7±3.1	8.3±3.5	7.3±3.3	5.6±2.9	4.0±2.5	3.7±2.4	4.0±2.5	4.9±2.8
Missaukee	*	*	*	*	*	-	*	*	*	*
Monroe	6.3±2.2	5.8±2.1	4.8±1.9	6.9±2.3	6.8±2.4	6.4±2.3	4.8±2.0	4.7±1.9	3.5±1.7	3.6±1.8
Montcalm	8.7±3.7	8.3±3.6	6.2±3.1	3.7±2.4	3.0±2.2	3.8±2.5	4.0±2.6	5.9±3.2	6.1±3.3	6.5±3.4
Montmorency	-	-	-	*	*	*	-	*	*	*

Table 14-B
White Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012
(Continued)

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Muskegon	7.5±2.2	6.1±2.0	5.9±2.0	4.5±1.8	5.0±1.9	5.7±2.0	6.4±2.2	6.5±2.2	6.3±2.2	7.1±2.4
Newaygo	4.4±3.0	4.4±3.0	5.5±3.4	5.9±3.5	8.9±4.2	8.0±4.0	8.4±4.2	5.4±3.5	7.4±4.2	6.9±4.1
Oakland	5.0±0.7	5.0±0.7	5.5±0.8	4.9±0.7	4.9±0.8	4.9±0.8	4.8±0.8	5.3±0.8	5.1±0.8	5.7±0.9
Oceana	8.3±5.4	8.9±5.5	9.7±5.7	9.6±5.6	7.4±5.1	*	*	5.9±4.7	*	9.6±6.3
Ogemaw	*	*	*	*	*	*	*	*	*	*
Ontonagon	-	-	-	*	*	*	*	-	-	-
Osceola	7.6±5.6	6.4±5.1	8.8±6.1	8.9±6.2	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
Ottawa	6.7±1.6	5.7±1.5	5.1±1.4	5.0±1.4	5.0±1.4	5.3±1.4	4.6±1.4	4.9±1.4	5.3±1.5	5.6±1.5
Presque Isle	*	*	*	*	*	*	*	*	*	22.1±17.5
Roscommon	*	12.1±8.9	10.1±8.0	*	*	*	11.2±8.9	*	*	*
Saginaw	5.6±1.9	5.3±1.9	5.4±1.9	5.0±1.8	5.7±2.0	6.6±2.2	6.4±2.2	4.7±1.9	2.9±1.5	2.9±1.5
St. Clair	6.1±2.0	7.2±2.1	7.5±2.2	7.0±2.1	5.8±2.0	5.0±1.9	6.2±2.1	5.4±2.1	6.3±2.3	6.2±2.3
St. Joseph	8.6±3.5	7.2±3.2	6.2±2.9	7.0±3.1	7.6±3.2	9.3±3.6	10.2±3.9	9.9±3.9	7.9±3.6	6.9±3.4
Sanilac	5.0±3.4	3.8±3.1	4.4±3.2	5.8±3.8	7.2±4.2	7.0±4.3	6.3±4.1	*	*	*
Schoolcraft	*	-	*	*	*	*	*	-	-	-
Shiawassee	8.7±3.5	9.9±3.8	9.4±3.7	7.8±3.4	9.0±3.8	5.5±3.0	5.9±3.2	3.3±2.4	3.4±2.5	3.9±2.7
Tuscola	7.3±3.7	9.0±4.1	7.5±3.8	7.8±3.9	6.3±3.6	3.9±2.9	4.0±3.0	6.1±3.8	6.9±4.1	7.0±4.1
Van Buren	6.1±2.9	5.8±2.8	6.5±3.0	4.9±2.6	3.6±2.2	4.8±2.6	6.1±3.0	6.0±3.0	4.1±2.5	5.4±2.9
Washtenaw	5.0±1.4	5.1±1.5	4.3±1.3	4.5±1.4	3.5±1.2	3.5±1.3	4.3±1.4	4.4±1.5	4.5±1.5	3.9±1.4
Wayne	6.1±0.7	6.2±0.7	5.9±0.7	5.0±0.7	5.4±0.7	5.6±0.7	5.6±0.8	5.4±0.8	5.5±0.8	5.9±0.9
Wexford	*	*	6.6±4.6	6.5±4.5	9.5±5.3	7.0±4.6	8.0±5.0	6.5±4.5	6.6±4.5	10.1±5.7

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

**Table 14-C
Black Three-Year Moving Average Infant Death Rates by County
Michigan Residents, 2001-2012**

County	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	17.6±1.0	17.7±1.0	17.5±1.0	16.6±1.0	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9
Berrien	16.0±6.2	10.8±5.2	12.0±5.5	11.9±5.5	16.9±6.5	14.9±6.0	16.7±6.4	16.0±6.2	19.5±6.9	18.6±6.9
Calhoun	10.2±7.0	9.7±6.7	14.2±8.0	20.8±9.8	25.3±10.7	24.2±10.5	20.5±9.6	22.1±10.4	25.4±11.3	20.2±10.1
Cass	-	-	*	*	*	*	*	*	*	*
Genesee	21.9±4.1	22.9±4.2	20.3±4.0	18.6±3.8	17.1±3.6	17.1±3.6	17.9±3.7	14.6±3.4	14.2±3.4	12.4±3.3
Ingham	14.9±5.8	14.3±5.7	17.2±6.2	19.8±6.8	19.4±6.8	17.8±6.3	16.5±6.0	16.7±5.9	13.1±5.3	11.4±5.0
Jackson	16.9±10.9	14.6±10.1	31.9±14.5	28.9±13.5	28.7±13.4	16.8±10.3	15.6±10.1	13.2±9.1	11.6±8.6	13.0±9.0
Kalamazoo	19.5±6.9	20.8±7.1	17.9±6.4	16.0±6.1	16.8±6.2	16.8±6.2	19.2±6.5	19.5±6.5	18.3±6.4	17.6±6.3
Kent	19.4±4.7	19.2±4.7	17.7±4.4	18.0±4.4	16.8±4.2	14.4±3.8	13.4±3.7	13.9±3.8	16.6±4.2	14.6±3.9
Macomb	18.7±6.6	15.3±5.6	14.7±5.1	12.7±4.5	13.5±4.3	13.4±4.0	15.1±4.0	13.8±3.8	13.1±3.6	11.4±3.2
Muskegon	13.0±6.2	17.6±7.1	17.6±7.0	13.4±6.0	9.8±5.1	9.0±4.9	8.2±4.6	13.2±5.9	14.9±6.3	16.4±6.8
Oakland	16.5±3.4	16.8±3.4	15.5±3.2	16.7±3.3	17.4±3.4	15.4±3.1	14.7±3.0	11.9±2.7	10.8±2.5	10.6±2.4
Saginaw	19.0±5.7	17.8±5.6	18.9±5.8	18.4±5.7	19.0±5.8	15.3±5.2	19.2±5.8	17.4±5.6	19.2±6.1	13.4±5.1
St. Clair	44.9±32.5	*	*	*	*	*	*	*	*	*
Van Buren	*	*	37.0±29.1	*	*	*	*	*	*	*
Washtenaw	16.8±5.8	14.3±5.2	16.1±5.5	12.1±4.6	13.4±4.9	13.2±4.9	11.6±4.6	10.5±4.4	8.7±4.0	8.9±4.1
Wayne	17.3±1.3	18.1±1.3	17.7±1.3	16.7±1.3	15.9±1.3	15.3±1.3	15.3±1.3	15.1±1.3	14.5±1.3	14.5±1.3

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 15-A
Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	8.2±0.3	8.1±0.3	8.0±0.3	7.6±0.3	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3
Allegan County Health Department	8.4±2.7	6.9±2.4	7.8±2.6	6.3±2.3	8.4±2.6	6.9±2.4	6.7±2.4	4.2±1.9	4.5±2.0	4.2±2.0
Barry-Eaton District Health Department	4.2±1.6	5.2±1.8	4.4±1.7	5.0±1.8	5.2±1.9	6.2±2.0	6.0±2.0	7.0±2.2	6.4±2.1	5.9±2.0
Bay County Health Department	6.7±2.6	4.8±2.2	5.6±2.4	6.6±2.6	8.0±2.8	7.5±2.8	6.6±2.6	7.9±2.9	8.3±3.0	7.7±3.0
Benzie-Leelanau District Health Department	7.8±5.1	9.5±5.6	11.1±6.0	7.0±4.8	7.7±5.0	*	*	*	*	*
Berrien County Health Department	9.3±2.4	7.1±2.1	7.6±2.2	7.3±2.1	9.4±2.4	8.8±2.3	8.9±2.4	7.8±2.2	8.3±2.3	8.1±2.3
Branch-Hillsdale-St. Joseph Health Department	8.5±2.3	7.1±2.1	6.8±2.0	7.1±2.0	7.2±2.1	8.0±2.2	7.5±2.2	7.2±2.2	6.3±2.0	6.4±2.1
Calhoun County Health Department	10.2±2.6	8.9±2.5	9.3±2.5	9.6±2.6	11.2±2.8	10.8±2.7	11.5±2.9	10.2±2.8	10.7±2.9	8.7±2.6
Central Michigan District Health Department	9.2±2.4	9.0±2.4	9.5±2.5	7.9±2.2	7.9±2.2	5.6±1.9	5.7±1.9	4.6±1.8	6.3±2.1	5.6±2.0
Chippewa County Health Department	5.3±4.3	*	6.8±4.7	7.4±4.8	8.6±5.3	5.4±4.3	*	*	5.3±4.2	7.5±5.2
City Of Detroit Health Department	15.6±1.2	16.2±1.2	15.9±1.2	15.0±1.2	14.7±1.2	14.3±1.2	14.8±1.3	14.4±1.3	13.6±1.3	13.6±1.3
Dickinson-Iron District Health Department	*	*	*	6.5±4.8	6.6±4.9	6.5±4.8	5.6±4.5	8.7±5.7	8.0±5.5	*
District Health Department #10	7.4±1.8	7.0±1.7	8.3±1.8	7.1±1.7	7.8±1.8	6.8±1.7	6.7±1.7	6.7±1.7	6.6±1.7	7.6±1.9
District Health Department #2	8.0±4.1	6.5±3.7	6.2±3.6	4.5±3.1	4.7±3.3	5.9±3.6	8.4±4.4	9.8±4.8	9.1±4.6	8.9±4.5
District Health Department #4	5.4±2.9	3.9±2.6	2.7±2.1	4.4±2.8	5.3±3.0	6.3±3.3	6.1±3.3	6.1±3.4	6.8±3.7	6.5±3.7
Genesee County Health Department	11.4±1.5	12.5±1.6	11.0±1.5	10.5±1.5	9.5±1.4	9.3±1.4	9.0±1.4	7.8±1.4	7.8±1.4	7.1±1.3
Grand Traverse County Health Department	6.8±3.0	5.9±2.8	5.5±2.7	5.8±2.7	6.1±2.8	7.0±3.0	6.9±3.0	5.6±2.8	3.3±2.1	2.9±2.0
Huron County Health Department	*	*	*	*	*	*	*	*	6.3±5.1	6.5±5.2
Ingham County Health Department	6.7±1.5	7.2±1.6	7.7±1.7	7.2±1.6	7.0±1.6	6.6±1.6	7.0±1.6	5.9±1.5	5.6±1.5	5.8±1.5
Ionia County Health Department	6.5±3.2	4.7±2.7	4.4±2.6	3.5±2.3	4.8±2.7	3.9±2.4	3.3±2.3	3.0±2.2	4.0±2.6	4.0±2.6
Jackson County Health Department	8.1±2.3	7.0±2.1	9.3±2.4	9.0±2.3	9.4±2.4	7.7±2.2	7.1±2.2	6.5±2.1	6.1±2.1	5.3±1.9

Table 15-A
All Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012
(Continued)

