

Number of Deaths, Unadjusted Mortality Rates and Age-adjusted Mortality Rates for Diseases of the Circulatory System as the Underlying Cause of Death among Michigan Adults (2017)

Diseases of the circulatory system listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

	Number of Deaths	Rate-Unadjusted		Rate-Age-adjusted	
		Diseases of circulatory system listed as underlying cause		Diseases of circulatory system listed as underlying cause	
Characteristics		Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	32,284	414.1	(409.6-418.7)	343.8	(340.0-347.6)
Characteristics					
Age Group (years)					
18-44	625	18.4	(16.9-19.8)	-	-
45-64	5,246	192.7	(187.5-197.9)	-	-
65-74	5,600	572.1	(557.2-587.0)	-	-
75-84	7,431	1,566.6	(1,531.2-1,601.9)	-	-
85 and older	13,382	6,264.2	(6,161.4-6,366.9)	-	-
Gender					
Male	16,347	430.6	(424.0-437.2)	414.5	(408.1-421.0)
Female	15,937	398.5	(392.3-404.7)	285.0	(280.5-289.5)
Race/Ethnicity					
Non-Hispanic White	26,625	437.3	(432.1-442.5)	330.4	(326.4-334.5)
Non-Hispanic Black	4,846	456.3	(443.5-469.1)	480.2	(466.5-494.0)
Non-Hispanic American Indian/Alaska Native	157	295.3	(249.2-341.4)	363.7	(304.4-423.0)
Non-Hispanic Asian/Pacific Islander	203	76.4	(65.9-86.9)	132.3	(113.5-151.1)
Hispanic/Latinx	434	133.2	(120.6-145.7)	238.0	(214.4-261.5)

95% CI – 95% Confidence Interval

ICD-10 CM diagnosis codes I00-I99 were used to define diseases of the circulatory system.

Major cardiovascular disease (CVD) listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

	Number of Deaths	Rate-Unadjusted		Rate-Age-adjusted	
		Major CVD listed as underlying cause		Major CVD listed as underlying cause	
Characteristics		Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	31,187	400.1	(395.6-404.5)	331.9	(328.2-335.6)
Characteristics					
Age Group (years)					
18-44	581	17.1	(15.7-18.4)	-	-
45-64	5,053	185.6	(180.5-190.7)	-	-
65-74	5,425	554.2	(539.5-568.9)	-	-
75-84	7,167	1,510.9	(1,476.2-1,545.6)	-	-
85 and older	12,961	6,067.1	(5,965.9-6,168.3)	-	-
Gender					
Male	15,884	418.4	(411.9-424.9)	402.7	(396.4-409.1)
Female	15,303	382.7	(376.6-388.7)	273.4	(269.0-277.8)
Race/Ethnicity					
Non-Hispanic White	25,772	423.3	(418.1-428.5)	319.6	(315.7-323.6)
Non-Hispanic Black	4,624	435.4	(422.9-447.9)	458.3	(444.9-471.8)
Non-Hispanic American Indian/Alaska Native	153	287.8	(242.3-333.3)	352.9	(294.6-411.3)
Non-Hispanic Asian/Pacific Islander	198	74.5	(64.1-84.9)	129.1	(110.5-147.7)
Hispanic/Latinx	421	129.2	(116.8-141.5)	231.2	(208.0-254.4)

95% CI – 95% Confidence Interval

The following ICD-10 CM diagnosis codes were used to define major cardiovascular disease (CVD): diseases of the heart (I00-I09, I11, I13, I20-I51), cerebrovascular disease or stroke (I60-I69), and diseases of the arteries, arterioles and capillaries (I70-I78).

