Massachusetts Births 2002

Mitt Romney, Governor
Kerry Healey, Lieutenant Governor
Ronald Preston, Secretary of Health and Human Services
Christine C. Ferguson, Commissioner, Department of Public Health

Deborah Klein Walker, Ed.D. Associate Commissioner
Bruce B. Cohen, Ph.D. Director, Health Statistics and Research
Stanley E. Nyberg, Ph.D. Registrar, Registry of Vital Records and Statistics

Center for Health Information, Statistics, Research, and Evaluation

Massachusetts Department of Public Health

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This report was prepared by J. K. West, Malena Orejuela, and Isabel Caceres of the Research and Epidemiology Program, Center for Health Information, Statistics, Research, and Evaluation.

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Massachusetts Department of Public Health
Center for Health Information,
Statistics, Research, and Evaluation
2 Boylston St, 6th floor
Boston, MA 02116

or

Registry of Vital Records and Statistics
(617) 740-2670

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EXECUTIVE SUMMARY

2002 Highlights

- **The teen birth rate continues its steady decline of the last twelve years**. The Massachusetts teen birth rate has decreased steadily from 35.4 births per 1,000 women ages 15-19 in 1990 to 22.6 in 2002; the lowest teen birth rate in the last 3 decades.

- **The infant mortality rate (IMR) in 2002 was 4.9 infant deaths per 1,000 live births, compared with 5.0 in 2001.** The year 2002 had **the second lowest number of infant deaths in Massachusetts's history.**

- **The Cesarean section delivery rate continues to increase in Massachusetts as well as throughout the United States**. In 2002, 28.2% of all births to Massachusetts residents were delivered by c-section, the highest rate ever reported in the state. This is a 10% increase from the 2001 c-section rate. Since 1997, c-section rates have increased by an average of 7% per year.

- **The percentage of women smoking during pregnancy decreased** from 9.1% in 2001 to 7.9% in 2002, **continuing its steady decline from the last decade**. The rate of smoking during pregnancy has decreased 59% since 1990 (19.3%).

- **The percentage of low birthweight infants (less than 2,500 grams or 5.5 pounds) increased to 7.5% in 2002, the highest since at least 1980.** Since 1990, the percentage of low birthweight infants has increased by 29%, from 5.8% in 1990 to 7.5% in 2002. The increase in low birth weight infants can be linked directly to the increase in multiple births and the aging of the population giving birth.

- **The percentage of preterm infants (delivered before the 37th week of gestation) increased 6% from 8.0% in 2001 to 8.5% in 2002.**

- **The twelve-year trend of increasing numbers of multiple births continues**. The percentage of multiple births increased from 4.4% of births in 2001 to 4.9% in 2002. The percentage of multiple births in Massachusetts has increased 89% since 1990 (2.6%).

- **The age of birth mothers in Massachusetts continues to increase.** In 1980, 1 out of 4 Massachusetts mothers were ages 30 and over, now more than 1 in 2 (57%).

- **In Massachusetts, the average age at first birth was 28.0 years** in 2002 compared with 25.1 years for the United States, which was an all time high.

- Despite a very small percent (less than 1%) decrease in overall births from 2001, certain groups have experienced large increases in the numbers of births. **Five groups have increased more than 10%: Asian Indians, Brazilians, Chinese, Africans, and Vietnamese.**

Number and Rate of Births

The number of births to Massachusetts residents declined by about 0.5% between 2001 and 2002, from 81,014 to 80,624. Since 1990, the number of births in Massachusetts has declined by 13%, and the birth rate among women of reproductive age has declined by 9%

(from 62.1 to 56.5 births per 1,000 females ages 15-44). **The average age at first birth was 28.0 years** in 2002 compared with 27.7 years in 1999.

Infant Mortality

The infant mortality rate (IMR) in 2002 was 4.9 infant deaths per 1,000 live births, compared with 5.0 in 2001. There were a total of 397 infant deaths in 2002, compared with 407 in 2001. The infant mortality rate has decreased 29% since 1990, from 7 deaths per 1,000 live births to 4.9 deaths per 1,000 live births.

Infants born to black non-Hispanic mothers continued to have the highest IMR (11.6 per 1,000 live births), although this was slightly lower than the 2001 rate (12.1). 2002 IMR rates for infants of Hispanic mothers and for infants of Asian mothers were slightly lower than in 2001, while rates remained the same for infants born to white non-Hispanic mothers.

Pregnancy-Associated and Maternal Mortality Ratios

In 2002, there were 19 pregnancy-associated deaths, including 2 maternal deaths in Massachusetts. The 2002 pregnancy-associated mortality ratio (PAMR) was 23.3 deaths per 100,000 live births and the maternal mortality ratio (MMR) was 2.4 per 100,000 live births. Since 1990, the annual PAMR fluctuated from a low of 18.0 in 1990 to a high of 32.8 in 2001. However, due to the small number of cases, the differences are not statistically significant.

(Note: A "pregnancy-associated death" is the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. A "maternal death" is the death of a woman while pregnant or within 42 days of pregnancy, the cause of which is related to the pregnancy or its management. See Glossary for further information).

Teen Births

Births to women ages 15-19 decreased between 2001 and 2002, from a total of 4,979 births to 4,642 births. The rate in 2002 was 22.6 births per 1,000 females ages 15-19, a 7% decrease from the 2001 rate of 24.3. The teen birth rate in Massachusetts has declined by 31% since 1990.

The low birthweight percentage among births to teen mothers was 10.3% in 2002, compared with 7.4% among births to mothers ages 20 and older in 2002.

Among Massachusetts municipalities in 2002 with the highest number of teen births, **teen birth rates were highest in Holyoke** (82.0 per 1,000 females ages 15-19), **Chelsea** (81.7), **Lawrence** (79.7), **Springfield** (70.1), and **New Bedford** (58.8).

Low Birthweight

The percentage of low birthweight infants (less than 2,500 grams or 5.5 pounds) increased to 7.5% in 2002 (from 7.2% in 2001). Since 1990, the percentage of low birthweight infants has increased by 29%, from 5.8% in 1990.

Between 2001 and 2002, the percentage of low birthweight infants increased by 3% for white non-Hispanics (6.6% to 6.8%), by 13% for black non-Hispanics (11.2% to 12.6%), by 10% for Asians (7.3% to 8.0%), and by 1% for Hispanics (8.2% to 8.3%).

Between 2001 and 2002, the percentage of low birthweight infants increased slightly among singletons (5.1% to 5.2%) and among multiple births (52% to 53%).

Very low birthweight (VLBW; infants weighing less than 3.3 pounds) has remained stable at 1.4% since 1999. For the third year in a row, black non-Hispanic infants continue to have the highest percentage of VLBW, experiencing a small decrease from 3.2% in 2001 to 3.1% in 2002.

Preterm Deliveries

The percentage of preterm infants (delivered before the 37th week of gestation) increased 6% from 8.0% in 2001 to 8.5% in 2002. Preterm rates increased for all race and Hispanic ethnicity groups, but increases were greatest for Asians (a 21% increase; from 6.3% to 7.6%) and Hispanics (a 7% increase; from 8.3% to 8.9%). Black non-Hispanic women had the highest proportion of preterm infants.

Less than a quarter of a percent (0.2%) of births had gestational age of less than 24 weeks, about the same since at least 1994. **The percentage of infants delivered very early (before the 28th week of gestation) has remained the same since 1997 at 0.6%.** Black non-Hispanic women had the highest proportion of infants delivered very early, 1.7%, which was more than double that of any other race group.

Births by Race, Hispanic Ethnicity, and Mother's Birthplace

The percentage of births to white non-Hispanic and black non-Hispanic mothers has decreased since 1990. From 1990 to 2002, it decreased by 8%, from 78.4% to 72.1% for white non-Hispanic mothers, and by 4% for black non-Hispanic mothers, from 7.7% to 7.4%. The percentage of births to Asian mothers increased by 78%, from 3.7% to 6.6%. The percent of births to Hispanic mothers increased by 30%, from 9.1% to 11.8%.

The percentage of births to non-U.S.-born mothers increased 6% between 2001 and 2002 – from 22.1% to 23.3%. **In 2002, more than 1 of every 5 births to Massachusetts residents was to a mother born outside the continental U.S., Puerto Rico, and the U.S. Territories.**

Smoking

The percentage of women who smoked during pregnancy decreased from 9.1% in 2001 to 7.9% in 2002. Decreases in smoking during pregnancy occurred among all races and Hispanic ethnicity groups.

Prenatal Care

Adequacy of prenatal care decreased by less than 1% from 85.2% in 2001 to 84.7% in 2002. Adequacy of prenatal care is a measure of the timing and number of prenatal care visits,

not an assessment of the quality of prenatal care. [Please note: these data are not comparable to data published in reports prior to 2001. Beginning with last year's report, the Adequacy of Prenatal Care Utilization (APNCU) Index is used to measure adequacy of prenatal care, replacing the Kessner Index. Please see Chapter 5 for more detail.]

Cesarean Sections

The Cesarean section delivery rate continues to increase. The cesarean section rate among births to Massachusetts residents was 28.2% in 2002, an increase of 10% from 2001 (25.6%). Increases were among both primary and repeat c-sections. The primary c-section rate increased by 9%, from 18.8% to 20.5%, and the repeat c-section rate increased by 6%, from 80.8% to 85.3%. Accordingly, the rate of vaginal births after cesarean section (VBAC) deliveries decreased substantially, from 19.2% in 2001 to 14.7% in 2002, a decrease of 23%.

Breastfeeding

The percentage of mothers breastfeeding or intending to breastfeed increased slightly from 75.3% in 2001 to 76.1% in 2002. The breastfeeding rate increased for all major race/Hispanic ethnicity groups, but the largest increase between 2001 and 2002 was among Hispanics (4% increase; from 78.1% to 81.0%) followed by black non-Hispanics (2% increase; from 75.8% to 77.0%).

Public Source of Prenatal Care Payment

The percentage of mothers paying for prenatal care through a public source **increased** between 2001 and 2002, **from 27.8% to 28.5%.**

Mothers whose prenatal care was Medicaid were more likely to be very young mothers, more likely to deliver LBW infants, less likely to receive adequate prenatal care, less likely to breastfeed, more likely to be unmarried, and less likely to receive a Cesarean section than mothers whose prenatal care was privately funded.

Multiple Births

The percentage of multiple births (twins, triplets, and higher order) continues to increase; 4.9% of births in 2002 were multiples, compared with 4.4% in 2001. This percentage has risen steadily since 1990 (2.6%). The percentage of multiples among births to mothers ages 35+ (7.9%) was double the percentage for mothers under age 35 (4.0%).

Comparison of Massachusetts and U.S. Indicators

Massachusetts perinatal health indicators in 2002 were generally better than those for the U.S. in 2002.

According to final U.S. birth statistics for 2002, comparisons were as follows:

- The **birth rate** for women ages 15-44 in Massachusetts (56.5 births per 1,000 women 15-44 years) was **13% lower** than the U.S. birth rate (64.8).

- The **teen birth rate** in Massachusetts (22.6 births per 1,000 women ages 15-19) was **47% lower** than the U.S. teen birth rate (42.9).

- The **low birthweight** rate in Massachusetts (7.5%) was **4% lower** than the U.S. low birthweight rate (7.8%).

- The **preterm** rate in Massachusetts (8.5%) was **29% lower** than the U.S. low birthweight rate (12.1%).

- The **percentage of women receiving prenatal care in the first trimester** in Massachusetts (84.2%) **was slightly higher** than the U.S. percentage (83.8%).

- The **cesarean section delivery rate** in Massachusetts (28.1%) was **8% higher** than the U.S. c-section rate (26.1%).

- **The average age at first birth in 2002 was 28.0 years** compared with the U.S figure of 25.1 years, nationally an all time high.

- According to final U.S. death statistics for 2001, the **infant mortality rate (IMR)** in Massachusetts (4.9) was **28% lower** than the U.S. IMR (6.8).

Birth Data Availability

Detailed information on 2002 births in Massachusetts is also available on the Department's free, Internet-based public health information service, **MassCHIP**. To register as a user, visit the MassCHIP website at http://masschip.state.ma.us or call 1-888-MASCHIP (within MA only) or (617) 988-3396.

This report is available on the DPH website at: http://www.state.ma.us/dph/pubstats.htm.

CHAPTER 1

BIRTH CHARACTERISTICS

Birth Numbers and Rates

In 2002, 80,624 births occurred to Massachusetts residents (Table 1). The number of resident live births in Massachusetts has decreased by 13% since 1990 (92,461 births).

In 2002, the fertility rate was 56.5 births per 1,000 women ages 15-44 years. This rate has decreased by 9% from 1990 and by 0.5% from 2001 (Table 1).

The Massachusetts fertility rate in 2002 was 13% below the U.S. rate of 64.8 per 1,000 women ages 15-44 (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2).

Distribution of Births by Race and Hispanic Ethnicity and Mother's Birthplace

In 2002, of all live births to Massachusetts residents, 72% (58,136) were to white non-Hispanic mothers; 12% (9,543) were to Hispanic mothers; 7% (5,948) were to black non-Hispanic mothers; 7% (5,300) were to Asian mothers; and 2% were to mothers who designated themselves as Indian or other race (Table 2A). The percentage of births to Asian mothers increased by 12% from 2001.

The percentage of births to white non-Hispanic and black non-Hispanic mothers has decreased since 1990. From 1990 to 2002, it decreased by 8%, from 78.4% to 72.1%, and the percentage of births to black non-Hispanic mothers decreased by 4%, from 7.7% to 7.4%. The percentage of births to Asian mothers increased by 78%, from 3.7% to 6.6%. The percent of births to Hispanic mothers increased by 30%, from 9.1% to 11.8% (Table 1).

In 2002, 26% of births in Massachusetts were to women born outside of the continental United States. The percentage of non-U.S.-born (born outside of the U.S. states, Puerto Rico, and U.S. territories) mothers varied by race and ethnicity: 90% of Asian births were to non-U.S.-born women; 46% of Hispanic births were to non-U.S.-born women, and another 21% were to women born in Puerto Rico or other U.S. Territories; and 45% of black non-Hispanic births were to women who were non-U.S.-born (Table 2A).

Emerging Populations

Despite a very small percent (less than 1%) decrease in overall births from 2001, certain groups have experienced large increases in the numbers of births. Five groups have increased more than 10%: Asian Indians, Brazilians, Chinese, Africans, and Vietnamese. Births to Asian Indian mothers have increased by 23% since last year. Births to both Brazilian and Chinese mothers have increased 18% since 2001, and the number of births to African mothers has increased 17%. The number of births to Vietnamese mothers has increased 11% since 2001.

Teen Births

In 2002, there were 4,642 births to women ages 15-19, compared with 4,979 births for this age group in 2001 (Table 1). The number of teen births has steadily decreased since 1990, with an overall decrease of 36% (7,258 teen births in 1990).

The teen birth rate (births per 1,000 women ages 15-19) was 22.6 in 2002, a decrease of 8% from 2001 (24.3) (Table 1). In contrast, the 2002 U.S. teen birth rate was 42.9 (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2), 47% above the Massachusetts teen birth rate.

Teen birth rates in Massachusetts have been decreasing steadily since 1990. The teen birth rate in Massachusetts decreased by 36% from 1990 to 2002 (Table 1).

Statewide, in 2002, 2% of births were to women under age 18, and 6% were to women under the age of 20 (Table 2A). The highest percentage of births to women under 18 among racial and ethnic groups was for Hispanics (6%), followed by black non-Hispanics (4%), Asians (2%), and white non-Hispanics (1%) (Table 2A).

Among maternal ancestry categories, Puerto Ricans and Cambodians had the highest teen birth percentages in 2002. For Puerto Rican women, 24% of births were to women under age 20 and 10% to women under age 18 (Table 2B). For Cambodians, these percentages were 18% and 10%, respectively.

Low Birthweight

In 2002, 7.5% of infants born to Massachusetts women were low birthweight (weighed less than 2,500 grams or 5.5 pounds at birth) (Table 1). This percentage increased 4%, from 7.2% in 2001. This figure was the highest ever recorded in the state.

In 2002, the low birthweight rate in Massachusetts was 4% below the national figure of 7.8%. The percentage of low birthweight births also increased nationwide from 2001 to 2002, from 7.7% to 7.8%, which was the highest in three decades (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2).

The percentage of low birthweight infants varied by mother's race and ethnicity. Black non-Hispanic mothers had the highest proportion of low birthweight infants: 12.6%; followed by Hispanic mothers: 8.3%; Asian mothers: 8.0%; and white non-Hispanic mothers: 6.8% (Table 2A). The low birthweight percentage for black non-Hispanic mothers increased by 13% from 11.2% in 2001 to 12.6% in 2002, and the low birthweight percentage for Asians increased 10% from 7.3% in 2001 to 8.0% in 2002. Percentages for other race groups increased by less than 4%.

In maternal ancestry categories, the highest percentages of low birthweight in 2002 occurred among mothers who identified their ancestries as African-American (13.6%), Cambodian (11.5%), Haitian (12.0%), West Indian/Caribbean (11.6%), and Puerto Rican (10.2%). The highest percentages of very low birthweight (less than 1,500 grams or 3.3 pounds), occurred among mothers who identified their ancestry as: West Indian/Caribbean (3.5%), Haitian (3.4%), and African-American (2.9%) (Table 2B).

Prenatal Care

SPECIAL NOTE ON MEASURING ADEQUACY OF PRENATAL CARE: Beginning with *Massachusetts Births 2001*, adequacy of prenatal care is being measured by the Adequacy of Prenatal Care Utilization (APNCU) Index instead of the Kessner Index, which has been used in

past reports. This improves upon the Kessner Index in various ways, the most important of which is the ability to distinguish between inadequate prenatal care due to the timing of initiation and inadequate care due to insufficient prenatal care visits.

Table 1 provides a comparison of values based on the two indices between 1996 and 2002. The values for the APNCU Index are consistently higher than those calculated with the Kessner Index. (Table 1). Please see the Technical Appendix for more information on the change from the Kessner Index to the APNCU Index. Please note: adequacy of prenatal care is a measure of the timing and number of prenatal care visits, and does not reflect the quality of care.

In 2002, 84.7% of mothers received adequate prenatal care, decreasing from 85.2% in 2001. Also in 2002, 84.2% of women received prenatal care during the first trimester of pregnancy (Table 2A).

The percentage of adequate prenatal care varied by mother's race and Hispanic ethnicity, ranging from 74.8% for black non-Hispanic mothers to 87.1% for white non-Hispanic mothers. The rates for Hispanic and Asian mothers were 79.0% and 81.9%, respectively (Table 2A).

Adequacy of prenatal care also varied by maternal ancestry. Mothers reporting their ancestries as European, Chinese, and Other Portuguese (not Cape Verdean or Brazilian) were the groups most likely to receive adequate prenatal care – 88.3%, 88.0%, 88.0%, respectively, while Cambodian and Cape Verdean mothers were least likely to receive adequate prenatal care – 62.4% and 69.7%, respectively (Table 2B).

Cesarean Section Deliveries

In 2002, 28.2% of births to resident Massachusetts women were delivered by Cesarean section, which is a 10% increase over the 2001 percentage of 25.6% (Table 2A). The Cesarean section percentage continues to increase; 6% from 1999 (22.4%) to 2000 (23.8%); 8% from 2000 to 2001 (25.6%), and increased 10% from 2001 to 2002 (28.1%). The Cesarean section rate in Massachusetts in 2002 was 8% higher than the nationwide rate of 26.1%. The nationwide rate for 2002 was the highest ever-recorded (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2).

Black non-Hispanic women had the highest percentage of Cesarean section deliveries, at 29.9%, and Asian women had the lowest percentage, at 24.1% (Table 2A). With regard to maternal ancestry, the highest percentage of Cesarean section deliveries occurred among Brazilian women (37.9%) and the lowest percentage among Cambodian women (13.8%) (Table 2B).

Breastfeeding

In 2002, 76.1% of Massachusetts mothers reported that they were breastfeeding or intending to breastfeed their infants (Table 2A). This represents a 35% increase since 1990 (56.6%).

The percentage of mothers breastfeeding differed slightly by maternal race and Hispanic ethnicity, with the highest percentage reported among Hispanics (81.0%) and the lowest among white non-Hispanics (74.7%) (Table 2A). There was more variation among mothers of different self-identified ancestry groups. The highest rates of breastfeeding were among Asian Indians

(95.9%), Brazilians (94.1%), and Salvadorans (93.3%) (Table 2B). In contrast, only 50.2% of women identifying themselves as "Other Portuguese", and 51.0% of Cambodians reported that they were breastfeeding or intending to breastfeed their infants.

