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# Massachusetts Births 2006



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Massachusetts Department of Public Health

Bureau of Health Information, Statistics, Research, and Evaluation  
Division of Research and Epidemiology

February 2008



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Massachusetts Department of Public Health

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## TABLE OF CONTENTS

<b>Note to Readers .....</b>	<b>9</b>
<b>Highlights .....</b>	<b>10</b>
<b>Introduction .....</b>	<b>11</b>
<b>Methods .....</b>	<b>11</b>
<b>Results .....</b>	<b>12</b>
Table 1. Trends in Birth Characteristics, Massachusetts: 1990, 1991, 1994-2006 .....	19
Table 2. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2006 .....	20
Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2006 .....	21
Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2006 .....	22
Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2006 .....	23
Table 5. Trends in Number and Percent Distribution of Births by Plurality and Age Massachusetts: 1993-2006 .....	24
Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2006 .....	25
Table 7. Trends in Teen Birth Rates for Selected Communities, Ranked by 2006 Teen Birth Rate, Massachusetts: 1996, 2005, and 2006 .....	26
Figure 2. Birth Rates Among Women Ages 15-19 by Mother's Race and Hispanic Ethnicity, Massachusetts: 1996 and 2006 .....	27
Table 8. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2006 .....	28
Table 9. Low Birthweight by Plurality, Massachusetts: 1996-2006 .....	29
Table 10. Births by Gestational Age, Race and Hispanic Ethnicity, Massachusetts: 2006 ....	30
Figure 3. Percent of Mothers who Smoked During Pregnancy, Massachusetts: 1990-2006 .....	31
Figure 4. Percent of Mothers who Reported Smoking During Pregnancy by Mother's Race and Hispanic Ethnicity, Massachusetts: 2006 .....	31
Figure 5. Trends in Adequacy of Prenatal Care by Race and Hispanic Ethnicity, Massachusetts: 1996-2006 .....	32
Figure 6. Adequacy of Prenatal Care by Selected Maternal Characteristics, Massachusetts: 2006 .....	33

Figure 7. Distribution of Prenatal Care Payment Source, Massachusetts: 2006 .....	34
Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race and Hispanic Ethnicity, Massachusetts: 1990-2006 .....	35
Figure 8. Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 2006.....	37
Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2006 ...	38
Table 13. Birth Characteristics by Licensed Maternity Facility, Massachusetts: 2006.....	40
Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2010 Objectives, Massachusetts: 2003-2006.....	42
<b>Appendix.....</b>	<b>43</b>
Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2006.....	45
Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed by Age Group, Massachusetts: 2006.....	47
Figure 10. Percent of Mothers who Smoked During Pregnancy by Mother's Race and Hispanic Ethnicity and Educational Attainment, Massachusetts: 2006 .....	48
Figure 11. Distribution of Smoking Status during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2006 .....	49
Table 16. Parity by Age of Mother, Massachusetts: 2006 .....	50
Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2006.....	51
Table 18. Inter-pregnancy Interval (IPI) and Birth Outcomes -- Pregnancies to Multiparous Mothers, Massachusetts: 2006.....	52
Figure 12. Inter-pregnancy Interval (IPI)vs. LBW and Preterm Pregnancies to Multiparous Mothers, Massachusetts: 2006.....	53
Table 19. Inter-pregnancy Interval (IPI) by Maternal Characteristics, Pregnancies to Multiparous Mothers, Massachusetts: 2006 .....	54
Figure 13. Inter-pregnancy Interval (IPI) Distribution by Maternal Age -- Pregnancies to Multiparous Mothers, Massachusetts: 2006 .....	55
Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2006 .....	56
Figure 15. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2006.....	57

Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2006 .....	58
Table 21. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race, Massachusetts: 1980-2006.....	60
Figure 16. Infant Mortality Rates and 95% Confidence Intervals by Race, Massachusetts: 1980-2006.....	63
Figure 17. Infant Mortality Rates, Massachusetts: 1842-2006.....	64
Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2006.....	65
Table 22. Feto-Infant Mortality Rate by Birthweight, Massachusetts: 1999-2006 .....	66
Figure 19. Feto-Infant Mortality Rate, Massachusetts: 1998-2006 .....	67
Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2006.....	68
Figure 20. Trends in Pregnancy-Associated and Maternal Mortality, Massachusetts: 1993-2006.....	69
Table 24. Number of Pregnancy-Associated and Maternal Deaths, Massachusetts: 1995-2006.....	69
Figure 21. Low Birthweight Among Smoking and Nonsmoking Mothers, by Race and Hispanic Ethnicity, Massachusetts: 2006.....	70
Table 25. Low Birthweight (LBW)by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2006.....	71
Table 26. Adequacy of Prenatal Care Utilization: Summary and Component Indices, Massachusetts: 2006.....	72
Table 27. Adequacy of Prenatal Care by Selected Characteristics, Massachusetts: 2006 ....	73
Table 28. Adequacy of Prenatal CareInitiation by Selected Characteristics, Massachusetts: 2006.....	74
Table 29. Adequacy of Prenatal Care Visits by Selected Characteristics, Massachusetts: 2006 .....	75
Table 30. Birth Characteristics by Race and Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2006.....	76
Table 31. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility, All Births, Massachusetts: 2006 .....	78
Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2006.....	80

Table 33. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006 .....	82
Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2006.....	90
Table 35. Birth Characteristics, Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2006 .....	91
TECHNICAL NOTES .....	92
Data Availability .....	92
Data Cautions .....	92
Changes in the Collection of Race And Ethnicity Information.....	92
Population Estimates .....	93
Table A. 2006 Massachusetts Population Estimatesby Age Group, Gender, Race and Hispanic Ethnicity(mutually exclusive).....	95
Change In Measurement Of Adequacy Of Prenatal Care.....	96
Tests of Statistical Significance .....	100
Table 36. 95% Confidence Intervals for Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 1990-2006.....	102
Definition Of Rates And Ratios .....	103
Table A1. Population Estimates for Massachusetts Communities: 2005 .....	106
Table A2. Population Estimates for Massachusetts Community Health Network Areas (CHNA) and Counties: 2005.....	109
GLOSSARY .....	110
Massachusetts Birth Certificate: 2006 .....	115
Massachusetts Births 2006 Evaluation Form.....	116



## Note to Readers

Please review the information below before reading the report.

1. **Gestational Diabetes Mellitus:** This year, gestational diabetes mellitus (GDM) has been added to the report. The trend in GDM must be followed in Massachusetts due to its documented association with increased risk of pregnancy complications and the development of overt diabetes for the mother and her offspring.
2. **Population:** Population estimates from the National Center for Health Statistics for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level, were used to calculate community rates. Data for 2006 were used to calculate state-wide rates, e.g., fertility rate, teen birth rate, etc. **Please note:** If the population in your community increased from 2005 to 2006, the rates listed may **overestimate** the actual rate. If the population in your community declined from 2005 to 2006, the rates given in the publication may **underestimate** the actual rate. As soon as new population data are available for cities and towns, revised rates will be available from MassCHIP (<http://masschip.state.ma.us>). Please see the Appendix for detailed information about population.
3. **Rate, Proportion, and Number comparisons:** The comparison of rates, proportions, and numbers made in this year's report is based on tests of statistical significance. Comparative words, for example, "higher", "lower", "increase", and "decrease" are used only when the statistics being compared are statistically different (i.e., statistically significant) at the  $P \leq .05$  level. Please see the Appendix for a discussion of how statistical significance is determined.
4. **Race and Ancestry Groups:**
  - This year, we have separated American Indian mothers from the "Other" race category.
  - We have eliminated the "Other-" categories from the mothers ancestry groups and replaced them with the specific ancestries within these groups that had counts greater than or equal to 300. This year, we have also presented the Native American ancestry count. Refer to the Technical Notes for the complete list of ancestries.
  - Note that the American Indian (race) count differs from the Native American/American Indian (ancestry) because mothers can select "American Indian" as a race category and "Native American" as an ethnicity category, or both.

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## Highlights

- In 2006, there were 77,670 births to Massachusetts residents, which was 846 more births than there were in 2005 (not a statistically significant increase). While the number of white non-Hispanic births remained stable, there were significant increases in the numbers of Hispanic (6.3%), black non-Hispanic (6.1%), and Asian (4.1%) births.
- In 2006, the fertility (birth rate) was 56.9 births per 1,000 women ages 15-44 years. This rate was statistically higher than the 2005 rate of 55.6 births per 1,000 women ages 15-44 years.
- Gestational diabetes mellitus (GDM) is an emerging health issue associated with an increased risk of developing overt diabetes later on in life for both mother and infant. The percentage of mothers with GDM increased by 9% from 3.5% in 2005 to 3.8% in 2006.
- In 2006, the Cesarean section delivery rate rose for the eighth straight year to an all time high of 33.4% of all deliveries.
- Compared with 2005, there has been an increase in births to mothers whose ancestries are Honduran, Guatemalan, Brazilian, and Salvadoran; however, these groups accounted for only 6% of all births in Massachusetts in 2006. Births to Honduran mothers increased by 41%, Guatemalan mothers, 29%, Brazilian mothers, 18%, and Salvadoran mothers, 15%.
- The percentage of low birthweight (LBW) infants (less than 2,500 grams or 5.5 pounds) was the same as it was in 2005, 7.9%. LBW has increased by more than 11% since 2000 when it was 7.1%.
- The Massachusetts Infant Mortality Rate (IMR) did not change significantly from 2005. In 2006, the IMR was 4.8 infant deaths per 1,000 live births compared with 5.1 infant deaths per 1,000 live births in 2005.
- The percentage of mothers who reported smoking during pregnancy was 7.4% in 2006 compared with 7.2% in 2005. The percentage of mothers who reported smoking during pregnancy has decreased by 24% since 2000 when it was 9.7%.
- Between 2005 and 2006, the percentage of women receiving adequate prenatal care decreased by 1% overall. The only race/ethnic group that had a significant decrease was white non-Hispanics. The overall percentage of women initiating prenatal care in the 1<sup>st</sup> trimester decreased from 83.2% in 2005 to 82.1% in 2006. This rate decreased by 3% for Hispanic mothers and by 1% for white non-Hispanic mothers.
- The percentage of mothers who had their prenatal care financed through public programs increased by 5%, from 32.6% in 2005 to 34.2% in 2006. This rate increased by 7% for white non-Hispanic mothers (21.5% in 2005 vs. 22.9% in 2006).
- Disparities in birth outcomes by race, ethnicity, education, and community persist:
  - The black non-Hispanic IMR was 2.6 times as high as the white non-Hispanic IMR (11.1 vs. 4.2 infant deaths per 1,000 live births).
  - The teen birth rate for Hispanics was almost 6 times that for white non-Hispanics (72.7 vs. 12.4 per 1,000 women ages 15-19).

