



# Table of Contents

i

Notes and Key definitions .....	ii
Michigan HIV Mortality: 1990-present .....	1
Geographic stratification: Region, Select Local Health Department (LHD) Jurisdictions, Select Metropolitan Statistical Areas (MSAs), Select cities .....	2
Demographic stratification Sex, gender, race, ethnicity, age at death, risk .....	3
Aggregated causes of death Communicable & infectious diseases, Noncommunicable diseases, Injuries .....	5

## Notes & Key definitions

The HIV Mortality Report includes deaths among persons with HIV (PWH) in Michigan. Mortality rates are age-adjusted using the [U.S. 2000 standard population](#) to control for the influence that age alone has on mortality. This report is meant to guide care and prevention strategies by identifying the populations of PWH who are at the highest risk of death, especially those who have a higher risk of death due to an HIV-related cause.

The following measures are displayed on pages 1-4 of this report:

Region or Demographic	All-cause deaths					HIV-related deaths			Non-HIV-related deaths			Persons with HIV
	Count	Rate	MI %	Time to death (years)	Age at death (years)	Count	Rate	MI %	Count	Rate	MI %	
Group X	A	B	C	D	E	F	G	H	I	J	K	L

**All-cause deaths** includes all deaths, regardless of cause, among PWH in Michigan during the given calendar year.

**Count (A):** The total number of deaths among PWH in Group X during the year.

**Rate (B):** The age-adjusted mortality rate per 1,000 PWH in Group X.

**MI % (C):** Of all deaths among PWH in Michigan during the year, the percent who are in Group X (i.e. column percent).

**Time to death (years) (D):** The median time from date of diagnosis to date of death for Group X in years expressed as Median (IQR) where IQR is the interquartile range. The IQR provides a measure of spread or variability in the data.

**Age at death (years) (E):** The median age at death for Group X in years expressed as Median (IQR) where IQR is the interquartile range.

**HIV-related deaths** includes deaths with an underlying cause due to HIV among PWH in Michigan during the given calendar year. (NOTE: a detailed description of underlying causes of death can be found on the following page.)

**Count (F):** The number of HIV-related deaths among PWH in in Group X during the year.

**Rate (G):** The age-adjusted HIV-related mortality rate per 1,000 PWH in Group X.

**MI % (H):** Of all HIV-related deaths among PWH in Michigan during the year, the percent who are in Group X (i.e. column percent).

**Non-HIV-related deaths** includes all deaths with an underlying cause other than HIV among PWH in Michigan during the given calendar year (excludes deaths with an unknown cause of death).

**Count (I):** The total number of non-HIV-related deaths among PWH in Group X during the year.

**Rate (J):** The age-adjusted non-HIV-related mortality rate per 1,000 PWH in Group X

**MI % (K):** Of all non-HIV-related deaths among PWH in Michigan during the year, the percent who are in Group X (i.e. column percent).

**Persons with HIV (PWH) (L):** All people living with HIV in Michigan as of December 31 of the previous calendar year along with persons newly diagnosed with HIV during the given calendar year. PWH is used as the denominator in the calculation of mortality rates.

**How are age-adjusted rates calculated?**

The crude rate in the area of study (e.g., race, county, etc.) is calculated for each age group by dividing the number of deaths (count) in that age group by the number of PWH in the same age group in that area of study and then multiplying by a constant of 1,000. This results in an age-specific death rate (ASDR) per 1,000 PWH for each age group. That is, for each age group,  $ASDR = \text{deaths in age group} \div \text{PWH in age group} \times 1,000$ .

Each ASDR is then multiplied by the proportion of the [U.S. 2000 Standard Population](#) in that same age group. The results are then summed to get the age-adjusted mortality rate for the area of study.

Age-adjusted mortality rates should only be compared to other age-adjusted mortality rates calculated using the same standard population.

**Cause of Death Codes and Classifications:**

For 1999 to present, all causes of death are classified according to the ICD-10 classification system. The ICD-9 coding system was used for deaths occurring between 1978 and 1998, so cause of death classifications before 1999 are not directly comparable to classifications for 1999 or later.

