

# Population Estimates and Projections



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## Estimates of the Population of Massachusetts Counties and Metropolitan Areas: July 1, 1977 (Revised) and 1978 (Provisional)

This report presents total population estimates for revised July 1, 1977 and provisional estimates for July 1, 1978 for counties and metropolitan areas in Massachusetts. These estimates were prepared by the Bureau of the Census as part of its continuing population estimates program. They are consistent in methodology with county estimates for other States jointly prepared by State agencies and the Bureau of the Census through the Federal-State Cooperative Program and published in **Current Population Reports**, Series P-26.

County estimates for July 1, 1971-76 and provisional estimates for July 1, 1977, were published earlier in **Current Population Reports**, Series P-25 or P-26. The provisional estimates in the last cited report are superseded by the numbers published here.

The decision on methodology used in this report was based upon the results of tests of the methods. The Administrative Records method has been tested against special censuses conducted since 1970. The other methods were evaluated against the 1970 census. For a detailed description of the Federal-State Cooperative Program and an analysis of 1970 test results for methods other than the Administrative Records method, see **Current Population Reports**, Series P-26, No. 21, "Federal-State Cooperative Program for Local Population Estimates: Test Results—April 1, 1970," April 1973. Summary results of tests of the Administrative Records method are presented in **Current Population Reports**, Series P-25, Nos. 649-698, and in detail in Series P-25, No. 699 (forthcoming).

The estimates shown for July 1, 1977, are based on an average of the following methods, adjusted to agree with the July 1, 1977 State estimate.

1. **The Regression (ratio-correlation) method.**<sup>1</sup> In the Regression method, a multiple regression equation is used to relate changes in a number of different data series to change in population distribution. The series of data used in the Regression method for Massachusetts are: school enrollment in grades 1 through 8 plus elementary special and ungraded enrollment ( $X_1$ ) and automobile registrations ( $X_2$ ). The prediction equation used for Massachusetts is given by:

$$\hat{Y} = 0.2464 + 0.4381X_1 + 0.3292X_2$$

2. **Component Method II.**<sup>1</sup> This method employs vital statistics to measure natural change and school enrollment to measure net migration. The estimates produced by Component Method II are specific to the population under 65 not residing in group quarters. To this population is added an estimate of the population 65 and over based on the change in Medicare enrollees from 1970 to

<sup>1</sup>More detailed descriptions of the methods are given in **Current Population Reports**, Series P-25, Nos. 427 and 520. Modifications made to the methodologies for the current series will be given in forthcoming reports in Series P-25.

the estimate date, the institutional and college population, and reported military population living in barracks.

**3. The Administrative Records method.**<sup>1</sup> This is a component method which uses individual Federal income tax returns to measure the intercounty migration of the nongroup quarters population and reported birth and death statistics to estimate natural change. The tax returns are matched by Social Security number in the base year and the estimate year to determine the number of persons whose county of residence changed during the estimating period. A net migration rate based on exemptions claimed by the matched cases is then applied to the total population. The resulting estimate is made specific to the nongroup quarters population under age 65 by excluding from the migration computations any data relating to persons 65 years and over as well as persons residing in group quarters. These estimates of migration are then combined with the independent estimates of the population 65 and over used in the Component Method II estimate and the other components of population change—births, deaths, immigration, and the net movement between the military and civilian population.

The provisional July 1, 1978 estimates for counties were developed by adding to the 1977 estimates, the average change between the 1977 and 1978 Component Method II estimates and the corresponding Regression method esti-

mates. All counties were subsequently adjusted to agree with the provisional July 1, 1978 State estimate.

Table 2 of this report presents estimates for New England county metropolitan areas (NECMA's) which are situated in whole or part in the State of Massachusetts. The titles and definitions of the NECMA's are those currently defined by the Office of Federal Statistical Policy and Standards, Department of Commerce. Where a NECMA falls in more than one State (indicated in the NECMA title), information on the other State parts of the area can be obtained by referring to the P-26 report for that particular State.