- Cambodian (54.4%), Guatemalan (60.4%), and Salvadoran (65.8%) mothers were less likely to receive prenatal care in their first trimester compared with mothers in other ethnicity groups (State average: 82.1%).
- Among the 30 largest Massachusetts municipalities, Brockton (11.5%), Springfield (10.9%), New Bedford (10.6%), Haverhill (10.5%), Fall River (10.5%), and Boston (9.0%) recorded LBW percentages that were higher than the statewide average of 7.9%.
- Mothers with a high school education or less were more likely to report smoking during their pregnancies, less likely to receive adequate prenatal care, and more likely to deliver LBW infants.
- The 2006 teen birth rate in Massachusetts (21.3 births per 1,000 women ages 15-19) was 49% lower than the preliminary 2006 U.S. teen birth rate of 41.9 births per 1,000 women ages 15-19; the preterm rate in Massachusetts (9.0%) was 30% lower than the U.S. preterm rate (12.8%); and the Cesarean section delivery rate in Massachusetts (33.4%) was 7% higher than the 2006 U.S. Cesarean section rate (31.1%).

## Introduction

This report presents detailed data on the number and characteristics of Massachusetts births in 2006; maternal behaviors and health characteristics; medical services utilization by pregnant mothers; and infant health characteristics. These data are obtained from the Massachusetts Certificate of Live Birth. Birth certificate data are essential for surveillance, research, and development of programs such as universal newborn hearing screening, high risk infant identification, and birth defects surveillance. The Registry of Vital Records and Statistics plays a critical role in the collection of birth information: its work provides the basic information that guides many public health initiatives.

## Methods

Data on births are based on information from the Massachusetts Certificate of Live Birth filed with the Registry of Vital Records and Statistics. Medical information such as birthweight and prematurity is based on information supplied by hospitals; demographic and behavioral data such as race and ethnicity, and smoking during pregnancy are supplied by the women who gave birth. For example, women chose their race from five categories: White, Black, Asian/Pacific Islander, American Indian, and Other. Mothers identified their ancestry by selecting one of 38 ancestry/ethnicity groups<sup>1</sup>.

Vital statistics birth data may be presented in terms of either maternal residence or place of birth. Resident data include all events that occur to residents of the Commonwealth, regardless of where they happen. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Occurrence data include all events that occur within the state, whether to residents or nonresidents. All data in this publication are for Massachusetts residents unless otherwise stated. There is an exchange agreement among the 50 states, District of Columbia, Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for the exchange of statistical copies of birth and death records for events occurring in a state other than their state of residence.

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<sup>1</sup> See the "Technical Notes" for a list of ancestries listed in check boxes.

## **Results**

### **Number and Rate of Births**

In 2006, Massachusetts residents gave birth to 77,670 infants, which was 1.1% more births than there were in 2005. Since 1990, the number of births to Massachusetts residents has declined by 16%, and the birth rate among women of reproductive age has declined by 11% (from 62.1 to 55.6 births per 1,000 females ages 15-44) (Table 1).

The number of women aged 30 years and older giving birth has risen dramatically since 1980. In 1980, about 1 in 4 Massachusetts births was to a woman aged 30 and older, while in 2006, more than half of births (54%) were to women aged 30 and older (Figure 1). In 2006, the average age of mothers at first birth decreased from 27.9 years in 2005 to 27.7 years.

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

The percentage of Massachusetts resident births to white non-Hispanic mothers has decreased by 11% since 1990, from 78.4% to 69.6%, while the percentage of births to Hispanic mothers increased by 44%, from 9.1% to 13.1% (Table 1). The percentage of births to non-U.S.-born mothers increased between 2005 and 2006 – from 26.1% to 26.9% (Table 2), but there was no significant increase for any race or ethnic group.

### **Emerging Populations**

The overall number of births increased by 1% from 2005 to 2006. Certain groups experienced disproportionate increases in the numbers of births in 2006. Births to Honduran, Guatemalan, Brazilian and Salvadoran mothers have increased by more than 15% since 2005; however, these groups accounted for only 6% of all births in Massachusetts in 2006. Births to Honduran mothers increased by 41%, Guatemalan mothers 29%, Brazilian mothers 18%, and Salvadoran mothers 15% (Table 3).

### **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 in 1980 were age 30 years and older compared with 54% in 2006. Beginning in 1996, the number of births to mothers ages 30 years and older exceeded the number of births to mothers under age 30. This trend has continued through 2006 (Figure 1).

Compared with the rates in 1990, birth rates have increased in the age groups of mothers ages 30-44 and decreased for age groups under 30. The largest birth rate increase has been for ages 40-44 while the largest decreases have been among the youngest age groups, 10-14 and 15-19. In 2006, there were 56 births to mothers ages 10-14 years (3 fewer births from 2005) and there were 213 births to women 45 years of age or older (an increase of 25 births from 2005) (Table 4).

### **Marital Status**

The percentage of mothers who were not married at the time of delivery increased by 7% from 30.2% in 2005 to 32.2% in 2006, continuing the trend of steady increase during the last 16 years (Table 1). Hispanic infants continue to have the highest percentage of unmarried mothers at 66.0%, which was an increase of 3% from 2005. The percentage of white non-Hispanic mothers who were not married increased by 8% from 21.5% in 2005 to 23.2% in 2006.

## **Breastfeeding**

The percentage of mothers who were breastfeeding or intending to breastfeed in 2006 was 79.9%, similar to the rate in 2005. The rate of breastfeeding has increased 53% since 1989 when it was 52.2%. Among race and ethnicity groups, Asians had the highest percentage of breastfeeding, 86.8% (Table 2). The percentage of mothers who were breastfeeding or intending to breastfeed among race/ethnic groups increased only for Hispanics from 80.7% in 2005 to 82.6% in 2006.

## **Multiple Births**

In 2006, 95.5% of births were singletons (74,146 births), 4.3% were twins (3,375 births), and 0.2% were triplets or higher order multiples (149 births) (Table 5). The percentage of births that were multiples has been stable for the last three years. The total percentage of multiple births (twins, triplets or more) was 4.5% in 2006, 4.6% in 2005, and 4.8% in 2004. In 2006, the percentage of multiple births among mothers ages 35 and older was 7.2%, nearly double the percentage for mothers under age 35 (3.7%).

White non-Hispanic mothers continue to have the highest percentage of multiple births at 5.2%, followed by black non-Hispanics at 4.0%. The percentage of multiple births decreased for Hispanics from 2.9% in 2005 to 2.3% in 2006. There were no other significant changes from 2005 to 2006 in the percentage of multiple births by race and ethnicity.

## **Teen Births**

In 2006, 4,722 births occurred to Massachusetts resident women ages 15-19, which was a difference of 183 additional births in 2005 (Table 1). The Massachusetts teen birth rate has decreased from 35.4 births per 1,000 women ages 15-19 in 1990 to the current figure of 21.3 in 2006. The Massachusetts teen birth rate in 2006 was 49% below the preliminary 2006 U.S. teen birth rate of 41.9 births per 1,000 women ages 15-19<sup>2</sup>.

In 2006, less than one-third of teen births were to women ages 15-17 (1,379 births), and more than two-thirds were to women ages 18-19 (3,343) (Table 6). The annual number of births to young teens (ages 10-14) was 56 in 2006 compared with 59 in 2005. This represents a 64% decline in births in this age group since 1994. In Massachusetts, in 2006, the youngest mothers were ages 12 and 13.

There were no significant changes from 2005 to 2006 in the birth rate to young teens (ages 10-14) by race and ethnicity. The 2006 birth rate for younger teens was 0.3 live births per 1,000 females ages 10-14 years, which was 50% below the preliminary 2006 U.S. birth rate for young teens (0.6).

In 2006, birth rates among resident teen women had the same rank order from highest to lowest by race and Hispanic ethnicity as they had ten years ago (Hispanic and black non-Hispanic women had the highest teen birth rates, while Asian and white non-Hispanic women had the lowest), and they have decreased for all groups compared with 1996 rates (Figure 2). In 2006, the teen birth rate for Hispanics was over 5 times that for white non-Hispanics (72.7 vs. 12.4 per 1,000 women ages 15-19). There were no significant changes in teen birth rates by race and ethnicity compared with 2005, but all rates have declined since 2000.

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<sup>2</sup> National Center for Health Statistics. Vol. 56, no7. *Births: Preliminary Data for 2006*. Released December 5, 2007.

Among Massachusetts municipalities with the highest *number* of teen births, teen birth *rates* were highest in Holyoke (94.8), Springfield (80.7), Lawrence (80.6), and Chelsea (79.0)<sup>3</sup>. These communities had rates over 3 times the statewide rate of 22.6 teen births per 1,000 women ages 15-19 (Table 7).

### **Low Birthweight (LBW)**

The percentage of low birthweight infants (less than 2,500 grams or 5.5 pounds) was 7.9% in 2006, which was the same as it was in 2005. The percentage of LBW infants has increased by 36% since 1990 when it was 5.8% (Table 8). Black non-Hispanic infants continue to have the highest percentage of LBW at 12.5%, followed by Hispanics at 8.4% (Table 8). There were no significant changes from 2005 to 2006 in LBW percentages by race and ethnicity. The percentage of very low birthweight (VLBW; infants weighing less than 1,500 grams or 3.3 pounds) was 1.3% in 2006 compared with 1.4% in 2005. Black non-Hispanic infants continue to have the highest percentage of VLBW at 3.4% (Table 8).

The increase in low birthweight in Massachusetts over the past decade can be attributed in part to the increase in multiple births in Massachusetts. The percentage of low birthweight (LBW) and very low birthweight (VLBW) increases for twins and higher order births. In 2006, 5.8% of singleton births were LBW, whereas 51.8% of twins and 94.6% of higher order births were LBW (Table 9).

