

Who is dying with HIV/AIDS, and how has this changed over time? Detailed Data Tables and Technical Notes

Recent changes to the presentation of Massachusetts HIV/AIDS surveillance data

Effective January 1, 2011, the Massachusetts Department of Public Health (MDPH), Bureau of Infectious Disease, HIV/AIDS fact sheets, epidemiologic reports and other HIV data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts. As of January 1, 2015, this resulted in the removal of 4,401 HIV/AIDS cases, of which 1,021 have died and 3,380 were living. These persons living with HIV/AIDS may still continue to reside and receive care in the Commonwealth. The total number of persons living with HIV/AIDS, irrespective of location at diagnosis, is the basis for MDPH service planning. Please note that previous HIV/AIDS fact sheets, data reports and presentations included cases that may have been first diagnosed in another state.

Also effective January 1, 2011, the MDPH HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to eliminate the presumed heterosexual risk category for men; those cases have been reassigned to the no identified risk (NIR) category. The presumed heterosexual risk category was used with the intention of identifying HIV risk for women when sex with men is the only reported risk factor, there is no evidence of current or past injection drug use (IDU), and behavioral risk and HIV status information about male sexual partners are unknown. The application of the presumed heterosexual risk category to men is overly inclusive in that woman to man HIV transmission is biologically less probable, and there are alternate risks that are possible for men, including sex with other men (MSM) or IDU. The CDC reports men diagnosed with HIV/AIDS who report sex with women as their only risk factor, without corresponding partner risk or HIV status information, in the NIR category. This revision to report presumed heterosexual male HIV/AIDS cases as NIR will bring Massachusetts HIV/AIDS case reporting for men in alignment with CDC standards. The MDPH will maintain presumed heterosexual and heterosexual risk categories for women.

To describe who is dying with HIV/AIDS and how this has changed over time, these tables and the accompanying fact sheet present a profile of deaths during the ten-year period from 2003–2012 among individuals diagnosed with HIV/AIDS. Additionally, information about deaths among people reported with AIDS for the ten-year period 2003 to 2012, as well as the years 1985, 1990, 1995, and 2000 is included for historical perspective. Death data are not available for people reported with HIV infection (non-AIDS) prior to 1999, as HIV infection was not a reportable condition before this time. Since 1999, the majority of annual deaths in persons diagnosed with HIV infection occur in persons who are reported with an AIDS diagnosis (ranging from 79% to 89%).

Death data presented in this analysis include all deaths among people reported with HIV infection or AIDS in Massachusetts. This includes deaths from all causes, including cardiovascular disease, liver disease, cancer, accidental injury, or poisoning inclusive of

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drug overdose. Therefore, the number of deaths reported here will vary from the number of HIV/AIDS deaths reported in *Massachusetts Deaths* by the Massachusetts Department of Public Health, Registry of Vital Records and Statistics, Bureau of Health Information, Statistics, Research and Evaluation.

On an annual basis, the HIV/AIDS Surveillance Program matches all reports of individuals living with HIV/AIDS against that year's vital statistics file of all individuals who died in Massachusetts. Additionally, death certificates with HIV/AIDS among reported underlying conditions are received by the HIV/AIDS Surveillance Program, and providers may report deaths among their patients.

Table 1. Ranking of ten leading underlying causes of death among persons 25–44 years of age: Massachusetts, 2012

Cause	Ranking	N	% of Total Deaths (N=1,880)
Unintentional Injuries	1	538	29%
Cancer	2	275	15%
Heart Disease	3	203	11%
Suicide	4	203	11%
Ill-defined conditions-signs and symptoms ¹	5	99	5%
Homicide	6	62	3%
Chronic liver disease	7	51	3%
Diabetes	8	33	2%
Stroke	9	24	1%
Injuries of undetermined intent	10	19	1%

¹ Deaths where investigation has not determined whether injuries were accidental or purposely inflicted.
 Data Source: MDPH Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Deaths 2012: Data Brief, available online at <http://www.mass.gov/eohhs/docs/dph/research-epi/death-data/death-databrief-2012.pdf>

