

Unadjusted Mortality Rates and Age-adjusted Mortality Rates for Diseases of the Circulatory System as the Underlying Cause of Death among Michigan Adults by Race/Ethnicity Five-Year Average (2013-2017 Combined)

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

Characteristics	Rate-Unadjusted		Rate-Age-adjusted	
	Diseases of the circulatory system listed as underlying cause		Diseases of the circulatory system listed as underlying cause	
	Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	405.7	(403.7-407.7)	343.6	(341.9-345.3)
Race/Ethnicity				
Non-Hispanic White	428.1	(425.8-430.5)	330.4	(328.6-332.3)
Non-Hispanic Black	438.5	(432.9-444.1)	475.2	(469.0-481.4)
Non-Hispanic American Indian/Alaska Native	320.6	(298.8-342.3)	413.8	(384.4-443.3)
Non-Hispanic Asian/Pacific Islander	72.6	(67.8-77.4)	133.0	(123.8-142.1)
Hispanic/Latinx	128.0	(122.4-133.7)	240.7	(229.5-251.9)

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 by race-ethnicity (18 years and older)

Characteristics	Rate-Unadjusted		Rate-Age-adjusted	
	Major CVD listed as underlying cause		Major CVD listed as underlying cause	
	Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	391.5	(389.5-393.4)	331.5	(329.8-333.2)
Race/Ethnicity				
Non-Hispanic White (Ref)	413.8	(411.6-416.1)	319.4	(317.6-321.2)
Non-Hispanic Black	419.0	(413.5-424.6)	454.2	(448.1-460.3)
Non-Hispanic American Indian/Alaska Native	308.6	(287.3-329.9)	396.8	(368.0-425.6)
Non-Hispanic Asian/Pacific Islander	69.9	(65.2-74.6)	127.9	(118.9-136.9)
Hispanic/Latinx	123.7	(118.1-129.2)	232.3	(221.3-243.2)

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 by race-ethnicity (18 years and older)

Characteristics	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	317.7	(316.0-319.5)	268.9	(267.4-270.4)
Race/Ethnicity				
Non-Hispanic White	335.4	(333.3-337.4)	258.9	(257.3-260.5)
Non-Hispanic Black	345.0	(339.9-350.0)	372.1	(366.6-377.6)
Non-Hispanic American Indian/Alaska Native	250.2	(231.0-269.4)	319.0	(293.3-344.8)
Non-Hispanic Asian/Pacific Islander	52.0	(47.9-56.1)	94.8	(87.0-102.5)
Hispanic/Latinx	97.4	(92.5-102.3)	180.3	(170.7-189.9)

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 by race-ethnicity (18 years and older)

	Rate-Unadjusted		Rate-Age-adjusted	
	Coronary heart disease listed as underlying cause		Coronary heart disease listed as underlying cause	
Characteristics	Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	194.7	(193.3-196.1)	164.7	(163.5-165.9)
Race/Ethnicity				
Non-Hispanic White	206.1	(204.5-207.7)	159.6	(158.3-160.8)
Non-Hispanic Black	206.5	(202.6-210.4)	223.5	(219.2-227.7)
Non-Hispanic American Indian/Alaska Native	169.9	(154.1-185.7)	215.2	(194.1-236.3)
Non-Hispanic Asian/Pacific Islander	34.8	(31.5-38.1)	62.2	(56.0-68.4)
Hispanic/Latinx	60.1	(56.2-64.0)	112.9	(105.3-120.5)

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 by race-ethnicity (18 years and older)

Characteristics	Rate-Unadjusted		Rate-Age-adjusted	
	Heart attack listed as underlying cause		Heart attack listed as underlying cause	
	Deaths per 100,000 MI adults	95% CI	Deaths per 100,000 MI adults	95% CI
Michigan	46.6	(45.9-47.2)	39.6	(39.0-40.2)
Race/Ethnicity				
Non-Hispanic White	51.4	(50.6-52.2)	40.1	(39.5-40.8)
Non-Hispanic Black	36.4	(34.7-38.0)	39.8	(38.0-41.6)
Non-Hispanic American Indian/Alaska Native	50.0	(41.4-58.6)	60.1	(49.2-71.1)
Non-Hispanic Asian/Pacific Islander	10.4	(8.6-12.3)	18.0	(14.7-21.3)
Hispanic/Latinx	14.5	(12.6-16.4)	27.7	(23.9-31.5)

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 by race-ethnicity (18 years and older)

Characteristics	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	60.1	(59.3-60.9)	51.0	(50.3-51.7)
Race/Ethnicity				
Non-Hispanic White	63.7	(62.8-64.6)	49.0	(48.3-49.7)
Non-Hispanic Black	61.6	(59.5-63.7)	68.6	(66.2-71.0)
Non-Hispanic American Indian/Alaska Native	43.4	(35.4-51.4)	57.9	(46.7-69.1)
Non-Hispanic Asian/Pacific Islander	16.1	(13.9-18.4)	29.9	(25.5-34.3)
Hispanic/Latinx	22.2	(19.8-24.5)	44.3	(39.4-49.2)

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: 2013-2017 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 (2013-2017).

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.