Corresponding estimates for other States will be published as they become available. The appendix table lists reports published to date for States in the 1977-78 series, together with those published for earlier years.

The 1970 census populations for the State and counties shown in the tables reflect all corrections to the census count made subsequent to the release of the official State figure. Counties with corrections of more than 500 are Middlesex and Worcester Counties.

The estimates presented in the table have been rounded to the nearest hundred without being adjusted to the State total, which was independently rounded to the nearest thousand. Percentages are based on unrounded numbers. Births and deaths are taken from reported vital statistics from April 1, 1970, to December 31, 1977. Net migration is the residual difference between net change and natural change.

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<sup>1</sup> See footnote 1 on page 1.

**Table 1. Estimates of the Population of Massachusetts Counties: July 1, 1977 and 1978**

(STATE ESTIMATES ARE SHOWN TO THE NEAREST THOUSAND, COUNTY ESTIMATES TO THE NEAREST HUNDRED)

COUNTY	JULY 1, 1978 (PROVISIONAL)	JULY 1, 1977	APRIL 1, 1970 (CENSUS)	CHANGE, 1970 TO 1977		COMPONENTS OF CHANGE, 1970 TO 1977 <sup>1</sup>			
				NUMBER	PERCENT	BIRTHS	DEATHS	NET MIGRATION	
								NUMBER	PERCENT
MASSACHUSETTS.....	5,774,000	5,777,000	5,689,170	88,000	1.5	544,000	403,000	-53,000	-0.9
BARNSTABLE.....	142,000	137,300	96,656	40,700	42.1	10,200	10,100	40,600	42.0
BERKSHIRE.....	143,700	144,000	149,402	-5,400	-3.6	13,400	11,300	-7,500	-5.0
BRISTOL.....	472,100	469,100	444,301	24,800	5.6	46,200	33,200	11,700	2.6
DUKES.....	8,300	8,100	6,117	1,900	31.6	700	700	1,900	31.3
ESSEX.....	626,200	625,200	637,887	-12,600	-2.0	60,100	47,700	-25,000	-3.9
FRANKLIN.....	62,100	61,700	59,210	2,500	4.2	6,100	4,900	1,300	2.2
HAMPDEN.....	454,500	457,600	459,050	-1,500	-0.3	45,200	32,400	-14,300	-3.1
HAMPSHIRE.....	132,700	131,700	123,981	7,800	6.3	10,300	7,200	4,700	3.8
MIDDLESEX.....	1,381,300	1,385,800	1,398,397	-12,600	-0.9	128,900	87,500	-54,000	-3.9
NANTUCKET.....	5,300	5,600	3,774	1,800	47.1	500	400	1,700	44.8
NORFOLK.....	619,600	618,900	604,854	14,000	2.3	49,400	38,800	3,500	0.6
PLYMOUTH.....	395,700	388,400	333,314	55,100	16.5	40,500	22,400	37,000	11.1
SUFFOLK.....	685,000	701,300	735,190	-33,900	-4.6	69,500	60,200	-43,200	-5.9
WORCESTER.....	645,100	642,800	637,037	5,800	0.9	63,100	46,100	-11,300	-1.8

<sup>1</sup>BIRTHS AND DEATHS ARE BASED ON REPORTED VITAL STATISTICS FROM APRIL 1, 1970 TO DECEMBER 31, 1977. NET MIGRATION IS THE DIFFERENCE BETWEEN NET CHANGE AND NATURAL CHANGE.