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Kalamazoo County Human Services Department	10.2±2.0	8.8±1.9	7.3±1.7	6.4±1.6	7.2±1.7	7.1±1.7	8.4±1.8	8.6±1.9	7.6±1.8	6.4±1.6
Kent County Health Department	8.5±1.1	8.6±1.1	8.2±1.1	8.0±1.0	7.6±1.0	7.8±1.0	6.9±1.0	6.8±1.0	6.4±1.0	6.2±0.9
Lapeer County Health Department	5.6±2.6	4.1±2.2	3.2±2.0	3.3±2.1	4.8±2.5	5.4±2.7	7.4±3.2	8.6±3.6	7.1±3.3	3.6±2.4
Lenawee County Health Department	4.3±2.1	3.5±1.9	4.3±2.1	5.6±2.4	6.7±2.6	8.3±3.0	8.5±3.1	10.8±3.5	9.4±3.3	9.2±3.3
Livingston County Health Department	5.5±1.8	4.6±1.7	5.2±1.8	3.8±1.5	5.3±1.9	5.5±1.9	6.7±2.2	6.3±2.1	6.7±2.2	5.9±2.1
Luce-Mackinac-Alger-Schoolcraft Health Department	6.1±4.9	7.3±5.4	9.5±6.2	9.6±6.2	8.5±5.9	13.2±7.4	11.2±6.9	10.4±6.8	*	-
Macomb County Health Department	5.8±0.9	5.6±0.8	5.9±0.9	5.6±0.8	6.0±0.9	6.1±0.9	7.3±1.0	6.7±1.0	6.5±1.0	5.6±0.9
Marquette County Health Department	4.3±3.0	*	*	3.8±2.8	4.6±3.0	4.0±2.8	3.9±2.7	4.1±2.8	5.1±3.1	4.1±2.8
Midland County Health Department	6.4±2.8	6.8±3.0	7.1±3.1	8.7±3.5	7.0±3.1	5.3±2.8	4.2±2.5	3.9±2.4	4.2±2.5	4.6±2.6
Mid-Michigan District Health Department	7.1±2.1	7.1±2.0	5.7±1.8	4.4±1.6	4.5±1.6	5.3±1.8	5.0±1.8	5.8±1.9	5.9±2.0	5.5±1.9
Monroe County Health Department	6.2±2.2	6.2±2.1	5.2±1.9	7.3±2.3	6.8±2.2	6.7±2.2	5.7±2.0	5.7±2.1	4.3±1.8	4.4±1.9
Muskegon County Health Department	9.0±2.2	8.6±2.2	8.4±2.1	6.7±1.9	6.3±1.8	6.7±1.9	7.1±2.0	7.9±2.1	8.0±2.1	8.7±2.3
Northwest Michigan Community Health Agency	4.4±2.2	4.7±2.2	4.0±2.1	4.6±2.2	5.4±2.4	6.1±2.6	6.5±2.8	6.4±2.8	6.8±2.9	6.9±2.9
Oakland County Health Department	6.3±0.7	6.4±0.7	6.7±0.8	6.6±0.8	6.6±0.8	6.4±0.8	6.2±0.8	6.2±0.8	5.8±0.7	6.2±0.8
Ottawa County Health Department	6.8±1.6	6.0±1.5	5.3±1.4	5.3±1.4	5.2±1.4	5.9±1.5	5.4±1.4	5.7±1.5	5.6±1.5	5.9±1.5
Public Health Delta & Menominee Counties	9.1±4.1	7.2±3.8	7.7±3.9	4.7±3.1	4.6±3.0	4.3±3.0	6.0±3.5	4.6±3.2	4.6±3.2	5.4±3.5
Saginaw County Health Department	9.3±2.1	8.7±2.0	9.2±2.1	8.7±2.0	9.5±2.2	9.4±2.2	10.5±2.3	8.8±2.2	7.9±2.1	6.1±1.8
Sanilac County Health Department	4.9±3.4	3.8±3.0	4.3±3.2	5.8±3.8	7.7±4.3	7.5±4.4	6.8±4.2	*	*	*
Shiawassee County Health Department	8.6±3.5	9.7±3.7	9.2±3.7	7.7±3.3	8.8±3.7	5.4±2.9	5.7±3.1	3.2±2.4	3.3±2.4	3.8±2.6
St Clair County Health Department	7.2±2.1	7.9±2.2	8.0±2.2	7.7±2.2	6.6±2.1	5.8±2.0	6.4±2.1	5.6±2.0	6.3±2.2	6.2±2.2
Tuscola County Health Department	8.2±3.9	8.8±4.0	7.4±3.7	7.7±3.9	6.2±3.5	3.8±2.8	3.9±2.9	6.0±3.7	6.8±4.0	6.8±4.0

Table 15-A
All Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012
(Continued)

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Van Buren-Cass County Health Department	7.2±2.4	7.5±2.5	9.4±2.8	8.0±2.5	7.2±2.4	5.6±2.1	7.2±2.4	6.9±2.4	5.5±2.2	6.0±2.3
Washtenaw County Health Department	6.8±1.4	6.3±1.4	6.3±1.4	6.0±1.3	5.7±1.3	5.2±1.3	5.3±1.3	5.1±1.3	4.9±1.3	4.7±1.3
Wayne County Health Department	6.8±0.8	7.0±0.8	6.9±0.8	6.5±0.8	6.7±0.8	6.9±0.8	6.7±0.8	6.6±0.8	6.7±0.8	6.9±0.8
Western Upper Peninsula District Health Department	5.4±3.2	6.9±3.6	4.3±2.8	5.7±3.2	6.6±3.4	7.5±3.7	5.2±3.1	5.3±3.1	3.5±2.6	4.1±2.8

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

**Table 15-B
White Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012**

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	6.2±0.3	6.0±0.3	5.8±0.3	5.4±0.3	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3
Allegan County Health Department	7.7±2.6	6.7±2.4	7.3±2.5	5.6±2.2	7.6±2.5	5.9±2.3	5.6±2.2	3.4±1.8	4.0±2.0	4.1±2.0
Barry-Eaton District Health Department	4.0±1.6	4.9±1.8	3.9±1.7	4.8±1.9	5.3±2.0	6.3±2.1	5.2±2.0	6.1±2.1	5.5±2.1	5.6±2.1
Bay County Health Department	6.7±2.6	4.9±2.3	5.6±2.4	6.4±2.6	7.5±2.8	7.1±2.8	6.1±2.6	7.4±2.9	7.9±3.0	7.6±3.0
Benzie-Leelanau District Health Department	8.3±5.4	10.2±6.0	10.9±6.1	6.5±4.8	7.3±5.1	*	*	*	*	*
Berrien County Health Department	7.2±2.5	6.1±2.3	6.0±2.2	5.3±2.1	5.9±2.3	5.9±2.3	4.8±2.1	4.0±1.9	3.6±1.8	4.6±2.1
Branch-Hillsdale-St. Joseph Health Department	8.1±2.2	6.8±2.1	6.2±1.9	6.5±2.0	6.7±2.0	7.7±2.2	7.2±2.2	6.9±2.2	6.2±2.1	6.0±2.1
Calhoun County Health Department	10.1±2.8	8.4±2.6	7.9±2.5	7.3±2.5	8.5±2.6	7.9±2.6	9.3±2.9	7.4±2.6	7.9±2.8	6.4±2.5
Central Michigan District Health Department	9.1±2.5	9.0±2.4	9.3±2.5	7.9±2.3	7.3±2.2	5.2±1.9	4.8±1.8	4.0±1.7	5.8±2.1	5.3±2.0
Chippewa County Health Department	*	*	*	6.8±5.4	8.4±6.2	*	*	*	*	*
City Of Detroit Health Department	8.2±2.0	8.2±2.1	7.5±2.0	4.9±1.6	5.5±1.8	5.2±1.9	5.5±2.1	5.8±2.3	6.5±2.8	10.3±3.9
Dickinson-Iron District Health Department	*	*	*	6.6±4.9	6.9±5.1	6.9±5.1	*	8.2±5.6	7.2±5.3	*
District Health Department #10	7.1±1.7	6.7±1.7	7.8±1.8	6.8±1.7	7.4±1.8	6.4±1.6	6.3±1.7	6.4±1.7	6.3±1.7	7.7±1.9
District Health Department #2	7.2±3.9	6.7±3.8	6.4±3.8	4.7±3.2	4.2±3.1	5.5±3.6	8.0±4.3	10.1±4.9	9.3±4.7	9.2±4.6
District Health Department #4	5.6±3.0	3.6±2.5	*	4.1±2.7	5.5±3.1	6.6±3.4	6.4±3.4	6.3±3.6	6.5±3.7	6.2±3.7
Genesee County Health Department	7.7±1.5	8.8±1.6	7.6±1.5	7.3±1.5	6.4±1.4	6.0±1.4	5.4±1.3	5.1±1.3	5.1±1.4	4.8±1.3
Grand Traverse County Health Department	6.6±3.1	5.0±2.6	5.0±2.6	5.3±2.7	6.4±2.9	7.4±3.2	7.3±3.2	6.0±3.0	3.5±2.3	3.1±2.2
Huron County Health Department	*	*	*	*	*	*	*	*	6.5±5.2	6.7±5.3
Ingham County Health Department	5.0±1.5	5.4±1.6	5.4±1.6	4.4±1.4	4.6±1.5	4.1±1.4	4.7±1.5	3.6±1.4	4.6±1.6	5.3±1.7
Ionia County Health Department	6.6±3.2	4.8±2.7	4.5±2.7	3.6±2.3	4.9±2.8	4.1±2.5	3.4±2.4	3.1±2.3	3.6±2.5	3.7±2.6
Jackson County Health Department	7.2±2.3	5.9±2.0	6.5±2.1	6.2±2.1	6.8±2.2	6.4±2.2	6.2±2.2	5.7±2.1	5.5±2.1	4.1±1.8

Table 15-B
White Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012
(Continued)

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Kalamazoo County Human Services Department	8.4±2.1	6.4±1.8	5.2±1.6	4.6±1.5	5.0±1.6	4.8±1.6	5.5±1.7	5.7±1.7	4.8±1.6	3.9±1.4
Kent County Health Department	7.0±1.1	6.6±1.0	6.2±1.0	5.4±0.9	5.2±0.9	5.6±1.0	5.0±0.9	5.0±0.9	4.4±0.9	4.4±0.9
Lapeer County Health Department	5.4±2.6	3.8±2.1	2.9±1.9	3.4±2.1	4.9±2.6	5.5±2.8	7.3±3.3	7.8±3.5	6.3±3.2	3.0±2.2
Lenawee County Health Department	4.2±2.1	3.7±2.0	4.2±2.1	5.6±2.4	6.8±2.8	9.0±3.3	8.4±3.3	10.6±3.7	8.7±3.4	9.6±3.6
Livingston County Health Department	5.2±1.8	4.4±1.7	5.0±1.8	3.7±1.6	5.1±1.8	5.3±1.9	6.6±2.2	6.1±2.2	6.6±2.2	5.8±2.1
Luce-Mackinac-Alger-Schoolcraft Health Department	*	*	8.6±6.3	8.8±6.5	8.8±6.5	11.7±7.6	10.5±7.2	9.5±7.0	*	-
Macomb County Health Department	5.2±0.9	5.0±0.8	5.1±0.9	4.8±0.8	5.1±0.9	5.2±0.9	6.2±1.0	5.9±1.0	5.6±1.0	4.8±0.9
Marquette County Health Department	3.9±2.9	*	*	4.0±2.9	4.9±3.2	4.2±2.9	3.6±2.7	3.7±2.8	4.8±3.1	4.2±2.9
Midland County Health Department	6.2±2.9	6.0±2.9	6.7±3.1	8.3±3.5	7.3±3.3	5.6±2.9	4.0±2.5	3.7±2.4	4.0±2.5	4.9±2.8
Mid-Michigan District Health Department	6.7±2.0	6.8±2.0	5.1±1.8	4.1±1.6	4.1±1.6	5.0±1.8	4.7±1.8	5.6±1.9	5.8±2.0	5.4±1.9
Monroe County Health Department	6.3±2.2	5.8±2.1	4.8±1.9	6.9±2.3	6.8±2.4	6.4±2.3	4.8±2.0	4.7±1.9	3.5±1.7	3.6±1.8
Muskegon County Health Department	7.5±2.2	6.1±2.0	5.9±2.0	4.5±1.8	5.0±1.9	5.7±2.0	6.4±2.2	6.5±2.2	6.3±2.2	7.1±2.4
Northwest Michigan Community Health Agency	4.3±2.2	4.9±2.3	4.1±2.2	4.8±2.3	5.6±2.5	6.4±2.7	6.5±2.8	6.4±2.9	6.8±3.0	6.9±3.0
Oakland County Health Department	5.0±0.7	5.0±0.7	5.5±0.8	4.9±0.7	4.9±0.8	4.9±0.8	4.8±0.8	5.3±0.8	5.1±0.8	5.7±0.9
Ottawa County Health Department	6.7±1.6	5.7±1.5	5.1±1.4	5.0±1.4	5.0±1.4	5.3±1.4	4.6±1.4	4.9±1.4	5.3±1.5	5.6±1.5
Public Health Delta & Menominee Counties	9.1±4.2	7.1±3.8	7.6±4.0	4.9±3.2	4.8±3.3	3.8±3.0	4.3±3.4	*	*	4.5±3.3
Saginaw County Health Department	5.6±1.9	5.3±1.9	5.4±1.9	5.0±1.8	5.7±2.0	6.6±2.2	6.4±2.2	4.7±1.9	2.9±1.5	2.9±1.5
Sanilac County Health Department	5.0±3.4	3.8±3.1	4.4±3.2	5.8±3.8	7.2±4.2	7.0±4.3	6.3±4.1	*	*	*
Shiawassee County Health Department	8.7±3.5	9.9±3.8	9.4±3.7	7.8±3.4	9.0±3.8	5.5±3.0	5.9±3.2	3.3±2.4	3.4±2.5	3.9±2.7
St Clair County Health Department	6.1±2.0	7.2±2.1	7.5±2.2	7.0±2.1	5.8±2.0	5.0±1.9	6.2±2.1	5.4±2.1	6.3±2.3	6.2±2.3
Tuscola County Health Department	7.3±3.7	9.0±4.1	7.5±3.8	7.8±3.9	6.3±3.6	3.9±2.9	4.0±3.0	6.1±3.8	6.9±4.1	7.0±4.1