The percentage of mothers breastfeeding or intending to breastfeed increased as mother's age increased. For teens 15-19, the percentage was 63.3%, while for women ages 45 and above the percentage was highest, at 84.0% (Figure 2).

Birth Characteristics in the 30 Largest Massachusetts Cities and Towns

In 2002, among live births to residents of the 30 largest municipalities in the Commonwealth:

- Crude birth rates (number of births per 1,000 population) were highest in Lawrence (20.0), Lowell (16.5), Lynn (16.4), and Brockton (16.3). The crude birth rates in these cities were 25% or more above the state level (12.7). Crude birth rates were lowest in Newton (9.8) and Barnstable (9.2) (Table 3A).

- Five communities (Springfield, Framingham, Brockton, Pittsfield, and Boston) recorded low birthweight percentages that were at least 25% higher than the statewide average of 7.5% (Table 3A).

- Over 90% of mothers living in Arlington, Brookline, Medford, Newton and Weymouth received adequate prenatal care. In contrast, fewer than 70% of mothers living in Pittsfield (54.6%) and Lowell (68.6%) received adequate prenatal care (Table 3A).

- The birth rate for teens was highest in Lawrence (79.7 births per 1,000 females ages 15 to 19 years) and in Springfield (70.1). These two communities had rates greater than three times the statewide teen rate of 22.6. (Table 3A), although the teen birth rate for Lawrence in 2002 was 16% lower than it was in 2001 (95.2).

- Two communities had 2002 infant mortality rates (IMR) in excess of 10 deaths per 1,000 live births: Haverhill (10.6) and Lawrence (10.1); and the infant mortality rate in Springfield approached 10 at 9.8. Infant mortality rates should be interpreted with caution in these communities since they are based on a small number of infant deaths (Haverhill: 9; Lawrence: 8; and Springfield: 23) (Table 3A).

- Based on a three-year infant mortality rate from 2000-2002, the communities with the highest IMRs were: Worcester (8.9), Lawrence (8.0), and Fall River (8.0) (Table 3A).

Birth Characteristics in Community Health Network Areas

In 2002, among live resident births in the 27 Massachusetts Community Health Network Areas (CHNAs):

- Two CHNAs had crude birth rates of 15 births or more per 1,000 residents: Community Partners for Health (Milford) (15.6) and Greater Lawrence Community Health Network (15.3) (Table 3B).

- More than 8.7% of resident births in four CHNAs were low birthweight -- The Community Health Connection (Springfield), Partners for a Healthier Community (Fall River), Alliance for Community Health (Boston/Chelsea/Revere/Winthrop), and the Greater Brockton Community Health Network (these percentages were 15% or more higher than the statewide average of 7.5%) (Table 3B).

- Less than 70% of mothers received adequate prenatal care in the Community Health Network of Berkshire County (65.4%), while over 90% of mothers living within the Community Health Network North (Beverly/Gloucester), Greater Haverhill Community Health Network, and the Community Health Alliance (Greater Quincy) received adequate prenatal care (Table 3B).

- Teen birth rates among the Community Health Connection (Springfield) and the Greater Lawrence Community Health Network were the highest in the state, approximately double the statewide teen birth rate, while rates were less than one-fourth the statewide average for Greater Woburn/Concord/Littleton Community Health Network, West Suburban Health Network (Newton/Waltham), and Partnership for Health in Hampshire County (Northampton) (Table 3B).

- The Community Health Connection (Springfield) had the highest infant mortality rate in 2002: 8.8 deaths per 1,000 live births. Because of the relatively small number of infant deaths, mortality rates in individual CHNAs should be interpreted with caution (Table 3B).

Tobacco Use

In 2002, 7.9% of births were to mothers who reported smoking cigarettes during their pregnancies (Fig. 3). This represents a 59% decline from 1990 (19.3%), and a decline of 13% from the previous year, 2001 (9.1%).

Smoking prevalence during pregnancy differed by mother's race and Hispanic ethnicity. White non-Hispanic women had the highest prevalence of smoking during pregnancy (8.9%), followed by black non-Hispanic women (7.2%), Hispanic women (6.3%), and, finally, Asian women (1.3%) (Fig. 3).

The prevalence of smoking during pregnancy mostly decreased with higher education levels of the mother; over 21% of mothers with less than a high school education smoked during pregnancy, compared with less than 1% of women with post-college education (Fig. 3). This pattern was the same for white non-Hispanic women, black non-Hispanic women, and Hispanic women.

The majority (85.3%) of women who gave birth in 2002 were non-smokers prior to pregnancy, and 99.9% of them continued to abstain from smoking during pregnancy (Fig. 4). (Fifty-four women started smoking during pregnancy.) Out of the15% of women who smoked prior to pregnancy, 53% were "light" smokers (1-10 cigarettes daily); 41% were "moderate" smokers (11-20 cigarettes daily); and 7% were "heavy" smokers (21 or more cigarettes daily). Almost half (47%) of pre-pregnancy smokers quit smoking during pregnancy.

Patterns in Number and Rate of Births by Age Group

There has been a marked change in the age distribution of Massachusetts resident mothers since 1980. Approximately 25% of women giving birth were ages 30 years and older in 1980 compared with 57% in 2002. Beginning in 1996, the number of births to mothers aged 30 years and older exceeded the number of births to mothers under age 30. This trend has continued through 2002 (Fig. 1).

In Massachusetts, the fertility rate (births to women ages 15-44 years per 1,000 women ages 15-44) decreased 9% from 1990 (62.2) to 2002 (56.5) (Table 4). In 2002, the age-specific birth rates were highest for 30-34 year old (108.5 per 1,000) and 25-29 year old mothers (83.8 per 1,000). The birth rates for women ages 30 years and older have increased steadily throughout the 1990s (data not shown).

Since 1990, birth rates have increased for every 5-year age group of women ages 30 and above and decreased for every 5-year age group of women under 30 (Table 4). The largest birth rate increases have been for mothers in the oldest age groups, while the largest decreases have been among the youngest age groups (Table 4).

In 2002, there were 73 births to mothers ages 12-14 years (a decrease of 5 births from 2001) and there were 175 births to women 45 years of age or older (an increase of 17%) (Table 4).

Plurality

Plurality is the number of births in one delivery. In 2002, 95.1% of all births were singletons, 4.6% were twins (3,708 births) and 0.3% were triplets (239 births), and one quadruplet. The total percentage of multiple births (twins, triplets or more) was 4.9% in 2002, which was an 11% increase over 2001 (4.4%) (Table 6).

The percentage of multiple births has increased by 89% since 1990 (2.6%) and this increase varies by age. For women under 35 years, the percentage of multiple births increased from 2.5% in 1990 to 4.0% in 2002, an increase of 60%. The percentage of multiple births for women ages 35 years and older has increased at more than double the rate for younger women (126%), from 3.5% in 1990 to 7.9% in 2002 (Table 6).

Education

In 2002, 10% of women who gave birth had less than a high school education; 25% had a high school diploma or GED; 23% had some college education; and 42% had a college degree or more (Table 7).

Maternal educational attainment varied by race and Hispanic ethnicity; 54% of Asian women and 50% of white non-Hispanic women had at least a college degree, compared with 19% of black non-Hispanic women and 10% of Hispanic women (Table 7).

Women with more education were more likely to receive adequate prenatal care; more likely to breastfeed; more likely to have multiple births; and more likely to be married. These mothers

were less likely to smoke during pregnancy and less likely to receive publicly financed prenatal care (Table 7).

Healthy People 2010 Objectives

Healthy People 2010 (HP2010) sets targets for each measurable objective[1]. Table 8 presents the most recent Massachusetts data for HP2010 Maternal, Infant, and Child Health objectives, and measures the state's progress toward meeting the targets set for 2010.

Out of 16 objectives presented, Massachusetts has already met the 2010 target for three indicators: the postneonatal mortality rate, breastfeeding, and maternal mortality ratio. For eight objectives, the 2002 Massachusetts indicators are within 25% of the target goals: infant mortality rate, fetal mortality rate, perinatal mortality rate, preterm birth, early and adequate prenatal care, prenatal care beginning in the first trimester, very low birthweight infants born at Level III hospitals, and smoking during pregnancy. For five objectives, Massachusetts is still more than 25% away from achieving the targets: neonatal mortality rate, low birthweight, very low birthweight, and Cesarean sections (both low-risk women giving birth for the first time and for low-risk women with prior Cesarean section).

[1] U.S. Department of Health and Human Services. *Tracking Healthy People 2010*. Washington, DC: U.S. Government Printing Office, November 2000.

Table 1. Trends in Birth Characteristics, Massachusetts: 1980, 1985, 1990-2002

Characteristic		1980	1985	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Births[1]	**n**[2]	72,591	81,781	92,461	88,176	87,202	84,627	83,758	81,562	80,164	80,321	81,406	80,866	81,582	81,014	80,624
	Rate[3]	53.4	57.5	62.1	59.4	59.1	57.6	57.0	55.5	54.6	54.7	55.6	55.9	57.2	56.8	56.5
Race of Mother																
White[4]	**n**	66,220	71,854	80,775	76,983	76,052	73,704	72,980	71,083	69,485	69,503	70,452	69,305	69,371	68,728	67,874
	%[5]	91.2	87.9	87.4	87.3	87.2	87.1	87.1	87.2	86.7	86.5	86.5	85.7	85.0	84.8	84.2
Black	**n**	4,626	5,099	7,729	7,352	7,203	6,916	6,713	6,299	5,946	6,182	6,337	6,524	6,445	6,555	6,649
	%[5]	6.4	6.2	8.3	8.3	8.3	8.2	8.0	7.7	7.4	7.7	7.8	8.1	7.9	8.1	8.2
Asian/Other[6]	**n**	1,069	1,741	3,688	3,566	3,582	3,664	3,790	3,817	3,950	4,217	4,248	4,615	5,205	5,279	5,793
	%[5]	1.5	2.1	4.0	4.0	4.1	4.3	4.5	4.7	4.9	5.3	5.2	5.7	6.4	6.5	7.2
Unknown	**n**	676	3,087	269	275	365	343	275	363	783	419	369	422	561	452	308
	%[5]	0.9	3.8	0.3	0.3	0.4	0.4	0.3	0.4	1.0	0.5	0.5	0.5	0.7	0.6	0.4
Teen Births (Ages 15-19)	**n**	7,694	6,859	7,258	6,892	6,555	6,469	6,412	5,990	5,758	5,801	5,823	5,515	5,305	4,979	4,642
	Rate[3]	28.1	28.7	35.4	35.4	34.5	34.0	33.2	30.3	28.5	28.5	28.1	26.7	25.8	24.3	22.6
Births to Unmarried Mothers	**n**	11,356	15,044	22,837	22,852	22,612	22,345	22,302	20,857	20,253	20,640	21,191	21,448	21,621	21,620	21,604
	%	15.6	18.4	24.7	25.9	25.9	26.4	26.6	25.6	25.3	25.7	26.0	26.5	26.5	26.7	26.8
Low Birthweight	**n**	4,413	4,751	5,388	5,199	5,137	5,202	5,335	5,174	5,105	5,617	5,655	5,708	5,711	5,795	6,060
	%	6.1	5.8	5.8	5.9	5.9	6.2	6.4	6.4	6.4	7.0	7.0	7.1	7.1	7.2	7.5
Preterm	**n**	6,732	6,009	6,313	6,492	6,438	5,705	5,831	6,117	6,136	5,831	6,117	6,136	6,582	6,412	6,795
	%	7.4	6.8	7.3	7.8	7.9	7.2	7.3	7.6	7.6	7.3	7.6	7.6	8.3	8.0	8.5
Adequate Prenatal Care																
Kessner Index[7]	**%**	82.0	79.4	80.1	81.6	82.9	83.8	84.3	84.2	79.9	80.0	79.8	79.4	79.1	80.4	79.9
APNCU Index[8]	**%**									83.3	82.9	82.9	82.9	83.3	85.2	84.7

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Births presented in all tables are resident live births unless otherwise specified. 2. Differences in numbers of births from previous publications are the result of updated files. 3. Birth rates represent the total number of births to women ages 15-44 years per 1,000 females ages 15-44; teen birth rates refer to number of births per 1,000 women age 15-19. 2000-2002 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates (see Technical Notes in Appendix). PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES. 4. On tables and graphs that include data prior to June 1986, the race classifications do not include an ethnicity component; most Hispanics are included in the race category of white. 5. Percentages are calculated based on all births, including those to mothers of unknown race. 6. Other races include American Indian and others not specified. 7. Adequacy of prenatal care in Massachusetts has historically been measured with the Kessner Index, based on the timing of care and number of visits. This measure is calculated based on only those births with known adequacy of prenatal care. Changes in the calculation of the Kessner Index in 1996, as well as computational adjustments made for 1996-2000 data, make data prior to 1996 non-comparable to data from 1996 onward. 8. Beginning with last year's publication, the APNCU Index has replaced the Kessner Index as the standard measurement of adequacy of prenatal care (see Technical Notes for more information).

Table 2A. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2002

Race and Hispanic Ethnicity (by mother's birthplace)	Births[1]		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breastfeeding[5]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate[4]		First Trimester					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**80,624**	**100.0**	**1,571**	**1.9**	**4,715**	**5.8**	**1,109**	**1.4**	**6,060**	**7.5**	**67,784**	**84.7**	**67,457**	**84.2**	**22,553**	**28.1**	**60,266**	**76.1**
U.S. States / D.C.	59,625	74.0	1,220	2.0	3,615	6.1	782	1.3	4,474	7.5	51,063	86.3	51,378	86.7	16,813	28.3	42,382	72.6
Puerto Rico/U.S. Terr.[7]	2,081	2.6	156	7.5	381	18.3	56	2.7	228	11.0	1,627	78.9	1,551	75.0	487	23.6	1,498	72.7
Non-U.S.-Born[8]	18,825	23.3	194	1.0	715	3.8	266	1.4	1,340	7.1	15,024	80.4	14,456	77.2	5,222	27.8	16,386	87.4
White non-Hispanic	**58,136**	**72.1**	**598**	**1.0**	**2,167**	**3.7**	**666**	**1.1**	**3,952**	**6.8**	**50,347**	**87.1**	**50,763**	**87.8**	**16,737**	**28.9**	**42,458**	**74.7**
U.S. States / D.C.	52,139	89.7	566	1.1	2,019	3.9	600	1.2	3,597	6.9	45,304	87.4	45,873	88.4	14,965	28.8	37,288	73.1
Puerto Rico/U.S. Terr.[7]	40	0.1	3	--[6]	3	--[6]	6	15.0	12	30.0	32	84.2	30	76.9	14	35.0	27	81.8
Non-U.S.-Born[8]	5,887	10.1	28	0.5	144	2.4	57	1.0	332	5.6	4,956	84.5	4,803	81.8	1,733	29.5	5,143	87.9
Black non-Hispanic	**5,948**	**7.4**	**229**	**3.9**	**630**	**10.6**	**182**	**3.1**	**747**	**12.6**	**4,370**	**74.8**	**4,199**	**71.4**	**1,769**	**29.9**	**4,540**	**77.0**
U.S. States / D.C.	3,179	53.4	213	6.7	552	17.4	107	3.4	446	14.1	2,404	76.8	2,312	73.4	867	27.4	2,102	66.9
Puerto Rico/U.S. Terr.[7]	25	0.4	0	0.0	2	--[6]	2	--[6]	4	--[6]	19	79.2	17	70.8	10	41.7	22	91.7
Non-U.S.-Born[8]	2,739	46.0	16	0.6	76	2.8	71	2.6	294	10.7	1,944	72.5	1,868	69.2	892	32.7	2,416	88.6
Hispanic	**9,543**	**11.8**	**607**	**6.4**	**1,557**	**16.3**	**162**	**1.7**	**792**	**8.3**	**7,491**	**79.0**	**7,155**	**75.3**	**2,325**	**24.5**	**7,702**	**81.0**
U.S. States / D.C.	3,106	32.5	343	11.0	842	27.1	52	1.7	307	9.9	2,419	78.4	2,323	75.2	691	22.3	2,152	69.7
Puerto Rico/U.S. Terr.[7]	2,009	21.1	153	7.6	376	18.7	48	2.4	212	10.6	1,570	78.7	1,498	75.0	461	23.1	1,444	72.3
Non-U.S.-Born[8]	4,428	46.4	111	2.5	339	7.7	62	1.4	273	6.2	3,502	79.6	3,334	75.5	1,173	26.6	4,106	92.8
Asian	**5,300**	**6.6**	**80**	**1.5**	**206**	**3.9**	**76**	**1.4**	**424**	**8.0**	**4,328**	**81.9**	**4,138**	**78.3**	**1,275**	**24.1**	**4,248**	**80.5**
U.S. States / D.C.	537	10.1	62	11.5	112	20.9	12	2.2	63	11.8	440	82.4	400	74.9	118	22.1	417	78.2
Puerto Rico/U.S. Terr.[7]	2	--[6]	0	0.0	0	0.0	0	0.0	0	0.0	2	--[6]	2	--[6]	1	--[6]	2	--[6]
Non-U.S.-Born[8]	4,745	89.5	18	0.4	92	1.9	64	1.3	358	7.5	3,874	81.9	3,724	78.6	1,151	24.3	3,829	80.8
Other[9]	**1,576**	**2.0**	**56**	**3.6**	**151**	**9.6**	**22**	**1.4**	**137**	**8.7**	**1,191**	**76.3**	**1,143**	**73.0**	**421**	**26.8**	**1,275**	**81.9**
U.S. States / D.C.	564	35.8	35	6.2	89	15.8	10	1.8	54	9.6	445	79.9	420	75.1	149	26.7	387	69.7
Puerto Rico/U.S. Terr.[7]	3	--[6]	0	0.0	0	0.0	0	0.0	0	0.0	3	100.0	3	--[6]	1	--[6]	2	--[6]
Non-U.S.-Born[8]	1,009	64.0	21	2.1	62	6.1	12	1.2	83	8.2	743	74.3	720	71.8	271	26.9	886	88.8
Unknown[10]	**121**	**0.2**	**1**	--[6]	**4**	--[6]	**1**	--[6]	**8**	**9.9**	**57**	**79.2**	**59**	**80.8**	**26**	**31.3**	**43**	**70.5**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. In the first category, "Births", percentages of race/Hispanic ethnicity are based on state total of births (including births of unknown race/ethnicity), percentages of mother's birthplace categories are based on subtotals of each race/Hispanic ethnicity category. For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. Beginning with last year's publication, the Adequacy of Prenatal Care Utilization Index has replaced the Kessner Index as the measure of adequate prenatal care. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Calculations based on fewer than five events are excluded. 7. The category "Puerto Rico/U.S. Territories" includes women born in Puerto Rico, the U.S. Virgin Islands, and Guam. Approximately 95% of the births in this category were to women born in Puerto Rico. 8. The category "Non-U.S.-Born" includes women born outside of the 50 U.S. states, District of Columbia, and Puerto Rico/U.S. territories. 9. Other: Mothers who designated themselves as American Indian or Other race. 10. Unknown: Mothers who did not indicate a race/ethnicity.