**Table 2. Estimates of the Population of Metropolitan Areas and Their Component Counties: Massachusetts, July 1, 1977 and 1978**

(NECMA TOTALS ROUNDED INDEPENDENTLY OF COUNTY NUMBERS)

NEW ENGLAND COUNTY METROPOLITAN AREA AND COUNTY	JULY 1, 1978 (PROVISIONAL)	JULY 1, 1977	APRIL 1, 1970 (CENSUS)	CHANGE, 1970 TO 1977		COMPONENTS OF CHANGE, 1970 TO 1977 <sup>1</sup>			
				NUMBER	PERCENT	BIRTHS	DEATHS	NET MIGRATION	
								NUMBER	PERCENT
BOSTON-LOWELL-BROCKTON-LAWRENCE-HAVERHILL, MASS.-N.H. (MASS. PORTION) <sup>2</sup>	3,707,800	3,719,600	3,709,642	9,900	0.3	348,300	256,600	-81,800	-2.2
ESSEX.....	626,200	625,200	637,887	-12,600	-2.0	60,100	47,700	-25,000	-3.9
MIDDLESEX.....	1,381,300	1,385,800	1,398,397	-12,600	-0.9	128,900	87,500	-54,000	-3.9
NORFOLK.....	619,600	618,900	604,854	14,000	2.3	49,400	38,800	3,500	0.6
PLYMOUTH.....	395,700	388,400	333,314	55,100	16.5	40,500	22,400	37,000	11.1
SUFFOLK.....	685,000	701,300	735,190	-33,900	-4.6	69,500	60,200	-43,200	-5.9
PITTSFIELD, MASS. <sup>4</sup>	472,100	469,100	444,301	24,800	5.6	46,200	33,200	11,700	2.6
NEW BEDFORD-FALL RIVER, MASS. <sup>3</sup>	143,700	144,000	149,402	-5,400	-3.6	13,400	11,300	-7,500	-5.0
BERKSHIRE.....	143,700	144,000	149,402	-5,400	-3.6	13,400	11,300	-7,500	-5.0
NEW BEDFORD-FALL RIVER, MASS. <sup>3</sup>	472,100	469,100	444,301	24,800	5.6	46,200	33,200	11,700	2.6
BRISTOL.....	472,100	469,100	444,301	24,800	5.6	46,200	33,200	11,700	2.6
SPRINGFIELD-CHICOPEE-HOLYOKE, MASS. <sup>5</sup>	587,200	589,300	583,031	6,300	1.1	55,500	39,600	-9,600	-1.6
HAMPDEN.....	454,500	457,600	459,050	-1,500	-0.3	45,200	32,400	-14,300	-3.1
HAMPSHIRE.....	132,700	131,700	123,981	7,800	6.3	10,300	7,200	4,700	3.8
WORCESTER-FITCHBURG-LEOMINSTER, MASS. <sup>6</sup>	645,100	642,800	637,037	5,800	0.9	63,100	46,100	-11,300	-1.8
WORCESTER.....	645,100	642,800	637,037	5,800	0.9	63,100	46,100	-11,300	-1.8
METROPOLITAN.....	5,556,000	5,564,700	5,523,413	41,300	0.7	526,500	386,800	-98,400	-1.8
NONMETROPOLITAN.....	217,700	212,600	165,757	46,900	28.3	17,500	16,200	45,500	27.5

<sup>1</sup>BIRTHS AND DEATHS ARE BASED ON REPORTED VITAL STATISTICS FROM APRIL 1, 1970 TO DECEMBER 31, 1977. NET MIGRATION IS THE DIFFERENCE BETWEEN NET CHANGE AND NATURAL CHANGE.

<sup>2</sup>NEW ENGLAND COUNTY METROPOLITAN AREA. THE POPULATION OF THE BOSTON SMSA IN 1970 WAS 2,899,101; FOR THE LOWELL, MASS.-N.H. SMSA (MASS. PORTION) IT WAS 212,860; FOR THE BROCKTON SMSA IT WAS 150,416; AND FOR THE LAWRENCE-HAVERHILL, MASS.-N.H. SMSA (MASS. PORTION) IT WAS 221,208.

<sup>3</sup>NEW ENGLAND COUNTY METROPOLITAN AREA. THE POPULATION OF THE FALL RIVER, MASS.-R.I. SMSA (MASS. PORTION) IN 1970 WAS 142,084; AND FOR THE NEW BEDFORD SMSA IT WAS 161,288.

<sup>4</sup>NEW ENGLAND COUNTY METROPOLITAN AREA. THE POPULATION OF THE PITTSFIELD SMSA IN 1970 WAS 96,817.