Table 15-B
White Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012
(Continued)

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Van Buren-Cass County Health Department	7.0±2.5	7.2±2.5	6.7±2.4	5.5±2.2	4.4±2.0	5.0±2.2	5.9±2.4	6.0±2.4	4.5±2.1	5.8±2.5
Washtenaw County Health Department	5.0±1.4	5.1±1.5	4.3±1.3	4.5±1.4	3.5±1.2	3.5±1.3	4.3±1.4	4.4±1.5	4.5±1.5	3.9±1.4
Wayne County Health Department	5.7±0.8	5.8±0.8	5.6±0.8	5.0±0.7	5.3±0.8	5.6±0.8	5.6±0.8	5.4±0.8	5.4±0.8	5.5±0.9
Western Upper Peninsula District Health Department	5.2±3.2	6.9±3.7	4.1±2.9	5.8±3.4	6.8±3.7	7.3±3.8	4.8±3.1	4.7±3.1	3.8±2.8	4.4±3.1

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

**Table 15-C
Black Three-Year Moving Average Infant Death Rates by District
Michigan Residents, 2001-2012**

District	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	17.6±1.0	17.7±1.0	17.5±1.0	16.6±1.0	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9
Barry-Eaton District Health Department	*	*	*	*	*	*	25.2±18.4	28.0±19.1	26.9±18.4	*
Berrien County Health Department	16.0±6.2	10.8±5.2	12.0±5.5	11.9±5.5	16.9±6.5	14.9±6.0	16.7±6.4	16.0±6.2	19.5±6.9	18.6±6.9
Calhoun County Health Department	10.2±7.0	9.7±6.7	14.2±8.0	20.8±9.8	25.3±10.7	24.2±10.5	20.5±9.6	22.1±10.4	25.4±11.3	20.2±10.1
City Of Detroit Health Department	17.6±1.4	18.3±1.4	17.9±1.4	16.8±1.4	16.2±1.4	15.8±1.4	16.5±1.5	16.0±1.5	15.0±1.5	14.7±1.5
District Health Department #10	*	-	-	-	*	*	*	*	*	*
Genesee County Health Department	21.9±4.1	22.9±4.2	20.3±4.0	18.6±3.8	17.1±3.6	17.1±3.6	17.9±3.7	14.6±3.4	14.2±3.4	12.4±3.3
Ingham County Health Department	14.9±5.8	14.3±5.7	17.2±6.2	19.8±6.8	19.4±6.8	17.8±6.3	16.5±6.0	16.7±5.9	13.1±5.3	11.4±5.0
Jackson County Health Department	16.9±10.9	14.6±10.1	31.9±14.5	28.9±13.5	28.7±13.4	16.8±10.3	15.6±10.1	13.2±9.1	11.6±8.6	13.0±9.0
Kalamazoo County Human Services Department	19.5±6.9	20.8±7.1	17.9±6.4	16.0±6.1	16.8±6.2	16.8±6.2	19.2±6.5	19.5±6.5	18.3±6.4	17.6±6.3
Kent County Health Department	19.4±4.7	19.2±4.7	17.7±4.4	18.0±4.4	16.8±4.2	14.4±3.8	13.4±3.7	13.9±3.8	16.6±4.2	14.6±3.9
Macomb County Health Department	18.7±6.6	15.3±5.6	14.7±5.1	12.7±4.5	13.5±4.3	13.4±4.0	15.1±4.0	13.8±3.8	13.1±3.6	11.4±3.2
Mid-Michigan District Health Department	*	*	*	*	*	-	-	-	*	*
Muskegon County Health Department	13.0±6.2	17.6±7.1	17.6±7.0	13.4±6.0	9.8±5.1	9.0±4.9	8.2±4.6	13.2±5.9	14.9±6.3	16.4±6.8
Oakland County Health Department	16.5±3.4	16.8±3.4	15.5±3.2	16.7±3.3	17.4±3.4	15.4±3.1	14.7±3.0	11.9±2.7	10.8±2.5	10.6±2.4
Ottawa County Health Department	*	*	*	-	-	*	*	*	*	*
Saginaw County Health Department	19.0±5.7	17.8±5.6	18.9±5.8	18.4±5.7	19.0±5.8	15.3±5.2	19.2±5.8	17.4±5.6	19.2±6.1	13.4±5.1
Van Buren-Cass County Health Department	*	*	30.5±20.8	28.6±20.9	33.3±22.7	*	*	*	*	*
Washtenaw County Health Department	16.8±5.8	14.3±5.2	16.1±5.5	12.1±4.6	13.4±4.9	13.2±4.9	11.6±4.6	10.5±4.4	8.7±4.0	8.9±4.1
Wayne County Health Department	15.6±3.4	16.6±3.5	16.9±3.4	16.0±3.2	14.4±3.0	12.7±2.7	10.4±2.4	11.7±2.5	12.6±2.5	13.6±2.6

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: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/21/2014
Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 16-A
Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2001-2012

City	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	8.2±0.3	8.1±0.3	8.0±0.3	7.6±0.3	7.8±0.3	7.6±0.3	7.6±0.3	7.3±0.3	7.1±0.3	6.9±0.3
Ann Arbor	5.9±2.5	5.0±2.3	5.7±2.5	5.3±2.4	5.4±2.5	3.9±2.1	4.3±2.2	3.7±2.1	3.1±1.9	2.7±1.8
Battle Creek	11.1±4.0	8.0±3.4	8.3±3.4	9.2±3.7	11.3±4.0	12.4±4.3	11.0±4.1	10.6±4.1	11.3±4.3	11.0±4.3
Dearborn	4.6±1.8	5.0±1.9	4.4±1.8	4.8±1.9	5.6±2.0	7.7±2.3	6.9±2.3	7.0±2.3	6.3±2.2	7.4±2.4
Dearborn Heights	2.7±2.1	3.1±2.3	5.1±2.9	6.0±3.1	7.6±3.5	5.8±3.0	5.8±3.0	3.8±2.5	5.2±2.9	5.7±3.1
Detroit	15.6±1.2	16.2±1.2	15.9±1.2	15.0±1.2	14.7±1.2	14.3±1.2	14.8±1.3	14.4±1.3	13.6±1.3	13.6±1.3
Farmington Hills	7.4±3.1	7.8±3.2	8.4±3.4	7.1±3.2	7.7±3.4	7.4±3.3	7.0±3.2	6.4±3.1	6.4±3.1	6.9±3.3
Flint	16.3±3.0	18.7±3.3	16.8±3.1	15.3±3.0	12.2±2.7	11.6±2.7	12.6±2.9	12.6±3.0	12.1±3.0	11.6±3.0
Grand Rapids	10.4±1.9	10.5±1.9	8.4±1.7	8.6±1.7	8.3±1.7	10.0±1.9	8.3±1.8	8.6±1.8	8.5±1.8	9.4±1.9
Kalamazoo	14.1±4.1	14.1±4.1	11.0±3.6	8.3±3.2	9.5±3.4	9.2±3.3	10.5±3.5	11.0±3.6	10.3±3.6	9.7±3.5
Kentwood	7.8±3.6	6.5±3.3	9.3±3.9	8.1±3.6	6.8±3.3	4.2±2.6	3.9±2.6	3.4±2.4	3.4±2.4	4.5±2.7
Lansing	7.7±2.2	8.2±2.2	8.2±2.2	8.0±2.2	8.0±2.3	8.5±2.3	8.9±2.4	8.7±2.4	7.1±2.2	6.5±2.1
Livonia	6.6±2.9	8.9±3.4	6.1±2.9	4.4±2.5	3.0±2.1	5.4±2.8	5.2±2.8	4.8±2.7	2.4±1.9	2.8±2.1
Midland	4.6±3.4	6.7±4.1	7.1±4.4	8.0±4.7	7.4±4.6	5.9±4.1	5.1±3.8	*	*	*
Muskegon	12.6±4.9	13.0±5.1	10.8±4.6	7.3±3.8	6.7±3.6	7.5±3.9	7.5±3.9	7.2±3.9	7.8±4.1	10.5±4.8
Novi	6.8±3.8	6.6±3.7	4.9±3.2	*	*	5.3±3.3	5.3±3.3	6.6±3.7	3.3±2.7	3.8±2.8
Pontiac	12.9±3.6	13.0±3.6	12.3±3.5	13.1±3.6	12.9±3.7	12.5±3.7	14.4±4.1	13.8±4.0	11.9±3.8	8.5±3.2
Portage	4.5±3.1	*	6.3±3.7	6.6±3.7	7.7±4.0	4.4±3.1	9.2±4.5	8.6±4.3	7.5±4.1	4.1±3.0
Rochester Hills	6.0±3.1	6.3±3.2	5.2±2.8	5.6±2.9	4.1±2.5	6.2±3.1	5.0±2.8	4.8±2.8	3.5±2.5	4.0±2.6
Roseville	6.1±3.5	5.1±3.2	3.7±2.8	5.3±3.3	9.9±4.6	9.7±4.4	10.0±4.6	5.5±3.4	5.7±3.5	7.4±4.0
Royal Oak	5.2±3.0	6.2±3.2	4.1±2.7	3.2±2.4	3.7±2.6	4.0±2.6	4.4±2.7	5.6±3.0	6.4±3.2	8.2±3.7
Saginaw	13.7±4.0	11.9±3.8	13.2±4.0	11.1±3.7	13.0±4.0	11.5±3.8	14.6±4.3	13.2±4.2	13.7±4.4	9.6±3.7
Southfield	13.4±4.3	12.3±4.2	12.3±4.3	10.7±4.1	13.5±4.6	12.4±4.5	13.1±4.6	11.2±4.4	10.0±4.1	10.9±4.3
St Clair Shores	4.8±3.2	6.0±3.6	6.1±3.6	6.0±3.5	4.2±2.9	3.7±2.7	5.4±3.4	4.0±3.0	4.7±3.3	*
Sterling Heights	6.6±2.3	5.7±2.1	4.1±1.8	3.7±1.8	6.2±2.3	7.0±2.4	7.5±2.5	7.0±2.5	6.2±2.4	6.6±2.4
Taylor	8.3±3.4	8.8±3.5	9.3±3.6	10.8±4.0	10.2±3.9	8.5±3.5	6.3±3.1	6.8±3.2	9.9±3.9	11.8±4.2
Troy	3.3±2.2	3.1±2.1	3.9±2.4	4.4±2.6	4.9±2.8	5.8±3.0	5.5±3.0	6.2±3.2	4.4±2.7	3.8±2.5
Warren	6.1±2.1	6.8±2.3	7.8±2.4	7.6±2.4	7.2±2.3	6.4±2.2	8.1±2.5	7.9±2.5	9.1±2.7	7.6±2.4
Westland	6.3±2.6	6.5±2.7	6.1±2.6	6.4±2.7	6.3±2.7	7.5±2.9	7.4±2.9	8.2±3.1	9.6±3.4	10.4±3.5
Wyoming	6.6±2.6	7.5±2.8	6.9±2.6	8.9±3.0	10.9±3.2	12.1±3.4	11.0±3.3	8.4±3.0	6.7±2.6	4.6±2.2

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.