Cause-of-death coding: Mortality statistics for these tables were compiled in accordance with the World Health Organization (WHO) regulations, which specify that member nations classify causes of death by the current Manual of the International Statistical Classification of Diseases, Injuries, and Causes of Death. The current version is the Tenth Revision of the International Classification of Diseases [ICD-10]. Mortality statistics for 1999 and earlier were classified using the Ninth Revision [ICD-9]. ([NCHS Data Definitions: Classification of Diseases](#))

Underlying causes of death: Tabulations of HIV-related and Non-HIV-related cause of death statistics are based solely on the underlying cause of death. Every death is attributed to one underlying condition, based on information reported on the death certificate and using the international rules for selecting the "underlying cause of death" from the conditions stated on the death certificate. The underlying cause is defined as the disease or injury that initiated the train of events leading directly to death, or the circumstances of the accident or violence, which produced the fatal injury. If more than one cause or condition of death is entered, the underlying cause is then determined by the sequence of conditions on the death certificate and selection rules of the ICD (Murphy 2000). ([NCHS Data Definitions: Cause of Death](#))

Aggregated causes of death: Examination of the combination of all listed causes can shed additional light on factors related to mortality among PWH. Therefore, in Michigan, we also present "aggregated" causes of death for disease groups and conditions. "Aggregated" refers to the presence of a cause of death code in either the underlying or non-underlying ("contributing") causes. For example, "HIV-related" is the count of death cases where HIV appears as the underlying cause of death while "HIV-contributing" is the count of death cases where HIV appears in any of the causes of death listed on the death certificate (both underlying and contributing).

**The following measures are displayed on page 5 of this report:**

	<b>Year of death</b>	<b>Count (K):</b> The number of deaths among PWH reported with an underlying or contributing cause of death associated with Group Y.
<b>Disease Group</b>	<b>Count</b> <b>MI %</b>	<b>MI % (L):</b> Of all deaths reported among PWH in Michigan in the specified year of death, the percent who were reported with an underlying or contributing cause of death associated with Group Y.
Group Y	K            L	

Year of Death	All-cause deaths				HIV-related deaths <sup>1</sup>		Non-HIV-related deaths <sup>1</sup>		Persons with HIV
	Count	Rate <sup>2</sup>	Time to death (years)	Age at death (years)	Count	Rate <sup>2</sup>	Count	Rate <sup>2</sup>	
1990	476	112.0	1 (0-2)	38 (32-43)	337	79.3	120	28.2	4,250
1991	564	108.1	1 (0-2)	38 (32-44)	418	80.1	120	23.0	5,219
1992	708	114.6	2 (1-3)	38 (32-44)	516	83.5	161	26.1	6,176
1993	879	130.0	2 (1-4)	38 (32-44)	667	98.6	175	25.9	6,763
1994	980	137.7	3 (1-5)	38 (33-45)	769	108.1	195	27.4	7,115
1995	1,021	139.6	3 (1-5)	39 (33-45)	813	111.1	185	25.3	7,315
1996	712	95.9	4 (2-6)	39 (34-45)	518	69.8	175	23.6	7,425
1997	499	64.4	4 (1-6)	41 (34-47)	315	40.7	172	22.2	7,749
1998	425	52.1	4 (1-7)	42 (36-48)	268	32.9	146	17.9	8,154
1999	408	48.3	5 (2-8)	43 (37-48)	242	28.6	148	17.5	8,451
2000	416	46.5	5 (2-9)	43 (37-49)	254	28.4	159	17.8	8,949
2001	437	46.5	5 (2-9)	44 (39-51)	268	28.5	149	15.8	9,401
2002	422	43.5	7 (3-10)	45 (38-51)	240	24.7	159	16.4	9,707
2003	414	40.9	7 (3-11)	46 (40-52)	233	23.0	163	16.1	10,122
2004	387	36.6	8 (3-12)	46 (40-53)	224	21.2	153	14.5	10,572
2005	389	35.1	9 (4-13)	47 (41-54)	231	20.9	149	13.5	11,067
2006	373	32.6	9 (4-13)	48 (40-54)	196	17.1	165	14.4	11,453
2007	361	30.4	10 (4-15)	47 (41-55)	195	16.4	158	13.3	11,863
2008	375	30.5	11 (4-15)	49 (42-56)	199	16.2	161	13.1	12,279
2009	307	24.2	10 (5-15)	51 (44-58)	151	11.9	143	11.3	12,708
2010	311	23.6	11 (4-16)	49 (42-57)	153	11.6	148	11.2	13,161
2011	315	23.1	13 (6-17)	52 (45-60)	132	9.7	170	12.5	13,622
2012	343	24.3	13 (6-18)	51 (44-59)	148	10.5	183	13.0	14,098
2013	298	20.5	13 (8-18)	53 (46-60)	127	8.8	166	11.4	14,509
2014	295	13.8	13 (6-19)	54 (45-61)	109	5.1	182	8.6	15,149
2015	316	17.9	14 (7-20)	55 (47-63)	118	6.8	190	10.6	15,577
2016	295	15.9	15 (8-20)	55 (47-62)	99	5.0	189	10.5	15,128
2017	303	14.5	16 (9-22)	55 (46-61)	93	4.4	207	10.0	16,331
2018	339	16.1	17 (9-24)	57 (49-65)	81	3.9	252	11.9	16,579
2019	313	14.6	17 (10-24)	57 (48-63)	81	3.9	230	10.7	16,900
2020	407	17.5	16 (11-24)	57 (47-65)	94	4.1	307	13.2	17,472
2021	386	15.5	18 (9-25)	57 (48-65)	93	3.8	288	11.5	17,946
2022	416	16.7	18 (10-26)	57 (46-66)	106	4.0	304	12.4	18,336
2023	416	15.7	19 (11-27)	59 (46-66)	113	4.4	301	11.2	18,648