Diseases of the heart listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

Characteristics	Number of Deaths	Rate-Unadjusted		Rate-Age-adjusted	
		Heart disease listed as underlying cause		Heart disease listed as underlying cause	
		Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	25,142	322.5	(318.5-326.5)	267.5	(264.2-270.9)
Characteristics					
Age Group (years)					
18-44	475	14.0	(12.7-15.2)	-	-
45-64	4,334	159.2	(154.5-163.9)	-	-
65-74	4,513	461.1	(447.6-474.5)	-	-
75-84	5,665	1,194.3	(1,163.4-1,225.2)	-	-
85 and older	10,155	4,753.6	(4,663.4-4,843.8)	-	-
Gender					
Male	13,290	350.1	(344.2-356.0)	335.6	(329.9-341.4)
Female	11,852	296.4	(291.0-301.7)	211.9	(208.1-215.8)
Race/Ethnicity					
Non-Hispanic White	20,732	340.5	(335.9-345.1)	257.2	(253.7-260.8)
Non-Hispanic Black	3,784	356.3	(345.0-367.6)	373.6	(361.5-385.7)
Non-Hispanic American Indian/Alaska Native	121	227.6	(187.1-268.1)	271.0	(220.5-321.4)
Non-Hispanic Asian/Pacific Islander	157	59.1	(49.8-68.3)	101.3	(84.9-117.6)
Hispanic/Latinx	330	101.3	(90.3-112.2)	178.9	(158.6-199.3)

95% CI – 95% Confidence Interval

ICD-10 CM diagnosis codes I00-I09, I11, I13, and I20-I25 were used to define diseases of the heart.

Coronary heart disease listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

Characteristics	Deaths	Rate-Unadjusted		Rate-Age-adjusted	
		Coronary heart disease listed as underlying cause		Coronary heart disease listed as underlying cause	
		Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	14,845	190.4	(187.4-193.5)	157.8	(155.2-160.4)
Characteristics					
Age Group (years)					
18-44	187	5.5	(4.7-6.3)	-	-
45-64	2,798	102.8	(99.0-106.6)	-	-
65-74	3,046	311.2	(300.2-322.2)	-	-
75-84	3,465	730.5	(706.2-754.7)	-	-
85 and older	5,349	2,503.9	(2,437.6-2,570.1)	-	-
Gender					
Male	8,476	223.3	(218.5-228.0)	211.3	(206.7-215.8)
Female	6,369	159.3	(155.4-163.2)	114.5	(111.7-117.4)
Race/Ethnicity					
Non-Hispanic White	12,222	200.7	(197.2-204.3)	152.0	(149.3-154.8)
Non-Hispanic Black	2,243	211.2	(202.5-219.9)	222.0	(212.7-231.3)
Non-Hispanic American Indian/Alaska Native	70	131.7	(100.8-162.5)	154.5	(116.6-192.3)
Non-Hispanic Asian/Pacific Islander	100	37.6	(30.3-45.0)	62.1	(49.5-74.7)
Hispanic/Latinx	195	59.8	(51.4-68.2)	106.9	(91.2-122.7)

95% CI – 95% Confidence Interval

ICD-10 CM diagnosis codes I20-I25 were used to define coronary heart disease.

Heart attack listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

		Rate-Unadjusted		Rate-Age-adjusted	
		Heart attack listed as underlying cause		Heart attack listed as underlying cause	
Characteristics	Deaths	Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	3,519	45.1	(43.7-46.6)	37.6	(36.3-38.8)
Characteristics					
Age Group (years)					
18-44	55	1.6	(1.2-2.0)	-	-
45-64	730	26.8	(24.9-28.8)	-	-
65-74	775	79.2	(73.6-84.7)	-	-
75-84	844	177.9	(165.9-189.9)	-	-
85 and older	1,115	521.9	(491.4-552.5)	-	-
Gender					
Male	1,993	52.5	(50.2-54.8)	49.3	(47.1-51.5)
Female	1,526	38.2	(36.2-40.1)	27.9	(26.5-29.3)
Race/Ethnicity					
Non-Hispanic White	3,002	49.3	(47.5-51.1)	37.6	(36.3-39.0)
Non-Hispanic Black	419	39.5	(35.7-43.2)	42.4	(38.3-46.5)
Non-Hispanic American Indian/Alaska Native	17	32.0	(16.8-47.2)	34.3	(17.2-51.3)
Non-Hispanic Asian/Pacific Islander	31	11.7	(7.6-15.8)	18.1	(11.5-24.7)
Hispanic/Latinx	48	14.7	(10.6-18.9)	25.1	(17.6-32.6)

95% CI – 95% Confidence Interval

ICD-10 CM diagnosis codes I21 and I22 were used to define heart attack.