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

Source: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/24/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 16-B
White Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2001-2012

City	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	6.2±0.3	6.0±0.3	5.8±0.3	5.4±0.3	5.6±0.3	5.6±0.3	5.6±0.3	5.4±0.3	5.2±0.3	5.3±0.3
Ann Arbor	3.2±2.2	2.4±1.9	2.5±2.0	3.0±2.2	3.2±2.3	*	3.7±2.5	3.2±2.4	3.7±2.6	*
Battle Creek	10.5±4.5	6.5±3.5	5.5±3.2	6.0±3.4	9.1±4.2	9.5±4.4	7.2±3.9	4.8±3.3	5.5±3.6	8.1±4.4
Dearborn	4.3±1.8	3.7±1.6	3.2±1.6	3.6±1.7	5.4±2.1	7.4±2.4	6.4±2.3	6.2±2.3	6.0±2.3	6.5±2.4
Dearborn Heights	2.9±2.3	3.4±2.5	5.3±3.1	6.3±3.4	7.2±3.6	5.2±3.1	4.3±2.8	3.0±2.4	3.1±2.5	3.7±2.7
Detroit	8.2±2.0	8.2±2.1	7.5±2.0	4.9±1.6	5.5±1.8	5.2±1.9	5.5±2.1	5.8±2.3	6.5±2.8	9.9±3.8
Farmington Hills	6.3±3.4	7.4±3.7	7.3±3.8	6.9±3.9	6.8±4.0	7.2±4.3	6.1±4.0	5.6±3.9	6.5±4.2	8.0±4.7
Flint	7.1±3.0	9.2±3.5	9.3±3.6	8.0±3.4	6.5±3.2	5.7±3.1	6.7±3.5	9.6±4.3	7.1±3.8	7.6±4.1
Grand Rapids	7.1±1.8	6.6±1.8	4.7±1.5	3.4±1.3	3.4±1.3	5.5±1.7	4.7±1.6	5.1±1.7	4.4±1.6	5.7±1.8
Kalamazoo	9.3±4.2	8.0±3.9	7.0±3.6	5.5±3.3	4.6±3.0	3.6±2.7	*	3.6±2.7	4.8±3.1	6.1±3.6
Kentwood	8.8±4.5	6.6±3.9	7.6±4.1	5.8±3.6	4.7±3.2	*	*	*	*	*
Lansing	5.6±2.2	5.5±2.2	4.3±2.0	3.4±1.8	3.8±1.9	4.5±2.1	5.2±2.3	4.6±2.2	5.2±2.4	5.3±2.5
Livonia	6.4±2.9	8.9±3.5	6.2±3.0	4.8±2.7	3.3±2.3	5.6±3.0	5.4±3.0	5.0±2.9	*	*
Midland	4.2±3.3	5.0±3.7	6.0±4.2	7.0±4.6	7.9±4.9	6.4±4.4	5.5±4.1	*	*	*
Muskegon	8.3±4.9	7.8±4.8	6.5±4.5	4.9±3.9	6.8±4.7	7.2±4.9	6.7±4.9	*	*	7.1±5.2
Novi	5.8±4.0	5.8±4.0	5.9±4.0	*	*	*	*	5.1±4.1	*	*
Pontiac	9.3±4.3	7.8±3.9	7.6±3.8	5.0±3.1	5.4±3.3	5.7±3.5	8.5±4.6	7.7±4.6	6.3±4.4	*
Portage	*	*	4.6±3.4	5.1±3.5	5.6±3.7	3.8±3.0	6.8±4.2	7.4±4.4	6.1±4.0	4.1±3.3
Rochester Hills	5.7±3.3	4.6±3.0	4.0±2.8	4.1±2.8	3.1±2.5	7.0±3.8	5.5±3.4	5.6±3.5	3.4±2.7	3.4±2.7
Roseville	5.1±3.3	3.5±2.8	*	4.4±3.2	8.5±4.6	9.8±4.9	10.3±5.2	6.3±4.1	5.3±3.9	5.6±4.1
Royal Oak	4.2±2.7	5.3±3.1	3.9±2.7	*	*	3.0±2.4	3.4±2.5	5.8±3.3	6.8±3.5	8.3±3.9
Saginaw	6.7±3.9	6.3±3.9	6.2±3.8	*	5.3±3.6	6.2±4.0	6.3±4.1	4.3±3.5	*	*
Southfield	*	*	*	*	*	*	*	11.6±9.2	11.9±9.5	12.0±9.5
St Clair Shores	4.5±3.1	5.8±3.6	5.3±3.4	5.2±3.4	4.0±2.9	4.1±3.0	6.0±3.7	4.5±3.4	5.3±3.6	*
Sterling Heights	6.9±2.6	5.9±2.4	4.4±2.1	4.0±2.0	5.7±2.4	6.1±2.5	6.9±2.7	7.7±2.9	6.9±2.8	7.6±3.0
Taylor	8.5±3.8	9.4±4.1	9.6±4.2	9.7±4.3	7.9±4.0	7.0±3.8	5.6±3.5	5.3±3.5	6.7±4.0	8.2±4.4
Troy	*	*	*	3.5±2.8	4.9±3.4	5.1±3.5	5.3±3.6	6.1±4.0	5.4±3.7	5.9±3.9
Warren	4.7±2.0	4.9±2.1	5.6±2.3	6.5±2.5	7.1±2.6	5.9±2.5	6.8±2.7	6.3±2.7	6.9±2.9	5.9±2.7
Westland	5.7±2.8	4.0±2.3	3.7±2.3	3.4±2.2	4.4±2.6	4.9±2.8	5.9±3.1	5.7±3.1	7.8±3.7	8.6±3.9
Wyoming	4.9±2.4	6.1±2.6	6.0±2.6	7.4±2.9	9.1±3.2	9.3±3.2	8.6±3.2	6.7±2.8	5.3±2.5	3.8±2.1

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

Source: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/24/2014
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

**Table 16-C
Black Three-Year Moving Average Infant Death Rates by City
Michigan Residents, 2001-2012**

City	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12
Michigan	17.6±1.0	17.7±1.0	17.5±1.0	16.6±1.0	16.4±1.0	15.3±0.9	15.5±0.9	14.8±0.9	14.5±0.9	13.8±0.9
Battle Creek	13.4±9.8	11.0±8.8	14.4±9.9	18.2±11.2	19.1±11.2	20.9±11.7	21.0±11.7	23.0±12.9	21.5±12.6	11.9±9.5
Detroit	17.6±1.4	18.3±1.4	17.9±1.4	16.8±1.4	16.2±1.4	15.8±1.4	16.5±1.5	15.9±1.5	15.0±1.5	14.7±1.5
Flint	23.6±4.8	26.1±5.1	22.4±4.8	20.1±4.6	15.8±4.1	15.5±4.1	16.6±4.2	14.7±4.1	15.3±4.3	14.1±4.2
Grand Rapids	22.5±5.9	21.6±5.9	17.8±5.3	17.0±5.1	17.7±5.1	17.6±5.1	16.8±5.0	16.0±5.0	18.8±5.4	16.7±5.1
Kalamazoo	22.8±9.0	25.0±9.5	18.4±8.0	14.0±7.0	17.4±7.7	18.5±8.0	22.4±8.7	21.6±8.5	17.7±7.9	12.7±6.9
Lansing	13.3±5.7	14.9±6.0	17.3±6.5	20.9±7.3	20.0±7.1	19.0±6.7	17.9±6.4	18.3±6.5	13.5±5.7	11.0±5.2
Muskegon	18.6±10.4	23.9±12.0	19.3±10.4	11.8±8.1	*	*	*	12.0±8.3	13.1±8.5	17.4±10.2
Pontiac	18.2±6.5	20.3±6.8	18.5±6.6	22.6±7.1	21.6±7.1	19.6±6.7	19.9±6.8	19.1±6.7	16.5±6.2	12.5±5.3
Saginaw	20.8±6.9	17.8±6.5	20.0±7.0	18.6±6.7	20.2±7.0	16.0±6.2	20.1±7.0	18.4±6.9	20.5±7.5	14.1±6.3
Southfield	17.4±6.2	15.1±5.8	14.7±5.7	12.9±5.3	15.4±5.9	14.8±5.8	15.0±5.8	11.6±5.2	10.0±4.7	11.2±5.0
Taylor	*	*	*	17.0±11.0	19.9±11.6	14.9±9.7	9.3±7.4	11.9±8.2	18.8±9.8	21.6±10.2
Warren	22.2±15.2	20.5±13.2	19.5±12.0	13.1±9.0	9.8±7.3	11.8±7.2	14.8±7.7	14.6±7.3	14.1±6.9	11.9±6.0
Westland	*	29.1±16.9	23.9±14.6	19.5±12.0	10.6±8.5	12.3±8.5	11.0±7.6	14.0±8.2	12.1±7.5	14.7±8.3

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.

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

Source: 2001-2011 Geocoded Michigan Death Certificate Registries; 2012 Michigan Death Certificate Registry. 2001-2012 Geocoded Michigan Birth Certificate Registries **Created:** 3/24/2014
Division for Vital Records & Health Statistics, Michigan Department of Community Health

Table 17-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	719	771	694	700	660	697	608	600	549	501	540
Alcona	1	3	-	1	-	-	1	1	-	-	1
Alger	-	-	-	-	-	-	3	-	-	-	-
Allegan	6	10	4	10	4	13	4	4	6	5	3
Alpena	-	-	1	-	3	-	1	-	-	1	-
Antrim	-	-	3	-	1	-	2	-	4	2	-
Arenac	-	2	-	-	1	-	-	2	-	1	1
Baraga	1	-	-	2	-	-	1	-	-	-	-
Barry	1	3	3	1	6	3	2	3	4	2	2
Bay	6	5	1	8	8	5	3	7	9	6	4
Benzie	-	2	-	1	2	2	-	-	-	-	-
Berrien	8	12	5	10	12	13	10	10	8	8	11
Branch	3	4	4	2	2	2	1	2	2	3	3
Calhoun	8	8	13	11	11	18	13	13	10	9	7
Cass	3	3	2	6	1	2	2	5	1	2	2
Charlevoix	2	-	-	1	-	2	1	2	-	-	-
Cheboygan	1	2	-	-	-	1	-	-	-	-	-
Chippewa	2	3	-	4	2	-	1	-	-	3	2
Clare	-	4	4	-	2	3	-	1	-	1	2
Clinton	4	7	2	2	2	6	1	1	3	2	2
Crawford	1	2	-	-	2	4	1	1	-	-	-
Delta	-	6	3	-	-	2	-	2	2	-	4
Dickinson	-	1	-	-	1	-	2	2	1	-	-
Eaton	8	5	3	3	4	4	3	3	7	5	2
Emmet	1	2	-	1	-	1	2	-	3	-	1
Genesee	49	51	51	33	44	40	27	34	19	22	19
Gladwin	1	1	1	4	-	1	1	1	1	1	-
Gogebic	3	-	-	-	1	1	-	-	2	-	-
Grand Traverse	4	4	6	2	4	5	7	3	3	-	3
Gratiot	2	1	4	-	4	4	2	3	3	3	-
Hillsdale	2	2	-	-	6	4	3	1	1	2	1

Table 17-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012
(Continued)