<sup>1</sup>A proportion of deaths are reported with an unknown cause of death in any given year and are not reflected in the HIV-related deaths and Non-HIV-related deaths counts.

<sup>2</sup>Crude rates are presented prior to 2014 due to the fact prevalence counts broken down by age prior to 2014 were unreliable due to incomplete reporting of current address. As of 2014, rates are age-adjusted using the U.S. 2000 Standard Population.

# Michigan HIV Mortality 2023: Geographic Stratification

Region	All-cause deaths					HIV-related deaths <sup>1</sup>			Non-HIV-related deaths <sup>1</sup>			Persons with HIV, 2023
	Count	Rate <sup>2</sup>	MI %	Time to death (years)	Age at death (years)	Count	Rate <sup>2</sup>	MI %	Count	Rate <sup>2</sup>	MI %	
Michigan	416	16.7	100%	18 (10-26)	57 (46-66)	106	4.0	100%	304	12.4	100%	18,336
DMA <sup>3</sup>	276	16.8	66%	19 (12-26)	59 (45-67)	72	4.5	68%	202	12.2	66%	11,769
Outstate <sup>4</sup>	137	13.9	33%	19 (10-29)	58 (48-64)	41	4.4	39%	96	9.5	32%	6,592
Prison <sup>5</sup>	3	15.0	1%	28 (15-37)	61 (48-62)	0	0.0	0%	3	15.0	1%	287
<b>Select Local Health Department (LHD) Jurisdictions: at least 10 deaths</b>												
Central Michigan District+North Districts <sup>6</sup>	22	16.0	5%	25 (17-30)	59 (45-67)	5	3.7	5%	17	12.3	6%	
Detroit LHD <sup>7</sup>	165	21.3	40%	19 (14-26)	59 (46-66)	37	4.8	35%	127	16.3	42%	
Genesee County	22	27.3	5%	19 (10-27)	56 (45-65)	3	3.2	3%	19	24.1	6%	
Ingham County	11	12.7	3%	16 (4-26)	55 (44-59)	5	6.5	5%	6	6.2	2%	850
Kent County	19	12.0	5%	16 (7-31)	59 (46-62)	5	2.8	5%	14	9.2	5%	5,740
Macomb County	30	16.3	7%	16 (5-27)	56 (37-66)	8	4.5	8%	21	11.2	7%	648
Oakland County	38	10.6	9%	16 (10-26)	59 (42-69)	14	4.1	13%	24	6.6	8%	520
Wayne Co. LHD	38	13.4	9%	20 (7-28)	61 (55-69)	12	4.7	11%	26	8.7	9%	1,176
												1,410
												2,359
												1,921
<b>Select Metropolitan Statistical Areas (MSA's): at least 10 deaths<sup>8</sup></b>												
Detroit-Warren-Dearborn	275	17.1	66%	19 (12-26)	59 (45-67)	72	4.6	68%	201	12.4	66%	11,307
Flint	22	28.1	5%	19 (10-27)	56 (45-65)	3	3.7	3%	19	24.5	6%	610
Grand Rapids-Wyoming	28	14.6	7%	16 (8-29)	59 (47-64)	8	3.8	8%	20	10.8	7%	1,384
Kalamazoo-Portage	11	13.6	3%	10 (1-28)	59 (51-61)	5	6.9	5%	6	6.7	2%	496
Lansing-E Lansing	12	10.6	3%	17 (6-26)	57 (46-59)	5	5.2	5%	7	5.3	2%	653
Micropolitan Area	28	21.1	7%	22 (14-30)	59 (49-67)	10	7.5	9%	18	13.6	6%	790
<b>Select Cities: at least 10 deaths</b>												
Detroit	151	20.9	36%	19 (14-26)	59 (46-66)	35	4.9	33%	115	15.9	38%	5,391
Flint	16	30.5	4%	13 (4-28)	49 (42-60)	3	4.6	3%	13	25.9	4%	426
Grand Rapids	14	14.6	3%	19 (14-32)	59 (46-61)	4	4.0	4%	10	10.6	3%	703
Pontiac	10	21.6	2%	10 (5-32)	48 (39-61)	5	11.3	5%	5	10.3	2%	357
Warren	10	20.0	2%	6 (2-19)	37 (26-59)	3	6.2	3%	7	13.8	2%	381