Table 2. Deaths among persons reported with HIV infection (non-AIDS) and AIDS by year of death: Massachusetts, 1985–2013¹			
	HIV	AIDS	Total HIV + AIDS
Year of death	N	N	
1985	-- ²	118	-- ²
1986	-- ²	196	-- ²
1987	-- ²	316	-- ²
1988	-- ²	408	-- ²
1989	-- ²	539	-- ²
1990	-- ²	619	-- ²
1991	-- ²	787	-- ²
1992	-- ²	882	-- ²
1993	-- ²	1,010	-- ²
1994	-- ²	1,160	-- ²
1995	-- ²	1,133	-- ²
1996	-- ²	758	-- ²
1997	-- ²	372	-- ²
1998	-- ²	321	-- ²
1999	49	337	386
2000	41	312	353
2001	60	356	416
2002	57	311	368
2003	68	323	391
2004	45	309	354
2005	54	278	332
2006	39	285	324
2007	44	242	286
2008	59	224	283
2009	51	237	288
2010	52	212	264
2011	40	190	230
2012	47	189	236
2013	39	149	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² HIV infection reporting was implemented in 1999; therefore there are minimal data for deaths among people with HIV that did not progress to AIDS during this time period.

Data Source MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/15

Table 3. Deaths among persons reported with HIV/AIDS by reported risk and year of death: Massachusetts¹, 2004–2013

	MSM		IDU		MSM/ IDU		HTSX		Pres. HTSX ²		Undeter- mined ³		Total ⁴
	N	%	N	%	N	%	N	%	N	%	N	%	
2004	68	19%	178	50%	17	5%	32	9%	12	3%	40	11%	354
2005	56	17%	171	52%	15	5%	39	12%	18	5%	31	9%	332
2006	63	19%	162	50%	19	6%	32	10%	16	5%	30	9%	324
2007	64	22%	125	44%	26	9%	28	10%	13	5%	25	9%	286
2008	59	21%	127	45%	15	5%	26	9%	11	4%	41	14%	283
2009	45	16%	144	50%	10	3%	36	13%	13	5%	39	14%	288
2010	58	22%	121	46%	14	5%	19	7%	10	4%	38	14%	264
2011	45	20%	98	43%	17	7%	23	10%	9	4%	35	15%	230
2012	52	22%	111	47%	10	4%	24	10%	11	5%	24	10%	236
2013	50	27%	79	42%	7	4%	19	10%	7	4%	23	12%	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes woman sex with men of unknown HIV status or risk. This category is limited to women.

³ Includes man sex with women of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

⁴ Totals include pediatric and blood/blood products reported risks

MSM = Male-to-Male Sex; IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/15

Table 4. Deaths among men reported with HIV/AIDS by reported risk and year of death: Massachusetts¹, 2004–2013

	MSM		IDU		MSM/IDU		HTSX		Undetermined ²		Total ³
	N	%	N	%	N	%	N	%	N	%	
2004	68	26%	116	45%	17	7%	17	7%	34	13%	258
2005	56	24%	118	51%	15	6%	14	6%	28	12%	233
2006	63	27%	108	47%	19	8%	11	5%	29	13%	232
2007	64	32%	78	39%	26	13%	9	4%	22	11%	201
2008	59	29%	83	40%	15	7%	13	6%	33	16%	207
2009	45	23%	94	48%	10	5%	13	7%	33	17%	196
2010	58	31%	75	40%	14	7%	6	3%	31	17%	187
2011	45	27%	62	37%	17	10%	10	6%	31	19%	166
2012	52	33%	69	43%	10	6%	5	3%	22	14%	159
2013	50	36%	53	38%	7	5%	5	4%	21	15%	139

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes man sex with women of unknown HIV status or risk, those still being followed up for risk information, those who have died with no determined risk, and those lost to follow-up.

³ Totals include pediatric and blood/blood products reported risks.