Table 2B. Birth Characteristics by Maternal Ancestry, Massachusetts: 2002

Maternal Ancestry	Births[1]		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breastfeeding[5]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate[4]		1st Trimester					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**80,624**	**100.0**	**1,571**	**1.9**	**4,715**	**5.8**	**1,109**	**1.4**	**6,060**	**7.5**	**67,784**	**84.7**	**67,457**	**84.2**	**22,553**	**28.1**	**60,266**	**76.1**
Puerto Rican	4,487	5.6	432	9.6	1,053	23.5	88	2.0	455	10.2	3,469	77.9	3,321	74.4	1,022	22.9	3,096	69.4
Dominican	1,760	2.2	75	4.3	207	11.8	38	2.2	136	7.7	1,462	83.4	1,412	80.5	508	28.9	1,586	90.3
Salvadoran	853	1.1	27	3.2	82	9.6	7	0.8	40	4.7	655	77.4	580	68.2	159	18.7	796	93.3
Other Central American	842	1.0	30	3.6	97	11.5	11	1.3	53	6.3	641	76.6	610	72.6	189	22.5	769	91.3
Other Hispanic[7]	1,601	2.0	43	2.7	118	7.4	18	1.1	108	6.8	1,264	79.4	1,232	77.2	447	28.0	1,455	91.1
Chinese	1,478	1.8	5	0.3	17	1.2	18	1.2	96	6.5	1,296	88.0	1,225	83.2	347	23.5	1,230	83.3
Vietnamese	844	1.0	11	1.3	31	3.7	12	1.4	69	8.2	658	78.5	634	75.3	188	22.3	553	65.6
Cambodian	575	0.7	55	9.6	106	18.4	12	2.1	55	9.6	358	62.4	314	54.7	79	13.8	293	51.0
Asian Indian	1,165	1.4	0	0.0	3	--[6]	15	1.3	99	8.5	997	85.7	978	84.1	342	29.4	1,116	95.9
Other Asian/PI[8]	1,326	1.6	10	0.8	47	3.5	16	1.2	110	8.3	1,089	82.3	1,059	80.0	350	26.5	1,155	87.5
Cape Verdean	790	1.0	30	3.8	91	11.5	9	1.1	67	8.5	544	69.7	505	64.3	200	25.4	612	77.7
Brazilian	1,518	1.9	30	2.0	104	6.9	9	0.6	101	6.7	1,218	80.2	1,187	78.2	575	37.9	1,428	94.1
Other Portuguese	1,435	1.8	29	2.0	108	7.5	12	0.8	106	7.4	1,258	88.0	1,205	84.3	386	26.9	719	50.2
Haitian	1,085	1.3	18	1.7	34	3.1	37	3.4	130	12.0	750	71.0	719	67.3	374	34.6	927	85.6
W. Indian /Carib.[9]	636	0.8	8	1.3	43	6.8	22	3.5	74	11.6	483	77.4	455	72.7	192	30.3	546	86.4
African-American	2,827	3.5	175	6.2	470	16.6	83	2.9	384	13.6	2,120	76.2	2,052	73.3	740	26.3	1,896	67.4
African[10]	1,113	1.4	1	--[6]	16	1.4	17	1.5	97	8.7	800	73.0	770	70.1	368	33.2	1,019	91.8
Middle Easterner[11]	990	1.2	2	--[6]	18	1.8	12	1.2	63	6.4	820	83.4	818	83.1	269	27.2	893	90.3
Native American	266	0.3	12	4.5	31	11.7	3	--[6]	20	7.5	212	80.0	210	79.2	86	32.5	184	69.4
European	15,202	18.9	47	0.3	250	1.6	155	1.0	880	5.8	13,342	88.3	13,303	87.9	4,500	29.7	12,406	82.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. In the first category, "Births", percentages are based on column total (state total of births, including births for which maternal ancestry is unknown and other). For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. Beginning with last year's publication, the Adequacy of Prenatal Care Utilization Index has replaced the Kessner Index as the measure of adequate prenatal care. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 6. Calculations based on fewer than five events are excluded. 7. Other Hispanic includes Mexican, Cuban, Colombian, and Other South American. 8. Other Asian and Pacific Islander includes Korean, Filipino, Japanese, Laotian, Thai, Pakistani and Hawaiian. 9. West Indian and Caribbean include Jamaican and Barbadian. 10. African includes Nigerian and other African. 11. Middle Easterner includes Lebanese, Iranian, and Israeli.

Table 3A. Resident Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2002

Municipality	Rank (by pop. size)	Population	Crude Birth Rate[2]	Mother's Race and Ethnicity				Very Low Birthweight (<1500 g)	Low Birthweight (<2500 g)
				White non-Hispanic	Black non-Hispanic	Hispanic	Asian or Other[4]		
				%[3]	%[3]	%[3]	%[3]	%	%
STATE TOTAL		**6,349,097**	12.7	72.1	7.4	11.8	8.5	1.4	7.5
Arlington	29	42,389	12.9	82.2	1.5	2.6	13.4	0.9	5.9
Attleboro	30	42,068	15.2	83.0	2.8	6.6	7.6	0.9	7.2
Barnstable	25	47,821	9.2	84.6	2.5	5.0	7.7	--[5]	7.7
Boston	1	589,141	13.6	35.1	30.1	22.9	11.9	2.1	9.5
Brockton	6	94,304	16.3	41.2	31.2	11.5	15.9	1.7	9.7
Brookline	17	57,107	11.4	72.6	2.2	4.3	20.8	1.2	9.3
Cambridge	5	101,355	10.6	57.0	17.6	8.3	16.8	1.6	7.0
Chicopee	21	54,653	11.7	77.6	3.3	16.4	2.7	1.3	8.6
Fall River	8	91,938	12.9	81.5	5.5	7.3	5.5	1.7	9.1
Framingham	14	66,910	14.0	66.6	4.3	15.3	13.8	1.1	9.8
Haverhill	16	58,969	14.4	80.3	3.2	12.1	4.4	1.7	8.4
Lawrence	13	72,043	20.0	19.0	1.9	74.3	4.7	1.5	7.5
Lowell	4	105,167	17.0	47.5	6.7	17.0	28.6	1.8	7.9
Lynn	9	89,050	16.4	40.1	12.6	36.2	11.1	1.4	8.0
Malden	18	56,340	14.4	53.9	12.4	7.4	26.2	1.5	7.1
Medford	20	55,765	11.5	76.1	9.1	4.2	10.6	1.3	7.3
Methuen	28	43,789	13.3	77.2	2.2	15.4	5.1	1.5	8.6
New Bedford	7	93,768	14.1	64.4	7.7	17.8	9.5	1.9	7.8
Newton	11	83,829	9.8	80.9	1.3	3.2	14.6	1.1	6.8
Peabody	24	48,129	10.7	85.2	2.3	7.4	5.1	1.2	8.9
Pittsfield	27	45,793	11.5	86.2	5.3	5.1	3.4	2.5	9.7
Plymouth	23	51,701	13.8	93.3	1.7	1.7	3.2	1.1	8.1
Quincy	10	88,025	13.1	64.6	4.2	2.7	28.4	1.2	6.3
Revere	26	47,283	13.7	61.2	4.6	22.2	11.9	1.2	7.7
Somerville	12	77,478	11.7	59.9	10.7	17.1	12.3	1.5	7.6
Springfield	3	152,082	15.5	33.4	20.8	42.1	3.7	2.2	10.8
Taunton	19	55,976	13.4	83.9	4.4	6.4	5.2	1.5	7.6
Waltham	15	59,226	11.3	61.9	7.1	16.4	14.6	1.5	7.0
Weymouth	22	53,988	13.0	87.7	3.8	1.9	6.1	0.9	7.8
Worcester	2	172,648	15.2	55.0	11.7	22.3	10.9	1.6	7.5

Table 3A.(cont'd) Resident Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2002

Municipality	Birth					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[8]		Neonatal Mortality Rate[8]	
	%	%	%	n	Rate[2]	2002	2000-2002	2002	2000-2002
STATE TOTAL	84.7	28.5	26.8	4,642	22.6	4.9	4.8	3.7	3.7
Arlington	91.0	5.0	7.7	5	6.5	--[5]	--[5]	--[5]	--[5]
Attleboro	78.2	23.2	22.5	32	27.8	--[5]	2.6	--[5]	2.6
Barnstable	87.1	39.9	27.4	35	27.2	--[5]	6.4	--[5]	3.5
Boston	83.3	48.0	44.1	664	29.9	7.0	7.0	5.1	5.3
Brockton	74.7	56.9	51.0	163	49.3	5.9	5.6	5.9	4.5
Brookline	94.1	6.5	6.2	5	3.6	7.7	2.7	7.7	2.7
Cambridge	88.2	16.2	16.8	24	6.4	6.5	4.8	4.7	2.5
Chicopee	81.8	47.6	44.6	60	33.2	--[5]	4.4	--[5]	3.8
Fall River	85.1	61.4	50.9	158	54.2	6.7	8.0	6.7	7.5
Framingham	89.2	27.5	18.6	41	21.3	5.3	6.5	--[5]	5.4
Haverhill	89.7	28.4	30.2	67	37.4	10.6	5.8	9.4	5.4
Lawrence	86.9	63.8	62.6	227	79.7	5.6	8.0	3.5	5.7
Lowell	68.6	50.5	46.3	228	58.3	10.1	7.0	6.1	5.3
Lynn	79.2	57.4	44.5	162	54.2	6.2	6.7	5.5	5.3
Malden	83.5	35.1	22.5	25	18.0	--[5]	3.7	--[5]	2.1
Medford	90.8	19.5	19.4	10	5.7	--[5]	3.2	--[5]	3.2
Methuen	87.8	22.8	25.3	26	20.6	--[5]	5.8	--[5]	5.8
New Bedford	76.9	60.4	57.7	175	58.8	7.6	6.6	--[5]	3.3
Newton	91.0	4.8	4.4	9	2.6	--[5]	3.9	--[5]	2.8
Peabody	85.9	20.9	16.7	10	7.7	--[5]	6.8	0.0	4.9
Pittsfield	54.6	46.1	44.5	61	44.8	--[5]	4.7	0.0	--[5]
Plymouth	79.4	16.8	14.3	22	14.0	--[5]	4.3	--[5]	2.4
Quincy	89.7	25.7	17.9	31	15.9	5.2	4.4	--[5]	3.5
Revere	84.5	43.0	33.4	51	42.0	--[5]	4.1	--[5]	3.6
Somerville	81.8	32.5	26.1	50	24.0	--[5]	3.7	--[5]	3.0
Springfield	73.5	66.7	64.3	423	70.1	9.8	7.3	6.8	4.4
Taunton	80.4	36.4	37.6	57	34.5	8.0	7.3	6.6	5.6
Waltham	83.5	23.1	21.9	24	10.7	--[5]	4.4	--[5]	2.9
Weymouth	91.4	16.3	16.1	21	15.8	--[5]	3.2	--[5]	3.2
Worcester	77.6	39.9	42.1	226	32.7	8.8	8.9	6.1	6.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in Appendix). 2. Crude birth rates represent the number of births per 1,000 residents; teen birth rates refer to the number of births per 1,000 females ages 15-19. 2002 birth rates are calculated using the DPH 2000 population estimates. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Mothers who designated themselves as Asian, American Indian or Other. 5. Calculations based on fewer than 5 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Deaths per 1,000 live births. See Definitions of Rates section in Appendix for definitions of infant and neonatal mortality rates.

Table 3B: Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2002

CHNA	Population	Crude Birth Rate[1]	Mother's Race and Ethnicity: White non-Hispanic %[3]	Black non-Hispanic %[3]	Hispanic %[3]	Asian or Other[2] %[3]	Very Low Birthweight (<1500 g) %	Low Birthweight (<2500 g) %
STATE TOTAL	6,349,097	12.7	72.1	7.4	11.8	8.5	1.4	7.5
Community Health Network of Berkshire County	134,953	9.2	89.7	2.9	4.2	3.1	1.9	7.6
Upper Valley Health Web (Franklin County)	86,889	9.3	91.7	1.2	3.9	2.6	1.4	6.9
Partnership for Health in Hampshire County (Northampton)	150,077	8.5	86.3	1.3	6.3	5.9	1.7	5.9
The Community Health Connection (Springfield)	291,665	12.9	55.0	13.5	27.8	3.7	1.9	9.3
Community Health Network of Southern Worcester County	113,702	12.3	88.2	1.4	8.0	2.1	1.2	7.6
Community Partners for Health (Milford)	152,117	15.6	92.9	1.1	2.5	3.5	1.2	7.2
Community Health Network of Greater Metro West (Framingham)	374,478	14.1	83.4	1.6	5.6	9.2	1.3	7.3
Community Wellness Coalition (Worcester)	289,834	13.9	66.3	8.1	15.2	10.4	1.3	6.7
Fitchburg/Gardner Community Health Network	250,362	12.6	82.1	2.9	10.8	4.0	1.1	7.0
Greater Lowell Community Health Network	270,083	14.6	69.9	3.5	8.5	18.1	1.3	7.4
Greater Lawrence Community Health Network	182,025	15.3	50.1	1.6	42.3	5.9	1.3	6.7
Greater Haverhill Community Health Network	144,275	13.7	89.2	1.8	6.1	2.9	1.5	8.4
Community Health Network North (Beverly/Gloucester)	118,280	10.7	91.5	0.7	3.5	4.2	0.4	6.3
North Shore Community Health Network	278,839	12.7	67.8	6.1	19.0	7.1	1.3	7.6
Greater Woburn/Concord/Littleton Community Health Network	208,406	11.9	81.1	2.2	2.7	13.7	1.1	6.6
North Suburban Health Alliance (Medford/Malden/Melrose)	261,844	13.1	75.9	6.6	6.7	10.8	1.3	7.5
Greater Cambridge/Somerville Community Health Network	278,402	11.3	67.5	9.7	8.9	13.7	1.3	6.9
West Suburban Health Network (Newton/Waltham)	253,187	11.2	80.9	2.6	5.8	10.7	1.1	6.2
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	746,914	13.5	39.2	24.7	24.1	11.9	1.8	9.0
Blue Hills Community Health Alliance (Greater Quincy)	365,457	12.9	77.8	5.9	2.3	13.6	1.3	7.1
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	159,254	12.1	67.5	2.6	27.7	2.1	1.4	8.4
Greater Brockton Community Health Network	232,260	13.6	65.8	17.3	6.7	9.9	1.6	8.7
South Shore Community Partners in Prevention (Plymouth)	180,609	13.5	95.3	1.1	0.9	2.6	0.9	6.6
Greater Attleboro-Taunton Health & Education Response	242,659	13.8	90.0	2.2	3.2	4.4	1.1	6.8
Partners for a Healthier Community (Fall River)	140,256	11.2	85.3	4.1	5.8	4.6	1.5	9.1
Greater New Bedford Health & Human Services Coalition	195,533	12.0	76.6	5.5	10.4	7.2	1.3	7.2
Cape and Islands Community Health Network	246,737	9.3	88.0	2.8	3.4	5.5	1.4	6.5

Table 3B.(cont'd) Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2002

CHNA	Births					Deaths			
	Adequate Prenatal Care[6]	Public Payment[7] for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[8]		Neonatal Mortality Rate[8]	
	%	%	%	n	Rate[4]	2002	2000-2002	2002	2000-2002
STATE TOTAL	84.7	28.5	26.8	4,642	22.6	4.9	4.8	3.7	3.7
Community Health Network of Berkshire County	65.4	42.2	40.3	126	26.7	5.6	4.1	4.0	2.2
Upper Valley Health Web (Franklin County)	83.6	37.7	34.6	73	25.5	0.0	2.7	0.0	2.3
Partnership for Health in Hampshire County (Northampton)	88.0	23.8	27.3	49	5.4	7.0	5.0	4.7	3.7
The Community Health Connection (Springfield)	78.6	50.1	46.9	467	44.4	8.8	5.9	5.9	3.7
Community Health Network of Southern Worcester County	83.8	27.3	30.3	88	24.0	5.7	4.0	4.3	2.6
Community Partners for Health (Milford)	89.9	10.9	12.6	65	14.4	5.5	5.8	4.6	4.8
Community Health Network of Greater Metro West (Framingham)	89.4	12.0	10.5	117	11.8	3.6	4.4	2.8	3.8
Community Wellness Coalition (Worcester)	78.8	28.8	31.5	261	25.2	7.5	7.0	5.7	5.4
Fitchburg/Gardner Community Health Network	83.1	26.6	27.8	208	25.4	4.8	4.2	3.2	2.9
Greater Lowell Community Health Network	77.2	27.8	27.7	273	31.8	5.3	4.5	3.3	3.4
Greater Lawrence Community Health Network	88.2	38.8	39.2	258	41.3	3.9	5.7	2.9	4.5
Greater Haverhill Community Health Network	91.7	18.2	20.5	91	21.6	7.1	4.5	6.1	3.6
Community Health Network North (Beverly/Gloucester)	91.8	18.5	15.4	37	9.9	--[5]	3.1	--[5]	2.4
North Shore Community Health Network	83.4	33.5	28.3	212	25.6	3.9	5.1	3.1	4.0
Greater Woburn/Concord/Littleton Community Health Network	87.6	6.3	6.8	22	4.1	2.4	2.8	--[5]	2.1
North Suburban Health Alliance (Medford/Malden/Melrose)	87.8	21.2	16.3	77	11.1	2.6	3.0	2.0	2.3
Greater Cambridge/Somerville Community Health Network	87.4	18.0	16.0	87	11.0	3.8	4.4	2.5	3.0
West Suburban Health Network (Newton/Waltham)	89.3	9.1	8.6	42	4.3	2.8	2.9	2.8	2.1
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	84.0	45.2	41.1	814	30.9	6.5	6.3	4.8	4.8
Blue Hills Community Health Alliance (Greater Quincy)	91.5	15.3	13.7	101	10.5	4.2	3.2	3.6	2.7
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	82.1	50.2	46.5	226	38.4	5.2	5.4	5.2	4.4
Greater Brockton Community Health Network	82.3	34.8	33.9	207	25.0	4.1	4.9	3.8	4.2
South Shore Community Partners in Prevention (Plymouth)	87.9	13.4	12.8	58	10.3	--[5]	3.1	--[5]	2.0
Greater Attleboro-Taunton Health & Education Response	81.7	21.1	21.1	148	19.4	4.5	4.4	4.2	3.7
Partners for a Healthier Community (Fall River)	86.6	53.5	42.7	173	39.0	6.3	7.9	6.3	7.3
Greater New Bedford Health & Human Services Coalition	76.8	44.6	43.7	237	36.3	6.0	6.0	3.0	3.4
Cape and Islands Community Health Network	86.3	32.6	24.0	125	20.3	5.2	5.8	3.5	4.2

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Births per 1,000 residents (male and female). 2002 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in Appendix). 2. Mothers who designated themselves as Asian, American Indian or Other. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Births per 1,000 female residents ages 15-19. 5. Calculations based on fewer than 5 events are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care. 8. Deaths per 1,000 live births. See Definitions of Rates section in Appendix for definitions of infant and neonatal mortality rates.

Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2002

Mother's Age	1990 Births[1]	1990 Rate	2002 Births	2002 Rate[2]	Percent Change in Rate
12-14	124	1.3	73	0.6	-53.8
15-19	7,258	35.8	4,642	22.6	-36.9
20-24	18,115	70.5	11,880	57.8	-18.0
25-29	29,913	107.5	18,484	83.8	-22.0
30-34	25,687	92.1	27,163	108.5	17.8
35-39	9,795	40.1	15,121	55.2	37.7
40-44	1,522	6.9	3,085	11.6	68.1
45+[3]	46	0.3	175	0.7	133.3
Birth rate, ages 15-44[4]	92,290	62.2	80,375	56.5	-9.2
Crude Birth Rate[5]	92,461	15.4	80,624	12.7	-17.5

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Differences in the number of births from previous publications are the result of updating of the birth files. The number of births for all age groups does not always add to the total number of births as mother's age is sometimes not recorded on the birth certificate.
2. 2002 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in Appendix). 3. Denominator is female population ages 45-49. 4. Rate represents the total number of births to women age 15-44 per 1,000 women age 15 to 44. 5. Births per 1,000 residents (females and males). Includes births to mothers of all age groups and mothers for whom age is unknown.

Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2002

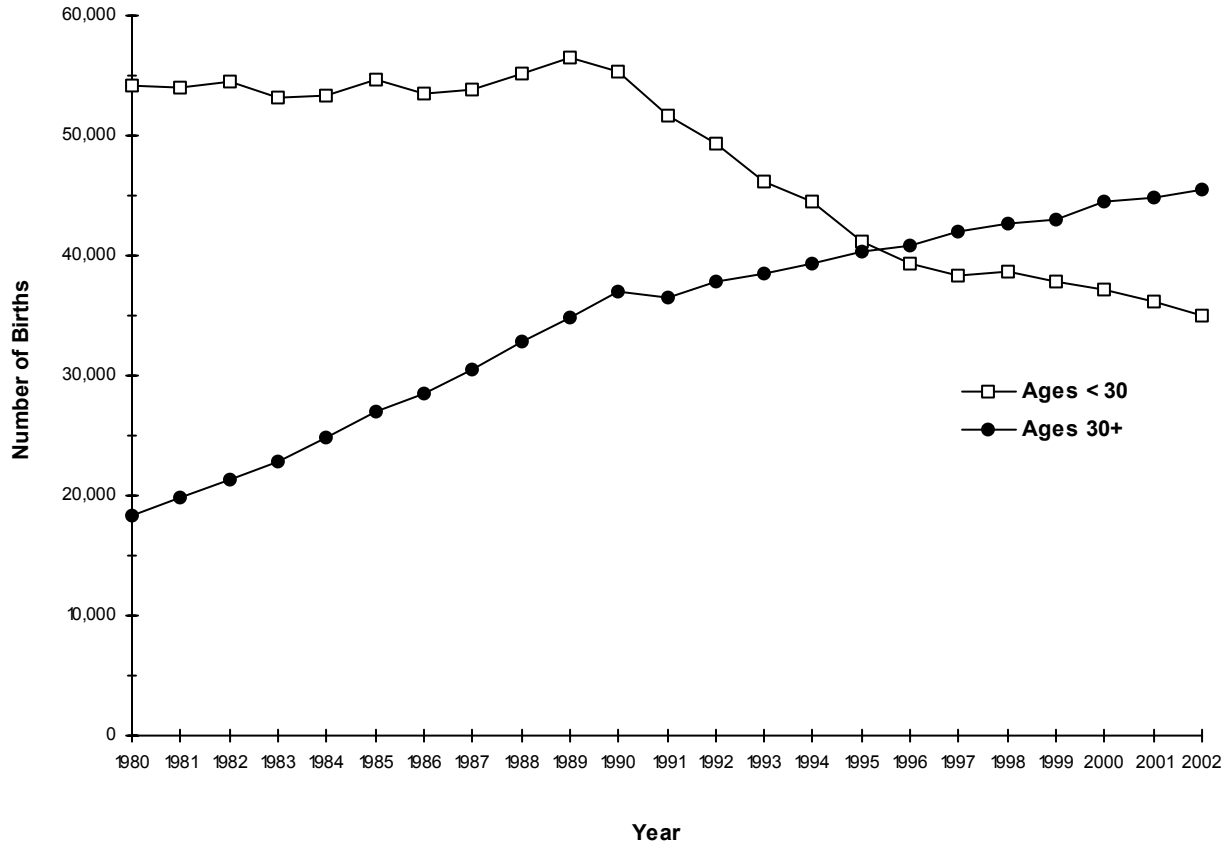
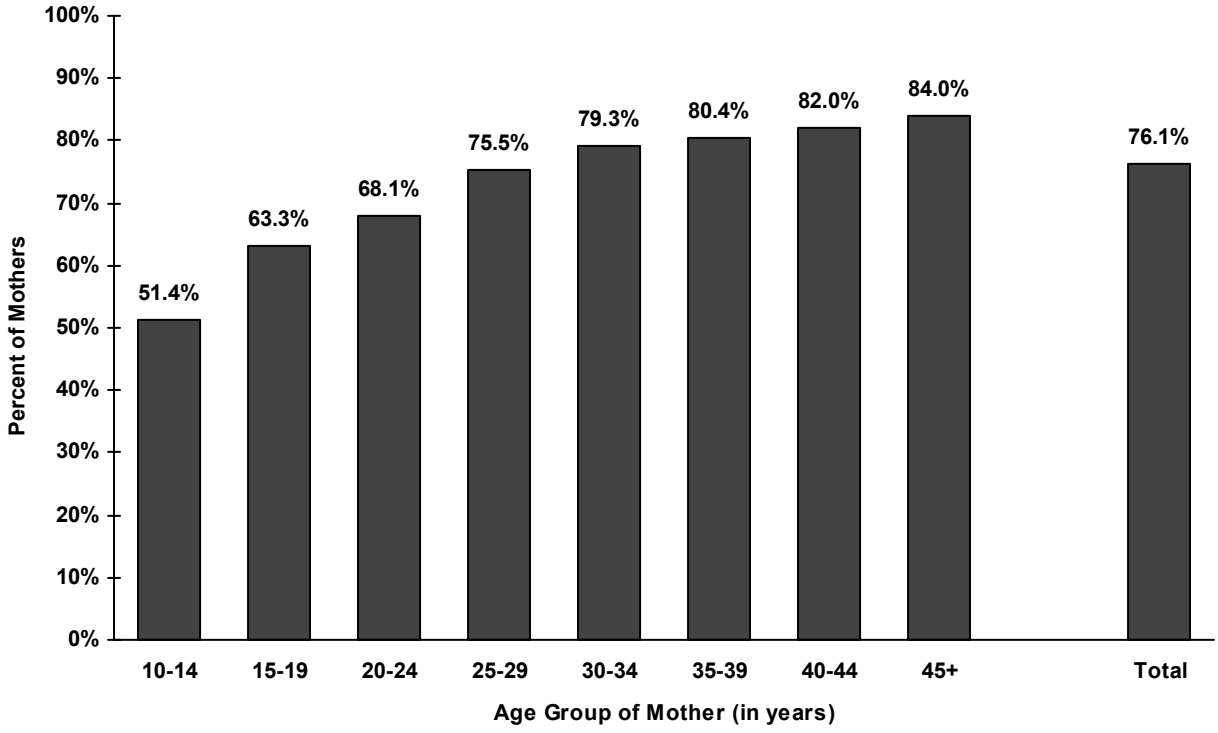


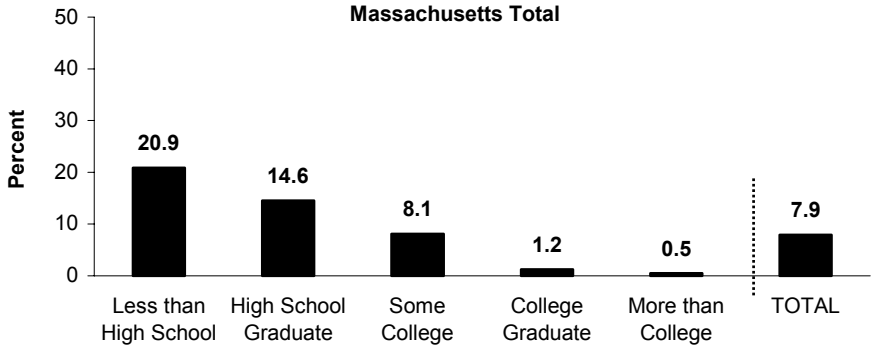
Figure 2. Percent of Mothers Breastfeeding or Intending to Breastfeed[1] by Age Group, Massachusetts [2]: 2002

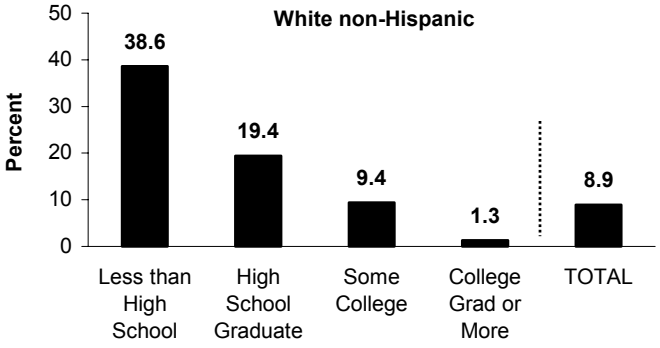


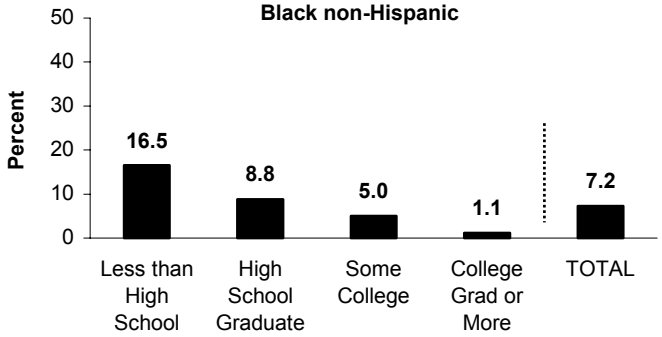
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

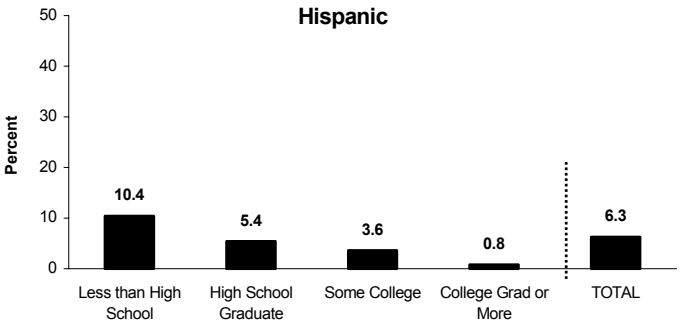
1. Information about breastfeeding was reported by the mother at the time the birth certificate was completed.
2. For race-specific breastfeeding rates see Table 2A.

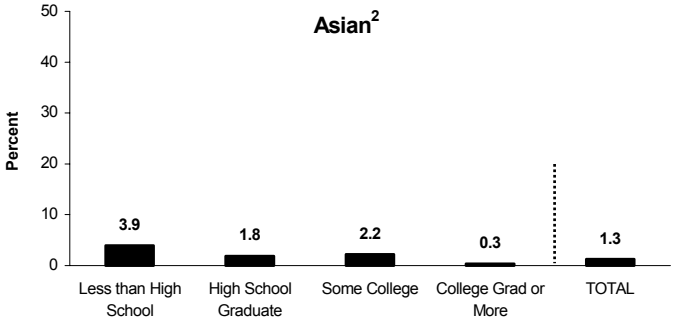
Figure 3. Percent of Mothers who Smoked During Pregnancy[1], by Mother's Race/Hispanic Ethnicity and Educational Attainment, Massachusetts: 2002







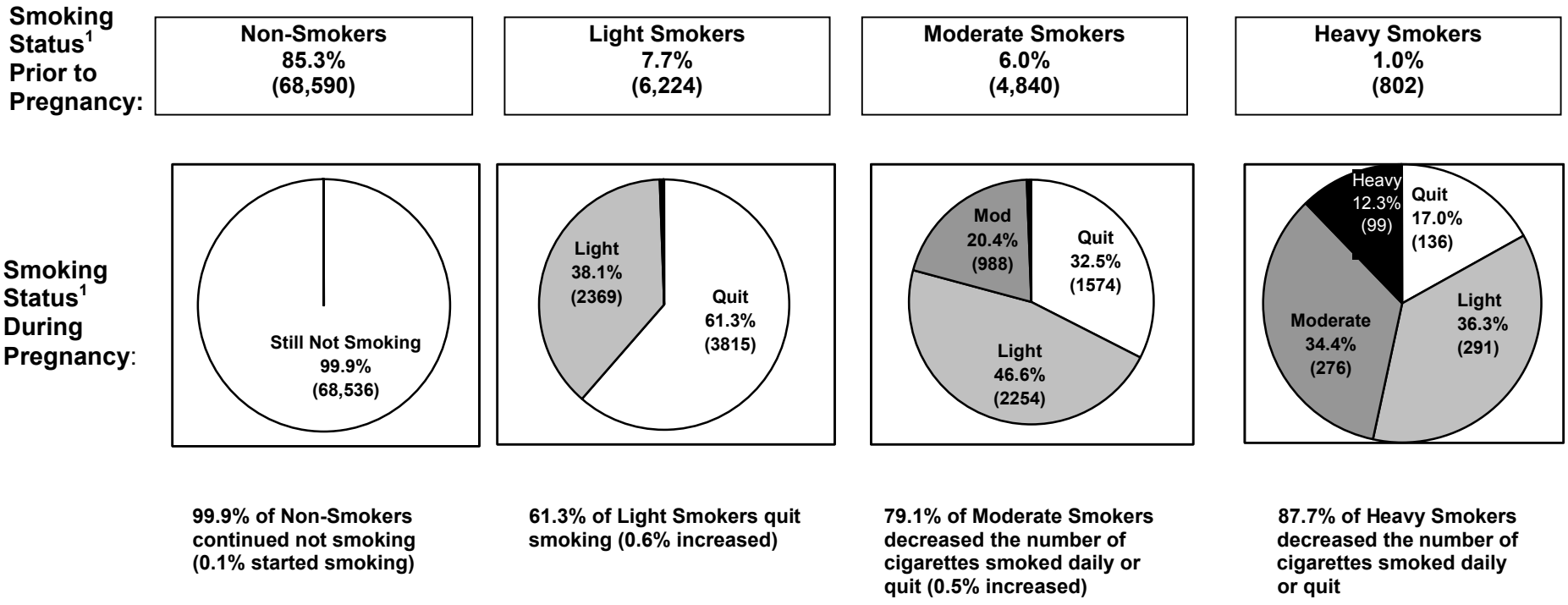




NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Based on information provided on the birth certificate as reported by the mother. Due to self-reported nature, data on smoking prevalence should be interpreted cautiously. Mothers with more than one delivery are counted for each birth. 2. Caution should be used with Asian data because of small numbers.

Figure 4. Distribution of Smoking Status[1] during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2002



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Light Smokers=1-10 cigarettes daily; Moderate Smokers=11-20 cigarettes daily; Heavy Smokers=21 cigarettes or more daily.

Table 5. Parity[1] by Age of Mother, Massachusetts: 2002

Age of Mother (years)		Total Births	1st	2nd	3rd	4th	5th+
STATE TOTAL	**n[2]**	**80,624**	**34,911**	**28,117**	**11,695**	**3,777**	**1,967**
	%[3]	100.0	43.4	34.9	14.5	4.7	2.4
10-14	**n**	73	73	0	0	0	0
	%	100.0	100.0	0.0	0.0	0.0	0.0
15-19	**n**	4,642	3,872	677	82	4	0
	%	100.0	83.5	14.6	1.8	--[4]	0.0
20-24	**n**	11,880	6,580	3,724	1,148	324	80
	%	100.0	55.5	31.4	9.7	2.7	0.7
25-29	**n**	18,484	8,869	6,037	2,426	751	362
	%	100.0	48.1	32.7	13.2	4.1	2.0
30-34	**n**	27,163	10,397	10,693	4,145	1,244	632
	%	100.0	38.3	39.4	15.3	4.6	2.3
35-39	**n**	15,121	4,199	5,826	3,248	1,202	622
	%	100.0	27.8	38.6	21.5	8.0	4.1
40-44	**n**	3,085	863	1,106	617	237	254
	%	100.0	28.0	35.9	20.1	7.7	8.3
45+	**n**	175	58	54	29	15	17
	%	100.0	33.5	31.2	16.8	8.7	9.8

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. The number of live births including this birth. 2. State totals include births of unknown parity and unknown mother's age. 3. Percents may not sum to 100.0 due to rounding. 4. Calculations based on fewer than 5 events are excluded.

Table 6. Trends in Number and Percent Distribution of Births[1] by Plurality and Age, Massachusetts: 1990-2002

Age Group	Year	Singletons n	Singletons %	Multiples[2] Twins n	Multiples[2] Twins %	Multiples[2] Triplets or more n	Multiples[2] Triplets or more %	Multiples[2] Total Multiples n	Multiples[2] Total Multiples %	Total births n	Total births %
All Ages											
	1990	90,049	97.4	2,312	2.5	99	0.1	2,411	2.6	92,460	100.0
	1991	85,802	97.3	2,285	2.6	89	0.1	2,374	2.7	88,176	100.0
	1992	84,722	97.2	2,347	2.7	133	0.2	2,480	2.8	87,202	100.0
	1993	82,055	97.0	2,367	2.8	205	0.2	2,572	3.0	84,627	100.0
	1994	81,187	96.9	2,357	2.8	214	0.3	2,571	3.1	83,758	100.0
	1995	78,935	96.8	2,429	3.0	198	0.2	2,627	3.2	81,562	100.0
	1996	77,355	96.5	2,621	3.3	194	0.2	2,815	3.5	80,164	100.0
	1997	77,203	96.1	2,856	3.6	262	0.3	3,118	3.9	80,321	100.0
	1998	78,004	95.8	3,114	3.8	288	0.4	3,402	4.2	81,406	100.0
	1999	77,473	95.8	3,147	3.9	246	0.3	3,393	4.2	80,866	100.0
	2000	78,075	95.7	3,263	4.0	244	0.3	3,507	4.3	81,582	100.0
	2001	77,409	95.6	3,371	4.2	234	0.3	3,605	4.4	81,014	100.0
	2002	76,673	95.1	3,708	4.6	243	0.3	3,951	4.9	80,624	100.0
Ages <35											
	1990	79,081	97.5	1,946	2.4	70	0.1	2,016	2.5	81,097	100.0
	1991	74,810	97.5	1,863	2.4	76	0.1	1,939	2.5	76,749	100.0
	1992	73,043	97.3	1,914	2.6	103	0.1	2,017	2.7	75,060	100.0
	1993	70,042	97.2	1,849	2.6	158	0.2	2,007	2.8	72,049	100.0
	1994	68,644	97.2	1,844	2.6	164	0.2	2,008	2.8	70,652	100.0
	1995	65,669	97.2	1,787	2.6	141	0.2	1,928	2.9	67,597	100.0
	1996	63,560	96.9	1,935	2.9	126	0.2	2,061	3.1	65,621	100.0
	1997	62,598	96.7	1,949	3.0	170	0.3	2,119	3.3	64,717	100.0
	1998	62,719	96.4	2,193	3.4	170	0.3	2,363	3.6	65,082	100.0
	1999	61,816	96.4	2,147	3.3	150	0.2	2,297	3.6	64,113	100.0
	2000	61,659	96.4	2,205	3.4	130	0.2	2,335	3.6	63,994	100.0
	2001	60,704	96.3	2,211	3.5	134	0.2	2,345	3.7	63,049	100.0
	2002	59,736	96.0	2,379	3.8	127	0.2	2,506	4.0	62,242	100.0
Ages 35+											
	1990	10,968	96.5	366	3.2	29	0.3	395	3.5	11,363	100.0
	1991	10,987	96.2	422	3.7	13	0.1	435	3.8	11,422	100.0
	1992	11,675	96.2	433	3.6	30	0.3	463	3.8	12,138	100.0
	1993	12,007	95.5	518	4.1	47	0.4	565	4.5	12,572	100.0
	1994	12,543	95.7	513	3.9	50	0.4	563	4.3	13,106	100.0
	1995	13,264	95.0	642	4.6	57	0.4	699	5.0	13,963	100.0
	1996	13,793	94.8	686	4.7	68	0.5	754	5.2	14,547	100.0
	1997	14,602	93.6	907	5.8	92	0.6	999	6.4	15,601	100.0
	1998	15,282	93.6	921	5.6	118	0.7	1,039	6.4	16,321	100.0
	1999	15,657	93.5	1,000	6.0	96	0.6	1,096	6.5	16,753	100.0
	2000	16,412	93.3	1,058	6.0	114	0.6	1,172	6.7	17,584	100.0
	2001	16,703	93.0	1,160	6.5	100	0.6	1,260	7.0	17,963	100.0
	2002	16,936	92.1	1,329	7.2	116	0.6	1,445	7.9	18,381	100.0

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Differences in the number of births from previous publications are the result of updating of files. 2. Numbers of multiples (n) represent individual infants rather than sets of infants.