### **Preterm Deliveries**

The percentage of preterm infants (infants delivered before the 37<sup>th</sup> week of gestation) was 9.0% in 2006, the same as it was in 2005 (Table 1). Black non-Hispanic mothers continue to have the highest percentage of preterm infants at 12.9%, while Asians had the lowest at 7.3%. There were no significant changes from 2005 to 2006 in the percentage of preterm infants by race and ethnicity.

The percentage of infants delivered very early (before the 28<sup>th</sup> week of gestation) has remained the same since 1997 at 0.6% (data not shown). Black non-Hispanic women had the highest proportion of infants delivered very early, 1.9%, which was more than double that of any other race group (Table 10).

### **Smoking**

The percentage of mothers who reported smoking during pregnancy was 7.4 in 2006 compared with 7.2% in 2005 and has declined by 63% since 1990 (19.3%) (Figure 3). White non-Hispanic mothers continued to have the highest reported percentage of smoking during pregnancy at 8.6% followed by black non-Hispanics at 6.7% (Figure 4). There were no significant changes in the percentage of mothers who reported smoking during pregnancy from 2005 to 2006 by race and ethnicity.

### **Prenatal Care**

The percentage of women receiving adequate prenatal care (PNC) decreased by 1% from 84% in 2005 to 83.1% in 2006 (Table 1). Adequacy of prenatal care is a measure of the timing and number of prenatal care visits, not an assessment of the quality of PNC. [Please note: these data are not comparable to data published in reports prior to 2001. Beginning with the 2001

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<sup>3</sup> Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. **Please note:** If the population in your community increased from 2005 to 2006, the rates listed may **overestimate** the actual rate. If the population in your community declined from 2005 to 2006, the rates given in the publication may **underestimate** the actual rate.

report, the Adequacy of Prenatal Care Utilization (APNCU) Index has been used to measure adequacy of prenatal care, replacing the Kessner Index].

The percentage of women receiving adequate PNC was significantly lower for Hispanic, black non-Hispanic, and Asian mothers than the state average, and it was significantly higher for white non-Hispanics than the state average. Seventy-five percent of black non-Hispanic and Hispanic mothers received adequate prenatal care, compared with 85.8% of white non-Hispanic mothers. The rate for Asian mothers was 81.6% (Figure 5).

Mothers with less than a high school education were less likely to receive adequate prenatal care than were mothers with a college degree or higher (70.6% vs. 89.4%) (Figure 6). Younger teens (ages 17 or younger) were less likely to receive adequate prenatal care than mothers ages 35 and older, 66.3% compared to 87.8%.

### **Publicly Financed and Privately Insured Prenatal Care**

Maternal and birth characteristics varied according to whether PNC was financed through public programs or through private insurance. The percentage of mothers who had their PNC financed through public programs increased by 5%, from 32.6% in 2005 to 34.2% in 2006 (Figure 7). Among white non-Hispanic mothers, this rate increased by 7% from 2005. Hispanic mothers continue to have the highest percentage of deliveries financed by public funds at 73.3%, followed by black non-Hispanics, which was 60.6%.

Overall in Massachusetts, 1 in 4 mothers (25.0%) had her prenatal care financed by Medicaid/MassHealth. However, Medicaid/MassHealth financing varied largely by race and Hispanic ethnicity. About half of Hispanic and black non-Hispanic mothers had their PNC financed by Medicaid/MassHealth; whereas, 19.9% of Asian and 17.4% of white non-Hispanic mothers' PNC was Medicaid/MassHealth financed (Table 30).

### **Cesarean Sections**

The Cesarean section delivery rate has increased every year since 2000 to an all time high of 33.4% in 2006. The 2006 Cesarean section delivery rate is a 3% increase over the 2005 percentage (32.3%) (Table 1). The Cesarean section rate in Massachusetts in 2006 was 7% higher than the preliminary 2006 nationwide rate of 31.1%. The nationwide rate for 2006 was also the highest ever recorded.

The percentage of Cesarean sections increased by 4% for white non-Hispanic mothers, who had the highest percentage of Cesarean section deliveries overall at 34.9%. Hispanic and Asian mothers had the lowest percentages (28.1% and 30.0%, respectively). Among the mothers' ancestry groups, the highest percentage of Cesarean section deliveries occurred to Brazilian mothers (45.3%), Haitian (41.0%), and Asian Indian (37.7%), and the lowest percentage was among Cambodian mothers (17.4%) (Table 3).

### **Gestational Diabetes Mellitus (GDM)**

In 2006, the proportion of births to mothers who were diagnosed with gestational diabetes mellitus increased by 9% from 2005, and by 36% from 2000. The 2006 GDM rate of 3.8% is the highest since 2000 (Table 1). This increasing trend is also seen nationwide. Nationwide, in 2005, 3.8% of all U.S. pregnancies, or about 160,000 U.S. pregnancies were complicated with gestational diabetes<sup>4</sup>.

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<sup>4</sup> National Center for Health Statistics. Vol. 56, no6. *Births: Final Data for 2005*. Released December 5, 2007. In a recent seven-state study, the percentage of gestational diabetes was reported as 4.4%.

The rate of GDM varied by mother's race and Hispanic ethnicity. Asian mothers have the highest rate (6.7%), and white non-Hispanic mothers have the lowest rate (3.5%). In 2006, only white non-Hispanic mothers experienced an increase in this rate from the previous year, from 3.1% in 2005 to 3.5% in 2006. Among the mothers' ancestry groups, the highest rates of gestational diabetes occurred among Asian Indian (8.9%), Middle Eastern (7.4%), Chinese (7.0%), Vietnamese (6.2%), Haitian (6.0%), and African (other than Nigerian and African-American) mothers (5.4%) and the lowest rates were among Cape Verdean (2.3%) and European (2.8%) mothers (Table 3).

### **Infant Mortality Rate (IMR)**

In 2006, there were 369 infant deaths (deaths of children less than one year of age) among Massachusetts residents, 22 fewer infant deaths than in 2005 (Table 11). The infant mortality rate was 4.8 deaths per 1,000 live births in 2006, compared with 5.1 deaths per 1,000 live births in 2005. This change was not significant. The infant mortality rate has decreased by 31% since 1990, from 7.0 deaths per 1,000 live births to 4.8 deaths per 1,000 live births.

In 2006, black non-Hispanics continued to have the highest IMR among race and ethnicity groups (Figure 8) at 11.1 deaths per 1,000 live births. The white non-Hispanic IMR was 4.3 in 2005 and 4.2 in 2006. The IMR for Asians was 3.4 in 2005 and 1.8 in 2006. The Hispanic IMR was 7.7 in 2005 and 5.8 in 2006. None of these changes was statistically significant (for confidence intervals, please see Table 36).

### **Birth Characteristics in the 30 Largest Massachusetts Cities and Towns**

In 2006, in the 30 largest municipalities in the Commonwealth (Table 12):

- Six communities recorded low birthweight percentages that were higher than the statewide average of 7.9%: Brockton (11.5%), Springfield (10.9%), New Bedford (10.6%), Haverhill (10.5%), Fall River (10.5%), and Boston (9.0%).
- At least 90% of mothers living in Brookline received adequate prenatal care. In contrast, fewer than 70% of mothers living in Pittsfield (65.9%) and Lowell (68.5%) received adequate prenatal care.
- Two-thirds or more of mothers living in Springfield (72.7%), Lawrence (67.7%), and Lynn (66.5%) had their prenatal care financed by public funds, compared with less than 10% of mothers living in Brookline (4.5%) and Newton (9.1%).
- Five communities had gestational diabetes rates higher than the statewide average rate of 3.8%: Fall River (8.5%), Lowell (5.5%), Malden (5.5%), Springfield (5.5%), and Worcester (4.9%).
- Springfield (9.1 deaths per 1,000 live births) had a higher infant mortality rate (IMR) than the state IMR of 4.8 deaths per 1,000 live births. Based on a three-year IMR from 2004-2006, which is a more stable rate than a one-year rate, Springfield (8.7, 95% CI: 6.5-10.8), Worcester (8.5, 95% CI: 6.5-10.5), and Brockton (8.3, 95% CI: 5.7-11.0) had higher IMRs when compared with the state IMR (4.8, 95% CI: 4.5-5.1)



### **Birth Characteristics by Facility**

Listed below are facilities that in 2006 had the 3 highest and 3 lowest rates for cesarean deliveries, low birthweight infants, publicly funded deliveries, and deliveries with adequate prenatal care (Table 13).

#### Cesarean section (state rate 33.3%)

Highest percentages in:

Caritas Holy Family Hospital and Medical Center	44.0%
Caritas Good Samaritan Medical Center	41.6%
Metrowest Medical Center-Framingham Union Campus	41.5%

Lowest percentages in:

Holyoke Hospital	19.9%
Nantucket Cottage Hospital	20.2%
Heywood Memorial Hospital	20.6%

#### Low Birthweight (LBW) (state rate 7.9%)

Highest percentages in:

Tufts-New England Medical Center Hospital	28.9%
Caritas St. Elizabeth's Medical Center of Boston	13.4%
Baystate Medical Center	12.6%

Lowest percentages in:

Harrington Memorial Hospital	2.5%
Franklin Medical Center	2.6%
Mary Lane Hospital	3.0%

#### Publicly Funded Delivery (state rate 34.2%)

Highest percentages in:

Boston Medical Center	86.7%
Cambridge Hospital	74.9%
Holyoke Hospital	69.6%

Lowest percentages in:

Newton Wellesley Hospital	3.6%
Emerson Hospital	4.0%
Winchester Hospital	5.3%

#### Adequacy of Prenatal Care by Facility (state rate 83.1%)

Lowest percentages in:

Caritas Good Samaritan Medical Center	61.3%
Berkshire Medical Center	62.8%
Caritas Norwood Hospital	63.4%

Highest percentages in:

North Shore Birth Center	97.6%
Beth Israel Deaconess Medical Center	96.0%
Brigham And Women's Hospital	95.2%

## **Healthy People 2010 Objectives**

Healthy People 2010 (HP2010) sets targets for each measurable Healthy People objective<sup>5</sup>. Table 14 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 targets for 2 indicators: postneonatal mortality rate and breastfeeding (Table 14). For eight objectives, the 2006 Massachusetts indicators are within 25% of the 2010 target goals: fetal mortality rate, perinatal mortality rate, neonatal 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 six objectives, Massachusetts is still more than 25% away from achieving the 2010 targets: perinatal mortality rate, maternal mortality, 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 sections).