<sup>1</sup>1% of deaths were reported with an unknown cause of death and are not reflected in the HIV-related deaths and Non-HIV-related deaths counts.

<sup>2</sup>Rates are age-adjusted using the U.S. 2000 Standard Population. Rates calculated on the basis of <20 deaths are considered unstable and should be interpreted with caution.

<sup>3</sup>Detroit Metro Area (DMA) includes Lapeer, Macomb, Monroe, Oakland, St. Clair, and Wayne Counties. Prisons are excluded.

<sup>4</sup>Outstate includes Michigan residents outside the DMA. Prisons are excluded.

<sup>5</sup>Persons in prisons (state or federal) located in Michigan are reported separately for geographic stratification.

<sup>6</sup>Central Michigan LHD includes all otherwise unlisted counties in the lower peninsula.

<sup>7</sup>Detroit LHD includes the cities of Detroit, Hamtramck, Harper Woods, Highland Park, & the Grosse Pointes. Detroit, under "select cities", includes only residents of the city of Detroit.

<sup>8</sup>MSA designations: [https://www2.census.gov/geo/maps/metroarea/stcbsa\\_pg/Feb2013/cbsa2013\\_MI.pdf](https://www2.census.gov/geo/maps/metroarea/stcbsa_pg/Feb2013/cbsa2013_MI.pdf)