Table 7. Selected Birth Characteristics by Maternal Education, Massachusetts: 2002

	Less than High School		High School Graduate		Some College		College Graduate		More than College	
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]
State Total	7,887	9.8	20,251	25.2	18,241	22.7	21,411	26.6	12,650	15.7
Race										
White non-Hispanic	2,859	4.9	12,849	22.1	13,629	23.5	18,251	31.4	10,491	18.1
Black non-Hispanic	829	14.0	2,170	36.6	1,812	30.5	788	13.3	336	5.7
Hispanic	3,208	33.6	3,654	38.3	1,726	18.1	645	6.8	303	3.2
Asian	664	12.5	1,041	19.7	726	13.7	1,501	28.3	1,364	25.8
Age										
20-29	3,647	12.0	10,675	35.2	8,379	27.6	5,492	18.1	2,111	7.0
30-39	1,472	3.5	7,256	17.2	8,921	21.1	14,894	35.3	9,637	22.8
40+	122	3.8	559	17.2	660	20.3	1,009	31.1	894	27.6
Non-U.S.-born[2]	2,883	36.6	5,837	28.9	3,536	19.4	3,786	17.7	2,743	21.7
Unmarried	5,752	72.9	9,293	45.9	4,851	26.6	1,206	5.6	452	3.6
Publicly-financed prenatal care	6,197	79.8	10,122	50.9	4,603	25.6	1,185	5.7	348	2.8
Very low birthweight[3]	141	1.8	325	1.6	227	1.2	237	1.1	170	1.3
Low birthweight[4]	738	9.4	1,766	8.7	1,301	7.1	1,329	6.2	901	7.1
Adequate prenatal care[5]	5,603	71.8	16,193	80.6	15,513	85.6	18,988	89.2	11,387	90.5
Cesarean section delivery	1,686	21.5	5,468	27.1	5,383	29.6	6,307	29.5	3,671	29.1
Breastfeeding[6]	4,779	61.2	13,081	65.5	13,223	73.6	17,801	85.2	11,308	91.2
Multiple births	185	2.3	769	3.8	844	4.6	1,256	5.9	891	7.0
Smoking during pregnancy	1,644	20.9	2,947	14.6	1,473	8.1	262	1.2	63	0.5

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on column totals. 2. Includes women born outside of the 50 U.S. States, Washington D.C., and Puerto Rico/U.S. territories (the U.S. Virgin Islands, and Guam). 3. Very low birthweight: less than 1,500 grams or 3.3 pounds. 4. Low birthweight: less than 2,500 grams or 5.5 pounds. 5. Beginning with last year's publication, the Adequacy of Prenatal Care Utilization Index has replaced the Kessner Index as the measure of adequate prenatal care. 6. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

Table 8. Comparison of Massachusetts Perinatal Health Indicators to Healthy People 2010 Objectives[1]

Healthy People 2010 Objectives (Focus Area 16: Maternal, Infant and Child Health[2])	HP2010 Target	Massachusetts				*Has Massachusetts achieved HP2010 target?* ✓ = YES ○ = NO, but within 25% of target ● = NO, > 25% from target
		1999	2000	2001	2002	
Fetal, Infant, and Maternal Deaths						
16-1a. Fetal Mortality Rate[3]	4.1	5.2	5.3	4.7	4.6	○
16-1b. Perinatal Mortality Rate[4]	4.5	6.0	5.4	5.6	4.7	○
16-1c. Infant Mortality Rate[5]	4.5	5.2	4.6	5.0	4.9	○
16-1d. Neonatal Mortality Rate[6]	2.9	4.1	3.5	3.8	3.7	●
16-1e. Postneonatal Mortality Rate[7]	1.2	1.1	1.1	1.2	1.2	✓
16-4. Maternal Mortality Ratio[8]	3.3	0.0	1.2	4.9	2.4	✓
Risk Factors						
16-10a. Low Birthweight[9] (%)	5.0	7.1	7.1	7.2	7.5	●
16-10b. Very Low Birthweight[10] (%)	0.9	1.4	1.4	1.4	1.4	●
16-11a. Preterm[11] (%)	7.6	7.6	8.3	8.0	8.5	○
Prenatal Care						
16-6a. Care beginning in first trimester (%)	90	84.3	83.8	84.3	84.2	○
16-6b. Early and adequate care[12] (%)	90	82.9	83.3	85.2	85.0	○
Obstetrical Care						
16-8. Very Low Birthweight[10] Infants born at Level III Hospitals[13] (%)	90	82.5	83.4	79.1	81.2	○
16-9a. Cesarean Sections: Low-Risk[14] Women Giving Birth for the First Time (%)	15	18.8	20.5	22.0	24.0	●
16-9b. Cesarean Sections: Low-Risk[14] Women with Prior Cesarean Section (%)	63	68.8	72.7	79.2	84.2	●
Breastfeeding						
16-19a. Breastfeeding[15] (%)	75	72.4	73.8	75.3	76.1	✓
Prenatal Substance Exposure						
16-17c. Abstinence from Smoking (%)	99	89.3	90.3	90.9	92.1	○

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. National health promotion and disease prevention agenda established by the U.S. Dept. of Health and Human Services. 2. Goal: to improve the health and well-being of women, infants, children, and families. 3. Number of fetal deaths per 1,000 fetal deaths plus live births. 4. Number of fetal and infant deaths in perinatal period (from 28 weeks gestation (inclusive) to 6 days (inclusive) after birth per 1,000 fetal deaths plus live births. 5. Number of infant deaths (under one year of age) per 1,000 live births. 6. Number of deaths to infants less than 28 days of age per 1,000 live births. 7. Number of deaths to infants 28-364 days of age per 1,000 live births. 8. See Definition of Rates section in Appendix. 9. Less than 2,500 grams, or 5.5 pounds. 10. Less than 1,500 grams, or 3.3 pounds. 11. Born before completion of 37th week of gestation. 12. Based on Adequacy of Prenatal Care Utilization Index (see glossary). 13. Facilities for high-risk deliveries and neonates that can provide care to very small infants, including mechanical ventilation and neonatal surgery and special care for transferred patients and for which a full-time neonatologist serves as the director. 14. "Low-risk"= full term birth, singleton, vertex presentation. 15. HP2010 specifies objective as mother breastfeeding in "early postpartum period." Massachusetts data is based on mother's self-report of current breastfeeding or intention to breastfeed at the time the birth certificate is completed.

CHAPTER 2

TEEN BIRTH CHARACTERISTICS

Birth Numbers and Rates

In 2002, 4,642 births occurred to Massachusetts resident women ages 15-19, compared with 4,979 births for this age group in 2001 (Table 9). The number of resident live teen births in Massachusetts has decreased by 29% since 1992 (6,555 births) (Table 11). About one-third of the teen births were to women ages 15-17 (1,498 births), and two-thirds were to women ages 18-19 (3,144 births) (Table 9).

In 2002, in addition to the births to 15-19 year olds, there were 73 births to younger mothers ages 12 to 14, which represents a 6% decline in births in this age group from 2001 (Table 4).

In 2002, the teen birth rate was 22.6 births per 1,000 women ages 15-19 years, a decrease of 7% from 2001 (24.3) (Table 1). The Massachusetts teen birth rate has decreased steadily from 35.4 births per 1,000 women ages 15-19 in 1990 to 22.6 in 2002, the lowest rate in the last 3 decades (Figure 6).

The Massachusetts teen birth rate in 2002 was 47% below the U.S. teen birth rate of 42.9 births per 1,000 women ages 15-19 (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2) (Figure 6).

Overall, teen mothers were more likely to have specific characteristics that may be associated with adverse birth outcomes. Teen mothers were less likely to breastfeed, less likely to be married, less likely to receive adequate prenatal care, and more likely to smoke during pregnancy than adult women. Teen mothers also had more adverse birth outcomes (i.e. higher rates of low birthweight and preterm infants) than adult women, reflecting an increased risk associated with adolescent maternity.

Distribution of Births by Race and Hispanic Ethnicity and Mother's Birthplace

In 2002, 46.4% of births to Massachusetts residents ages 15-19 (2,151) were to white non-Hispanic mothers; 32.6% (1,513) were to Hispanic mothers; 13.4% (622) were to black non-Hispanic mothers; 4.4% (203) were to Asian mothers; and 3.2% (149) were to mothers of other races (Table 9).

In 2002, birth rates among resident teen women were in the same relative order by race and Hispanic ethnicity as they were in 1990 (black non-Hispanic and Hispanic women had the highest teen birth rates while white non-Hispanic women had the lowest), and they have decreased for all groups. However, black non-Hispanics have had the greatest decrease, 49% from 1990 (89.2) to 2002 (45.9); the white non-Hispanic teen birth rate has decreased by 44% (from 24.0 to 13.4); and the Asian teen birth rate has decreased by 43% (from 32.7 to 18.6). The Hispanic teen birth rate has declined the least at 37% (from 120.7 to 76.4) (Figure 7).

Seventy-seven percent of teen births were to mothers who were born in the 50 U.S. states or D.C. Eight percent of teen births were to mothers born in Puerto Rico or other U.S. Territories, and the percentage of births to non-U.S.-born teen mothers was 15% (Table 9).

Low Birthweight

In 2002, 10.3% of the infants born to women under age 20 were low birthweight (less than 2,500 grams or 5.5 pounds) as compared with 7.4% of infants born to Massachusetts women ages 20 and older (Figure 5).

The percentage of low birthweight infants was 17% greater for teen mothers ages 15-17 (11.7%) than for teens ages 18-19 (10.0%) (Table 9).

Preterm

In 2002, 10.2% of infants born to women under age 20 were preterm (born before the mother had completed the 37th week of pregnancy) as compared with 8.3% of infants born to Massachusetts women ages 20 and older (Figure 5). The percentage of preterm infants born to teen mothers increased by 13% from 2001 (8%) to 2002 (9%) (data not shown).

The percentage of preterm infants was 32% greater for teen mothers ages 15-17 (10.7%) than for teens ages 18-19 (8.1%) (Table 9).

Prenatal Care

In 2002, of the births to women under age 20, 71.5% of the mothers received adequate prenatal care, compared with 85.5% of births to women ages 20 and over (Figure 5). (Adequacy of prenatal care is a measure of the timing and number of prenatal care visits.)

The percentage of women ages 15-17 who received inadequate prenatal care (22.1%) was 18% greater than that of women ages 18-19 (18.8%) (Table 9).

Over 75% of women less than 20 years of age had their prenatal care funded by public sources, compared with 25% of women ages 20 and over (Figure 5).

Teen Birth Characteristics in the 30 Largest Massachusetts Cities and Towns

In 2002, among live births to women ages 15-19 who were residents of the 30 largest cities and towns in the Commonwealth:

- Teen birth rates (number of births per 1,000 females 15-19) were highest in Lawrence (80), Springfield (71), New Bedford (58), Lowell (58), and Fall River and Lynn (both at 54). These communities had rates two to three times the statewide rate of 22.6. All of these communities experienced decreases in teen birth rates from the previous year.

- Teen birth rates were lowest in Newton (3 teen births per 1,000 females 15-19), Brookline (4), and Medford (6) (Table 10).

- Among births to teen mothers, six communities (Barnstable, Lynn, Pittsfield, Haverhill, Brockton and Lawrence) recorded low birthweight percentages that were at least 25% higher than the statewide average of 10% for teen mothers (Table 10).

- Over 85% of mothers ages 15-19 living in Lowell, Springfield, Lynn, and Fall River had their prenatal care paid for by a public source. Only 20% of mothers ages 15-19 living in Arlington had their prenatal care paid for by a public source.

- Over 80% of mothers ages 15-19 living in Brookline, Newton, Lawrence, Haverhill, Cambridge, and Framingham received adequate prenatal care. In contrast, fewer than 60% of teen mothers living in Lowell, Attleboro, and Pittsfield, received adequate prenatal care (Table 10).

Communities with Highest Teen Births

Among the communities with the greatest number of teen births, teen birth rates were highest in Holyoke (82), Chelsea (82), Lawrence (80), and Springfield (70). These communities had rates over three times the statewide rate of 22.6 teen births per 1,000 females 15-19 (Table 11).

Tobacco Use

In 2002, 15.9% of teen births were to mothers who reported smoking cigarettes during their pregnancies (Table 9). In comparison, 7.4% of mothers ages 20 and over reported smoking during pregnancy (Figure 5).

For teen mothers ages 18-19, 17.1% smoked cigarettes during their pregnancies compared with 13.7% of mothers ages 15-17 (Table 9).

Parity

In 2002, 83.5% of all live births to teen mothers were the mother's first live-born infant. The percentage of births that were the teen mother's second live-born infant was 14.6%, and only 1.9% were the mother's third or greater live-born infants (Table 9).

As expected, mothers ages 18-19 had the greatest percentage of previous live births; almost three times higher (20.4% v. 8.1%) than teens ages 15-17 (Table 9).

Plurality

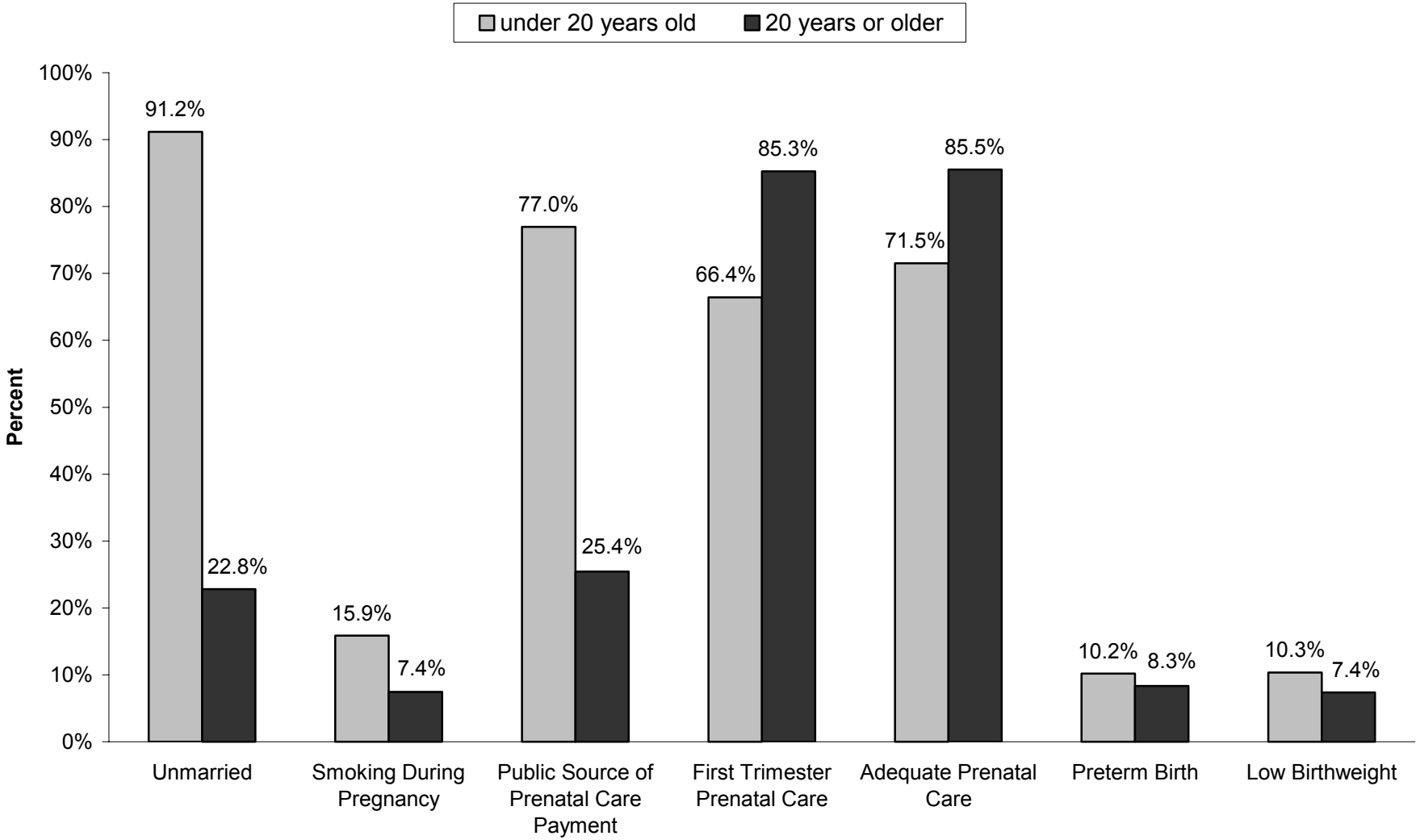
Plurality represents the number of births to a woman in one delivery. In 2002, 98.0% of all births to mothers ages 15-19 were singletons, and 2.0% were twins or higher order multiple births. Of these multiple births, 89 were twins and 3 triplets (Table 9).

Table 9. Summary of Selected Teen Birth Characteristics, Massachusetts: 2002

	Age 15-17		Age 18-19		Age 15-19	
	N	%[1]	N	%[1]	N	%[1]
State total	1,498	32.3%	3,144	67.7%	4,642	100.0%
	Maternal Demographics					
Race/Hispanic Ethnicity						
White non-Hispanic	582	38.9%	1,569	50.0%	2,151	46.4%
Black non-Hispanic	221	14.8%	401	12.8%	622	13.4%
Asian	77	5.1%	126	4.0%	203	4.4%
Hispanic	563	37.6%	950	30.2%	1,513	32.6%
Other	54	3.6%	95	3.0%	149	3.2%
Birthplace						
U.S. States / D.C.	1,169	78.1%	2,395	76.2%	3,564	76.8%
Puerto Rico / US Terr.	143	9.6%	225	7.2%	368	7.9%
Non-U.S.-born	185	12.4%	521	16.6%	706	15.2%
Prenatal care funding[2]						
Public	1,112	75.7%	2,393	77.4%	3,505	76.8%
Private, other	357	24.3%	699	22.6%	1,056	23.2%
	Pregnancy related factors					
Adequacy of Prenatal Care[3]						
Adequate Total[4]	1,042	70.5%	2,260	72.5%	3,302	71.8%
Adequate Intensive	544	36.8%	1,092	35.0%	1,636	35.6%
Adequate Basic	498	33.7%	1,168	37.5%	1,666	36.2%
Intermediate	110	7.4%	270	8.7%	380	8.3%
Inadequate/None	327	22.1%	587	18.8%	914	19.9%
Unknown	19	1.3%	27	0.9%	46	1.0%
Parity[6]						
1	1,372	91.8%	2,500	79.6%	3,872	83.5%
2	111	7.4%	566	18.0%	677	14.6%
3+	11	0.7%	75	2.4%	86	1.9%
Smoking during Pregnancy						
Yes	205	13.7%	537	17.1%	742	16.0%
No	1,292	86.3%	2,605	82.9%	3,897	84.0%
	Birth outcomes					
Birthweight						
< 500 g	4	--[5]	10	0.3%	14	0.3%
500-1,499 g	29	1.9%	47	1.5%	76	1.6%
1,500-2,499 g	142	9.5%	246	7.8%	388	8.4%
LBW (0-2,499 g)	175	11.7%	303	10%	478	10.3%
2,500-3,999 g	1,260	84.3%	2,613	83.2%	3,873	83.6%
4000+ g	60	4.0%	224	7.1%	284	6.1%
Gestational age						
< 28 weeks	21	1.4%	36	1.2%	57	1.2%
< 37 weeks	159	10.7%	254	8.1%	413	8.9%
37-42 weeks	1,307	87.8%	2,835	90.7%	4,142	89.8%
43+ weeks	1	--[5]	2	--[5]	3	--[5]
Plurality						
Singleton	1,469	98.1%	3,081	98.0%	4,550	98.0%
Multiple birth	29	1.9%	63	2.0%	92	2.0%

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. For state total row, percentages are based on total births to women ages 15-19. For the rest of the table, percentages are based on all births for a given age group and characteristic. 2. See Glossary for definitions of categories. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4. Adequate Total = Adequate Basic + Adeq. Intensive. 5. Calculations based on fewer than five events are excluded. 6. Number of live births including the current birth.

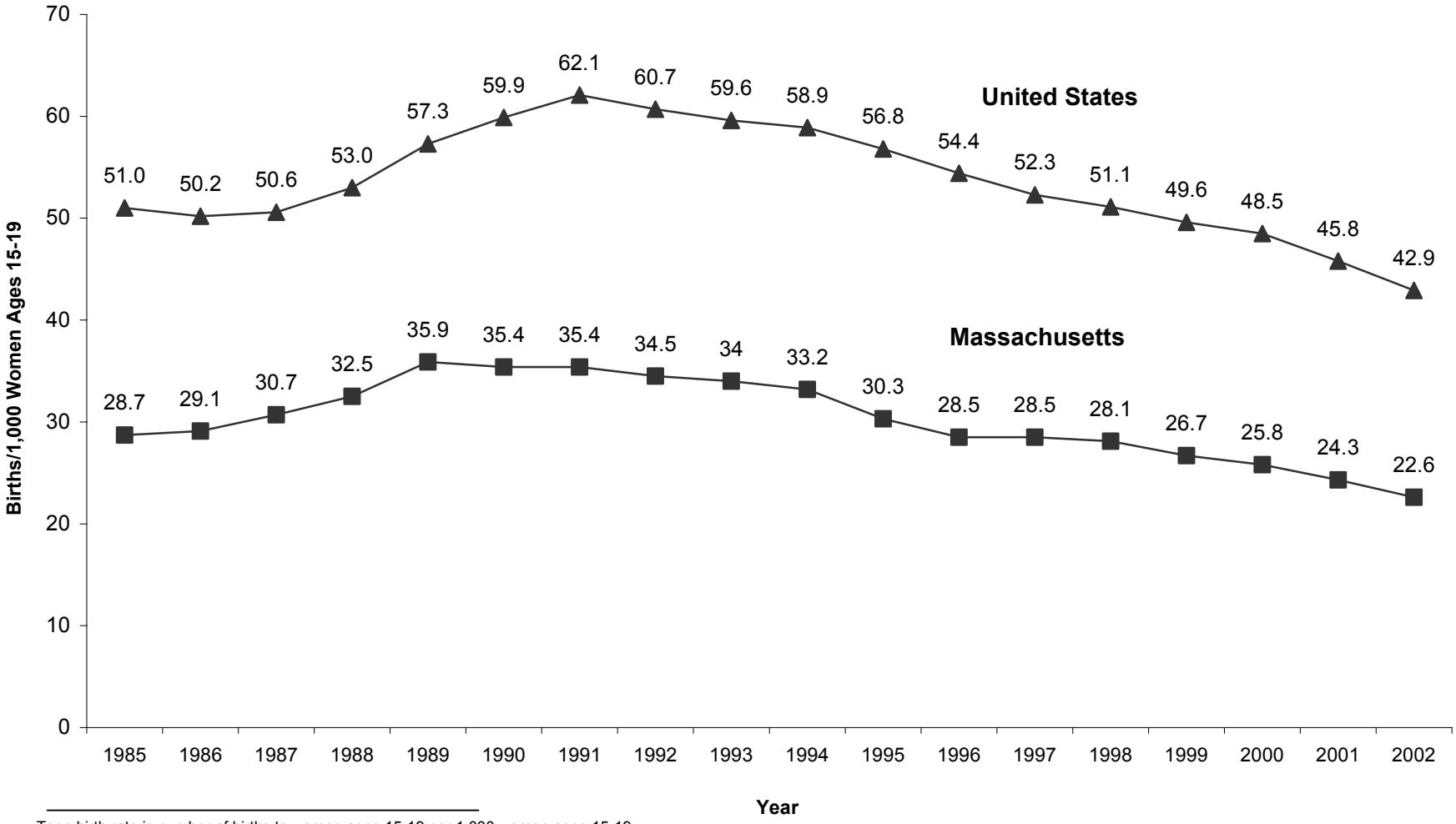
Figure 5. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2002



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

Definitions: Unmarried = marital status at time of birth. Adequate Prenatal Care = based on Adequacy of Prenatal Care Utilization (APNCU) Index. See Appendix (Glossary and Technical Notes) for more details on the APNCU Index. Preterm Birth = gestational age less than 37 weeks, based on clinical estimate of gestational age. Low Birthweight = less than 2,500 grams (5.5 lbs.).