## **A Comparison of Massachusetts and U.S. Indicators**

According to preliminary U.S. birth statistics for 2006, the following Massachusetts perinatal health indicators in 2006 were better than those for the U.S.:

- The teen birth rate in Massachusetts (21.3 births per 1,000 women ages 15-19) was 49% lower than the U.S. teen birth rate (41.9 births per 1,000 women ages 15-19).
- The percentage of unmarried mothers in Massachusetts (32.2%) was 16% lower than the U.S. percent (38.5%).
- The low birthweight rate in Massachusetts (7.9%) was 5% lower than the U.S. low birthweight rate (8.3%). Both rates are still away from the HP2010 target (5.0%).
- The preterm rate in Massachusetts (9.0%) was 30% lower than the U.S. preterm rate (12.8%).

The Cesarean section delivery rate in Massachusetts (33.4%) was 7% higher than the 2006 U.S. Cesarean section rate (31.1%).

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<sup>5</sup> 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: 1990, 1991, 1994-2006

Characteristic		1990	1991	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Births <sup>1</sup>	n <sup>2</sup>	92,461	88,176	83,758	81,562	80,164	80,321	81,406	80,866	81,582	81,014	80,624	80,167	78,460	76,824	77,670
	Rate <sup>3</sup>	62.1	59.4	57.0	55.5	54.6	54.7	55.6	55.9	57.1	56.6	56.8	56.8	56.2	55.6	56.9
Race of Mother																
White non-Hispanic	n	72,483	68,619	64,589	63,043	61,829	61,204	61,764	60,402	60,051	59,115	58,136	57,604	55,322	53,469	52,975
	% <sup>4</sup>	78.4	77.8	77.1	77.3	77.1	76.2	75.9	74.7	73.6	73.0	72.1	71.9	70.5	69.6	68.2
Black non-Hispanic	n	7,158	6,737	6,262	5,858	5,491	5,482	5,549	5,844	5,755	5,862	5,948	5,902	6,053	6,077	6,452
	% <sup>4</sup>	7.7	7.6	7.5	7.2	6.9	6.8	6.8	7.2	7.1	7.2	7.4	7.4	7.7	7.9	8.3
Asian	n	3,349	3,218	3,325	3,355	3,398	3,719	3,748	4,138	4,667	4,784	5,300	5,224	5,454	5,251	5,469
	% <sup>4</sup>	3.6	3.7	4.0	4.1	4.2	4.6	4.6	5.2	5.7	5.9	6.6	6.5	7.0	6.8	7.0
Hispanic	n	8,406	8,477	8,429	8,077	7,756	8,211	8,665	8,815	9,247	9,410	9,543	9,764	9,798	10,061	10,696
	% <sup>4</sup>	9.1	9.6	10.1	9.9	9.7	10.2	10.6	10.9	11.3	11.6	11.8	12.2	12.5	13.1	13.8
Teen Births (Ages 15-19)	n	7,258	6,892	6,412	5,990	5,758	5,801	5,823	5,515	5,305	4,979	4,642	4,639	4,559	4,539	4,722
	Rate <sup>3</sup>	35.4	35.4	33.2	30.3	28.5	28.5	28.1	26.7	25.9	24.9	23.3	23.0	22.2	21.7	21.3
Births to Unmarried Mothers	n	22,837	22,852	22,302	20,857	20,253	20,640	21,191	21,448	21,621	21,620	21,604	22,262	22,376	23,170	24,977
	%	24.7	25.9	26.6	25.6	25.3	25.7	26.0	26.5	26.5	26.7	26.8	27.8	28.5	30.2	32.2
C-section	n	20,615	19,495	17,289	16,758	15,675	15,742	16,975	18,080	19,086	20,639	22,553	23,392	24,295	24,732	25,901
	%	22.3	22.1	20.6	20.6	19.6	19.6	20.9	22.4	23.4	25.5	28.0	29.2	31.0	32.3	33.4
Gestational Diabetes <sup>5</sup>	n									2,245	2,402	2,633	2,693	2,741	2,666	2,925
	%									2.8	3.0	3.3	3.4	3.5	3.5	3.8
Low Birthweight	n	5,388	5,199	5,335	5,174	5,105	5,617	5,655	5,708	5,711	5,795	6,060	6,115	6,125	6,073	6,150
	%	5.8	5.9	6.4	6.4	6.4	7.0	7.0	7.1	7.1	7.2	7.5	7.6	7.8	7.9	7.9
Preterm	n	5,899	6,492	6,492	6,438	5,705	5,831	6,117	6,136	6,582	6,412	6,795	6,963	7,222	6,925	6,954
	%	6.5	7.8	7.8	7.9	7.2	7.3	7.6	7.6	8.3	8.0	8.5	8.7	9.2	9.0	9.0
Adequate Prenatal Care																
Kessner Index <sup>6</sup>	%	80.1	81.6	84.3	84.2	79.9	80.0	79.8	79.4	79.1	80.4	79.9	79.9	79.5	78.9	77.6
	APNCU Index <sup>7</sup>					83.3	82.9	82.9	82.9	83.3	85.2	84.7	84.5	84.2	84.0	83.1

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 ages 15-19. 2000-2005 birth rates are calculated Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005 (MMARS00-05), released October 2006. 2006 rates are calculated using the NCHS population estimates for 2006 by age, sex, race, and Hispanic origin. 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. Percentages are calculated based on births, including those to mothers of unknown race. 5. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 6. 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. 7. Beginning with *Births 2001*, the APNCU Index has replaced the Kessner Index as the standard measurement of adequacy of prenatal care (see Technical Notes in Appendix for more information).

**Table 2. Birth Characteristics by Maternal Race and Hispanic Ethnicity and Birthplace, Massachusetts: 2006**

Race and Hispanic Ethnicity (by mother's birthplace)	Births		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breastfeeding <sup>5</sup>	
			<18 Years		<20 Years		Very Low <sup>2</sup>		Low <sup>3</sup>		Adequate <sup>4</sup>		1 <sup>st</sup> Trimester					
	n	% <sup>1</sup>	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
<b>State Total</b>	<b>77,670</b>	<b>100.0</b>	<b>1,435</b>	<b>1.8</b>	<b>4,778</b>	<b>6.2</b>	<b>1,041</b>	<b>1.3</b>	<b>6,150</b>	<b>7.9</b>	<b>63,781</b>	<b>83.1</b>	<b>63,326</b>	<b>82.1</b>	<b>25,901</b>	<b>33.4</b>	<b>61,076</b>	<b>79.9</b>
U.S. States/D.C.	54,655	70.4	1,129	2.1	3,690	6.8	718	1.3	4,332	7.9	45,889	84.9	45,950	84.6	18,435	33.8	40,564	75.7
Puerto Rico/U.S. Terr. <sup>7</sup>	2,079	2.7	132	6.4	383	18.4	40	1.9	221	10.6	1,549	75.1	1,523	73.5	608	29.3	1,539	74.3
Non-U.S.-Born <sup>8</sup>	20,929	26.9	173	0.8	704	3.4	282	1.3	1,594	7.6	16,339	79.2	15,850	76.6	6,855	32.9	18,969	91.3
<b>White Non-Hispanic</b>	<b>52,975</b>	<b>68.2</b>	<b>519</b>	<b>1.0</b>	<b>2,115</b>	<b>4.0</b>	<b>590</b>	<b>1.1</b>	<b>3,799</b>	<b>7.2</b>	<b>45,062</b>	<b>85.8</b>	<b>45,310</b>	<b>85.8</b>	<b>18,443</b>	<b>34.9</b>	<b>40,639</b>	<b>78.2</b>
U.S. States/D.C.	46,396	87.6	501	1.1	1,964	4.2	512	1.1	3,362	7.3	39,625	86.2	39,948	86.4	16,127	34.8	34,676	76.3
Puerto Rico/U.S. Terr. <sup>7</sup>	57	0.1	1	-- <sup>6</sup>	6	10.5	1	-- <sup>6</sup>	3	5.3	41	73.2	44	78.6	18	31.6	47	83.9
Non-U.S.-Born <sup>8</sup>	6,519	12.3	16	0.2	144	2.2	77	1.2	434	6.7	5,394	83.4	5,316	81.8	2,298	35.3	5,914	91.7
<b>Black non-Hispanic</b>	<b>6,452</b>	<b>8.3</b>	<b>215</b>	<b>3.3</b>	<b>620</b>	<b>9.6</b>	<b>220</b>	<b>3.4</b>	<b>806</b>	<b>12.5</b>	<b>4,728</b>	<b>75.2</b>	<b>4,539</b>	<b>71.9</b>	<b>2,143</b>	<b>33.3</b>	<b>5,172</b>	<b>80.7</b>
U.S. States/D.C.	3,337	51.7	193	5.8	544	16.3	124	3.7	463	13.9	2,498	76.8	2,395	73.3	996	30.0	2,319	70.1
Puerto Rico/U.S. Terr. <sup>7</sup>	24	0.4	0	0.0	0	0.0	0	0.0	2	8.3	21	87.5	22	91.7	7	29.2	19	82.6
Non-U.S.-Born <sup>8</sup>	3,090	47.9	22	0.7	76	2.5	95	3.1	340	11.0	2,209	73.4	2,122	70.2	1,139	37.0	2,834	92.0
<b>Hispanic</b>	<b>10,696</b>	<b>13.8</b>	<b>588</b>	<b>5.5</b>	<b>1,709</b>	<b>16.0</b>	<b>131</b>	<b>1.2</b>	<b>895</b>	<b>8.4</b>	<b>7,980</b>	<b>75.6</b>	<b>7,675</b>	<b>72.4</b>	<b>2,998</b>	<b>28.1</b>	<b>8,821</b>	<b>82.6</b>
U.S. States/D.C.	3,438	32.1	339	9.9	924	26.9	57	1.7	346	10.1	2,618	77.0	2,492	72.9	929	27.1	2,460	71.8
U.S. Territories	1,984	18.5	131	6.6	375	18.9	37	1.9	213	10.8	1,476	74.9	1,445	73.0	581	29.3	1,464	73.9
Non-U.S.-Born <sup>8</sup>	5,273	49.3	118	2.2	410	7.8	37	0.7	335	6.4	3,886	74.9	3,738	71.8	1,487	28.2	4,897	92.9
<b>Asian</b>	<b>5,469</b>	<b>7.0</b>	<b>63</b>	<b>1.2</b>	<b>147</b>	<b>2.7</b>	<b>52</b>	<b>1.0</b>	<b>436</b>	<b>8.0</b>	<b>4,435</b>	<b>81.6</b>	<b>4,241</b>	<b>77.9</b>	<b>1,642</b>	<b>30.0</b>	<b>4,746</b>	<b>86.8</b>
U.S. States/D.C.	677	12.4	55	8.1	125	18.5	7	1.0	67	9.9	523	77.4	495	73.2	163	24.1	540	79.8
Puerto Rico/U.S. Terr. <sup>7</sup>	4	-- <sup>6</sup>	0	0.0	0	0.0	0	0.0	0	0.0	4	-- <sup>6</sup>	4	-- <sup>6</sup>	0	0.0	4	-- <sup>6</sup>
Non-U.S.-Born <sup>8</sup>	4,788	87.5	8	0.2	22	0.5	45	0.9	369	7.7	3,908	82.2	3,742	78.5	1,479	30.9	4,202	87.8
<b>American Indian<sup>9</sup></b>	<b>115</b>	<b>0.1</b>	<b>5</b>	<b>4.3</b>	<b>18</b>	<b>15.7</b>	<b>1</b>	<b>--<sup>6</sup></b>	<b>10</b>	<b>8.7</b>	<b>92</b>	<b>80.0</b>	<b>91</b>	<b>79.1</b>	<b>28</b>	<b>24.3</b>	<b>86</b>	<b>76.1</b>
U.S. States/D.C.	107	93.0	5	4.7	18	16.8	1	-- <sup>6</sup>	9	8.4	84	78.5	83	77.6	26	24.3	80	76.2
U.S. Territories	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0
Non-U.S.-Born <sup>8</sup>	8	7.0	0	0.0	0	0.0	0	0.0	1	-- <sup>6</sup>	8	100.0	8	100.0	2	-- <sup>6</sup>	6	75.0
<b>Other<sup>10</sup></b>	<b>1,880</b>	<b>2.4</b>	<b>45</b>	<b>2.4</b>	<b>167</b>	<b>8.9</b>	<b>46</b>	<b>2.5</b>	<b>194</b>	<b>10.3</b>	<b>1,450</b>	<b>79.1</b>	<b>1,433</b>	<b>77.4</b>	<b>627</b>	<b>33.5</b>	<b>1,582</b>	<b>87.7</b>
U.S. States/D.C.	643	34.2	36	5.6	113	17.6	16	2.5	80	12.5	519	82.8	513	80.8	182	28.3	468	76.0
Puerto Rico/U.S. Terr. <sup>7</sup>	10	0.5	0	0.0	2	-- <sup>6</sup>	2	-- <sup>6</sup>	3	-- <sup>6</sup>	7	6.1	8	7.0	2	-- <sup>6</sup>	5	4.3
Non-U.S.-Born <sup>8</sup>	1,226	65.2	9	0.7	52	4.2	28	2.3	111	9.1	923	77.0	911	75.5	443	36.3	1,108	93.9
<b>Unknown<sup>11</sup></b>	<b>83</b>	<b>0.1</b>	<b>0</b>	<b>0.0</b>	<b>2</b>	<b>--<sup>6</sup></b>	<b>1</b>	<b>--<sup>6</sup></b>	<b>10</b>	<b>20.0</b>	<b>34</b>	<b>85.0</b>	<b>37</b>	<b>78.7</b>	<b>20</b>	<b>41.7</b>	<b>30</b>	<b>96.8</b>