MSM = Male-to-Male Sex; IDU = Injection Drug Use; MSM/IDU = Male-to-Male Sex and Injection Drug Use; HTSX = Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Table 5. Deaths among women reported with HIV/AIDS by reported risk and year of death: Massachusetts¹, 2004–2013

	IDU		HTSX		Pres. HTSX ²		Undetermined ³		Total ⁴
	N	%	N	%	N	%	N	%	N
2004	62	65%	15	16%	12	13%	6	6%	96
2005	53	54%	25	25%	18	18%	3	3%	99
2006	54	59%	21	23%	16	17%	1	1%	92
2007	47	55%	19	22%	13	15%	3	4%	85
2008	44	58%	13	17%	11	14%	8	11%	76
2009	50	54%	23	25%	13	14%	6	7%	92
2010	46	60%	13	17%	10	13%	7	9%	77
2011	36	56%	13	20%	9	14%	4	6%	64
2012	42	55%	19	25%	11	14%	2	3%	77
2013	26	53%	14	29%	7	14%	2	4%	49

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Includes woman sex with men of unknown HIV status or risk. This category is limited to women.

³ Includes those still being followed up for risk information, those who have died with no determined risk and those lost to follow-up.

⁴ Totals include pediatric and blood/blood products reported risks

IDU = Injection Drug Use; HTSX = Heterosexual Sex; Pres. HTSX = Presumed Heterosexual Sex

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Table 6. Deaths among persons reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2004–2013

	White (NH)		Black (NH)		Hispanic/Latino		API		Total ²
	N	%	N	%	N	%	N	%	N
2004	175	49%	88	25%	87	25%	4	1%	354
2005	153	46%	88	27%	88	27%	3	1%	332
2006	172	53%	77	24%	73	23%	2	1%	324
2007	146	51%	78	27%	61	21%	1	<1%	286
2008	139	49%	76	27%	62	22%	5	2%	283
2009	135	47%	74	26%	73	25%	6	2%	288
2010	122	46%	67	25%	68	26%	3	1%	264
2011	112	49%	64	28%	53	23%	0	0%	230
2012	115	49%	59	25%	57	24%	3	1%	236
2013	99	53%	50	27%	37	20%	1	1%	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity

(NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Table 7. Deaths among *men* reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2004–2013

	White (NH)		Black (NH)		Hispanic/Latino		API		Total ²
	N	%	N	%	N	%	N	%	N
2004	138	53%	57	22%	59	23%	4	2%	258
2005	112	48%	56	24%	62	27%	3	1%	233
2006	135	58%	46	20%	49	21%	2	1%	232
2007	116	58%	38	19%	46	23%	1	<1%	201
2008	110	53%	53	26%	38	18%	5	2%	207
2009	89	45%	53	27%	48	24%	6	3%	196
2010	92	49%	42	22%	49	26%	2	1%	187
2011	84	51%	44	27%	37	22%	0	0%	166
2012	84	53%	34	21%	37	23%	3	2%	159
2013	75	54%	33	24%	29	21%	1	1%	139

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity (NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Table 8. Deaths among *women* reported with HIV/AIDS by race/ethnicity and year of death: Massachusetts¹, 2004–2013

	White (NH)		Black (NH)		Hispanic/Latina		API		Total ²
	N	%	N	%	N	%	N	%	N
2004	37	39%	31	32%	28	29%	0	0%	96
2005	41	41%	32	32%	26	26%	0	0%	99
2006	37	40%	31	34%	24	26%	0	0%	92
2007	30	35%	40	47%	15	18%	0	0%	85
2008	29	38%	23	30%	24	32%	0	0%	76
2009	46	50%	21	23%	25	27%	0	0%	92
2010	30	39%	25	32%	19	25%	1	1%	77
2011	28	44%	20	31%	16	25%	0	0%	64
2012	31	40%	25	32%	20	26%	0	0%	77
2013	24	49%	17	35%	8	16%	0	0%	49

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Totals include American Indian/Alaskan Native individuals and those of other or undetermined race/ethnicity (NH) = Non-Hispanic, API = Asian/Pacific Islander

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Technical Notes: Explanation of Crude and Age-Adjusted Rates of Death

A rate of a disease per 100,000 population is a more precise way to compare groups that have substantially different population sizes rather than relying on the raw number of deaths. To adjust for fluctuations in the annual rate of death among people reported with HIV/AIDS, an average annual rate of death for the period 2011 to 2013 is used. The average number of deaths is calculated over the three-year period by adding the total number of deaths among people reported with HIV/AIDS in each of the three years and dividing by three. The crude average annual rate of death is then calculated by dividing the average number of people reported with HIV/AIDS who died during the three years by the entire population (everyone or the sub-population involved) and multiplying by 100,000. (See example 1 below). The Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010 file is the source of population sizes for these calculations.