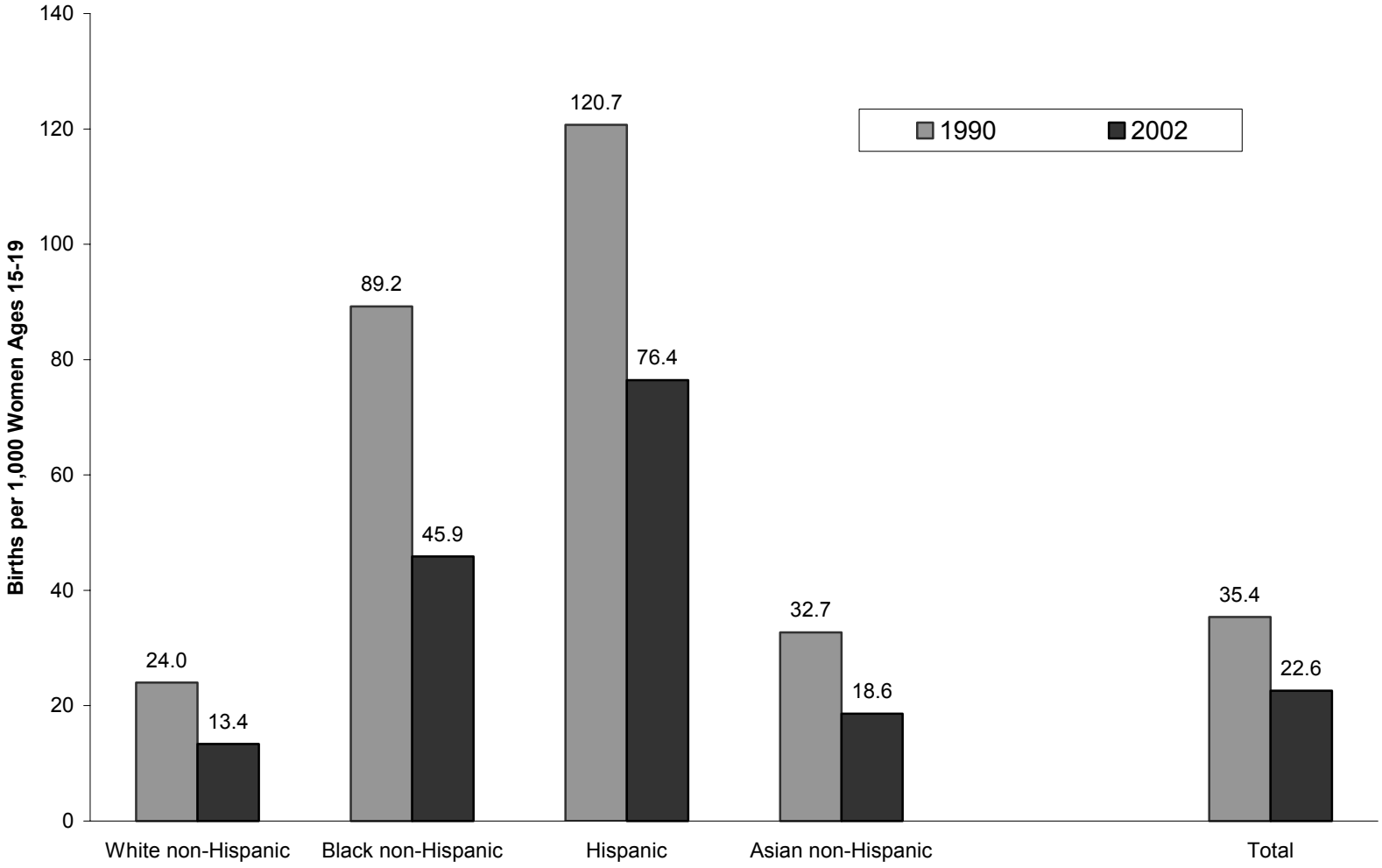
Figure 6. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2002



Teen birth rate is number of births to women ages 15-19 per 1,000 women ages 15-19

Data sources: 1) U.S. annual natality data (NCHS) and 1990 U.S. Census data (population data used in denominators); 2) Massachusetts: annual birth data files, decennial Census counts (1990, 2000) and intercensal population estimates based on MISER (Massachusetts Institute for Social and Economic Research) population estimates for 1991 through 1998 and DPH population estimates for 1999. 2000-2002 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts.

Figure 7. Birth Rates Among Women Ages 15-19 by Mother's Race/Hispanic Ethnicity, Massachusetts: 1990 and 2002



Teen birth rate is number of births to women ages 15-19 per 1,000 women ages 15-19
Population data sources: denominators for 1990 rates are based on the 1990 U.S. Census. 2002 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts.

Table 10. Resident Teen Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2002

Municipality	Total Population Rank	Female Population, age 15-19	Number of Teen Births	Teen Birth Rate[2]	Mother's Race and Hispanic Ethnicity (% of teen births)			
					White non-Hispanic	Black non-Hispanic	Hispanic	Asian or other[3]
State Total		**205,277**	**4,642**	**22.6**	**46.4**	**13.4**	**32.6**	**7.6**
Arlington	29	767	5	6.5	80.0	20.0	0.0	0.0
Attleboro	30	1,151	32	27.8	78.1	0.0	6.3	15.6
Barnstable	25	1,287	35	27.2	71.4	8.6	8.6	11.4
Boston	1	22,240	664	29.9	12.1	44.5	34.2	9.2
Brockton	6	3,304	163	49.3	30.1	31.9	21.5	16.6
Brookline	17	1,382	5	3.6	40.0	20.0	40.0	0.0
Cambridge	5	3,733	24	6.4	16.7	50.0	29.2	4.2
Chicopee	21	1,809	60	33.2	53.3	3.3	41.7	1.7
Fall River	8	2,915	158	54.2	74.1	8.9	13.3	3.8
Framingham	14	1,925	41	21.3	46.3	9.8	36.6	7.3
Haverhill	16	1,793	67	37.4	70.1	7.5	20.9	1.5
Lawrence	13	2,847	227	79.7	11.9	1.3	84.6	2.2
Lowell	4	3,913	228	58.3	36.8	1.8	26.8	34.6
Lynn	9	2,990	162	54.2	24.7	8.0	56.8	10.5
Malden	18	1,391	25	18.0	64.0	8.0	4.0	24.0
Medford	20	1,749	10	5.7	80.0	10.0	10.0	0.0
Methuen	28	1,264	26	20.6	65.4	0.0	34.6	0.0
New Bedford	7	2,978	175	58.8	52.3	5.7	32.2	9.8
Newton	11	3,411	9	2.6	66.7	11.1	11.1	11.1
Peabody	24	1,300	10	7.7	80.0	0.0	10.0	10.0
Pittsfield	27	1,361	61	44.8	73.8	8.2	13.1	4.9
Plymouth	23	1,577	22	14.0	72.7	13.6	9.1	4.5
Quincy	10	1,950	31	15.9	54.8	9.7	9.7	25.8
Revere	26	1,215	51	42.0	54.9	7.8	19.6	17.6
Somerville	12	2,087	50	24.0	46.0	18.0	36.0	0.0
Springfield	3	6,037	423	70.1	16.5	22.2	59.8	1.4
Taunton	19	1,652	57	34.5	66.1	1.8	19.6	12.5
Waltham	15	2,251	24	10.7	45.8	8.3	37.5	8.3
Weymouth	22	1,331	21	15.8	76.2	4.8	9.5	9.5
Worcester	2	6,918	226	32.7	42.0	10.6	43.4	4.0

Table 10 (cont.). Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2002

Municipality	Public payment for prenatal care[4] (%)	Unmarried (%)	Low Birthweight[6] (%)	Preterm[7] (%)	Adequacy of Prenatal Care[8]			
					Adequate Intensive	Adequate Basic	Intermediate	Inadequate
State Total	**76.9**	**91.1**	**10.3**	**10.2**	**35.6**	**36.3**	**8.3**	**19.9**
Arlington	20.0	80.0	0.0	0.0	60.0	20.0	0.0	20.0
Attleboro	67.9	93.8	3.1	9.4	32.3	16.1	25.8	25.8
Barnstable	82.4	100.0	17.1	8.6	42.9	28.6	5.7	22.9
Boston	82.1	94.3	12.4	13.6	29.6	44.0	8.3	18.1
Brockton	85.0	93.9	12.9	11.7	34.0	32.7	6.2	27.2
Brookline	60.0	80.0	0.0	0.0	0.0	100.0	0.0	0.0
Cambridge	50.0	83.3	0.0	0.0	41.7	41.7	4.2	12.5
Chicopee	80.0	93.3	8.3	10.0	30.0	43.3	11.7	15.0
Fall River	91.5	89.2	10.8	7.6	67.1	10.1	3.2	19.6
Framingham	75.6	75.6	7.3	9.8	34.2	46.3	4.9	14.6
Haverhill	63.6	94.0	13.4	14.9	40.3	44.8	3.0	11.9
Lawrence	81.0	90.8	12.8	8.8	44.9	41.4	1.3	12.3
Lowell	86.0	92.5	10.5	10.1	26.0	32.2	16.3	25.6
Lynn	89.3	86.4	14.8	16.1	39.5	30.3	9.3	21.0
Malden	48.0	76.0	4.0	4.0	48.0	24.0	4.0	24.0
Medford	80.0	90.0	0.0	0.0	10.0	70.0	20.0	0.0
Methuen	53.9	92.3	11.5	15.4	38.5	34.6	3.9	23.1
New Bedford	83.9	94.3	11.0	6.6	30.6	41.0	8.1	20.2
Newton	77.8	66.7	11.1	11.1	55.6	33.3	0.0	11.1
Peabody	60.0	80.0	10.0	10.0	70.0	10.0	10.0	10.0
Pittsfield	75.4	93.4	14.8	18.3	15.0	28.3	38.3	18.3
Plymouth	54.6	100.0	9.1	9.1	50.0	18.2	18.2	13.6
Quincy	67.7	93.6	9.7	6.5	23.3	53.3	3.3	20.0
Revere	72.6	90.2	7.8	7.8	56.9	17.7	3.9	21.6
Somerville	68.0	92.0	12.0	8.0	32.0	36.0	10.0	22.0
Springfield	87.1	92.9	11.4	12.7	31.9	31.4	9.1	27.6
Taunton	81.8	94.7	3.6	7.1	40.0	29.1	10.9	20.0
Waltham	60.9	83.3	8.3	8.7	29.2	41.7	16.7	12.5
Weymouth	66.7	85.7	4.8	4.8	28.6	33.3	14.3	23.8
Worcester	70.7	86.3	9.3	10.7	31.8	40.4	10.8	17.0

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to DPH 2000 population estimates, based on the U.S. Census 2000 population counts (see Technical Notes in Appendix). 2 Birth rates represent the number of births per 1,000 females age 15-19. 3 Mothers who designated themselves as Asian, American Indian, or Other. 4. See Glossary under "Prenatal Care Payment Source." 5. Calculations based on fewer than five teen births overall are excluded. 6. Less than 2,500 grams or 5.5 pounds. 7. Less than 37 weeks gestational age. 8. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary and Technical Notes in the Appendix for definitions of index and adequacy categories.

Table 11. Trends in Teen Birth Rates for Selected Communities[1], Ranked by 2002 Teen Birth Rate[2], Massachusetts: 2002, 2001, 1992

		2002		2001		1992[3]	
2002 Rank	Municipality	Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate
	State Total	**4,642**	**22.6**	**4,979**	**24.3**	**6,555**	**31.7**
1	Holyoke	124	82.0	133	87.9	185	127.9
2	Chelsea	90	81.7	89	80.8	87	95.1
3	Lawrence	227	79.7	271	95.2	302	109.7
4	Springfield	423	70.1	431	71.4	523	87.9
5	New Bedford	175	58.8	185	62.1	261	75.7
6	Lowell	228	58.3	215	54.9	275	72.3
7	Fall River	158	54.2	155	53.2	209	65.4
8	Lynn	162	54.2	158	52.8	171	70.0
9	Wareham	33	51.6	20	31.3	28	48.1
10	Brockton	163	49.3	170	51.5	221	69.4
11	Pittsfield	61	44.8	49	36.0	55	35.9
12	Fitchburg	67	44.1	91	59.9	107	60.2
13	Revere	51	42.0	50	41.2	58	54.5
14	Haverhill	67	37.4	62	34.6	98	62.9
15	Taunton	57	34.5	63	38.1	79	50.7
16	Chicopee	60	33.2	73	40.4	76	40.6
17	Worcester	226	32.7	269	38.9	384	56.6
18	Leominster	39	32.0	37	30.3	51	45.9
19	Boston	664	29.9	702	31.6	1,050	48.7
20	Everett	30	28.8	28	26.9	28	27.6
21	Attleboro	32	27.8	39	33.9	41	35.5
22	Barnstable	35	27.2	36	28.0	27	25.1
23	Somerville	50	24.0	42	20.1	65	29.7
24	Framingham	41	21.3	46	23.9	47	21.0
25	Quincy	31	15.9	30	15.4	55	23.7

1. Selected communities include the 25 Massachusetts cities and towns with the greatest number of teen births. Ranking is by 2001 teen birth rate. 2. Rates are per 1,000 females ages 15-19 per city/town.
3. Source for 1991 births and rates: Massachusetts Community Health Information Profile (MassCHIP), MDPH, v2.8 r270, January 2003; natality dataset and MISER 1991 population estimate.

CHAPTER 3

INFANT AND MATERNAL MORTALITY

Overall Changes in Infant Mortality Rate

In 2002, there were 397 infant deaths (deaths of children less than one year of age) among Massachusetts residents, 10 fewer infant deaths than in 2001, and **the second lowest number of infant deaths in Massachusetts history** (Table 12A).

The infant mortality rate (IMR) in 2002 was 4.9 deaths per 1,000 live births, which was slightly lower than the 2001 rate of 5.0, and a 30% decrease since 1990. **The 2002 IMR is the second lowest rate ever recorded for the state** (Table 12A).

According to final U.S. statistics for 2001, the **infant mortality rate (IMR)** in Massachusetts (4.9) was **28% lower** than the U.S. IMR (6.8) (National Vital Statistics Report, Vol. 52, No. 2, September 15, 2003, p. 3).

Race and Ethnicity Patterns in Infant Mortality Rates

The 2002 IMR for whites was 4.5 deaths per 1,000 live births in 2002, which was the same as the rate in 2001 (Table 12A). The IMR for black infants was 11.1 deaths per 1,000 live births, which was a 5% decrease from the 2001 rate.

Since 1980, there has been a substantial decline in IMRs among black and white infants. From 1980 to 2002, the IMR decreased by 54% for whites and 40% for blacks**. However, the IMR for black infants, 11.6 deaths per 1,000 live births, was consistently more than twice as high as the IMR for white infants during this time period.** Yet, the disparity in IMR between white and black infants continues to decrease since 2001 (Figure 8).

The Massachusetts death certificate was revised in 1989 to include a Hispanic identifier. This revision enables the calculation of white non-Hispanic, black non-Hispanic, and Hispanic infant mortality rates (Table 12B). Infants born to black non-Hispanic mothers continued to have the highest IMR (11.6 per 1,000 live births), although this rate represented a 4% decrease from the 2001 rate (12.1). Rates decreased also for Hispanic mothers by 4% and for Asian mothers by 3%. Rates remained the same for white non-Hispanic mothers.

The 2002 IMR for Hispanic infants was 70% higher than the white non-Hispanic rate (4.1) and 40% below the black non-Hispanic rate (11.6). Asian infants had the lowest infant mortality rate of all groups in 2002 with an IMR of 3 deaths per 1,000 live births (Table 12B). However, caution should be used when interpreting this rate since it is based on a small number of deaths.

Neonatal and Post Neonatal Mortality Rates

The overall neonatal mortality rate (deaths among infants less than 28 days old) was 3.7 per 1,000 live births in 2002, which is a decrease of 3% over the 2001 neonatal mortality rate of 3.8 (Table 12B).

As was true for infant mortality, the direction of change differed by race/ethnicity groups. Decreases occurred for black non-Hispanics, while the rate for Asians increased. The rate for white non-Hispanics and Hispanics remained the same as in 2001(Table 12B).

The overall post neonatal mortality rate (deaths among infants between 28 and 364 days old), was 1.2 in 2002, which was the same as in 2001(Table 12B). The post neonatal mortality rate for black non-Hispanic infants increased 31% from 2.6 in 2001 to 3.4 in 2002, and remained almost three times that of white non-Hispanics. The post neonatal mortality rate for Hispanic infants decreased 14% in 2002, from 2.1 deaths per 1,000 live births to 1.8 in 2002.

Trends in the Time of Infant Deaths

From 1990 to 2002, the percentage of all infant deaths that occurred in the post neonatal period (28-364 days) declined from 31% to 24%. During the same time period, the percentage of infant deaths that occurred in the very early neonatal period (within the first day after birth) rose from 44% to 52% of all infant deaths, and the percentage of infant deaths occurring later in the neonatal period (from 1-27 days) remained about the same (24%) (Figure 10).

(Cause-specific infant death information will be available in the upcoming report, *Massachusetts Deaths 2002*.)

Pregnancy-Associated and Maternal Mortality Ratios

In 2002, there were 19 pregnancy-associated deaths, including 2 maternal deaths (Fig. 11). A pregnancy-associated death is the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. Women who die from a cause related to pregnancy or childbirth either during pregnancy or up to 42 days after pregnancy termination are called maternal deaths and are a subset of pregnancy-associated deaths. (See technical notes for further information).

The 2002 pregnancy-associated mortality ratio (PAMR) was 23.3 deaths per 100,000 live births and the maternal mortality ratio (MMR) was 2.4 per 100,000 live births (Figure 11). Since 1990, the annual PAMR fluctuated from a low of 18.0 in 1990 to a high of 32.8 in 2001. However, due to the small number of cases, the differences are not statistically significant.

Note: This year we have improved our methodology for finding cases for 1999 to 2002, so numbers for these years differ from previously published numbers.