	All-cause deaths					HIV-related deaths <sup>1</sup>			Non-HIV-related deaths <sup>1</sup>			Persons with HIV, 2023
	Count	Rate <sup>2</sup>	MI %	Time to death (years)	Age at death (years)	Count	Rate <sup>2</sup>	MI %	Count	Rate <sup>2</sup>	MI %	
<b>Sex assumed at birth</b>												
Male	319	15.1	77%	20 (11-28)	59 (46-66)	84	4.2	74%	233	11.0	77%	14,928
Female	97	16.8	23%	17 (12-24)	55 (46-65)	29	4.7	26%	68	12.1	23%	3,720
<b>Transgender<sup>3</sup></b>	9	50.3	2%	15 (12-28)	44 (47-66)	2	4.4	2%	7	46.0	2%	333
<b>Race &amp; Latinx ethnicity by sex assumed at birth<sup>4</sup></b>												
Black/AA overall	238	18.1	57%	18 (12-25)	58 (44-66)	58	4.4	51%	179	13.6	59%	10,062
Black/AA males	175	18.8	42%	19 (12-26)	58 (43-66)	43	4.5	38%	131	14.2	44%	7,576
Black/AA females	63	16.7	15%	18 (13-24)	58 (46-67)	15	3.9	13%	48	12.7	16%	2,486
Latino overall	19	10.6	5%	14 (7-19)	52 (37-60)	6	3.2	5%	13	7.4	4%	1,426
Latino males	15	10.5	4%	13 (7-19)	52 (37-60)	5	2.9	4%	10	7.6	3%	1,189
Latino females	4	11.9	1%	17 (10-24)	48 (37-61)	1	4.0	1%	3	7.9	1%	237
White overall	139	13.3	33%	23 (12-29)	60 (51-67)	42	4.3	37%	97	8.9	32%	6,282
White males	114	12.4	27%	25 (13-30)	61 (54-68)	31	3.9	27%	83	8.5	28%	5,457
White females	25	18.2	6%	19 (10-26)	53 (44-59)	11	7.3	10%	14	10.8	5%	825
Multi/other overall	20	17.1	5%	14 (4-23)	54 (44-62)	7	6.3	6%	12	10.0	4%	875
Multi/other males	15	16.4	4%	14 (4-29)	55 (40-62)	5	6.5	4%	9	8.8	3%	704
Multi/other females	5	19.1	1%	10 (1-14)	53 (48-59)	2	5.2	2%	3	13.9	1%	171
<b>Age at death</b>												
00-14	0	0.0	0%	N/A	N/A	0	0.0	0%	0	0.0	0%	53
15-19	0	0.0	0%	N/A	N/A	0	0.0	0%	0	0.0	0%	105
20-29	14	6.7	3%	5 (4-10)	26 (25-29)	6	2.9	5%	8	3.8	3%	2,080
30-39	54	12.4	13%	10 (5-15)	35 (32-37)	16	3.7	14%	37	8.5	12%	4,352
40-49	60	17.5	14%	15 (7-21)	45 (42-48)	27	7.9	24%	32	9.3	11%	3,438
50-59	94	20.6	23%	19 (14-26)	56 (53-58)	23	5.0	20%	71	15.5	24%	4,569
60+	194	47.9	47%	25 (17-30)	67 (63-72)	41	10.1	36%	153	37.8	51%	4,051
<b>HIV transmission risk by gender<sup>5</sup></b>												
Sex w men	271	14.1	65%	19 (12-27)	58 (43-65)	79	4.2	70%	191	9.9	63%	14,082
Cis men	200	14.1	48%	20 (12-28)	59 (43-66)	58	4.3	51%	141	9.7	47%	10,696
Cis women	64	13.2	15%	17 (12-22)	54 (45-65)	19	3.4	17%	45	9.8	15%	3,081
Transgender	7	52.0	2%	19 (11-22)	44 (35-61)	2	4.9	2%	5	47.1	2%	305

HIV transmission risk continued on next page

<sup>1</sup>1% of deaths were reported with an unknown cause of death and are not reflected in the HIV-related deaths and Non-HIV-related deaths counts.

<sup>2</sup>Rates are age-adjusted using the U.S. 2000 Standard Population with the exception of rates presented by age at death. Rates calculated on the basis of <20 deaths are considered unstable and should be interpreted with caution.

<sup>3</sup>Transgender persons are also included in the sex at birth categories.

<sup>4</sup>Black/AA, White, & Multi/Other are non-Latinx, Latinx persons may be of any race but are only included in the Latinx group.

<sup>5</sup>For additional risk details see [HIV Transmission Risk Category Definitions](#).