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Houghton	2	2	3	1	2	2	3	1	3	1	2
Huron	2	-	-	2	2	-	-	3	1	1	-
Ingham	19	17	21	19	13	17	22	14	12	16	16
Ionia	3	4	2	2	3	2	-	1	2	1	-
Iosco	1	-	-	1	1	-	-	1	1	1	-
Iron	-	-	1	-	-	1	-	-	1	-	-
Isabella	4	5	1	7	3	5	1	1	-	6	2
Jackson	5	14	13	17	11	12	11	7	9	8	3
Kalamazoo	29	19	12	16	14	22	13	20	17	8	17
Kalkaska	1	-	1	3	-	-	-	1	1	-	3
Kent	55	60	49	45	59	47	48	42	32	40	38
Keweenaw	-	-	-	-	1	-	-	-	-	-	-
Lake	-	2	-	2	-	-	-	1	-	-	1
Lapeer	5	4	-	-	5	4	3	6	4	-	1
Leelanau	1	3	1	1	-	-	-	-	3	-	-
Lenawee	2	1	4	6	8	5	9	8	11	3	6
Livingston	5	10	6	8	5	11	6	9	6	9	7
Luce	-	1	-	1	1	-	1	-	-	-	-
Mackinac	-	1	1	1	1	-	1	1	-	-	-
Macomb	39	45	37	41	30	48	40	52	39	43	40
Manistee	2	6	2	1	1	-	1	1	1	-	-
Marquette	2	1	-	2	2	2	2	2	1	3	-
Mason	1	3	-	1	3	-	1	1	2	1	-
Mecosta	4	3	3	1	2	1	4	-	1	4	4
Menominee	2	-	1	2	-	1	1	1	-	1	-
Midland	4	3	6	7	7	3	1	3	2	2	3
Missaukee	-	3	-	1	-	-	-	1	-	-	1
Monroe	9	2	6	7	11	6	5	3	4	2	6
Montcalm	5	5	3	-	1	2	1	2	5	3	3
Montmorency	-	-	-	-	1	-	-	-	1	-	-

**Table 17-A
Number of Neonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012
(Continued)**

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Muskegon	9	17	16	10	9	13	9	9	16	11	11
Newaygo	3	1	3	5	1	6	3	1	2	6	2
Oakland	67	73	83	73	72	71	62	60	63	45	61
Oceana	4	2	4	3	1	1	2	2	3	-	2
Ogemaw	-	-	1	-	-	1	-	-	1	1	1
Ontonagon	-	-	-	-	1	1	-	-	-	-	-
Osceola	2	2	1	3	2	1	-	1	1	-	-
Oscoda	1	1	-	-	-	-	1	1	-	-	1
Otsego	-	-	-	-	-	3	1	-	2	3	1
Ottawa	21	17	12	11	18	16	19	10	17	17	14
Presque Isle	1	-	1	-	1	2	-	-	1	1	3
Roscommon	1	1	2	1	-	3	1	1	-	1	-
Saginaw	16	11	13	18	9	16	10	15	10	8	8
St. Clair	8	12	16	10	9	10	4	6	4	6	10
St. Joseph	4	3	5	4	7	6	8	9	2	3	1
Sanilac	1	1	3	1	4	4	1	2	-	-	1
Schoolcraft	-	-	1	1	-	1	-	-	-	-	-
Shiawassee	5	5	6	4	-	8	-	2	2	1	2
Tuscola	6	1	3	3	3	1	-	2	4	1	4
Van Buren	3	4	6	9	-	5	6	4	2	3	4
Washtenaw	21	19	19	19	15	17	14	18	11	10	14
Wayne	225	244	215	225	198	180	197	172	158	151	172
Detroit City	153	160	149	161	121	120	123	114	98	80	104
Wayne County Excluding Detroit City	72	84	66	64	77	60	74	58	60	71	68
Wexford	2	-	1	2	-	4	2	2	2	2	5
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.

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

Source: 2002-2012 Michigan Resident Death Files,
Division for Vital Records & Health Statistics, Michigan Department of Community Health

Created: 3/21/2014

Table 17-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	335	341	290	313	280	300	286	281	268	248	243
Alcona	-	1	-	-	1	-	-	-	-	1	-
Alger	1	2	-	-	-	-	-	1	-	-	-
Allegan	3	4	4	3	4	5	2	2	-	2	1
Alpena	1	-	-	-	1	1	-	3	1	1	-
Antrim	1	-	-	-	1	2	-	1	-	-	-
Arenac	1	-	1	-	-	-	-	-	1	1	-
Baraga	-	-	-	-	-	-	-	-	-	-	-
Barry	-	1	1	1	1	2	3	2	4	-	1
Bay	1	3	2	2	4	3	5	1	3	3	1
Benzie	-	1	-	2	-	-	-	-	1	-	-
Berrien	8	7	3	10	5	8	6	7	6	10	3
Branch	1	2	4	4	-	-	1	-	2	1	1
Calhoun	7	9	5	7	6	10	1	7	8	6	3
Cass	5	1	1	2	2	1	2	1	1	1	2
Charlevoix	-	1	-	-	1	-	-	-	-	1	-
Cheboygan	-	-	1	-	1	1	1	2	-	-	-
Chippewa	-	-	-	1	2	1	-	-	2	1	-
Clare	1	3	1	-	1	-	1	1	1	-	-
Clinton	1	1	1	1	1	-	2	1	2	-	-
Crawford	1	-	-	-	-	1	-	-	-	1	-
Delta	-	1	1	1	1	2	-	1	-	1	-
Dickinson	-	-	-	2	3	-	-	-	1	-	-
Eaton	2	1	3	1	2	2	4	3	1	1	3
Emmet	2	-	1	2	-	-	-	1	-	-	1
Genesee	34	21	26	20	17	17	19	17	11	18	19
Gladwin	2	1	2	-	-	-	-	1	1	-	-
Gogebic	-	-	-	-	1	-	-	-	-	-	-
Grand Traverse	2	1	-	3	2	2	1	2	-	1	1
Gratiot	1	1	1	1	1	-	1	-	2	-	-
Hillsdale	-	2	-	-	1	1	1	-	1	-	1

Table 17-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012
(Continued)

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Houghton	2	1	-	-	-	1	1	-	-	-	-
Huron	-	-	-	-	1	-	-	-	-	1	3
Ingham	5	8	7	11	5	9	3	6	2	5	6
Ionia	1	1	1	1	-	4	1	-	3	2	1
Iosco	1	-	1	-	-	1	1	2	2	1	1
Iron	-	-	-	-	-	-	-	1	1	1	-
Isabella	2	2	2	2	3	2	-	3	4	-	2
Jackson	5	5	1	8	6	3	3	5	2	3	4
Kalamazoo	6	7	9	6	3	7	9	9	13	3	2
Kalkaska	1	2	-	-	-	-	-	-	1	-	1
Kent	20	28	26	21	26	18	21	14	22	19	12
Keweenaw	-	-	-	-	-	-	-	-	-	-	-
Lake	-	1	1	1	1	-	-	1	1	-	-
Lapeer	1	2	1	3	1	1	1	5	3	-	1
Leelanau	1	1	1	-	-	1	-	-	-	1	-
Lenawee	1	4	1	-	2	4	2	1	4	3	2
Livingston	1	6	-	2	2	3	4	3	5	3	1
Luce	-	-	-	-	1	-	1	-	-	-	-
Mackinac	-	-	-	-	-	-	1	-	-	-	-
Macomb	15	15	21	20	21	21	22	26	9	10	12
Manistee	-	-	-	3	-	-	-	1	1	1	-
Marquette	1	-	-	1	2	-	-	2	1	1	2
Mason	-	-	-	-	1	1	1	-	1	-	-
Mecosta	-	-	2	1	-	1	5	-	2	2	-
Menominee	-	-	-	-	-	-	1	-	-	-	1
Midland	4	1	2	1	1	-	2	2	-	2	3
Missaukee	-	-	-	1	-	-	-	-	-	-	-
Monroe	7	1	7	4	4	4	6	6	5	1	3
Montcalm	1	5	1	1	3	-	2	2	1	1	2
Montmorency	-	-	-	-	-	-	-	-	-	-	2

Table 17-B
Number of Postneonatal Deaths by County of Residence,
State of Michigan, Michigan Counties and Detroit City
Michigan Residents, 2002-2012
(Continued)

County	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Muskegon	5	8	5	3	4	6	7	6	7	4	7
Newaygo	-	1	-	1	3	3	-	2	1	1	-
Oakland	27	33	13	30	19	21	26	17	21	25	32
Oceana	-	-	-	3	1	1	1	-	1	-	3
Ogemaw	-	-	1	1	-	1	1	1	1	-	1
Ontonagon	-	-	-	-	-	-	-	-	-	-	-
Osceola	-	-	1	1	-	1	-	-	1	2	-
Oscoda	-	-	-	-	-	-	1	-	-	-	1
Otsego	1	-	3	-	2	2	-	1	-	1	2
Ottawa	2	5	6	5	4	1	4	5	3	4	4
Presque Isle	-	1	-	-	-	-	-	1	1	-	-
Roscommon	1	-	2	-	-	1	-	-	-	-	-
Saginaw	8	13	8	10	10	10	15	11	2	9	5
St. Clair	5	4	4	4	4	2	4	9	2	5	3
St. Joseph	3	3	3	2	2	4	2	1	5	1	6
Sanilac	-	1	-	1	-	2	-	1	1	-	3
Schoolcraft	-	-	-	-	1	-	-	-	-	-	-
Shiawassee	7	1	2	6	2	2	1	-	2	-	1
Tuscola	3	3	2	3	1	1	1	2	1	1	-
Van Buren	2	2	3	5	1	1	4	1	2	1	4
Washtenaw	4	8	10	6	8	6	3	4	9	4	6
Wayne	117	103	85	78	75	94	78	76	75	79	66
Detroit City	86	67	62	49	54	59	52	52	48	50	47
Wayne County Excluding Detroit City	31	36	23	29	21	35	26	24	27	29	19
Wexford	-	1	-	4	1	1	1	-	1	1	1
Unknown	-	-	-	-	-	-	-	-	-	-	-

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: 2002-2012 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

Created: 3/21/2014

**Table 18-A
Number of Neonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2002-2012**

Health Department	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	719	771	694	700	660	697	608	600	549	501	540
Allegan County Health Department	6	10	4	10	4	13	4	4	6	5	3
Barry-Eaton District Health Department	9	8	6	4	10	7	5	6	11	7	4
Berrien County Health Department	8	12	5	10	12	13	10	10	8	8	11
Branch-Hillsdale-St. Joseph Health Department	9	9	9	6	15	12	12	12	5	8	5
Calhoun County Health Department	8	8	13	11	11	18	13	13	10	9	7
Central Michigan District Health Department	8	15	9	15	8	13	3	7	2	10	5
Chippewa County Health Department	2	3	-	4	2	-	1	-	-	3	2
City Of Detroit Health Department	153	160	149	161	121	120	123	114	98	80	104
Public Health Delta & Menominee Counties	2	6	4	2	-	3	1	3	2	1	4
Dickinson-Iron District Health Department	-	1	1	-	1	1	2	2	2	-	-
District Health Department #10	18	22	14	19	10	16	14	11	12	13	18
District Health Department #2	3	4	1	2	1	1	2	3	2	2	3
District Health Department #4	2	2	2	-	5	3	1	-	2	2	3
Genesee County Health Department	49	51	51	33	44	40	27	34	19	22	19
Grand Traverse County Health Department	4	4	6	2	4	5	7	3	3	-	3
Ingham County Health Department	19	17	21	19	13	17	22	14	12	16	16
Ionia County Health Department	3	4	2	2	3	2	-	1	2	1	-
Jackson County Health Department	5	14	13	17	11	12	11	7	9	8	3
Kalamazoo County Human Services Department	29	19	12	16	14	22	13	20	17	8	17
Kent County Health Department	55	60	49	45	59	47	48	42	32	40	38
Lapeer County Health Department	5	4	-	-	5	4	3	6	4	-	1
Lenawee County Health Department	2	1	4	6	8	5	9	8	11	3	6
Livingston County Health Department	5	10	6	8	5	11	6	9	6	9	7
Luce-Mackinac-Alger-Schoolcraft Health Department	-	2	2	3	2	1	5	1	-	-	-
Macomb County Health Department	39	45	37	41	30	48	40	52	39	43	40