<sup>5</sup>NEW ENGLAND COUNTY METROPOLITAN AREA. THE POPULATION OF THE SPRINGFIELD-CHICOPEE-HOLYOKE, MASS.-CONN. SMSA (MASS. PORTION) IN 1970 WAS 534,859.

<sup>6</sup>NEW ENGLAND COUNTY METROPOLITAN AREA. THE POPULATION OF THE WORCESTER SMSA IN 1970 WAS 372,144; AND FOR THE FITCHBURG-LEOMINSTER SMSA IT WAS 97,164.

## Appendix

## Estimates Published in Series P-26 Since 1975

(Reports issued under the Federal-State Cooperative Program for Local Population Estimates, jointly prepared by the Bureau of the Census and designated State agencies)

State	Report No.			State	Report No.		
	1977 and provisional 1978	1976 and provisional 1977	1975 and provisional 1976		1977 and provisional 1978	1976 and provisional 1977	1975 and provisional 1976
Alabama.....		77-1	76-1	Montana.....	78-26	77-26	76-26
Alaska.....		77-2	(3) 76-3	Nebraska.....	78-27	77-27	76-27
Arizona.....	(1) 78-4	(2) 77-4	76-3	Nevada.....	78-28	77-28	76-28
Arkansas.....		77-4	76-4	New Hampshire....	78-29	77-29	76-29
California.....		77-5	76-5	New Jersey.....		77-30	76-30
Colorado.....		77-6	76-6	New Mexico.....		77-31	76-31
Connecticut.....	78-7	77-7	76-7	New York.....		77-32	76-32
Delaware.....	78-8	77-8	76-8	North Carolina...	78-33	77-33	76-33
Florida.....		77-9	76-9	North Dakota.....	78-34	77-34	76-34
Georgia.....		77-10	76-10	Ohio.....		77-35	76-35
Hawaii.....	78-11	77-11	76-11	Oklahoma.....	78-36	77-36	76-36
Idaho.....	78-12	77-12	76-12	Oregon.....		77-37	76-37
Illinois.....		77-13	76-13	Pennsylvania.....		77-38	76-38
Indiana.....		77-14	76-14	Rhode Island.....	78-39	77-39	76-39
Iowa.....		77-15	76-15	South Carolina...		77-40	76-40
Kansas.....		77-16	76-16	South Dakota.....	78-41	77-41	76-41
Kentucky.....	78-17	77-17	76-17	Tennessee.....	78-42	77-42	76-42
Louisiana.....	78-18	77-18	76-18	Texas.....		(2)	(3)
Maine.....	78-19	77-19	76-19	Utah.....	78-44	77-44	76-44
Maryland.....	78-20	77-20	76-20	Vermont.....	78-45	77-45	76-45
Massachusetts.....	(1)	(2)	(3)	Virginia.....	78-46	77-46	76-46
Michigan.....	78-22	77-22	76-22	Washington.....	(1)	(2)	(3)
Minnesota.....	78-23	77-23	76-23	West Virginia.....		77-48	76-48
Mississippi.....	78-24	77-24	76-24	Wisconsin.....		77-49	76-49
Missouri.....		77-25	76-25	Wyoming.....	78-50	77-50	76-50
				Puerto Rico.....			76-51

<sup>1</sup>County or county equivalent estimates for 1977 and provisional 1978 are published in Series P-25 for the following States: Arizona, No. 804; Washington, No. 808; Massachusetts, No. 811.

<sup>2</sup>County or county equivalent estimates for 1976 and provisional 1977 are published in Series P-25 for the following States: Arizona, No. 730; Washington, No. 738; Massachusetts, No. 797; and Texas, No. 798.

<sup>3</sup>County or county equivalent estimates for 1975 and provisional 1976 are published in Series P-25 for the following States: Washington, No. 707; Alaska, No. 712; Massachusetts, No. 715; and Texas, No. 717.

# Counties, Metropolitan Areas, and Selected Places: Massachusetts