All stroke (Ischemic and Hemorrhagic combined) listed as underlying cause of death per 100,000 Michigan adults (18 years and older)

Characteristics	Deaths	Rate-Unadjusted		Rate-Age-adjusted	
		Stroke listed as underlying cause		Stroke listed as underlying cause	
		Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	4,980	63.9	(62.1-65.7)	53.0	(51.5-54.5)
Characteristics					
Age Group (years)					
18-44	74	2.2	(1.7-2.7)	-	-
45-64	566	20.8	(19.1-22.5)	-	-
65-74	725	74.1	(68.7-79.5)	-	-
75-84	1,244	262.3	(247.7-276.8)	-	-
85 and older	2,371	1,109.9	(1,065.5-1,154.3)	-	-
Gender					
Male	2,080	54.8	(52.4-57.1)	54.1	(51.8-56.5)
Female	2,900	72.5	(69.9-75.2)	51.4	(49.5-53.3)
Race/Ethnicity					
Non-Hispanic White	4,126	67.8	(65.7-69.8)	51.0	(49.4-52.6)
Non-Hispanic Black	714	67.2	(62.3-72.2)	72.1	(66.7-77.5)
Non-Hispanic American Indian/Alaska Native	22	41.4	(24.1-58.7)	55.4	(31.5-79.3)
Non-Hispanic Asian/Pacific Islander	37	13.9	(9.4-18.4)	25.7	(17.2-34.1)
Hispanic/Latinx	81	24.9	(19.4-30.3)	46.7	(36.2-57.3)

95% CI – 95% Confidence Interval

ICD-10 CM diagnosis codes I60-I69 were used to define stroke (ischemic and hemorrhagic combined).

Data Sources and Reference

Source: 2017 Michigan Resident Death Files, Division for Vital Records and Health Statistics, Michigan Department of Health and Human Services.

United States Department of Health and Human Services (US DHHS), Centers for Disease Control and Prevention (CDC), National Center for Health Statistics (NCHS), Bridged-Race Population Estimates, United States July 1st resident population by state, county, age, sex, bridged-race, and Hispanic origin, on CDC WONDER On-line Database (2017).

Klein RJ, Schoenborn CA. Age adjustment using the 2000 projected U.S. population. Healthy People Statistical Notes, no. 20. Hyattsville, Maryland: National Center for Health Statistics. January 2001.

Definition

Latinx: A person of Latin American origin or descent (used as a gender-neutral or nonbinary alternative to Latino or Latina).

Confidence Interval (CI): A range about a measurement within which we would expect for the number of deaths among the population. The true rate lies between the lower and upper bounds of the interval, which in this case is 95% statistical confidence.

Methods and Limitations

The chronic disease deaths and rates provided were deaths listed as the underlying cause of death per 100,000 adult Michigan resident (18 years and older). The underlying cause of death (numerator) is the condition giving rise to the chain of events leading to death. The Michigan Resident Death Files provided the death data. The following ICD-10 CM diagnosis codes were used to define the diseases of the circulatory system:

- 1) diseases of the circulatory system were defined as I00-I99;
- 2) major cardiovascular disease was defined as diseases of the heart I00-I09, I11, I13, and I20-I51; cerebrovascular disease (stroke) I60-I69, and diseases of the arteries, arterioles and capillaries(I70-I78);
- 3) diseases of the heart were defined as I00-I09, I11, I13, and I20-I51;
- 4) coronary heart disease was defined as I20-I25;
- 5) heart attack disease was defined as I21 and I22;
- 6) stroke was defined as I60-I69.

The Michigan resident estimates (denominator) were bridged-race population estimates located on the CDC Wonder on-line database. Using the direct method, age-adjusted rates were rates adjusted to the 2000 U.S. Standard Population using five age groups (18–44, 45–64, 65–74, 75–84, and 85+ years). Rates indicated as unadjusted were rates that were not age-adjusted. Confidence intervals were included.