Table 12A. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race[1], Massachusetts: 1980-2002

INFANT MORTALITY (less than one year of age)

	State Total[2]		White		Black		Asian/Other[3]	
Year	**n**	**Rate[4]**	**n**	**Rate[4]**	**n**	**Rate[4]**	**n**	**Rate**
1980	748	10.3	655	9.8	87	18.6	5	4.6
1981	710	9.6	616	9.1	85	18.2	8	6.1
1982	764	10.1	656	9.4	102	21.3	5	3.3
1983	682	9.0	579	8.3	89	19.0	12	7.4
1984	699	8.9	601	8.4	82	16.4	13	7.5
1985	745	9.1	608	8.1	126	23.8	11	6.1
1986	695	8.4	560	7.5	123	22.0	11	4.6
1987	608	7.2	486	6.4	110	17.5	12	4.5
1988	693	7.9	546	7.0	133	19.5	13	3.8
1989	697	7.6	549	6.8	131	17.7	17	4.8
1990	649	7.0	519	6.4	106	13.7	24	6.5
1991	577	6.5	461	6.0	102	13.8	14	3.9
1992	569	6.5	438	5.7	114	15.8	17	4.7
1993	523	6.2	423	5.7	87	12.5	13	3.5
1994	499	6.0	407	5.6	81	12.0	11	2.9
1995	419	5.1	333	4.7	65	10.3	21	5.5
1996	403	5.0	329	4.7	65	10.8	8	2.0
1997	425	5.3	349	5.0	66	10.6	10	2.4
1998	414	5.1	345	4.9	59	9.3	10	2.3
1999	418	5.2	334	4.8	75	11.4	9	1.9
2000	377	4.6	280	4.0	76	11.7	19	3.6
2001	407	5.0	314	4.5	77	11.7	16	3.0
2002	397	4.9	306	4.5	74	11.1	17	2.9

Table 12A (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race[1], Massachusetts: 1980-2002

NEONATAL MORTALITY (birth to 27 days)

	State Total[2]		White		Black		Asian/Other[3]	
Year	**n**	**Rate[4]**	**n**	**Rate[4]**	**n**	**Rate[4]**	**n**	**Rate[4]**
1980	550	7.6	483	7.2	62	13.3	5	4.6
1981	510	6.9	442	6.5	59	12.4	5	3.8
1982	573	7.6	494	7.1	75	15.7	3	--[5]
1983	482	6.3	411	5.9	63	13.4	7	4.3
1984	472	6.0	411	5.8	49	9.8	8	4.6
1985	538	6.6	447	6.0	85	16.0	5	2.8
1986	478	5.8	383	5.2	89	15.9	5	2.1
1987	432	5.1	343	4.6	80	12.7	9	3.4
1988	477	5.4	383	4.9	87	12.8	6	1.8
1989	479	5.2	376	4.7	95	12.8	8	2.3
1990	446	4.8	347	4.3	80	10.3	9	5.1
1991	401	4.5	319	4.1	72	9.8	10	2.8
1992	415	4.8	325	4.3	79	10.9	11	3.1
1993	375	4.4	300	4.1	66	9.5	9	2.4
1994	349	4.2	280	3.8	60	8.9	9	2.4
1995	298	3.6	237	3.3	50	7.9	11	2.9
1996	290	3.6	249	3.5	35	5.8	5	1.2
1997	323	4.0	271	3.9	45	7.2	7	1.7
1998	315	3.9	261	3.7	47	7.4	7	1.6
1999	332	4.1	265	3.8	61	9.3	6	1.3
2000	288	3.5	214	3.1	58	8.9	14	2.7
2001	308	3.8	239	3.5	59	9.0	10	1.9
2002	299	3.7	235	3.4	51	7.6	13	2.2

Table 12A (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race[1], Massachusetts: 1980-2002

POST NEONATAL MORTALITY (28-364 days)

	State Total[2]		White		Black		Asian/Other[3]	
Year	n	Rate[4]	n	Rate[4]	n	Rate[4]	n	Rate[4]
1980	198	2.7	172	2.6	25	5.3	0	0.0
1981	200	2.7	174	2.6	26	5.8	3	--[5]
1982	191	2.5	162	2.3	27	5.6	2	--[5]
1983	200	2.7	168	2.4	26	5.6	5	3.1
1984	227	2.9	190	2.6	33	6.6	5	2.9
1985	207	2.5	161	2.1	41	7.8	6	3.3
1986	217	2.6	177	2.3	34	6.1	6	2.5
1987	176	2.1	143	1.8	30	4.8	3	--[5]
1988	216	2.5	163	2.1	46	6.7	7	2.0
1989	218	2.4	173	2.1	36	4.9	9	2.5
1990	203	2.2	172	2.1	26	3.4	5	1.4
1991	176	2.0	142	1.8	30	4.1	4	--[5]
1992	154	1.8	113	1.5	35	4.8	6	1.7
1993	148	1.7	123	1.7	21	3.0	4	--[5]
1994	150	1.8	127	1.7	21	3.1	2	--[5]
1995	121	1.5	96	1.3	15	2.4	10	2.6
1996	113	1.4	80	1.1	30	5.0	3	--[5]
1997	102	1.3	78	1.1	21	3.4	3	--[5]
1998	99	1.2	84	1.2	12	1.9	3	--[5]
1999	86	1.1	69	1.0	14	2.1	3	--[5]
2000	89	1.1	66	0.9	18	2.8	5	1.0
2001	99	1.2	75	1.1	18	2.7	6	1.1
2002	98	1.2	71	1.0	23	3.4	4	--[5]

1. Hispanic origin could not be identified from the Massachusetts death certificate before 1989; thus, Hispanic trend data are not available. Most Hispanics are included in the race category of white. Hispanic infant mortality data for the years 1990 through 2002 are presented in Table 12B. 2. Deaths of infants of unknown race are included in the total calculation. For rate computations, infants of unknown race are allocated into the race categories according to the distribution of births of known race. 3. Other: American Indian and Other races. 4. Rates are expressed per 1,000 live births. 5. Calculations based on fewer than five events are excluded.

Table 12B. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2002

INFANT MORTALITY (less than one year of age)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1990	649	7.0	442	6.1	98	13.7	77	9.1	24	7.0	8	9.5
1991	577	6.5	381	5.5	101	15.0	80	9.4	14	4.2	1	--[4]
1992	569	6.5	371	5.5	110	16.4	67	7.9	16	4.9	5	5.1
1993	523	6.2	346	5.3	84	13.1	77	9.3	13	3.9	3	--[4]
1994	499	6.0	343	5.3	79	12.6	64	7.6	8	2.4	5	5.3
1995	419	5.1	275	4.4	65	11.1	58	7.2	19	5.5	2	--[4]
1996	403	5.0	289	4.7	63	11.4	40	5.1	8	2.2	2	--[4]
1997	425	5.3	294	4.8	64	11.7	55	6.7	10	2.6	2	--[4]
1998	414	5.1	287	4.6	59	10.6	58	6.7	10	2.7	0	0.0
1999	418	5.2	285	4.7	72	12.3	49	5.5	8	1.9	4	--[4]
2000	377	4.6	232	3.8	74	12.8	48	5.2	19	4.1	4	--[4]
2001	407	5.0	245	4.1	71	12.1	69	7.3	15	3.1	7	4.1
2002	397	4.9	239	4.1	69	11.6	67	7.0	16	3.0	6	3.8

NEONATAL MORTALITY (birth to 27 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1990	446	4.8	298	4.1	75	10.5	49	5.8	19	5.5	5	5.5
1991	401	4.5	266	3.9	72	10.7	53	6.2	10	3.0	0	0.0
1992	415	4.8	274	4.0	76	11.4	51	6.0	10	3.0	4	--[4]
1993	375	4.4	245	3.7	64	10.0	55	6.7	9	2.7	2	--[4]
1994	349	4.2	240	3.7	58	9.3	40	4.7	7	2.1	4	--[4]
1995	298	3.6	198	3.1	50	8.5	39	4.8	10	2.9	1	--[4]
1996	290	3.6	222	3.6	34	6.2	27	3.5	5	1.4	1	--[4]
1997	323	4.0	228	3.7	44	8.0	43	5.2	7	1.8	1	--[4]
1998	315	3.9	218	3.5	47	8.5	43	5.0	7	1.9	0	0.0
1999	332	4.1	226	3.7	58	9.9	39	4.4	5	1.2	4	--[4]
2000	288	3.5	177	2.9	57	9.9	37	4.0	14	3.0	3	--[4]
2001	308	3.8	190	3.2	56	9.5	49	5.2	10	2.1	3	--[4]
2002	299	3.7	185	3.2	49	8.2	50	5.2	13	2.4	2	--[4]

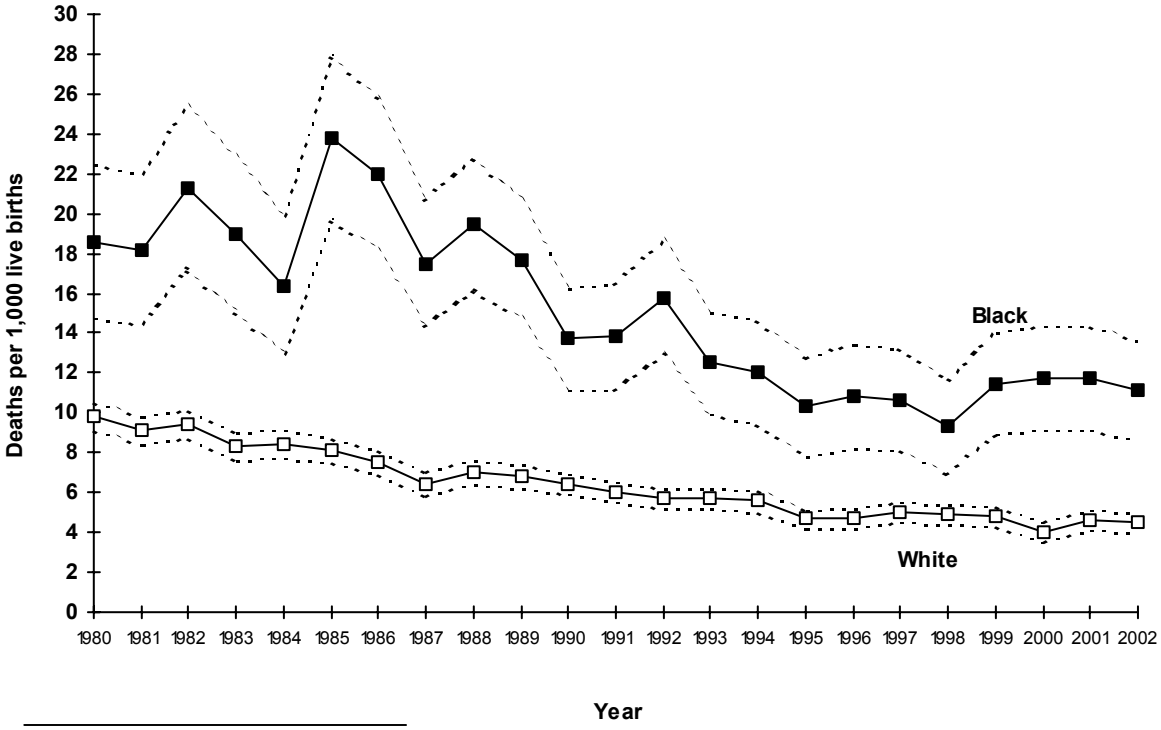
Table 12B (cont.). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2002

POST NEONATAL MORTALITY (28-364 days)

	State Total[1]		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[2]	
Year	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**	**n**	**Rate[3]**
1990	203	2.2	144	2.0	23	3.2	28	3.3	5	1.5	3	--[4]
1991	176	2.0	115	1.7	29	4.3	27	3.2	4	--[4]	1	--[4]
1992	154	1.8	97	1.4	34	5.1	16	1.9	6	1.8	1	--[4]
1993	148	1.7	101	1.5	20	3.1	22	2.7	4	--[4]	1	--[4]
1994	150	1.8	103	1.6	21	3.3	24	2.8	1	--[4]	1	--[4]
1995	121	1.5	77	1.2	15	2.6	19	2.3	9	2.6	1	--[4]
1996	113	1.4	67	1.1	29	5.3	13	1.7	3	--[4]	1	--[4]
1997	102	1.3	66	1.1	20	3.7	12	1.5	3	--[4]	1	--[4]
1998	99	1.2	69	1.1	12	2.2	15	1.7	3	--[4]	0	0.0
1999	86	1.1	59	1.0	14	2.4	10	1.1	3	--[4]	0	0.0
2000	89	1.1	55	0.9	17	2.9	11	1.2	5	1.1	1	--[4]
2001	99	1.2	55	0.9	15	2.6	20	2.1	5	1.0	4	--[4]
2002	98	1.2	54	0.9	20	3.4	17	1.8	3	--[4]	4	--[4]

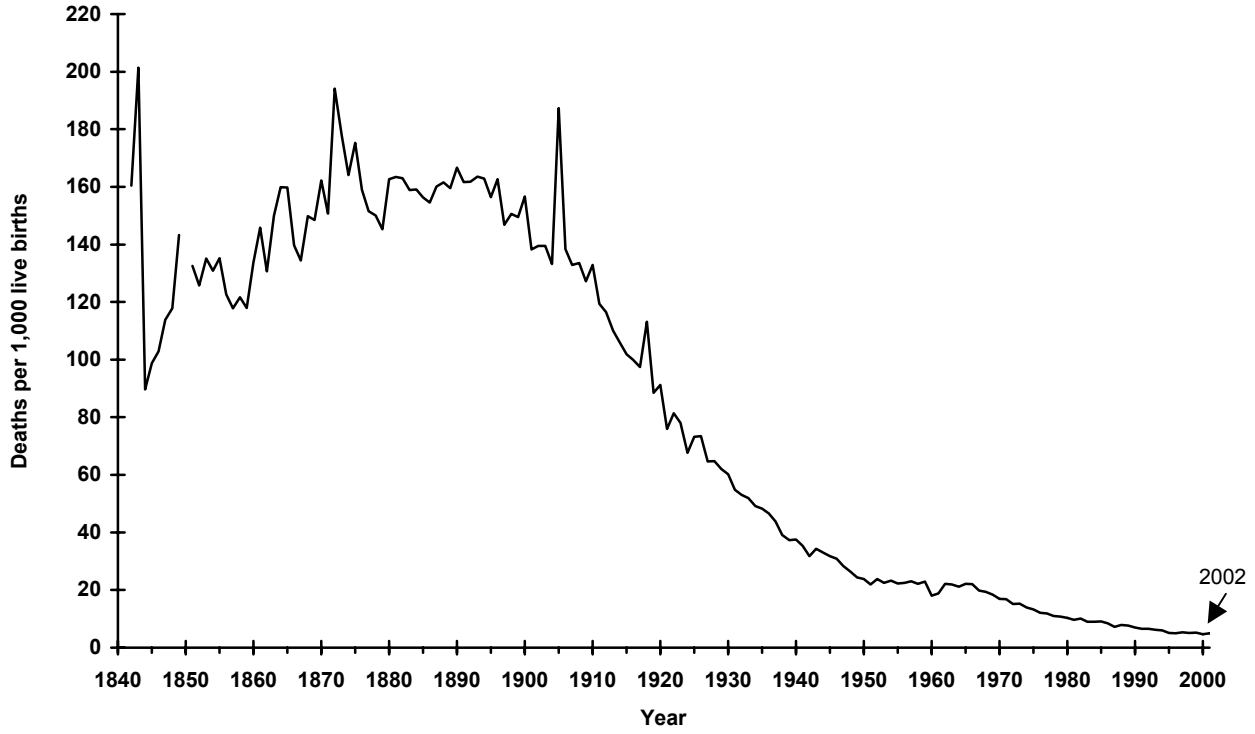
1. Deaths of infants of unknown race are included in the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Other: American Indian and Other races. 3. Rates are expressed per 1,000 live births.
4. Calculations based on fewer than five events are excluded.

Figure 8. Infant Mortality Rates and 95% Confidence Intervals[1] by Race[2], Massachusetts: 1980-2002



[1]See Appendix for explanation.
[2]For rate computations, infant births of unknown race are allocated into race categories according to the distribution of the births of known race.
[3]On tables and graphs, which include data prior to June 1989, the race classifications do not include ethnicity; most Hispanics are included in the race category of whites.

Figure 9. Infant Mortality Rates, Massachusetts: 1842-2002[1]



1. Data not available for 1850.

Figure 10. Trends in the Timing of Infant Deaths, 1990-2002

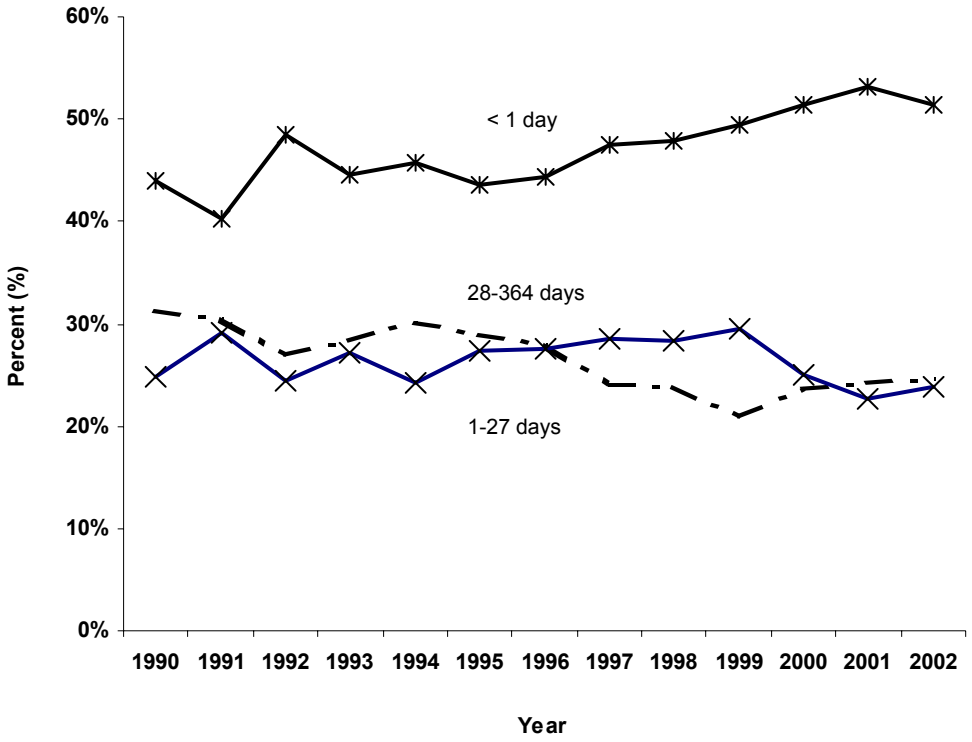
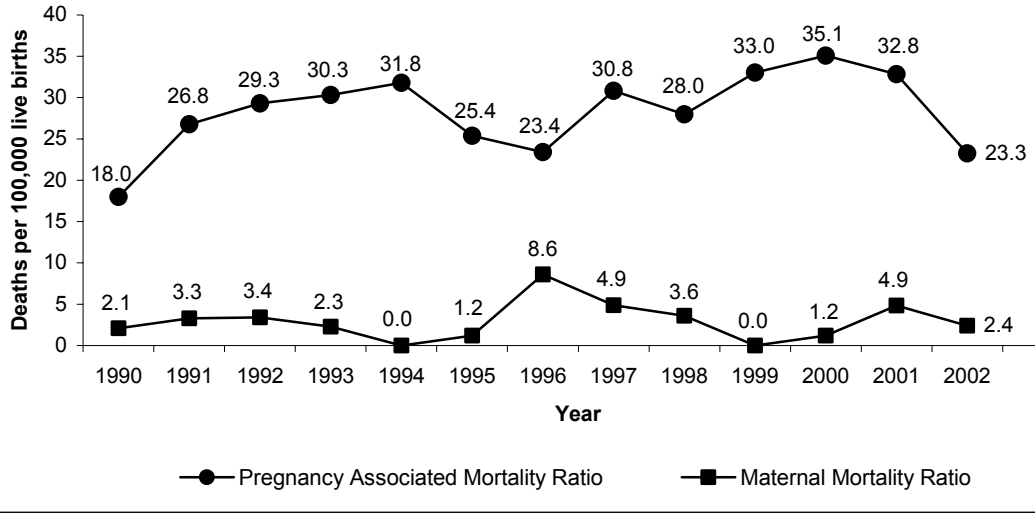


Figure 11. Trends in Pregnancy-Associated[1] and Maternal Mortality[2], Massachusetts: 1990-2002



Number of Pregnancy-Associated[1] and Maternal Deaths[2], 1990-2002

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002
Pregnancy-Associated Deaths[1]	17	24	26	26	27	21	19	25	23	27	29	27	19
Maternal Deaths[2]	2	3	3	2	0	1	7	4	3	0	1	4	2

NOTE: Ratios shown in graph are per 100,000 live births. Ratios are based on occurrence births, not resident births.