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

1. This column "Births %", the percentages of the race/Hispanic groups (bolded) are based on the state total (including births of unknown race/ethnicity), and the birthplace percents for the race/ethnicities are based on the total number in 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 *Births 2001*, 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. This count is of mothers who selected American Indian as their race. 10. Unknown: Mothers who did not indicate a race/ethnicity. 11. Mothers who did not indicate a race/ethnicity.

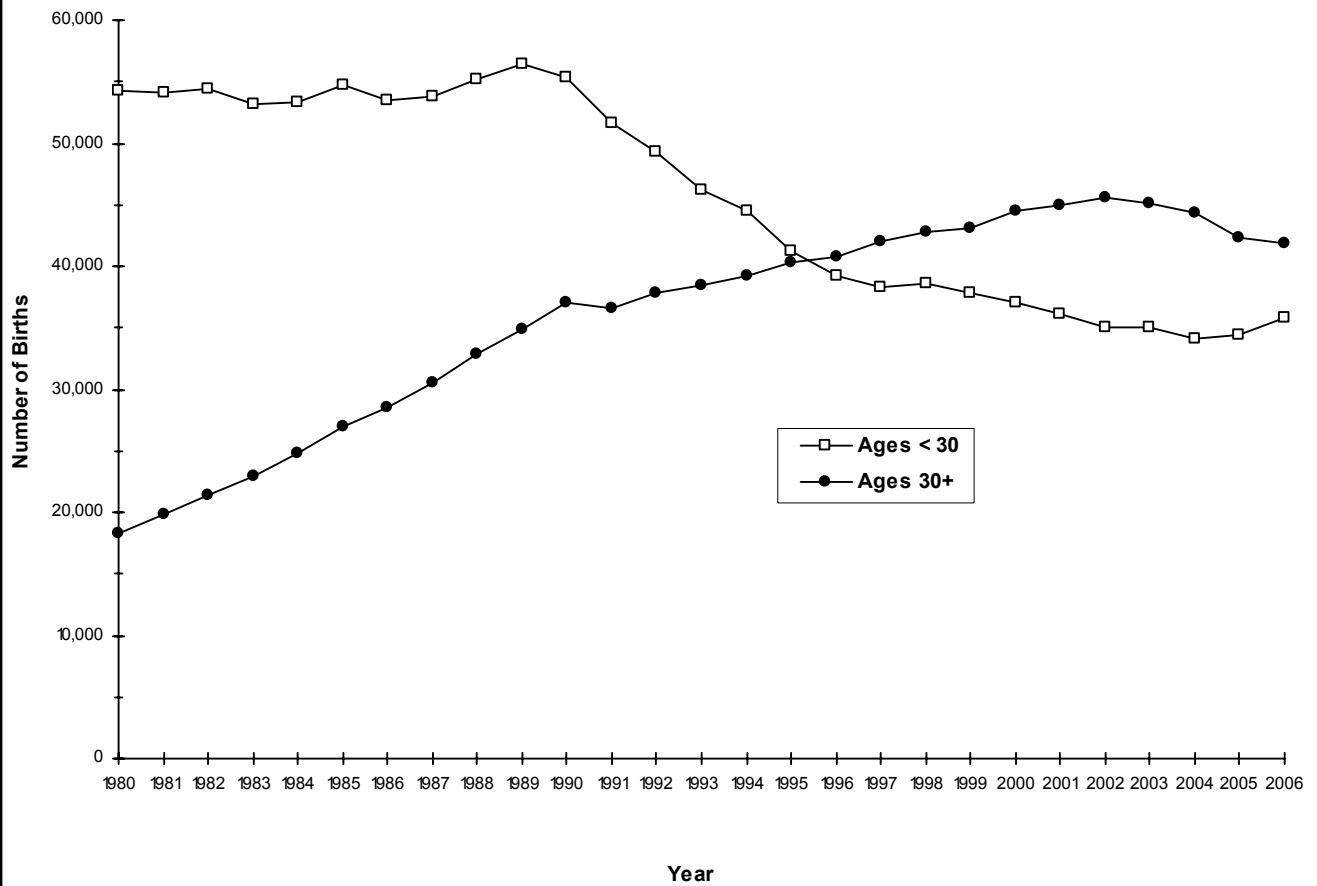
**Table 3. Birth Characteristics by Maternal Ancestry, Massachusetts: 2006**