Table 18-A
Number of Neonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2002-2012
(Continued)

Health Department	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Marquette County Health Department	2	1	-	2	2	2	2	2	1	3	-
Mid-Michigan District Health Department	11	13	9	2	7	12	4	6	11	8	5
Midland County Health Department	4	3	6	7	7	3	1	3	2	2	3
Monroe County Health Department	9	2	6	7	11	6	5	3	4	2	6
Muskegon County Health Department	9	17	16	10	9	13	9	9	16	11	11
Oakland County Health Department	67	73	83	73	72	71	62	60	63	45	61
Ottawa County Health Department	21	17	12	11	18	16	19	10	17	17	14
Bay County Health Department	6	5	1	8	8	5	3	7	9	6	4
Saginaw County Health Department	16	11	13	18	9	16	10	15	10	8	8
Shiawassee County Health Department	5	5	6	4	-	8	-	2	2	1	2
St Clair County Health Department	8	12	16	10	9	10	4	6	4	6	10
Van Buren-Cass County Health Department	6	7	8	15	1	7	8	9	3	5	6
Washtenaw County Health Department	21	19	19	19	15	17	14	18	11	10	14
Wayne County Health Department	72	84	66	64	77	60	74	58	60	71	68
Benzie-Leelanau District Health Department	1	5	1	2	2	2	-	-	3	-	-
Northwest Michigan Community Health Agency	3	2	3	2	1	6	6	2	9	5	2
Western Upper Peninsula District Health Department	6	2	3	3	5	4	4	1	5	1	2
Tuscola County Health Department	6	1	3	3	3	1	-	2	4	1	4
Huron County Health Department	2	-	-	2	2	-	-	3	1	1	-
Sanilac County Health Department	1	1	3	1	4	4	1	2	-	-	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.

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

Source: 2002-2012 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

Created: 3/21/2014

**Table 18-B
Number of Postneonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2002-2012**

Health Department	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Michigan	335	341	290	313	280	300	286	281	268	248	243
Allegan County Health Department	3	4	4	3	4	5	2	2	-	2	1
Barry-Eaton District Health Department	2	2	4	2	3	4	7	5	5	1	4
Berrien County Health Department	8	7	3	10	5	8	6	7	6	10	3
Branch-Hillsdale-St. Joseph Health Department	4	7	7	6	3	5	4	1	8	2	8
Calhoun County Health Department	7	9	5	7	6	10	1	7	8	6	3
Central Michigan District Health Department	7	6	9	3	4	4	1	5	8	3	2
Chippewa County Health Department	-	-	-	1	2	1	-	-	2	1	-
City Of Detroit Health Department	86	67	62	49	54	59	52	52	48	50	47
Public Health Delta & Menominee Counties	-	1	1	1	1	2	1	1	-	1	1
Dickinson-Iron District Health Department	-	-	-	2	3	-	-	1	2	1	-
District Health Department #10	2	5	3	14	7	8	8	4	9	6	5
District Health Department #2	1	1	2	1	1	2	3	3	3	2	3
District Health Department #4	1	1	1	-	2	2	1	6	2	1	2
Genesee County Health Department	34	21	26	20	17	17	19	17	11	18	19
Grand Traverse County Health Department	2	1	-	3	2	2	1	2	-	1	1
Ingham County Health Department	5	8	7	11	5	9	3	6	2	5	6
Ionia County Health Department	1	1	1	1	-	4	1	-	3	2	1
Jackson County Health Department	5	5	1	8	6	3	3	5	2	3	4
Kalamazoo County Human Services Department	6	7	9	6	3	7	9	9	13	3	2
Kent County Health Department	20	28	26	21	26	18	21	14	22	19	12
Lapeer County Health Department	1	2	1	3	1	1	1	5	3	-	1
Lenawee County Health Department	1	4	1	-	2	4	2	1	4	3	2
Livingston County Health Department	1	6	-	2	2	3	4	3	5	3	1
Luce-Mackinac-Alger-Schoolcraft Health Department	1	2	-	-	2	-	2	1	-	-	-
Macomb County Health Department	15	15	21	20	21	21	22	26	9	10	12

Table 18-B
Number of Postneonatal Deaths by Local Health Department and
State of Michigan,
Michigan Residents, 2002-2012
(Continued)

Health Department	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Marquette County Health Department	1	-	-	1	2	-	-	2	1	1	2
Mid-Michigan District Health Department	3	7	3	3	5	-	5	3	5	1	2
Midland County Health Department	4	1	2	1	1	-	2	2	-	2	3
Monroe County Health Department	7	1	7	4	4	4	6	6	5	1	3
Muskegon County Health Department	5	8	5	3	4	6	7	6	7	4	7
Oakland County Health Department	27	33	13	30	19	21	26	17	21	25	32
Ottawa County Health Department	2	5	6	5	4	1	4	5	3	4	4
Bay County Health Department	1	3	2	2	4	3	5	1	3	3	1
Saginaw County Health Department	8	13	8	10	10	10	15	11	2	9	5
Shiawassee County Health Department	7	1	2	6	2	2	1	-	2	-	1
St Clair County Health Department	5	4	4	4	4	2	4	9	2	5	3
Van Buren-Cass County Health Department	7	3	4	7	3	2	6	2	3	2	6
Washtenaw County Health Department	4	8	10	6	8	6	3	4	9	4	6
Wayne County Health Department	31	36	23	29	21	35	26	24	27	29	19
Benzie-Leelanau District Health Department	1	2	1	2	-	1	-	-	1	1	-
Northwest Michigan Community Health Agency	4	1	4	2	4	4	-	3	-	2	3
Western Upper Peninsula District Health Department	2	1	-	-	1	1	1	-	-	-	-
Tuscola County Health Department	3	3	2	3	1	1	1	2	1	1	-
Huron County Health Department	-	-	-	-	1	-	-	-	-	1	3
Sanilac County Health Department	-	1	-	1	-	2	-	1	1	-	3
Unknown	-	-	-	-	-	-	-	-	-	-	-

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: 2002-2012 Michigan Resident Death Files,
 Division for Vital Records & Health Statistics, Michigan Department of Community Health

Created: 3/21/2014

Historical Trends of Infant Deaths from the Michigan Birth Cohort Registry

The Michigan Birth Cohort Registry: Every year, the Division for Vital Records and Health Statistics (DVRHS) matches birth/infant death file records to produce a more comprehensive infant death file. From this file, the division calculates statistics by characteristics of mother and newborn. (For example, see Table 6.) These matched files are sometimes referred to as "Period Linked Birth/Infant Death" files and they contain matches of all the infants who died in the same year to the birth records occurring in the same or previous year of death. For example, if an infant died in 2010, the infant was born either in 2009 or 2010; therefore, the infant's death certificate could be match to a 2009 or 2010 birth certificate depending on year of birth.

Since 1970, the DVRHS has generated another sort of matched file, the birth cohort registry, based on the infant's year of birth. These files link all infants who died and were born in the same year to their birth certificates. Normally, the DVRHS does not report birth cohort statistics in annual reports. This is because it takes one additional year before the matching can be completed, and because the standard period linked file accurately estimates the risk of death for the current release of data. However, for very long historical trends, the birth cohort registry provides an additional decade of statistics (the period matched files begin in 1980). In addition, since about 1987, the birth cohort registry is more complete than the period matched file. Late, out-of-state reports of deaths are unknown at the time of the matched file's release. However, because the birth cohort is delayed by a year, late reported deaths are more likely to find their way to the birth cohort registry. The birth cohort file is the best source for calculating infant mortality risks.

Trends of infant deaths in Michigan and Detroit: Between 1972 to 2000, the number of live births was on average 139,000. After 2000 the number of births began to decline, so that by 2012, the number of births had dropped 17%, from 136,048 to 112,708 live births. Between 2000 and 2010, the infant mortality rate and the birth cohort mortality rate were about the same, though the later was slightly higher. In 2011 the infant mortality rate was 6.6 deaths per 1,000 live births; the cohort rate was 7.0 per 1,000 births. (See Table 19.)

Detroit rates have historically higher infant death rates than Michigan as a whole. In 1990, the Detroit birth cohort mortality rate was 21.7 deaths per 1,000 live births; in Michigan, the rate was 11.1. By 2011, the Detroit rate had declined 34% to 14.4 deaths per 1,000 live births. The Michigan mortality rate had declined 37% to 7.0. (See Table 20.)

Prematurity and very low birth weight births: Infants born with very low birth weights (less than 1,500 grams) have higher risks of dying. However, these risks have dropped since the 1970s. About 59% of infants born with a very low birth weight died in 1970, but by 2010, 23% of very low birth weight infants died. The rate of infants born premature who died has declined since the 1970s. The mortality rate dropped by 64%, from 106.4 deaths to 38.1 deaths per 1,000 premature births. However, since the mid nineties, the rate of premature deaths has remained on average 51 deaths per 1,000 premature deaths. (See Table 22.)

Low birth weight infant deaths by cause of death: In 2011, infants were born with a low birth weight (less than 2,500 grams) at a rate of 846 per 10,000 live births. These infants died at a rate of 559 deaths per 10,000 low birth weight live births. The causes of death could often be attributed to disorders relating to either prematurity, RDS or congenital anomalies. Since 1989, an average of 2.2% of the low birth weight births resulted in deaths due to disorders relating to short gestation. During the same period, deaths reported due to RDS declined by 92%. There has been a slight decline in the low birth weight mortality rate for congenital anomalies since the 1980s. Between 1980-1989, the average mortality rate for the congenital anomalies was 145.2 deaths per 10,000 low weight births; between 2000-2011, there were on average 109 deaths per 10,000 low weight births. (See Table 23.)

Table 19
Infant Deaths by Year of Death and Year of Birth,
Michigan Residents 1970-2012

Year of Infant Death & Number of Infant Deaths		Live Births	Infant Mortality Rate	Year of Birth & Number of Infant Deaths		Live Births	Birth Cohort Infant Mortality Rate
2012	783	112,708	6.9	2012	---	112,708	---
2011	749	114,159	6.6	2011	795	114,159	7.0
2010	817	114,717	7.1	2010	830	114,717	7.2
2009	881	117,309	7.5	2009	919	117,309	7.8
2008	894	121,231	7.4	2008	945	121,231	7.8
2007	997	125,172	8.0	2007	1,062	125,172	8.5
2006	940	127,537	7.4	2006	963	127,537	7.6
2005	1,013	127,518	7.9	2005	1,050	127,518	8.2
2004	984	129,710	7.6	2004	1,031	129,710	7.9
2003	1,112	130,850	8.5	2003	1,137	130,850	8.7
2002	1,054	129,518	8.1	2002	1,078	129,518	8.3
2001	1,066	133,247	8.0	2001	1,113	133,247	8.4
2000	1,112	136,048	8.2	2000	1,169	136,048	8.6
1999	1,071	133,429	8.0	1999	1,091	133,429	8.2
1998	1,091	133,649	8.2	1998	1,119	133,649	8.4
1997	1,085	133,549	8.1	1997	1,136	133,549	8.5
1996	1,072	133,231	8.0	1996	1,097	133,231	8.2
1995	1,110	134,169	8.3	1995	1,139	134,169	8.5
1994	1,184	137,844	8.6	1994	1,223	137,844	8.9
1993	1,319	139,560	9.5	1993	1,311	139,560	9.4
1992	1,460	143,827	10.2	1992	1,519	143,827	10.6
1991	1,554	149,478	10.4	1991	1,566	149,478	10.5
1990	1,638	153,080	10.7	1990	1,706	153,080	11.1
1989	1,645	148,164	11.1	1989	1,668	148,164	11.3
1988	1,542	139,635	11.0	1988	1,599	139,635	11.5
1987	1,538	140,466	10.9	1987	1,527	140,466	10.9
1986	1,565	137,626	11.4	1986	1,569	137,626	11.4
1985	1,575	138,052	11.4	1985	1,545	138,052	11.2
1984	1,595	135,782	11.7	1984	1,548	135,782	11.4
1983	1,573	133,026	11.8	1983	1,513	133,026	11.4
1982	1,672	137,950	12.1	1982	1,625	137,950	11.8
1981	1,851	140,579	13.2	1981	1,798	140,579	12.8
1980	1,851	145,162	12.8	1980	1,821	145,162	12.5

Table 19
Infant Deaths by Year of Death and Year of Birth,
Michigan Residents 1970-2012
(Continued)

Year of Infant Death & Number of Infant Deaths		Live Births	Infant Mortality Rate	Year of Birth & Number of Infant Deaths		Live Births	Birth Cohort Infant Mortality Rate
1979	1,921	144,452	13.3	1979	1,882	144,452	13.0
1978	1,931	138,802	13.9	1978	1,863	138,802	13.4
1977	1,945	138,416	14.1	1977	1,920	138,416	13.9
1976	1,978	131,378	15.1	1976	1,943	131,378	14.8
1975	2,205	133,931	16.5	1975	2,109	133,931	15.7
1974	2,387	137,414	17.4	1974	2,276	137,414	16.6
1973	2,561	141,550	18.1	1973	2,350	141,550	16.6
1972	2,801	146,854	19.1	1972	2,648	146,854	18.0
1971	3,157	162,244	19.5	1971	2,855	162,244	17.6
1970	3,492	171,667	20.3	1970	3,177	171,667	18.5

Notes: Mortality rates are per 1,000 live births. Before 1987, infant deaths were not matched to delayed reports of live births.