	All-cause deaths					HIV-related deaths <sup>1</sup>			Non-HIV-related deaths <sup>1</sup>			Persons with HIV, 2023
	Count	Rate <sup>2</sup>	MI %	Time to death (years)	Age at death (years)	Count	Rate <sup>2</sup>	MI %	Count	Rate <sup>2</sup>	MI %	
<b>HIV transmission risk by gender<sup>3</sup>, continued from previous page</b>												
PWID	57	31.6	14%	24 (13-29)	62 (53-69)	13	7.8	12%	44	23.8	15%	956
Cis men	28	27.8	7%	25 (17-29)	64 (53-70)	5	5.8	4%	23	22.0	8%	513
Cis women	29	36.8	7%	17 (12-28)	62 (53-68)	8	10.4	7%	21	26.4	7%	443
Transgender	0	--	0%	N/A	N/A	0	--	0%	0	--	0%	0
Sex w men & PWID	23	17.8	6%	25 (15-30)	58 (49-63)	4	3.3	4%	19	14.5	6%	795
Cis men	21	16.1	5%	26 (20-30)	58 (55-63)	4	3.3	4%	17	12.8	6%	768
Transgender	2	39.5	0%	9 (4-15)	40 (35-45)	0	0.0	0%	2	39.5	1%	27
Sex w women	16	15.8	4%	16 (8-25)	61 (49-67)	3	3.1	3%	13	12.7	4%	684
Cis men	16	15.8	4%	16 (8-25)	61 (49-67)	3	3.1	3%	13	12.7	4%	684
Transgender	0	--	0%	N/A	N/A	0	--	0%	0	--	0%	0
Perinatal or Pediatric	1	2.5	0%	28 (28-28)	33 (33-33)	0	0.0	0%	1	2.5	0%	230
Other risk	2	163.6	0%	32 (29-35)	61 (36-85)	1	151.8	1%	1	11.8	0%	46
Unknown risk	46	15.9	11%	14 (4-19)	60 (53-66)	13	4.6	12%	32	10.8	11%	1,855
<b>Any Ryan White (RW) service during 2023</b>												
No RW service	269	21.0	65%	18 (10-27)	58 (44-66)	78	6.1	69%	189	14.7	63%	9,599
RW client	147	10.8	35%	20 (14-27)	61 (49-67)	35	2.7	31%	112	8.1	37%	9,049

<sup>1</sup>1% of deaths were reported with an unknown cause of death and are not reflected in the HIV-related deaths and Non-HIV-related deaths counts.

<sup>2</sup>Rates are age-adjusted using the U.S. 2000 Standard Population with the exception of rates presented by age at death. Rates calculated on the basis of <20 deaths are considered unstable and should be interpreted with caution.

<sup>3</sup>For additional risk details see [HIV Transmission Risk Category Definitions](#).

	2019		2020		2021		2022		2023	
	Count	MI %	Count	MI %	Count	MI %	Count	MI %	Count	MI %
<b>Communicable &amp; infectious diseases</b>										
HIV	110	35%	150	37%	135	35%	153	37%	158	38%
COVID-19	0	0%	43	11%	37	10%	26	6%	7	2%
Other infectious diseases	51	16%	69	17%	77	20%	71	17%	85	20%
Respiratory infections	32	10%	61	15%	50	13%	48	12%	31	7%
STI	0	0%	2	0%	1	0%	1	0%	0	0%
<b>Noncommunicable diseases</b>										
Cardiovascular diseases	123	39%	166	41%	152	39%	180	43%	167	40%
Congenital anomalies	0	0%	0	0%	1	0%	1	0%	1	0%
Diabetes	10	3%	27	7%	24	6%	24	6%	32	8%
Digestive diseases	21	7%	35	9%	29	8%	22	5%	30	7%
Endocrine, blood, and immune disorders	20	6%	30	7%	24	6%	36	9%	41	10%
Genitourinary diseases	35	11%	54	13%	52	13%	49	12%	62	15%
Malignant cancers	68	22%	77	19%	95	25%	96	23%	91	22%
Other cancers	0	0%	1	0%	2	1%	2	0%	1	0%
Mental and behavioral disorders	65	21%	94	23%	92	24%	118	28%	120	29%
Musculoskeletal diseases	4	1%	1	0%	4	1%	5	1%	4	1%
Neurological conditions	17	5%	20	5%	13	3%	24	6%	14	3%
Nutritional deficiencies	6	2%	21	5%	10	3%	14	3%	14	3%
Respiratory diseases	64	20%	94	23%	77	20%	84	20%	89	21%
Sense organ diseases	0	0%	0	0%	0	0%	1	0%	0	0%
Skin diseases	1	0%	0	0%	1	0%	6	1%	5	1%
<b>Injuries</b>										
Intentional injuries	9	3%	16	4%	9	2%	20	5%	9	2%
Unintentional/unspecified injuries	51	16%	53	13%	66	17%	48	12%	66	16%
<b>Total Deaths</b>	<b>313</b>	<b>100%</b>	<b>407</b>	<b>100%</b>	<b>386</b>	<b>100%</b>	<b>416</b>	<b>100%</b>	<b>416</b>	<b>100%</b>

Cause of Death categories are classified using the ICD-10 reference tables in the [Deaths: Leading Causes National Vital Statistics Report](#).