Maternal Ancestry	Births <sup>1</sup>		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breast-feeding <sup>5</sup>		Gestational Diabetes <sup>6</sup>	
			<18 Years		<20 Years		Very Low <sup>2</sup>		Low <sup>3</sup>		Adequate <sup>4</sup>		1 <sup>st</sup> Trimester							
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%		
State Total	77,670	100.0	1,435	1.8	4,778	6.2	1,041	1.3	6,150	7.9	63,781	83.1	63,326	82.1	25,901	33.4	61,076	79.9	2,925	3.8
American	32,662	42.1	435	1.3	1,657	5.1	382	1.2	2,421	7.4	27,812	85.6	28,074	86.2	11,023	33.8	24,356	74.6	1,143	3.5
European	13,966	18.0	44	0.3	233	1.7	115	0.8	868	6.2	12,158	87.6	12,134	87.1	4,907	35.2	11,886	85.2	434	3.1
Puerto Rican	4,591	5.9	397	8.6	1,121	24.4	79	1.7	473	10.3	3,425	75.4	3,306	72.3	1,265	27.6	3,224	70.4	168	3.7
African-American	2,967	3.8	173	5.8	480	16.2	97	3.3	391	13.2	2,221	76.9	2,155	74.3	868	29.4	2,087	70.5	95	3.2
Brazilian	2,434	3.1	16	0.7	102	4.2	25	1.0	152	6.3	1,975	81.4	1,917	79.0	1,102	45.3	2,330	95.8	71	2.9
Dominican	1,941	2.5	68	3.5	217	11.2	19	1.0	149	7.7	1,545	79.8	1,543	79.7	637	32.9	1,748	90.1	65	3.4
Chinese	1,442	1.9	3	-- <sup>7</sup>	4	-- <sup>7</sup>	12	0.8	85	5.9	1,282	89.4	1,205	83.8	428	29.7	1,295	89.9	101	7.0
Asian Indian	1,300	1.7	0	0.0	2	-- <sup>7</sup>	17	1.3	132	10.2	1,069	82.5	1,057	81.5	489	37.7	1,264	97.3	116	8.9
Salvadoran	1,198	1.5	32	2.7	108	9.0	5	0.4	68	5.7	798	69.2	764	65.8	272	22.7	1,125	94.0	44	3.7
African	1,132	1.5	6	0.5	22	1.9	27	2.4	114	10.1	820	73.4	767	68.5	410	36.3	1,049	92.7	61	5.4
Haitian	1,064	1.4	9	0.8	30	2.8	40	3.8	144	13.6	739	72.5	693	67.7	435	41.0	966	90.8	63	6.0
Portuguese	971	1.3	21	2.2	72	7.4	10	1.0	76	7.8	827	85.3	822	84.7	331	34.1	522	53.9	51	5.3
Cape Verdean	931	1.2	30	3.2	112	12.0	21	2.3	84	9.0	655	71.3	617	67.1	286	30.8	769	82.7	21	2.3
Guatemalan	866	1.1	23	2.7	84	9.7	4	-- <sup>7</sup>	59	6.8	605	71.0	518	60.4	188	21.7	785	90.6	33	3.8
Vietnamese	741	1.0	9	1.2	22	3.0	6	0.8	54	7.3	594	81.1	564	76.9	203	27.4	567	76.5	46	6.2
Cambodian	611	0.8	46	7.5	98	16.0	3	-- <sup>7</sup>	56	9.2	385	63.2	332	54.4	106	17.4	348	57.0	20	3.3
Mexican	490	0.6	16	3.3	45	9.2	7	1.4	31	6.3	371	76.8	364	75.2	161	32.9	456	93.3	27	5.6
South American	484	0.6	9	1.9	29	6.0	4	-- <sup>7</sup>	25	5.2	376	78.3	361	75.1	168	34.7	456	94.2	13	2.7
Middle Eastern	363	0.5	0	0.0	3	-- <sup>7</sup>	2	-- <sup>7</sup>	35	9.6	278	76.6	261	71.9	119	32.8	342	94.2	27	7.4
Colombian	357	0.5	14	3.9	28	7.8	2	-- <sup>7</sup>	21	5.9	272	77.1	269	76.0	86	24.1	334	93.6	10	2.8
Korean	339	0.4	0	0.0	0	0.0	4	-- <sup>7</sup>	20	5.9	289	85.8	287	85.2	110	32.5	330	97.3	19	5.6
Honduran	313	0.4	9	2.9	31	9.9	2	-- <sup>7</sup>	22	7.1	222	72.3	204	66.4	72	23.0	298	95.2	11	3.6
Jamaican	310	0.4	3	-- <sup>7</sup>	8	2.6	11	3.5	41	13.2	232	77.6	228	75.5	88	28.4	275	89.0	16	5.2
Native American <sup>8</sup>	231	0.3	10	4.3	35	15.2	6	2.6	16	7.0	184	79.7	175	75.8	64	27.9	175	76.4	15	6.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. See the Glossary entry "ethnicity" (ancestry) for the complete list of ethnicities (ancestries).

1. In the first category, "Births", percentages are based on column total (state total of births, including births for which maternal ethnicity 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. 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. Gestational diabetes is defined as glucose intolerance found during pregnancy for the first time. It excludes cases with pre-existing diabetes. 7. Calculations based on values of 1-4 are excluded. 8. This count is of mothers who selected Native American as their ancestry.

**Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2006**



**Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2006**

Mother's Age	1990		2006		Percent Change in Rate
	Births <sup>1</sup>	Rate	Births	Rate <sup>2</sup>	
10-14	124	1.3	56	0.3	-78.5
15-19	7,258	35.1	4,722	21.3	-39.2
20-24	18,115	69.5	12,420	55.2	-20.6
25-29	29,913	107.2	18,633	90.0	-16.1
30-34	25,687	93.9	23,611	113.7	21.1
35-39	9,795	40.1	14,749	61.4	53.0
40-44	1,522	6.9	3,256	12.3	78.8
45+ <sup>3</sup>	46	0.3	213	0.2	-48.3
Birth rate, ages 15-44 <sup>4</sup>	92,290	62.2	77,391	56.7	-8.9
Crude Birth Rate <sup>5</sup>	92,461	15.4	77,670	12.1	-21.7

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 updated 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. Population estimates from the National Center for Health Statistics for 2006 were used to calculate birth rates at the state level. 3. Denominator is female population ages 45-49. 4. Rate represents the total number of births to women ages 15-44 per 1,000 women ages 15 to 44. 5. Births per 1,000 residents (male and female). Includes births to mothers of all age groups and mothers for whom age is unknown.

**Table 5. Trends in Number and Percent Distribution of Births<sup>1</sup> by Plurality and Age  
Massachusetts: 1993-2006**

		Singletons		Multiples <sup>2</sup>						Total births	
				Twins		Triplets or more		Total Multiples			
Age Group	Year	n	%	n	%	n	%	n	%	n	%
<b>All Ages</b>											
	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
	2003	76,367	95.3	3,551	4.4	249	0.3	3,800	4.7	80,167	100.0
	2004	74,677	95.2	3,538	4.5	245	0.3	3,783	4.8	78,460	100.0
	2005	73,258	95.4	3,375	4.4	190	0.2	3,565	4.6	76,824	100.0
	2006	74,146	95.5	3,375	4.3	149	0.2	3,524	4.5	77,670	100.0
<b>Ages &lt;35</b>											
	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
	2003	59,347	95.9	2,389	3.9	118	0.2	2,507	4.1	61,854	100.0
	2004	57,618	96.0	2,229	3.7	142	0.2	2,371	4.0	59,989	100.0
	2005	56,380	96.3	2,086	3.6	102	0.2	2,188	3.7	58,569	100.0
	2006	57,237	96.3	2,116	3.6	89	0.1	2,205	3.7	59,442	100.0
<b>Ages 35+</b>											
	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
	2003	17,015	92.9	1,162	6.3	131	0.7	1,293	7.1	18,308	100.0
	2004	17,055	92.4	1,309	7.1	103	0.6	1,412	7.6	18,467	100.0
	2005	16,874	92.5	1,289	7.1	88	0.5	1,377	7.5	18,251	100.0
	2006	16,901	92.8	1,257	6.9	60	0.3	1,317	7.2	18,218	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 updated files. 2. Numbers of multiples (n) represent individual infants rather than sets of infants.



**Table 6. Summary of Selected Teen Birth Characteristics, Massachusetts: 2006**

	Ages 15-17		Ages 18-19		Combined Ages 15-19	
	N	% <sup>1</sup>	N	% <sup>1</sup>	N	% <sup>1</sup>
<b>State total</b>	1,379	29.2%	3,343	70.8%	4,722	100.0%
<b>Maternal Demographics</b>						
Race/Hispanic Ethnicity	N	% <sup>2</sup>	N	% <sup>2</sup>	N	% <sup>2</sup>
White non-Hispanic	509	36.9%	1,596	47.8%	2,105	44.6%
Black non-Hispanic	202	14.6%	405	12.1%	607	12.9%
Asian	62	4.5%	84	2.5%	146	3.1%
Hispanic	558	40.5%	1,121	33.6%	1,679	35.6%
Other	48	3.5%	135	4.0%	183	3.9%
<b>Birthplace</b>						
U.S. States / D.C.	1,086	78.8%	2,561	76.6%	3,647	77.3%
Puerto Rico / US Terr.	126	9.1%	251	7.5%	377	8.0%
Non-U.S.-born	166	12.0%	531	15.9%	697	14.8%
<b>Prenatal care funding</b>						
Public	1,031	75.8%	2,599	79.0%	3,630	78.1%
Private, other	330	24.2%	690	21.0%	1,020	21.9%
<b>Pregnancy-Related Factors</b>						
<b>Adequacy of Prenatal Care<sup>3</sup></b>						
Adequate Total <sup>4</sup>	911	67.1%	2,356	71.1%	3,267	69.9%
Adequate Intensive	420	30.9%	1,081	32.6%	1,501	32.1%
Adequate Basic	491	36.2%	1,275	38.5%	1,766	37.8%
Intermediate	126	9.3%	320	9.7%	446	9.5%
Inadequate/None	321	23.6%	639	19.3%	960	20.5%
Unknown	21	1.5%	28	0.8%	49	1.0%
<b>Parity<sup>6</sup></b>						
1	1,291	93.7%	2,773	83.1%	4,064	86.2%
2	84	6.1%	497	14.9%	581	12.3%
3+	3	-- <sup>5</sup>	67	2.0%	70	1.5%
<b>Smoking during Pregnancy</b>						
Yes	145	10.5%	488	14.6%	633	13.4%
No	1,232	89.5%	2,850	85.4%	4,082	86.6%
<b>Birth Outcomes</b>						
<b>Birthweight</b>						
< 500 g	8	0.6%	7	0.2%	15	0.3%
500-1,499 g	21	1.5%	33	1.0%	54	1.1%
1,500-2,499 g	125	9.1%	253	7.6%	378	8.0%
<b>LBW (&lt;2,499 g)</b>	154	11.2%	293	9%	447	9.5%
2,500-3,999 g	1,158	84.0%	2,869	85.9%	4,027	85.4%
4000+ g	66	4.8%	176	5.3%	242	5.1%
<b>Gestational age</b>						
< 28 weeks	17	1.2%	21	0.6%	38	0.8%
< 37 weeks	132	9.6%	285	8.5%	417	8.8%
37-42 weeks	1,244	90.4%	3,050	91.4%	4,294	91.1%
43+ weeks	0	0.0%	3	-- <sup>5</sup>	3	-- <sup>5</sup>
<b>Plurality</b>						
Singleton	1,359	98.5%	3,281	98.1%	4,640	98.3%
Multiple birth	20	1.5%	62	1.9%	82	1.7%