Example 1: Calculation of Crude Average Annual Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2011–2013 (2.1 per 100,000)

$$\begin{aligned} \text{Crude average annual rate of} & \\ \text{death among reported} & \\ \text{HIV/AIDS cases for white} & \\ \text{individuals, 2011–2013} & = (((\text{number of white individuals reported with HIV/AIDS} \\ & \text{who died in 2011} + \text{number of white individuals reported} \\ & \text{with HIV/AIDS who died in 2012} + \text{number of white} \\ & \text{individuals reported with HIV/AIDS who died in 2013}) \div 3) \\ & \div \text{population size of white individuals}) \times 100,000 \\ & = (((112 + 115 + 99) \div 3) \div 5,132,633) \times 100,000 \\ & = ((326 \div 3) \div 5,132,633) \times 100,000 \\ & = (108.6667 \div 5,132,633) \times 100,000 \\ & = 0.0000211717 \times 100,000 \\ & = \mathbf{2.1} \end{aligned}$$

Sometimes, in addition to the population size being different, the age composition of the populations is different. In Massachusetts, black and Hispanic/Latino populations are younger than white. The median age of the black non-Hispanic population (29.7 years) and the Hispanic/Latino population (24.5 years) is younger than that of white population (38.8 years). Therefore, it is necessary to “age-adjust” the rate of death among people reported with HIV/AIDS to get a true comparison of the impact of the disease across racial/ethnic groups without an effect from the differences in age composition. Age-adjustment of rates minimizes the distortion created by differences in age composition.

Age-adjusted rates are calculated by weighting the age-specific rates for a given population by the age distribution of a standard population. The age-specific rates are calculated for eleven age groups ranging from less than one year old to 85 years or above and are weighted by the 2000 US standard population. The weighted age-

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specific rates are then added to produce the adjusted rate for all ages combined. (See example 2 below).

Example 2: Calculation of Age-adjusted Rate of Death among People Reported with HIV/AIDS for White Individuals, Massachusetts, 2011–2013, (1.7 per 100,000)

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
Age group (in years)	Average number of deaths among reported HIV/AIDS cases 2011–2013	Population (2010)	2000 US standard population weight	Age-adjusted rate $((B \div C \times D) \times 100,000)$
<1	0	48,010	0.013818	0.00
1-4	0	200,452	0.055317	0.00
5-14	0	571,967	0.145565	0.00
15-24	0.333333	677,899	0.138646	0.01
25-34	1.666667	603,245	0.135573	0.04
35-44	10.666667	676,064	0.162613	0.26
45-54	50	841,315	0.134834	0.80
55-64	35.666667	697,852	0.087247	0.45
65-74	8.666667	403,518	0.066037	0.14
75-84	1.666667	275,380	0.044842	0.03
85+ years	0	136,931	0.015508	0.00
Total	108.6667	5,132,633	1	1.7

To see the effect of age-distribution on rates of death see Table 9 below for a comparison of crude and age-adjusted rates by race/ethnicity.

Table 9. Crude and age-adjusted rates of death among people reported with HIV/AIDS per 100,000 population¹ by race/ethnicity and gender: average annual rate 2011–2013, Massachusetts²

State Total:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic)	2.1	1.7
Black (non-Hispanic)	13.9	14.6
Hispanic/Latino	7.8	10.7
Mass. Total Rate	3.3	2.9
Men:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic) Men	3.3	2.6
Black (non-Hispanic) Men	18.4	20.5
Hispanic/Latino Men	11.1	16.9
Mass. Total Rate Among Men	4.9	4.2
Women:	Crude Rate per 100,000	Age-Adjusted Rate per 100,000
White (non-Hispanic) Women	1.0	0.9
Black (non-Hispanic) Women	9.6	9.8
Hispanic/Latina Women	4.6	5.6
Mass. Total Rate Among Women	1.9	1.7

¹The denominators for rate calculations are from the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2010; all rates are age-adjusted using the 2000 US standard population.

²Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

Data Source: MDPH HIV/AIDS Surveillance Program; Data as of 1/1/15

Table 10. Deaths among persons reported with HIV/AIDS by gender and year of death: Massachusetts¹, 2004–2013

Year of death	Men		Women		Total
	N	%	N	%	N
2004	258	73%	96	27%	354
2005	233	70%	99	30%	332
2006	232	72%	92	28%	324
2007	201	70%	85	30%	286
2008	207	73%	76	27%	283
2009	196	68%	92	32%	288
2010	187	71%	77	29%	264
2011	166	72%	64	28%	230
2012	159	67%	77	33%	236
2013	139	74%	49	26%	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/15

Table 11. Deaths among persons reported with HIV/AIDS by place of birth and year of death: Massachusetts¹, 2004–2013

Year of Death	US		Puerto Rico/ US Dependency ²		Non-US		Total
	N	%	N	%	N	%	N
2004	266	75%	57	16%	31	9%	354
2005	244	73%	62	19%	26	8%	332
2006	249	77%	46	14%	29	9%	324
2007	229	80%	35	12%	22	8%	286
2008	208	73%	40	14%	35	12%	283
2009	218	76%	39	14%	31	11%	288
2010	202	77%	39	15%	23	9%	264
2011	171	74%	37	16%	22	10%	230
2012	191	81%	24	10%	21	9%	236
2013	149	79%	21	11%	18	10%	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Ninety-eight percent of all people diagnosed with HIV infection in MA who were born in a US dependency were born in Puerto Rico, 1% were born in the US Virgin Islands, <1% were born in American Samoa, <1% were born in Guam and 1% were born in an unspecified dependency.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), Data as of 1/1/15

Table 12. Deaths among persons reported with HIV/AIDS by age at death and year of death: Massachusetts¹, 2004–2013

Year	<13		13–19		20–24		25–29		30–34		35–39		40–44		45–49		50–54		55–59		60+		Total
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N
2004	4	1%	2	1%	2	1%	2	1%	13	4%	52	15%	66	19%	86	24%	66	19%	36	10%	25	7%	354
2005	6	2%	0	0%	3	1%	5	2%	19	6%	27	8%	84	25%	77	23%	55	17%	32	10%	24	7%	332
2006	0	0%	0	0%	0	0%	3	1%	7	2%	38	12%	73	23%	77	24%	66	20%	31	10%	29	9%	324
2007	1	0%	0	0%	2	1%	6	2%	7	2%	28	10%	45	16%	66	23%	64	22%	32	11%	35	12%	286
2008	1	0%	1	0%	1	0%	6	2%	7	2%	24	8%	49	17%	60	21%	52	18%	38	13%	44	16%	283
2009	0	0%	0	0%	0	0%	2	1%	6	2%	15	5%	45	16%	58	20%	64	22%	44	15%	54	19%	288
2010	0	0%	0	0%	1	0%	4	2%	5	2%	11	4%	41	16%	46	17%	56	21%	47	18%	53	20%	264
2011	0	0%	1	0%	2	1%	0	0%	3	1%	14	6%	27	12%	46	20%	41	18%	47	20%	49	21%	230
2012	0	0%	0	0%	3	1%	2	1%	3	1%	7	3%	19	8%	40	17%	64	27%	37	16%	61	26%	236
2013	0	0%	0	0%	2	1%	1	1%	4	2%	4	2%	7	4%	34	18%	46	24%	37	20%	53	28%	188

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being reported in Massachusetts.

² Reflects year of HIV infection diagnosis among all individuals reported with HIV infection, with or without an AIDS diagnosis for the most recently available 10 year period after the implementation of HIV infection reporting in 1999.

Data Source: MDPH HIV/AIDS Surveillance Program (percentages may not add up to 100% due to rounding), data as of 1/1/15

Technical Notes: Trends in survival after an AIDS diagnosis

The following analyses describe changes over time in the survival of people who are diagnosed with AIDS in Massachusetts.

Tables 13–17 describe how many people died within 1 year of an AIDS diagnosis, between 1 and 2 years, between 2 and 3 years, etc., and up to 10 or more years for all people diagnosed with AIDS from 1987 to 2008. For example, the first column of Table 13 indicates that of 628 people diagnosed with AIDS in 1987, 250, or 40%, died within 1 year of diagnosis; 157, or 25%, died between 1 and 2 years of diagnosis; and 90, or 14%, died between 2 and 3 years of diagnosis.