Source: 1970-2011 Michigan Birth Cohort Registries, 1970 - 2012 Michigan Resident Birth and Death Files.

Updated: 3/16/2014

Table 20
Infant Deaths by Year of Death and Year of Birth,
Detroit City, Michigan Residents 1970-2012

Year of Infant Death & Number of Infant Deaths		Live Births	Infant Mortality Rate	Year of Birth & Number of Infant Deaths		Live Births	Birth Cohort Infant Mortality Rate
2012	151	10,081	15.0	2012	---	10,081	---
2011	130	10,338	12.6	2011	149	10,338	14.4
2010	146	10,941	13.3	2010	153	10,941	14.0
2009	166	11,180	14.8	2009	185	11,180	16.5
2008	175	11,791	14.8	2008	188	11,791	15.9
2007	179	12,126	14.8	2007	203	12,126	16.7
2006	175	13,002	13.5	2006	185	13,002	14.2
2005	210	13,156	16.0	2005	217	13,156	16.5
2004	211	13,556	15.6	2004	217	13,556	16.0
2003	227	13,972	16.2	2003	257	13,972	18.4
2002	239	14,187	16.8	2002	228	14,187	16.1
2001	210	15,145	13.9	2001	233	15,145	15.4
2000	232	15,795	14.7	2000	267	15,795	16.9
1999	245	15,800	15.5	1999	251	15,800	15.9
1998	241	16,429	14.7	1998	246	16,429	15.0
1997	253	16,725	15.1	1997	273	16,725	16.3
1996	248	16,586	15.0	1996	255	16,586	15.4
1995	274	17,578	15.6	1995	284	17,578	16.2
1994	322	19,421	16.6	1994	344	19,421	17.7
1993	348	20,260	17.2	1993	353	20,260	17.4
1992	462	21,548	21.4	1992	471	21,548	21.9
1991	456	23,457	19.4	1991	474	23,457	20.2
1990	491	24,129	20.3	1990	523	24,129	21.7
1989	485	22,721	21.3	1989	510	22,721	22.4
1988	413	19,729	20.9	1988	453	19,729	23.0
1987	409	20,056	20.4	1987	406	20,056	20.2
1986	390	18,998	20.5	1986	403	18,998	21.2
1985	355	17,802	19.9	1985	350	17,802	19.7
1984	388	18,517	21.0	1984	378	18,517	20.4
1983	354	17,922	19.8	1983	337	17,922	18.8
1982	402	18,476	21.8	1982	413	18,476	22.4
1981	415	18,953	21.9	1981	386	18,953	20.4
1980	431	20,535	21.0	1980	426	20,535	20.7

Table 20
Infant Deaths by Year of Death and Year of Birth,
Detroit City, Michigan Residents (continued)

Year of Infant Death & Number of Infant Deaths		Live Births	Infant Mortality Rate	Year of Birth & Number of Infant Deaths		Live Births	Birth Cohort Infant Mortality Rate
1979	439	20,639	21.3	1979	424	20,639	20.5
1978	452	20,195	22.4	1978	456	20,195	22.6
1977	402	20,665	19.5	1977	433	20,665	21.0
1976	463	20,331	22.8	1976	458	20,331	22.5
1975	521	22,155	23.5	1975	491	22,155	22.2
1974	588	22,813	25.8	1974	556	22,813	24.4
1973	640	25,557	25.0	1973	575	25,557	22.5
1972	741	27,050	27.4	1972	703	27,050	26.0
1971	747	29,813	25.1	1971	656	29,813	22.0
1970	746	31,880	23.4	1970	655	31,880	20.5

Notes: Mortality rates are per 1,000 live births. Before 1987, infant deaths were not matched to delayed reports of live births.

Source: 1970-2011 Michigan Birth Cohort Registries and Division for Vital Records & Health Statistics, Michigan Department of Community Health Michigan Infant Death Registry. Detroit infant death and live birth counts were revised based on the geocoded residence. **Created:** 3/16/2014

Table 21
Infant Deaths, Live Births and Infant Mortality Rates by Year of Birth and Sex of Infant,
Michigan Residents, 1970-2012

Infant Deaths					Live Births					Infant Death Rates			
Birth Year	Total	Male	Female	Sex Ratio	Birth Year	Total	Male	Female	Sex Ratio	Year	Total	Male	Female
2012	---	---	---	---	2012	112,708	57,740	54,961	105.1	2012	---	---	---
2011	795	427	367	116.3	2011	114,159	58,723	55,435	105.9	2011	7.0	7.3	6.6
2010	830	428	399	107.3	2010	114,717	58,661	56,053	104.7	2010	7.2	7.3	7.1
2009	919	525	391	134.3	2009	117,309	60,162	57,144	105.3	2009	7.8	8.7	6.8
2008	945	517	426	121.4	2008	121,231	62,033	59,196	104.8	2008	7.8	8.3	7.2
2007	1,062	587	466	126.0	2007	125,172	64,270	60,893	105.5	2007	8.5	9.1	7.7
2006	963	523	437	119.7	2006	127,537	65,129	62,406	104.4	2006	7.6	8.0	7.0
2005	1,050	570	477	119.5	2005	127,518	65,411	62,100	105.3	2005	8.2	8.7	7.7
2004	1,031	586	443	132.3	2004	129,710	66,527	63,178	105.3	2004	7.9	8.8	7.0
2003	1,137	656	481	136.4	2003	130,850	67,097	63,750	105.3	2003	8.7	9.8	7.5
2002	1,078	585	490	119.4	2002	129,518	66,251	63,264	104.7	2002	8.3	8.8	7.7
2001	1,113	646	461	140.1	2001	133,247	68,669	64,569	106.3	2001	8.4	9.4	7.1
2000	1,169	691	476	145.2	2000	136,048	69,500	66,545	104.4	2000	8.6	9.9	7.2
1999	1,091	624	466	133.9	1999	133,429	68,202	65,221	104.6	1999	8.2	9.1	7.1
1998	1,119	625	492	127.0	1998	133,649	68,633	65,015	105.6	1998	8.4	9.1	7.6
1997	1,136	615	512	120.1	1997	133,549	68,066	65,483	103.9	1997	8.5	9.0	7.8
1996	1,097	590	504	117.1	1996	133,231	68,207	65,018	104.9	1996	8.2	8.7	7.8
1995	1,139	623	496	125.6	1995	134,169	68,758	65,402	105.1	1995	8.5	9.1	7.6
1994	1,223	629	580	108.4	1994	137,844	70,776	67,059	105.5	1994	8.9	8.9	8.6
1993	1,311	750	555	135.1	1993	139,560	71,418	68,135	104.8	1993	9.4	10.5	8.1
1992	1,519	866	639	135.5	1992	143,827	73,845	69,976	105.5	1992	10.6	11.7	9.1
1991	1,566	893	663	134.7	1991	149,478	76,338	73,132	104.4	1991	10.5	11.7	9.1
1990	1,706	986	706	139.7	1990	153,080	78,260	74,812	104.6	1990	11.1	12.6	9.4
1989	1,668	907	750	120.9	1989	148,164	76,092	72,067	105.6	1989	11.3	11.9	10.4
1988	1,599	856	735	116.5	1988	139,635	71,405	68,226	104.7	1988	11.5	12.0	10.8
1987	1,527	854	669	127.7	1987	140,466	71,733	68,730	104.4	1987	10.9	11.9	9.7
1986	1,569	928	637	145.7	1986	137,626	70,616	67,004	105.4	1986	11.4	13.1	9.5
1985	1,545	894	644	138.8	1985	138,052	71,226	66,821	106.6	1985	11.2	12.6	9.6
1984	1,548	867	678	127.9	1984	135,782	69,759	66,018	105.7	1984	11.4	12.4	10.3
1983	1,513	830	676	122.8	1983	133,026	68,538	64,482	106.3	1983	11.4	12.1	10.5
1982	1,625	936	685	136.6	1982	137,950	70,704	67,242	105.1	1982	11.8	13.2	10.2
1981	1,798	1,025	767	133.6	1981	140,579	71,935	68,640	104.8	1981	12.8	14.2	11.2
1980	1,821	1,015	805	126.1	1980	145,162	74,161	70,998	104.5	1980	12.5	13.7	11.3
1979	1,882	1,088	788	138.1	1979	144,452	74,107	70,339	105.4	1979	13.0	14.7	11.2
1978	1,863	1,100	759	144.9	1978	138,802	70,999	67,795	104.7	1978	13.4	15.5	11.2
1977	1,920	1,089	828	131.5	1977	138,416	71,042	67,366	105.5	1977	13.9	15.3	12.3
1976	1,943	1,082	857	126.3	1976	131,378	67,391	63,981	105.3	1976	14.8	16.1	13.4
1975	2,109	1,202	906	132.7	1975	133,931	68,495	65,431	104.7	1975	15.7	17.5	13.8
1974	2,276	1,320	955	138.2	1974	137,414	70,749	66,663	106.1	1974	16.6	18.7	14.3
1973	2,350	1,335	1,013	131.8	1973	141,550	72,625	68,922	105.4	1973	16.6	18.4	14.7
1972	2,648	1,482	1,166	127.1	1972	146,854	75,342	71,512	105.4	1972	18.0	19.7	16.3
1971	2,855	1,682	1,173	143.4	1971	162,244	83,358	78,886	105.7	1971	17.6	20.2	14.9
1970	3,177	1,800	1,377	130.7	1970	171,667	88,003	83,664	105.2	1970	18.5	20.5	16.5

Notes: Mortality rates are per 1,000 live births. Very low-weight births are births wherein the birth weight is less than 1,500 grams; low-weight births are births wherein the birth weight is less than 2,500 grams; premature births are births born less than 37 completed weeks of gestation; and plural births are births where in the birth occurred from a multiple birth set.