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

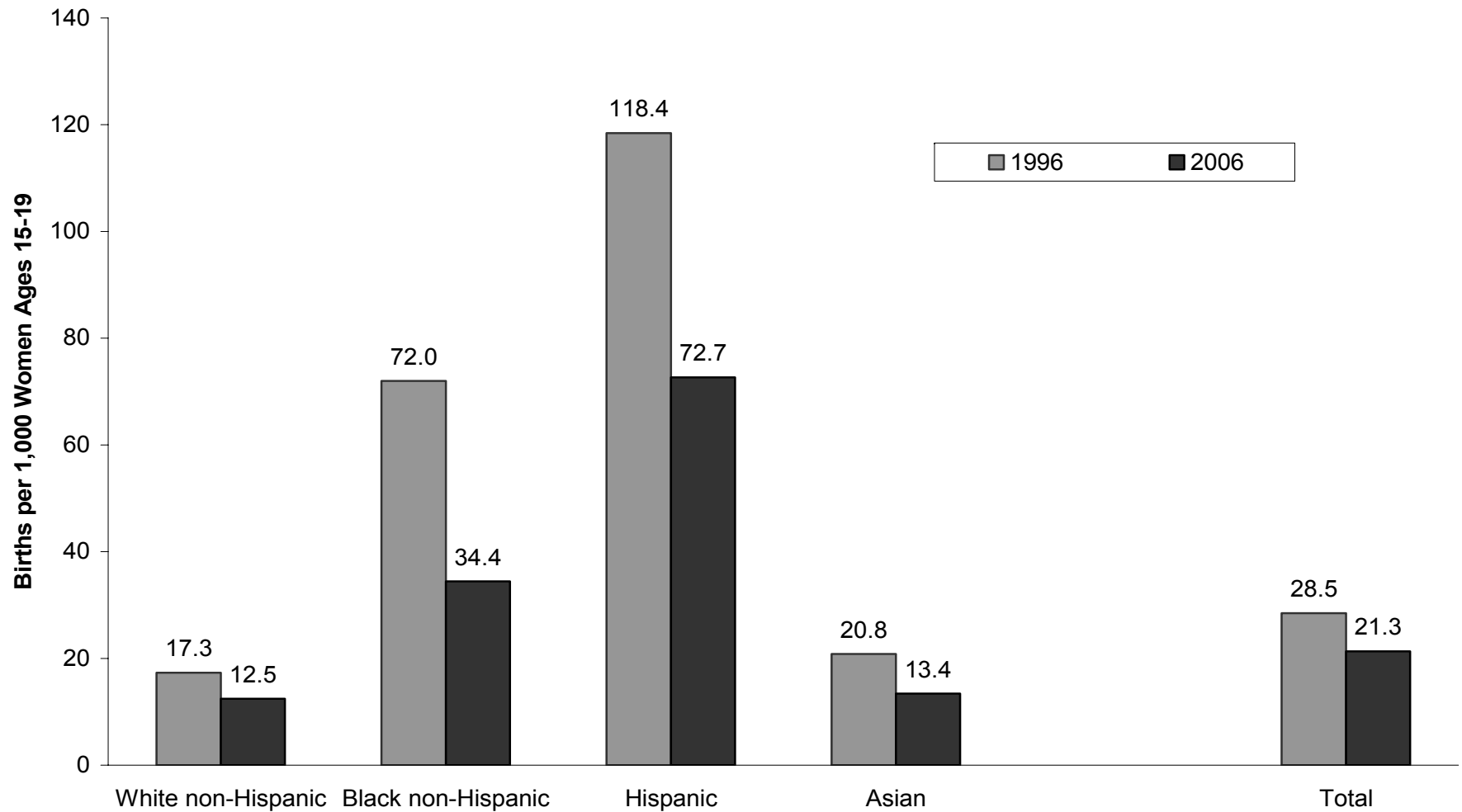
1. For state total row, percentages are based on total births to women ages 15-19. For the rest of the table, percentages are based on births for a given age group and characteristic. 2. Percents are based on state total of the age group. 3. Based on Adequacy of Prenatal Care Utilization (APNCU) Index. 4. Adequate Total = Adequate Basic + Adequate Intensive. 5. Calculations based on values of 1-4 are excluded. 6. Number of live births including the current birth.

**Table 7. Trends in Teen Birth Rates for Selected Communities<sup>1</sup>, Ranked by 2006 Teen Birth Rate<sup>2</sup>,  
Massachusetts: 1996, 2005, and 2006**

2006 Rank	Municipality	1996 <sup>3</sup>		2005		2006	
		Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate	Number of Teen Births	Teen Birth Rate <sup>4</sup>
	<b>State Total</b>	<b>5,757</b>	<b>28.5</b>	<b>4,539</b>	<b>21.7</b>	<b>4,722</b>	<b>21.3</b>
<b>1</b>	Holyoke	188	129.2	146	96.8	143	94.8
<b>2</b>	Springfield	479	88.3	435	71.6	490	80.7
<b>3</b>	Lawrence	278	108.5	217	71.7	244	80.6
<b>4</b>	Chelsea	91	102.4	75	75.0	79	79.0
<b>5</b>	New Bedford	216	71.5	174	58.9	207	70.0
<b>6</b>	Southbridge	38	68.8	36	64.5	36	64.5
<b>7</b>	Fitchburg	100	62.0	62	39.6	91	58.2
<b>8</b>	Fall River	152	55.4	140	49.5	146	51.6
<b>9</b>	Lowell	233	64.4	204	51.4	202	50.9
<b>10</b>	Pittsfield	56	39.0	67	52.7	63	49.6
<b>11</b>	Lynn	155	64.2	146	47.3	147	47.7
<b>12</b>	Brockton	208	76.2	148	40.7	156	42.9
<b>13</b>	Haverhill	69	43.6	59	30.9	73	38.3
<b>14</b>	Revere	38	35.2	48	45.6	39	37.0
<b>15</b>	Everett	30	32.3	35	33.0	37	34.9
<b>16</b>	Worcester	304	47.7	262	37.2	242	34.4
<b>17</b>	Chicopee	64	35.7	72	41.4	58	33.4
<b>18</b>	Framingham	45	23.2	45	23.0	65	33.3
<b>19</b>	Taunton	98	63.1	53	32.5	53	32.5
<b>20</b>	Leominster	72	64.7	22	17.5	38	30.3
<b>21</b>	Boston	793	42.9	566	28.6	568	28.7
<b>22</b>	Barnstable	27	22.2	29	21.3	29	21.3
<b>23</b>	Plymouth	39	22.5	26	15.6	30	17.9
<b>24</b>	Somerville	71	43.5	37	17.1	34	15.7
<b>25</b>	Cambridge	46	15.1	20	5.1	32	8.2

1. Selected communities include the 25 Massachusetts cities and towns with the greatest number of teen births. Ranking is by 2006 teen birth rate. 2. Rates are per 1,000 females ages 15-19 per city/town. 3. Source for 1996 births and rates: Massachusetts Community Health Information Profile (MassCHIP), MDPH, v3.0 r315, October 2007; natality dataset and MISER 1996 population estimate. 4. Population estimates from the National Center for Health Statistics for 2006 were used to calculate birth rates at the state level. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. Please note: If the population in your community increased from 2005 to 2006, the rates listed may overestimate the actual rate. If the population in your community declined from 2005 to 2006, the rates given in the publication may underestimate the actual rate. As soon as new population data are available for cities and towns, revised rates will be available from MassCHIP <http://masschip.state.ma.us>.

**Figure 2. Birth Rates Among Women Ages 15-19 by Mother's Race and Hispanic Ethnicity, Massachusetts: 1996 and 2006**



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

Population data sources: denominators for 1996 rates are based on the 1993 MISER Population Estimates. 2006 birth rates are calculated using population estimates from the National Center for Health Statistics for 2006 were used to calculate birth rates at the state level.

Table 8. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2006

Birthweight (in grams)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown race/ethnicity n
	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	
<b>State Total</b>	<b>77,670</b>	<b>100.0</b>	<b>52,975</b>	<b>100.0</b>	<b>6,452</b>	<b>100.0</b>	<b>10,696</b>	<b>100.0</b>	<b>5,469</b>	<b>100.0</b>	<b>1,995</b>	<b>100.0</b>	<b>83</b>
<b>&lt;500</b>	120	0.2	62	0.1	39	0.6	15	0.1	2	-- <sup>2</sup>	1	-- <sup>2</sup>	1
<b>500-999</b>	389	0.5	212	0.4	93	1.4	58	0.5	13	0.2	13	0.7	0
<b>1,000-1,499</b>	532	0.7	316	0.6	88	1.4	58	0.5	37	0.7	33	1.7	0
<b>1,500-1,999</b>	1,232	1.6	788	1.5	172	2.7	163	1.5	67	1.2	40	2.0	2
<b>2,000-2,499</b>	3,877	5.0	2,421	4.6	414	6.4	601	5.6	317	5.8	117	5.9	7
<b>2,500-2,999</b>	12,829	16.5	7,791	14.7	1,346	20.9	2,069	19.3	1,264	23.1	351	17.6	8
<b>3,000-3,499</b>	28,862	37.2	19,102	36.1	2,440	37.8	4,226	39.5	2,289	41.9	785	39.3	20
<b>3,500-3,999</b>	22,444	28.9	16,539	31.2	1,450	22.5	2,733	25.6	1,194	21.8	517	25.9	11
<b>4,000-4,499</b>	6,198	8.0	4,820	9.1	346	5.4	675	6.3	244	4.5	112	5.6	1
<b>4,500-4,999</b>	959	1.2	785	1.5	47	0.7	77	0.7	32	0.6	18	0.9	0
<b>&gt;=5,000</b>	103	0.1	75	0.1	12	0.2	9	0.1	4	-- <sup>2</sup>	3	-- <sup>2</sup>	0
<b>Unknown birthweight</b>	125	0.2	64	0.1	5	0.1	12	0.1	6	0.1	5	0.3	33
<b>VLBW<sup>3</sup> (0-1,499 g)</b>	1,041	1.3	590	1.1	220	3.4	131	1.2	52	1.0	47	2.4	1
<b>LBW<sup>4</sup> (0-2,499 g)</b>	6,150	7.9	3,799	7.2	806	12.5	895	8.4	436	8.0	204	10.3	10

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

1. Percentages are based on column totals. 2. Calculations based on values of 1-4 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.).