It should be noted that if a person was diagnosed with AIDS in 2008, only one complete year of survival can be assessed, since this report includes data only up to January 1, 2010. Likewise, a diagnosis of AIDS in 2007 would not allow observation for more than two years, etc. These observations are relevant when interpreting the following tables and especially when comparing the distribution of survival times across years. With these caveats in mind, there has been a fairly consistent decline in the percentage of people who die within two years of an AIDS diagnosis. This most likely reflects higher rates of early diagnosis and improved care and treatment of people living with AIDS in the Commonwealth.

In comparing survival for people diagnosed in 1988 with people diagnosed in more recent years, it is evident that the proportion of people who are still alive is greater for each successive time period. More people are surviving for longer time periods after being diagnosed with AIDS. Advances in the prevention of opportunistic infections and the treatment of HIV infection over the years account for this significant increase in survival.

Table 13. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1987–1991

Survival time ²	1987		1988		1989		1990		1991	
	N	%	N	%	N	%	N	%	N	%
<1 yr.	250	40%	256	31%	264	28%	272	26%	340	26%
1 - <2 yr.	158	25%	198	24%	216	23%	207	20%	297	23%
2 - <3 yr.	90	14%	139	17%	167	17%	192	18%	204	16%
3 - <4 yr.	44	7%	69	8%	86	9%	113	11%	114	9%
4 - <5 yr.	16	3%	35	4%	63	7%	63	6%	70	5%
5 - <6 yr.	11	2%	26	3%	43	4%	39	4%	35	3%
6 - <7 yr.	8	1%	12	1%	17	2%	13	1%	12	1%
7 - <8 yr.	5	1%	13	2%	7	1%	9	1%	13	1%
8 - <9 yr.	9	1%	3	<1%	4	<1%	10	1%	10	1%
9 - <10 yr.	0	0%	2	<1%	5	1%	7	1%	5	<1%
10+ yr.	10	2%	21	3%	28	3%	38	4%	46	4%
Still Alive	28	4%	61	7%	60	6%	83	8%	150	12%
Total	629	100%	835	100%	960	100%	1,046	100%	1,296	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; Data as of 1/1/15

Table 14. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1992–1996

Survival time ²	1992		1993		1994		1995		1996	
	N	%	N	%	N	%	N	%	N	%
<1 yr.	332	20%	324	19%	267	19%	195	15%	97	9%
1 - <2 yr.	362	21%	345	20%	246	17%	94	7%	46	4%
2 - <3 yr.	297	18%	254	15%	115	8%	56	4%	53	5%
3 - <4 yr.	170	10%	110	6%	51	4%	49	4%	39	3%
4 - <5 yr.	58	3%	47	3%	35	2%	40	3%	42	4%
5 - <6 yr.	33	2%	34	2%	42	3%	30	2%	37	3%
6 - <7 yr.	36	2%	32	2%	26	2%	36	3%	34	3%
7 - <8 yr.	17	1%	32	2%	43	3%	45	3%	23	2%
8 - <9 yr.	32	2%	21	1%	25	2%	28	2%	25	2%
9 - <10 yr.	21	1%	22	1%	17	1%	27	2%	18	2%
10+ yr.	103	6%	117	7%	135	10%	134	10%	122	11%
Still Alive	223	13%	365	21%	419	29%	601	45%	600	53%
Total	1,684	100%	1,703	100%	1,421	100%	1,335	100%	1,136	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