Source: 1970-2012 Michigan Resident Birth Files; 1970-2010 Death Files, Division for Vital Records & Health Statistics, Michigan Department of Community Health. **Updated:** 3/17/2014

Table 22
Plural, Premature, Very Low and Low Birth Weight
Live Births, Infant Deaths and Infant Death Rates,
Birth Cohort Registry,
Michigan Residents, 1970-2012

Year	Very Low Birth Weight			Low Birth Weight Excluding Very LBW			Low Birth Weight			Premature			Plurality		
	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate	Infant Deaths	Live Births	Infant Death Rate
2012	---	1,775	---	---	7,760	---	---	9,535	---	---	13,798	---	---	4,114	---
2011	429	1,827	234.8	112	7,858	14.3	541	9,685	55.9	535	14,041	38.1	136	4,126	33.0
2010	459	1,897	242.0	106	7,788	13.6	565	9,685	58.3	568	13,927	40.8	109	4,277	25.5
2009	526	1,952	269.5	121	7,894	15.3	647	9,846	65.7	618	14,463	42.7	155	4,328	35.8
2008	551	2,191	251.5	143	8,148	17.6	694	10,339	67.1	642	14,970	42.9	158	4,349	36.3
2007	605	2,147	281.8	144	8,403	17.1	749	10,550	71.0	715	12,523	57.1	165	4,495	36.7
2006	574	2,090	274.6	148	8,630	17.1	722	10,720	67.4	670	12,303	54.5	169	4,741	35.6
2005	636	2,140	297.2	178	8,525	20.9	814	10,665	76.3	746	12,794	58.3	171	4,548	37.6
2004	619	2,148	288.2	169	8,719	19.4	788	10,867	72.5	734	12,939	56.7	194	4,799	40.4
2003	710	2,235	317.7	205	8,543	24.0	915	10,778	84.9	837	14,651	57.1	199	4,812	41.4
2002	651	2,103	309.6	182	8,300	21.9	833	10,403	80.1	756	14,625	51.7	202	4,577	44.1
2001	680	2,222	306.0	173	8,492	20.4	853	10,714	79.6	782	15,018	52.1	222	4,791	46.3
2000	642	2,133	301.0	194	8,573	22.6	836	10,706	78.1	785	14,834	52.9	179	4,441	40.3
1999	623	2,238	278.4	204	8,465	24.1	827	10,703	77.3	766	15,792	48.5	167	4,530	36.9
1998	596	2,106	283.0	185	8,362	22.1	781	10,468	74.6	744	15,797	47.1	165	4,268	38.7
1997	610	2,095	291.2	199	8,240	24.2	809	10,335	78.3	760	14,328	53.0	143	4,099	34.9
1996	594	2,035	291.9	167	8,193	20.4	761	10,228	74.4	714	13,781	51.8	149	3,901	38.2
1995	605	1,981	305.4	208	8,375	24.8	813	10,356	78.5	759	14,200	53.5	135	3,789	35.6
1994	654	2,201	297.1	254	8,564	29.7	908	10,765	84.3	819	15,026	54.5	193	4,057	47.6
1993	668	2,098	318.4	258	8,602	30.0	926	10,700	86.5	859	15,491	55.5	167	3,716	44.9
1992	815	2,198	370.8	359	8,631	41.6	1174	10,829	108.4	1,011	15,645	64.6	237	3,846	61.6
1991	837	2,326	359.8	340	9,380	36.2	1177	11,706	100.5	1,047	16,567	63.2	204	4,011	50.9
1990	871	2,386	365.0	372	9,222	40.3	1243	11,608	107.1	1,131	16,428	68.8	230	3,938	58.4
1989	882	2,256	391.0	376	9,067	41.5	1258	11,323	111.1	1,100	16,042	68.6	221	3,882	56.9
1988	833	2,018	412.8	347	8,219	42.2	1180	10,237	115.3	1,034	14,911	69.3	192	3,261	58.9
1987	798	2,007	397.6	313	8,088	38.7	1111	10,095	110.1	977	14,677	66.6	147	3,190	46.1
1986	791	1,874	422.1	292	7,663	38.1	1083	9,537	113.6	1,017	14,684	69.3	183	3,198	57.2
1985	799	1,860	429.6	253	7,543	33.5	1052	9,403	111.9	980	14,035	69.8	180	3,069	58.7
1984	813	1,838	442.3	266	7,663	34.7	1079	9,501	113.6	1,010	13,782	73.3	160	2,876	55.6
1983	735	1,696	433.4	240	7,667	31.3	975	9,363	104.1	940	13,331	70.5	144	2,870	50.2
1982	866	1,827	474.0	302	7,684	39.3	1168	9,511	122.8	1,077	13,631	79.0	189	2,802	67.5
1981	889	1,787	497.5	257	7,912	32.5	1146	9,699	118.2	1,147	17,390	66.0	215	2,911	73.9
1980	857	1,843	465.0	276	8,103	34.1	1133	9,946	113.9	1,083	17,502	61.9	206	3,045	67.7
1979	828	1,769	468.1	263	8,358	31.5	1091	10,127	107.7	977	13,717	71.2	227	3,081	73.7
1978	837	1,739	481.3	302	8,222	36.7	1139	9,961	114.3	946	16,424	57.6	213	2,811	75.8
1977	920	1,744	527.5	270	8,178	33.0	1190	9,922	119.9	1,048	13,104	80.0	221	2,781	79.5
1976	865	1,704	507.6	298	8,080	36.9	1163	9,784	118.9	1,070	12,411	86.2	219	2,662	82.3
1975	924	1,685	548.4	312	8,277	37.7	1236	9,962	124.1	1,103	12,438	88.7	221	2,734	80.8
1974	958	1,748	548.1	354	8,421	42.0	1312	10,169	129.0	1,191	12,540	95.0	222	2,573	86.3
1973	1,022	1,831	558.2	381	9,119	41.8	1403	10,950	128.1	1,301	13,678	95.1	235	2,682	87.6
1972	1,150	1,913	601.2	465	9,492	49.0	1615	11,405	141.6	1,495	14,395	103.9	268	2,888	92.8
1971	1,169	1,999	584.8	435	10,498	41.4	1604	12,497	128.4	1,575	15,637	100.7	294	3,164	92.9
1970	1,314	2,241	586.3	419	11,191	37.4	1733	13,432	129.0	1,740	16,357	106.4	326	3,444	94.7

Notes: Mortality rates are per 1,000 live births. Very low-weight births are births wherein the birth weight is less than 1,500 grams; low-weight births are births wherein the birth weight is less than 2,500 grams; and plural births are births where in the birth occurred from a multiple birth set. Premature births are births born less than 37 completed weeks of gestation. Gestational age is calculated from reported variables in the birth certificate registry; if prematurity cannot be calculated, the doctor's estimate of gestational age is used instead.

Source: 1970-2011 Michigan Birth Cohort Files, 1970-2012 Michigan Birth Registry. Division for Vital Records & Health Statistics, Michigan Department of Community Health. **Created:** 03/18/2014

Table 23
Number of Live Births, Low Birth Weight Live Births and Selected Causes of Death
Rates Per 10,000 Live Births and Low Birth Weight Births,
Michigan Residents 1970-2012

Year	Live Births			Causes of Death									
				Disorders relating to short gestation and unspecified low birthweight		Respiratory Distress Syndrome				Congenital Anomalies			
	Number	Low Birth Weight	Low Birth Weight Rate	Number	Low Birth Weight Mortality Rate	Number	Mortality Rate	Low Birth Weight	Low Birth Weight Mortality Rate	Number	Mortality Rate	Low Birth Weight	Low Birth Weight Mortality Rate
2012	112,708	9,535	846.0	---	---	---	---	---	---	---	---	---	---
2011	114,159	9,576	838.8	202	210.9	14	1.2	13	13.6	123	10.8	71	74.1
2010	114,717	9,685	844.3	211	217.9	23	2.0	22	22.7	186	16.2	113	116.7
2009	117,309	9,846	839.3	199	202.1	23	2.0	22	22.3	181	15.4	114	115.8
2008	121,231	10,339	852.8	221	213.8	40	3.3	40	38.7	179	14.8	105	101.6
2007	125,172	10,550	842.8	246	233.2	46	3.7	39	37.0	205	16.4	123	116.6
2006	127,537	10,720	840.5	215	200.6	33	2.6	31	28.9	179	14.0	120	111.9
2005	127,518	10,665	836.4	235	220.3	59	4.6	58	54.4	201	15.8	110	103.1
2004	129,710	10,867	837.8	217	199.7	59	4.5	58	53.4	187	14.4	132	121.5
2003	130,850	10,778	823.7	236	219.0	48	3.7	46	42.7	206	15.7	133	123.4
2002	129,518	10,403	803.2	208	199.9	59	4.6	56	53.8	186	14.4	120	115.4
2001	133,247	10,714	804.1	263	245.5	61	4.6	58	54.1	177	13.3	98	91.5
2000	136,048	10,706	786.9	273	255.0	63	4.6	60	56.0	201	14.8	122	114.0
1999	133,429	10,703	802.1	232	216.8	78	5.8	75	70.1	204	15.3	135	126.1
1998	133,649	10,468	783.2	186	177.7	79	5.9	74	70.7	187	14.0	111	106.0
1997	133,549	10,335	773.9	224	216.7	86	6.4	81	78.4	215	16.1	120	116.1
1996	133,231	10,228	767.7	210	205.3	73	5.5	68	66.5	199	14.9	117	114.4
1995	134,169	10,356	771.9	231	223.1	86	6.4	79	76.3	202	15.1	114	110.1
1994	137,844	10,765	781.0	248	230.4	82	5.9	78	72.5	223	16.2	127	118.0
1993	139,560	10,700	766.7	271	253.3	97	7.0	94	87.9	214	15.3	117	109.3
1992	143,827	10,829	752.9	296	273.3	114	7.9	110	101.6	249	17.3	156	144.1
1991	149,478	11,706	783.1	293	250.3	153	10.2	150	128.1	258	17.3	132	112.8
1990	153,080	11,608	758.3	266	229.2	171	11.2	164	141.3	294	19.2	166	143.0
1989	148,164	11,323	764.2	247	218.1	201	13.6	197	174.0	269	18.2	152	134.2
1988	139,635	10,237	733.1	186	181.7	144	10.3	139	135.8	306	21.9	160	156.3
1987	140,466	10,095	718.7	208	206.0	123	8.8	119	117.9	270	19.2	143	141.7
1986	137,626	9,537	693.0	154	161.5	161	11.7	150	157.3	279	20.3	138	144.7
1985	138,052	9,403	681.1	149	158.5	175	12.7	172	182.9	325	23.5	171	181.9
1984	135,782	9,501	699.7	174	183.1	151	11.1	148	155.8	272	20.0	135	142.1
1983	133,026	9,363	703.8	131	139.9	169	12.7	155	165.5	271	20.4	134	143.1
1982	137,950	9,511	689.5	135	141.9	217	15.7	206	216.6	313	22.7	144	151.4
1981	140,579	9,699	689.9	163	168.1	186	13.2	176	181.5	324	23.0	125	128.9
1980	145,162	9,946	685.2	146	146.8	206	14.2	184	185.0	314	21.6	127	127.7
1979	144,452	10,127	701.1	132	130.3	255	17.7	228	225.1	334	23.1	136	134.3
1978	138,802	9,961	717.6	147	147.6	245	17.7	229	229.9	337	24.3	149	149.6
1977	138,416	9,922	716.8	156	157.2	279	20.2	264	266.1	316	22.8	129	130.0
1976	131,378	9,784	744.7	178	181.9	277	21.1	254	259.6	362	27.6	170	173.8
1975	133,931	9,962	743.8	180	180.7	305	22.8	269	270.0	368	27.5	148	148.6
1974	137,414	10,169	740.0	221	217.3	360	26.2	305	299.9	364	26.5	143	140.6
1973	141,550	10,950	773.6	242	221.0	367	25.9	325	296.8	375	26.5	138	126.0
1972	146,854	11,405	776.6	304	266.5	387	26.4	335	293.7	431	29.3	173	151.7
1971	162,244	12,497	770.3	347	277.7	402	24.8	344	275.3	474	29.2	173	138.4
1970	171,667	13,432	782.4	403	300.0	430	25.0	358	266.5	486	28.3	175	130.3

Notes: 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 8th, 9th and 10th revisions to the International Classification of Diseases. The ICD-8, 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.

Between 1970-1978, RDS was classified using the ICD-8 codes 776.1 Or 776.2. For a justification of this grouping see "Epidemiology of Hyaline Membrane Disease in the United States: Analysis of National Mortality Statistics"; Pediatrics 1976;58:167 P. M. Farrell and R. E. Wood.

Between 1970-1978, SIDS was classified using ICD-8 code 795.0. For a justification of this grouping, see "A Computer-Based Method for Cause of Death Classification in Stillbirths and Neonatal Deaths." International Journal of Epidemiology. 1997; 26: 1298-1306. I. Winbo, et. al.

Source: 1970-2012 Michigan Birth Cohort Registries and Division for Vital Records & Health Statistics, Michigan Department of Community Health Michigan Infant Death Registry. Created: 3/18/2014