1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for further information). 2. Maternal death is defined as the death of a woman while pregnant or within 42 days of termination of pregnancy, irrespective of the duration or site of the pregnancy, from any cause related to or aggravated by pregnancy or its management, but not from accidental or incidental causes. Maternal mortality ratio is the number of maternal deaths per 100,000 live occurrence births (see Definition of Rates and Technical Notes in Appendix for more information.)

CHAPTER 4

BIRTHWEIGHT AND GESTATIONAL AGE

Overall Birthweight Distribution

In 2002, 7.5% (6,060) of Massachusetts resident infants were low birthweight (LBW) (less than 2,500 grams or 5.5 pounds), and 11.2% were 4,000 grams (8.8 pounds) or more (Table 13).

The low birthweight percentage increased 4%, from 7.2% in 2001 to 7.5% in 2002, **the highest since at least 1980** (Table 15). In 2002, 1.4% (1,109) of infants born to Massachusetts resident women were very low birthweight (VLBW) (less than 1,500 grams or 3.3 pounds); this percentage has remained the same since 1999.

The increase in low birthweight infants can be linked directly to the increase in multiple births and the aging of the population giving birth. The trend in low birthweight infants in Massachusetts is consistent with national trends.

The low birthweight rate in Massachusetts was 4% below the U.S. rate of 7.8% (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2).

Patterns of Birthweight by Race and Ethnicity

The proportion of low birthweight infants varied by mother's race and ethnicity (Table 13). Black non-Hispanic women had the highest proportion of low birthweight infants: 12.6%; Hispanic mothers delivered 8.3% low birthweight infants; Asian mothers, 8.0% low birthweight infants; and white non-Hispanic mothers delivered 6.8% low birthweight infants.

The proportion of low birthweight deliveries in 2002 increased for all major race and ethnic groups: the rate for black non-Hispanics increased 13% from 11.2% to 12.6%, the rate for Asians increased by 10% from 7.3% to 8.0%, the rate for white non-Hispanics increased 3% from 6.6% to 6.8%, and the rate for Hispanics increased 1% from 8.2% to 8.3% (data not shown).

The proportion of very low birthweight infants also varied by mother's race and ethnicity. Black non-Hispanic women had the highest proportion of very low birthweight infants: 3.1%; compared with 1.7% of Hispanics, 1.4% of Asians, and 1.1% of white non-Hispanics (Table 13).

White non-Hispanic mothers delivered the highest proportion of high birthweight infants (weighed 4,000 grams or 8.8 pounds and more): 12.6% (Table 13). This is a decrease from 2001, when the rate for white non-Hispanic mothers was 12.8% (data not shown).

The Massachusetts 2002 low birthweight rate for black non-Hispanic women, 12.6%, was lower than the U.S. rate for all black women, 13.3%. The rate of low birthweight for Massachusetts Hispanic women (8.3%) was higher than the corresponding 2002 U.S. rate of 6.5% (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 2). This may be due to differences in the composition of the Hispanic population between Massachusetts and the nation as a whole. In Massachusetts, the Hispanic population is comprised mainly of Puerto Ricans, Dominicans, and Central Americans. The U.S. Hispanic population has a much greater percentage of Mexicans and Cubans who tend to have relatively lower rates of low birthweight. The Massachusetts low birthweight rate

for Puerto Rican mothers was 10.2% in 2002 (Table 2B), compared with 9.7% among Puerto Rican mothers nationwide in 2002 (National Vital Statistics Reports, Vol. 52, No. 10, December 17, 2003, p. 18).

Birthweight and Smoking

Cigarette smoking during pregnancy increases the likelihood of delivering a low birthweight infant. During 2002 in Massachusetts, 11% of infants born to mothers who smoked during pregnancy were low birthweight, compared with 7% of infants born to non-smoking mothers (Figure 12). Approximately 1 out of 6 (16%) infants born to black non-Hispanic women who smoked during their pregnancies were low birthweight.

Birthweight and Age of Mother

In general, the relation between mother's age and percentage low birthweight follows a "U-shaped" distribution: the percentage of low birthweight deliveries is highest among both the youngest mothers (under age 24 years) and the oldest mothers (over age 35 years), while it is lowest for mothers between 25 and 34 years of age (Table 14).

Low Birthweight and Plurality

The increase in low birthweight in Massachusetts over the past decade can be attributed in part to the dramatic increase in multiple births in Massachusetts. The percentage of low birthweight (LBW) and very low birthweight (VLBW) rises dramatically for twins and higher order births. In 2002, 5% of singleton births were LBW, whereas half of twins, and 96% of higher order births were LBW (Table 15). Similarly, 0.9% of singletons, 9% of twins, and 28% of higher order births were VLBW. The percentage of VLBW singleton infants remained approximately the same from 1992 to 2002, while LBW increased 11% in this group: 4.7% in 1992 to 5.2% in 2002. The percentage of LBW deliveries for twins also increased slightly from 2001 to 2002.

Preterm Deliveries

In 2002, 8.5% (6,795) of infants born to Massachusetts resident women were preterm (premature, that is, born before the mother had completed the 37th week of pregnancy) (Table 16). This was an increase of 2% from the previous year.

The proportion of preterm births varied by mother's race and ethnicity. Black non-Hispanic women had the highest proportion of preterm infants, 12.3%. Hispanic women had 8.9% preterm births; white non-Hispanic women, 8.1%; and Asian women had the lowest, 7.6% (Table 16).

The percentage of infants delivered very early (before the 28th week of gestation) has remained the same since 1997 at 0.6%. Black non-Hispanic women had the highest proportion of infants delivered very early (1.7%) more than double that of any other racial and ethnic group (Table 16).

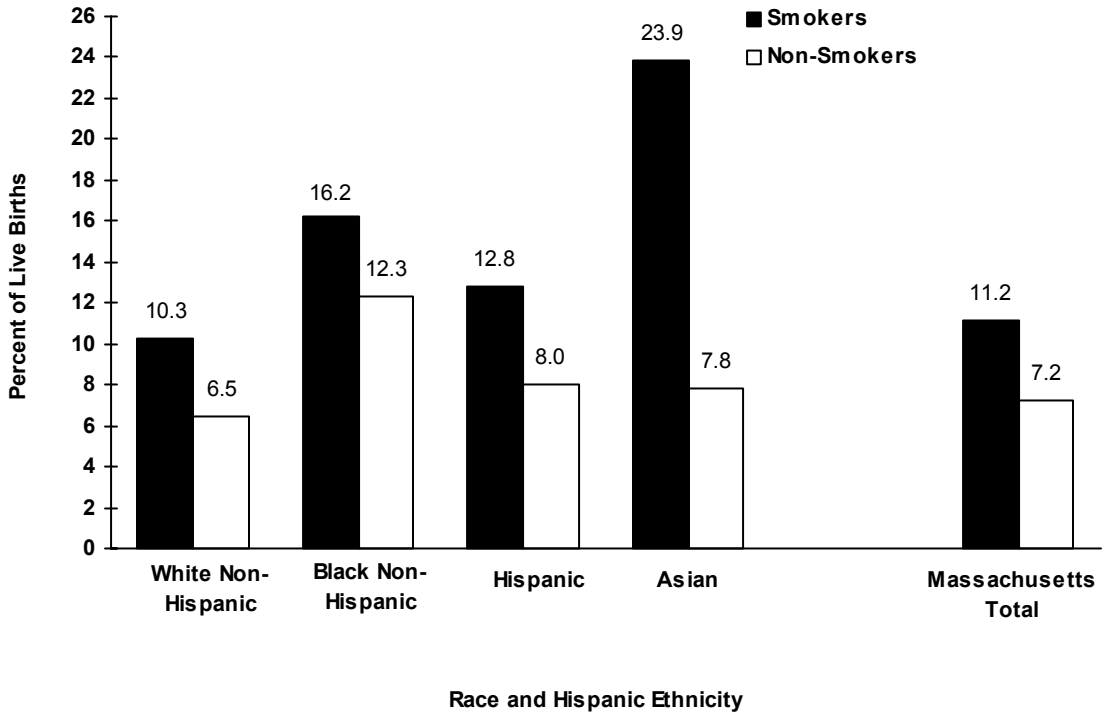
Table 13. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2002

Birthweight (in grams)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n
State Total	80,624	100.0	58,136	100.0	5,948	100.0	9,543	100.0	5,300	100.0	1,576	100.0	121
<500	125	0.2	54	0.1	32	0.5	26	0.3	9	0.2	4	--[2]	0
500-999	417	0.5	238	0.4	80	1.3	63	0.7	25	0.5	10	0.6	1
1000-1499	567	0.7	374	0.6	70	1.2	73	0.8	42	0.8	8	0.5	0
1500-1999	1,207	1.5	831	1.4	134	2.3	143	1.5	66	1.2	31	2.0	2
2000-2499	3,744	4.6	2,455	4.2	431	7.2	487	5.1	282	5.3	84	5.3	5
2500-2999	12,091	15.0	7,676	13.2	1,233	20.7	1,735	18.2	1,162	21.9	273	17.3	12
3000-3499	29,219	36.2	20,350	35.0	2,188	36.8	3,822	40.1	2,242	42.3	596	37.8	21
3500-3999	24,184	30.0	18,770	32.3	1,347	22.6	2,421	25.4	1,187	22.4	432	27.4	27
4000-4499	7,559	9.4	6,207	10.7	342	5.7	650	6.8	235	4.4	118	7.5	7
4500-4999	1,255	1.6	1,011	1.7	75	1.3	105	1.1	44	0.8	14	0.9	6
>=5000	129	0.2	107	0.2	6	0.1	9	0.1	5	0.1	2	--[2]	0
Unknown	127	0.2	63	0.1	10	0.2	9	0.1	1	--[2]	4	--[2]	40
VLBW[3] (0-1,499 g)	1,109	1.4	666	1.1	182	3.1	162	1.7	76	1.4	22	1.4	1
LBW[4] (0-2,499 g)	6,060	7.5	3,952	6.8	747	12.6	792	8.3	424	8.0	137	8.7	8

NOTE: Percentages for detailed birthweight rows ("<500" through "Unknown") are calculated based on all births including those with unknown birthweight. Percentages for VLBW and LBW rows are calculated based on births with known birthweights only.

1. Percentages are based on column totals. 2. Calculations based on fewer than five events are excluded. 3. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.).
4. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.).

Figure 12. Low Birthweight[1] Among Smoking and Nonsmoking[2] Mothers, by Race and Hispanic Ethnicity, Massachusetts: 2002



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Maternal smoking is self-reported, usually following childbirth; these data should be interpreted cautiously.

1. Low birthweight: less than 2,500 grams or 5.5 pounds.
2. Based on information provided on the birth certificate by the mother.

Table 14. Low Birthweight (LBW)[1] by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2002

Mother's Age (in years)	Total LBW Infants		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[4]		Unknown[5]
	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n
State Total[2]	**6,060**	**7.5**	**3,951**	**6.8**	**747**	**12.6**	**792**	**8.3**	**424**	**8.0**	**137**	**8.7**	**9**
<18	184	11.7	56	9.4	41	17.9	67	11.0	13	16.3	7	12.5	0
18-19	303	9.6	121	7.7	49	12.2	103	10.8	17	13.5	12	12.6	1
20-24	889	7.5	434	6.6	160	12.3	203	6.9	58	9.1	34	8.6	0
25-29	1,262	6.8	752	5.9	179	12.1	193	8.0	103	6.8	31	7.5	4
30-34	1,845	6.8	1,362	6.3	175	12.1	139	8.2	136	7.0	33	9.0	0
35-39	1,243	8.2	969	7.8	108	12.7	69	8.8	79	9.4	16	7.6	2
40+	333	10.2	257	9.7	35	14.3	18	11.2	18	11.0	4	10.5	1

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Low Birthweight (LBW): less than 2,500 grams or 5.5 pounds at birth. 2. State totals include women of unknown age. 3. Percentages are based upon the number of low birthweight infants divided by the total births in each age and race/ethnicity category. 4. Other races include American Indian and others not specified. 5. Race and/or mother's age unknown.

Table 15. Low Birthweight by Plurality, Massachusetts: 1992-2002

Age Group	Year	Singleton				Multiples												Total Births			
						Twin				Triplets or more				Total Multiples							
		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
All Ages	**1992**	656	0.8	3,959	4.7	192	8.3	1,062	45.7	39	29.8	116	88.5	231	9.4	1,178	48.0	887	1.0	5,137	5.9
	1993	673	0.8	3,919	4.8	216	9.2	1,105	47.1	73	36.0	178	87.7	289	11.3	1,283	50.4	962	1.1	5,202	6.2
	1994	687	0.8	4,015	5.0	223	9.5	1,122	47.9	66	30.8	198	92.5	289	11.3	1,320	51.6	976	1.2	5,335	6.4
	1995	674	0.9	3,867	4.9	227	9.4	1,128	46.6	63	31.8	179	90.4	290	11.1	1,307	49.9	964	1.2	5,174	6.4
	1996	657	0.9	3,674	4.8	227	8.8	1,264	49.1	45	24.5	167	90.8	272	9.9	1,431	51.9	929	1.2	5,105	6.4
	1997	731	0.9	3,938	5.1	292	10.3	1,439	50.5	75	28.6	240	91.6	367	11.8	1,679	54.0	1,098	1.4	5,617	7.0
	1998	690	0.9	3,819	4.9	298	9.6	1,570	50.7	82	28.5	266	92.4	380	11.2	1,836	54.2	1,070	1.3	5,655	7.0
	1999	731	0.9	3,869	5.0	324	10.3	1,617	51.6	65	26.5	222	90.6	389	11.5	1,839	54.5	1,120	1.4	5,708	7.1
	2000	722	0.9	3,886	5.1	284	8.9	1,603	50.0	84	35.0	222	92.5	368	10.7	1,825	53.0	1,090	1.4	5,711	7.1
	2001	730	0.9	3,931	5.1	310	9.2	1,654	49.2	74	32.9	210	93.3	384	10.7	1,864	52.0	1,114	1.4	5,795	7.2
	2002	699	0.9	3,972	5.2	342	9.2	1,855	50.2	68	28.0	233	95.9	410	10.4	2,088	53.0	1,109	1.4	6,060	7.5
Ages < 35	**1992**	551	0.8	3,378	4.6	166	8.8	870	46.0	29	28.7	92	91.1	195	9.8	962	48.3	746	1.0	4,340	5.8
	1993	561	0.8	3,307	4.7	168	9.2	881	48.2	56	35.9	136	87.2	224	11.3	1,017	51.2	785	1.1	4,324	6.0
	1994	567	0.8	3,397	5.0	181	9.9	891	48.5	47	28.7	150	91.5	228	11.4	1,041	52.0	795	1.1	4,438	6.3
	1995	543	0.8	3,187	4.9	196	11.0	852	47.9	52	36.9	135	95.7	248	12.9	987	51.4	791	1.2	4,174	6.2
	1996	501	0.8	2,937	4.7	194	10.2	944	49.9	32	27.1	111	94.1	226	11.2	1,055	52.5	727	1.1	3,992	6.1
	1997	566	0.9	3,179	5.1	214	11.0	1,030	53.0	46	27.1	153	90.0	260	12.3	1,183	55.9	826	1.3	4,362	6.8
	1998	540	0.9	3,086	4.9	248	11.4	1,148	52.5	60	35.3	153	90.0	308	13.1	1,301	55.2	848	1.3	4,387	6.8
	1999	569	0.9	3,082	5.0	231	10.8	1,124	52.6	49	32.9	138	92.6	280	12.3	1,262	55.2	849	1.3	4,344	6.8
	2000	555	0.9	3,096	5.1	204	9.4	1,097	50.7	49	38.0	125	96.9	253	11.0	1,222	53.3	808	1.3	4,318	6.9
	2001	576	1.0	3,147	5.2	235	10.7	1,156	52.4	41	31.3	120	91.6	276	11.8	1,276	54.6	852	1.4	4,423	7.0
	2002	537	0.9	3,129	5.2	237	10.0	1,229	51.9	42	33.1	125	98.4	279	11.2	1,354	54.2	816	1.3	4,483	7.2
Ages 35+	**1992**	104	0.9	580	5.0	26	6.0	192	44.4	10	33.3	24	80.0	36	7.8	216	46.8	140	1.2	796	6.6
	1993	112	0.9	612	5.1	48	9.3	224	43.4	17	36.2	42	89.4	65	11.5	266	47.2	177	1.4	878	7.0
	1994	120	1.0	618	4.9	42	8.3	231	45.6	19	38.0	48	96.0	61	11.0	279	50.1	181	1.4	897	6.9
	1995	130	1.0	679	5.1	31	4.8	276	43.0	11	19.3	44	77.2	42	6.0	320	45.8	172	1.2	999	7.2
	1996	156	1.1	737	5.4	33	4.9	320	47.1	13	19.7	56	84.8	46	6.2	376	50.5	202	1.4	1,113	7.7
	1997	165	1.1	759	5.2	78	8.6	409	45.3	29	31.5	87	94.6	107	10.8	496	49.9	272	1.7	1,255	8.1
	1998	150	1.0	733	4.8	50	5.5	422	46.2	22	18.6	113	95.8	72	7.0	535	51.8	222	1.4	1,268	7.8
	1999	162	1.0	787	5.0	93	9.3	493	49.5	16	16.7	84	87.5	109	10.0	577	52.8	271	1.6	1,364	8.2
	2000	167	1.0	790	4.9	80	7.7	506	48.6	35	31.5	97	87.4	115	10.0	603	52.3	282	1.6	1,393	8.1
	2001	154	0.9	784	4.7	75	6.5	498	43.2	33	35.1	90	95.7	108	8.7	588	47.2	262	1.5	1,372	7.7
	2002	161	1.0	842	5.0	105	7.9	626	47.1	26	22.4	108	93.1	131	9.1	734	50.8	292	1.6	1,576	8.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
1. Very Low Birthweight (VLBW): less than 1,500 grams (3.3 lbs.). 2. Low Birthweight (LBW): less than 2,500 grams (5.5 lbs.). 3. Calculations based on fewer than five events are excluded.

Table 16. Births by Gestational Age[1], Race and Hispanic Ethnicity, Massachusetts: 2002

Gestational Age	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other[3]		Unknown
(weeks completed)	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n
State Total	80,624	100.0	58,136	100.0	5,948	100.0	9,543	100.0	5,300	100.0	1,576	100.0	121
<20	19	0.0	4	--[7]	7	0.1	5	0.1	1	--[7]	2	--[7]	0
20-23	163	0.2	89	0.2	42	0.7	20	0.2	11	0.2	1	--[7]	0
24-27	330	0.4	186	0.3	53	0.9	62	0.6	23	0.4	6	0.4	0
28-31	722	0.9	486	0.8	102	1.7	83	0.9	35	0.7	16	1.0	0
32-35	2,990	3.7	2,116	3.6	286	4.8	361	3.8	159	3.0	64	4.1	4
36	2,571	3.2	1,806	3.1	241	4.1	310	3.2	175	3.3	36	2.3	3
37-39[4]	36,310	45.0	25,908	44.6	2,704	45.5	4,357	45.7	2,600	49.1	705	44.7	36
40[4]	26,283	32.6	19,287	33.2	1,747	29.4	3,052	32.0	1,641	31.0	528	33.5	28
41[4]	9,820	12.2	7,323	12.6	629	10.6	1,098	11.5	587	11.1	176	11.2	7
42[4]	1,048	1.3	702	1.2	107	1.8	151	1.6	55	1.0	33	2.1	0
43	21	0.0	12	0.0	4	--[7]	3	--[7]	2	--[7]	0	0.0	0
44+	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
Unknown[5]	347	0.4	217	0.4	26	0.4	41	0.4	11	0.2	9	0.6	43
Very early gestation, <28 weeks	512	0.6	279	0.5	102	1.7	87	0.9	35	0.7	9	0.6	0
Preterm, <37 weeks[6]	6,795	8.5	4,687	8.1	731	12.3	841	8.9	404	7.6	125	8.0	7

NOTE: Percentages for detailed gestational age category rows ("<20" through "Unknown") are calculated based on all births including those with unknown gestational age. Percentages for "Very early gestation" and "Preterm" rows are calculated based on births with known gestational age only.

1. A clinical estimate of the number of weeks of pregnancy completed; as estimated by the attendant at birth or the postnatal physician. 2. Percentages are based on column total. 3. Other races include American Indian and others not specified. 4. Normal gestational age is defined as 37-42 weeks. 5. Estimate of gestational age not provided. 6. Also known as early gestational age, premature delivery, or preterm delivery. 7. Calculations based on fewer than five events are excluded.