Data Source: MDPH Surveillance Program; Data as of 1/1/15

Table 15. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 1997–2001

Survival time ²	1997		1998		1999		2000		2001	
	N	%	N	%	N	%	N	%	N	%
<1 yr.	67	7%	52	6%	59	7%	55	7%	62	9%
1 - <2 yr.	38	4%	39	4%	31	4%	18	2%	23	3%
2 - <3 yr.	33	4%	19	2%	34	4%	26	3%	21	3%
3 - <4 yr.	28	3%	23	2%	22	2%	19	2%	14	2%
4 - <5 yr.	39	4%	27	3%	27	3%	21	3%	16	2%
5 - <6 yr.	24	3%	26	3%	18	2%	25	3%	20	3%
6 - <7 yr.	22	2%	24	3%	17	2%	13	2%	10	1%
7 - <8 yr.	22	2%	28	3%	17	2%	11	1%	12	2%
8 - <9 yr.	21	2%	18	2%	19	2%	10	1%	7	1%
9 - <10 yr.	20	2%	18	2%	12	1%	15	2%	13	2%
10+ yr.	79	9%	71	8%	60	7%	37	5%	9	1%
Still Alive	512	57%	576	63%	567	64%	525	68%	497	71%
Total	905	100%	921	100%	883	100%	775	100%	704	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; Data as of 1/1/15

Table 16. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 2002–2006

Survival time ²	2002		2003		2004		2005		2006	
	N	%	N	%	N	%	N	%	N	%
<1 yr.	43	6%	41	7%	49	7%	39	6%	35	5%
1 - <2 yr.	20	3%	18	3%	21	3%	10	1%	10	1%
2 - <3 yr.	15	2%	9	1%	15	2%	10	1%	9	1%
3 - <4 yr.	19	3%	13	2%	16	2%	8	1%	5	1%
4 - <5 yr.	12	2%	14	2%	11	2%	14	2%	6	1%
5 - <6 yr.	13	2%	10	2%	8	1%	16	2%	9	1%
6 - <7 yr.	16	2%	13	2%	10	1%	8	1%	3	<1%
7 - <8 yr.	8	1%	6	1%	5	1%	6	1%	3	<1%
8 - <9 yr.	6	1%	6	1%	9	1%	4	1%	-- ³	-- ³
9 - <10 yr.	7	1%	11	2%	5	1%	-- ³	-- ³	-- ³	-- ³
10+ yr.	8	1%	4	1%	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
Still Alive	526	76%	479	77%	554	79%	582	83%	587	88%
Total	693	100%	624	100%	703	100%	698	100%	668	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; Data as of 1/1/15

Table 17. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 2007–2010

Survival time ²	2007		2008		2009		2010	
	N	%	N	%	N	%	N	%
<1 yr.	26	5%	32	7%	26	6%	28	7%
1 - <2 yr.	19	3%	9	2%	4	1%	4	1%
2 - <3 yr.	8	1%	7	1%	8	2%	5	1%
3 - <4 yr.	5	1%	5	1%	10	2%	4	1%
4 - <5 yr.	6	1%	7	1%	6	1%	-- ³	-- ³
5 - <6 yr.	6	1%	2	<1%	-- ³	-- ³	-- ³	-- ³
6 - <7 yr.	2	<1%	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
7 - <8 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
8 - <9 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
9 - <10 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
10+ yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
Still Alive	496	87%	412	87%	414	88%	385	90%
Total	568	100%	474	100%	468	100%	426	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; Data as of 1/1/15

Table 18. Time from AIDS diagnosis to death by year of AIDS diagnosis: Massachusetts¹, 2011–2013

Survival time ²	2011		2012		2013	
	N	%	N	%	N	%
<1 yr.	20	5%	10	3%	9	3%
1 - <2 yr.	7	2%	2	1%	-- ³	-- ³
2 - <3 yr.	2	<1%	-- ³	-- ³	-- ³	-- ³
3 - <4 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
4 - <5 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
5 - <6 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
6 - <7 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
7 - <8 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
8 - <9 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
9 - <10 yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
10+ yr.	-- ³	-- ³	-- ³	-- ³	-- ³	-- ³
Still Alive	400	93%	383	97%	307	97%
Total	429	100%	396	100%	316	100%

¹ Effective, January 1, 2011 the Massachusetts Department of Public Health, Office of HIV/AIDS fact sheets, epidemiologic reports, and other data presentations have been updated to remove all HIV/AIDS cases that were first diagnosed in another state before being diagnosed and reported in Massachusetts.

² Years between AIDS diagnosis and death

³ Individuals diagnosed in this year have not yet had the opportunity to survive this many years before death.

Data Source: MDPH Surveillance Program; Data as of 1/1/15