**Table 9. Low Birthweight by Plurality, Massachusetts: 1996-2006**

Age Group	Year	Singleton				Twin				Multiples				Total Multiples				Total Births			
		VLBW <sup>1</sup>		LBW <sup>2</sup>		VLBW <sup>1</sup>		LBW <sup>2</sup>		Triplets or more		Total Multiples		VLBW <sup>1</sup>		LBW <sup>2</sup>		VLBW <sup>1</sup>		LBW <sup>2</sup>	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
All Ages	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
	2003	713	0.9	4,006	5.3	331	9.3	1,877	52.9	71	28.5	232	93.2	402	10.6	2,109	55.6	1,115	1.4	6,115	7.6
	2004	740	1.0	4,015	5.4	324	9.2	1,879	53.2	84	34.4	231	94.7	408	10.8	2,110	55.9	1,148	1.5	6,125	7.8
	2005	701	1.0	4,126	5.6	322	9.5	1,765	52.3	75	39.5	181	95.3	397	11.1	1,946	54.6	1,098	1.4	6,072	7.9
	2006	687	0.9	4,264	5.8	308	9.1	1,746	51.8	46	31.1	140	94.6	354	10.1	1,886	53.6	1,041	1.3	6,150	7.9
Ages < 35	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
	2003	539	0.9	3,161	5.3	256	10.7	1,325	55.5	38	32.2	114	96.6	294	11.7	1,439	57.5	833	1.3	4,600	7.5
	2004	565	1.0	3,128	5.4	207	9.3	1,224	55.0	56	39.7	133	94.3	263	11.1	1,357	57.3	828	1.4	4,485	7.5
	2005	552	1.0	3,198	5.7	215	10.3	1,149	55.1	47	46.1	100	98.0	262	12.0	1,249	57.1	814	1.4	4,447	7.6
	2006	534	0.9	3,342	5.8	217	10.3	1,157	54.8	28	31.5	83	93.3	245	11.1	1,240	56.3	779	1.3	4,582	7.7
Ages 35+	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
	2003	174	1.0	844	5.0	75	6.5	552	47.5	33	25.2	118	90.1	108	8.4	670	51.9	282	1.5	1,514	8.3
	2004	174	1.0	886	5.2	117	9.0	655	50.2	28	27.2	98	95.1	145	10.3	753	53.5	319	1.7	1,639	8.9
	2005	149	0.9	927	5.5	107	8.3	616	47.8	28	31.8	81	92.0	135	9.8	697	50.6	284	1.6	1,624	8.9
	2006	151	0.9	919	5.4	89	7.1	587	46.8	18	30.5	57	96.6	107	8.1	644	49.0	258	1.4	1,563	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.).

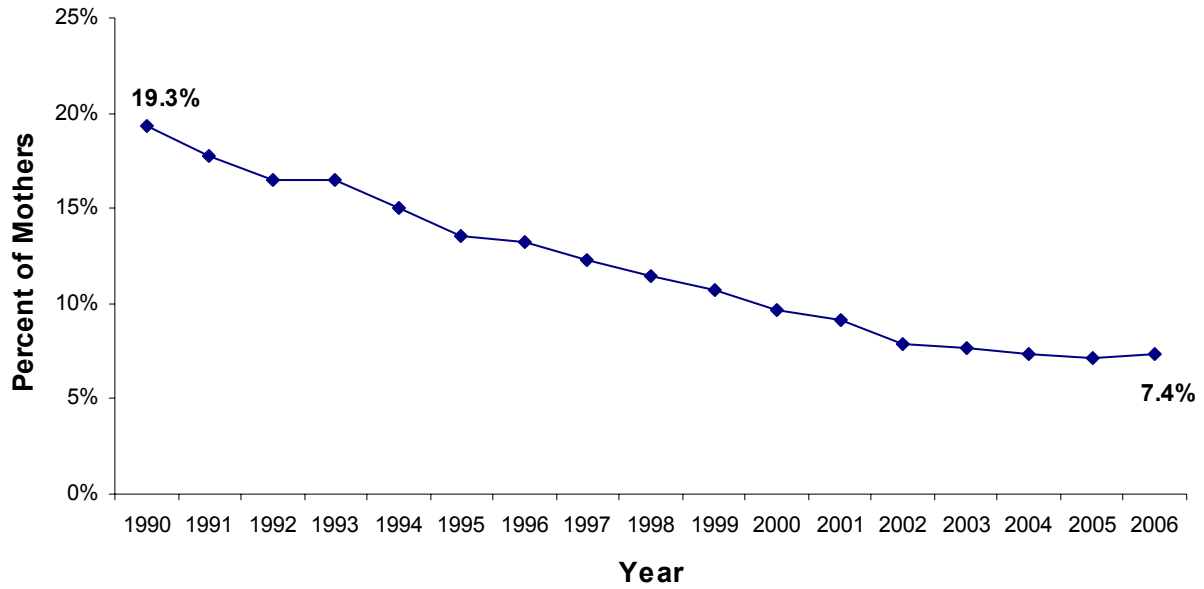
Table 10. Births by Gestational Age<sup>1</sup>, Race and Hispanic Ethnicity, Massachusetts: 2006

Gestational Age <sup>4</sup>	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other <sup>3</sup>		Unknown
(weeks completed)	n	% <sup>2</sup>	n	% <sup>2</sup>	n	% <sup>2</sup>	n	% <sup>2</sup>	n	% <sup>2</sup>	n	% <sup>2</sup>	n
<b>State Total</b>	<b>77,670</b>	<b>100.0</b>	<b>52,975</b>	<b>100.0</b>	<b>6,452</b>	<b>100.0</b>	<b>10,696</b>	<b>100.0</b>	<b>5,469</b>	<b>100.0</b>	<b>1,995</b>	<b>100.0</b>	<b>83</b>
<b>&lt;20</b>	22	0.0	10	0.0	8	0.1	3	-- <sup>8</sup>	0	0.0	0	0.0	1
<b>20-23</b>	154	0.2	73	0.1	52	0.8	23	0.2	3	-- <sup>8</sup>	3	-- <sup>8</sup>	0
<b>24-27</b>	323	0.4	190	0.4	65	1.0	40	0.4	14	0.3	14	0.7	0
<b>28-31</b>	678	0.9	429	0.8	97	1.5	92	0.9	37	0.7	23	1.2	0
<b>32-35</b>	3,103	4.0	2,028	3.8	364	5.6	424	4.0	184	3.4	96	4.8	7
<b>36</b>	2,674	3.4	1,850	3.5	243	3.8	358	3.3	160	2.9	62	3.1	1
<b>37-39</b>	38,131	49.1	25,924	48.9	3,018	46.8	5,352	50.0	2,911	53.2	899	45.1	27
<b>40</b>	24,131	31.1	16,515	31.2	2,011	31.2	3,258	30.5	1,666	30.5	673	33.7	8
<b>41</b>	7,781	10.0	5,552	10.5	529	8.2	1,041	9.7	455	8.3	199	10.0	5
<b>42</b>	533	0.7	344	0.6	51	0.8	83	0.8	34	0.6	20	1.0	1
<b>43</b>	21	0.0	5	0.0	6	0.1	8	0.1	0	0.0	2	-- <sup>8</sup>	0
<b>44+</b>	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	0
<b>Unknown<sup>5</sup></b>	119	0.2	55	0.1	8	0.1	14	0.1	5	0.1	4	-- <sup>8</sup>	33
<b>Very early gestation, &lt;28 weeks<sup>6</sup></b>	499	0.6	273	0.5	125	1.9	66	0.6	17	0.3	17	0.9	1
<b>Late Preterm Weeks 34-37</b>	4,918	6.3	3,317	6.3	481	7.5	677	6.3	304	5.6	123	6.7	7
<b>Preterm, &lt;37 weeks<sup>7</sup></b>	6,954	9.0	4,580	8.7	829	12.9	940	8.8	398	7.3	198	9.9	9

NOTE: Percentages for detailed gestational age category rows ("<20" through "Unknown") are calculated based on 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.

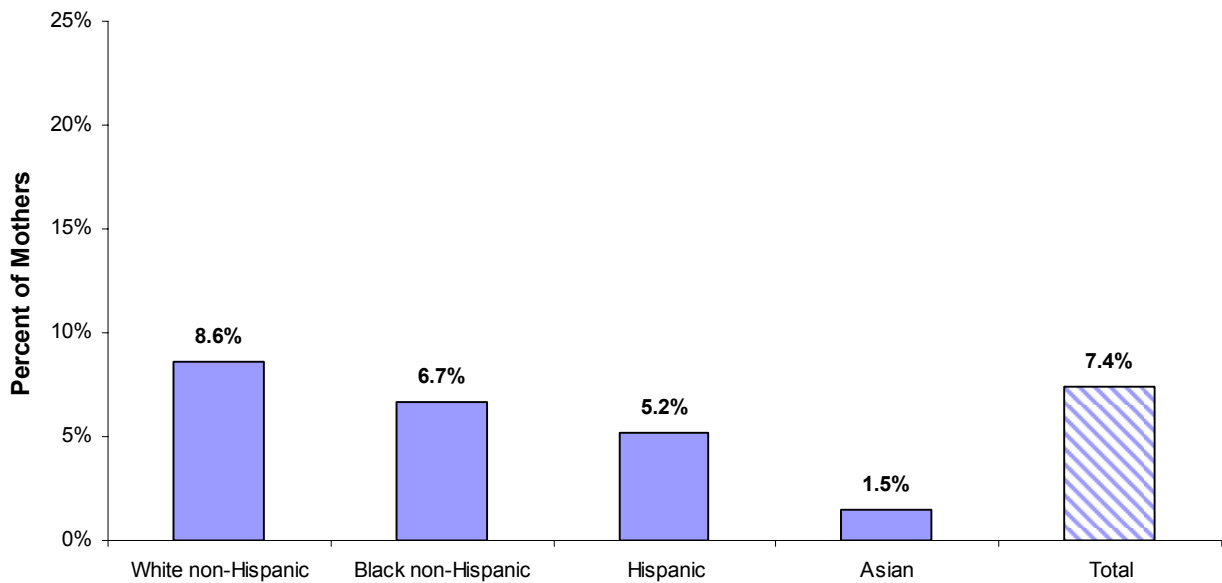
1. A clinical estimate of the number of weeks of pregnancy completed; as estimated by the attendant at birth or the postnatal physician. 2. Percentages are based on column total. 3. Other races include American Indian and others not specified. 4. Normal gestational age is defined as 37-42 weeks. 5. Estimate of gestational age not provided. 6. Also known as extremely premature delivery, or extremely preterm delivery. 7. Also known as early gestational age, premature delivery, or preterm delivery. 8. Calculations based on values of 1-4 are excluded.

**Figure 3. Percent of Mothers who Smoked During Pregnancy<sup>1</sup>,  
Massachusetts: 1990-2006**



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.

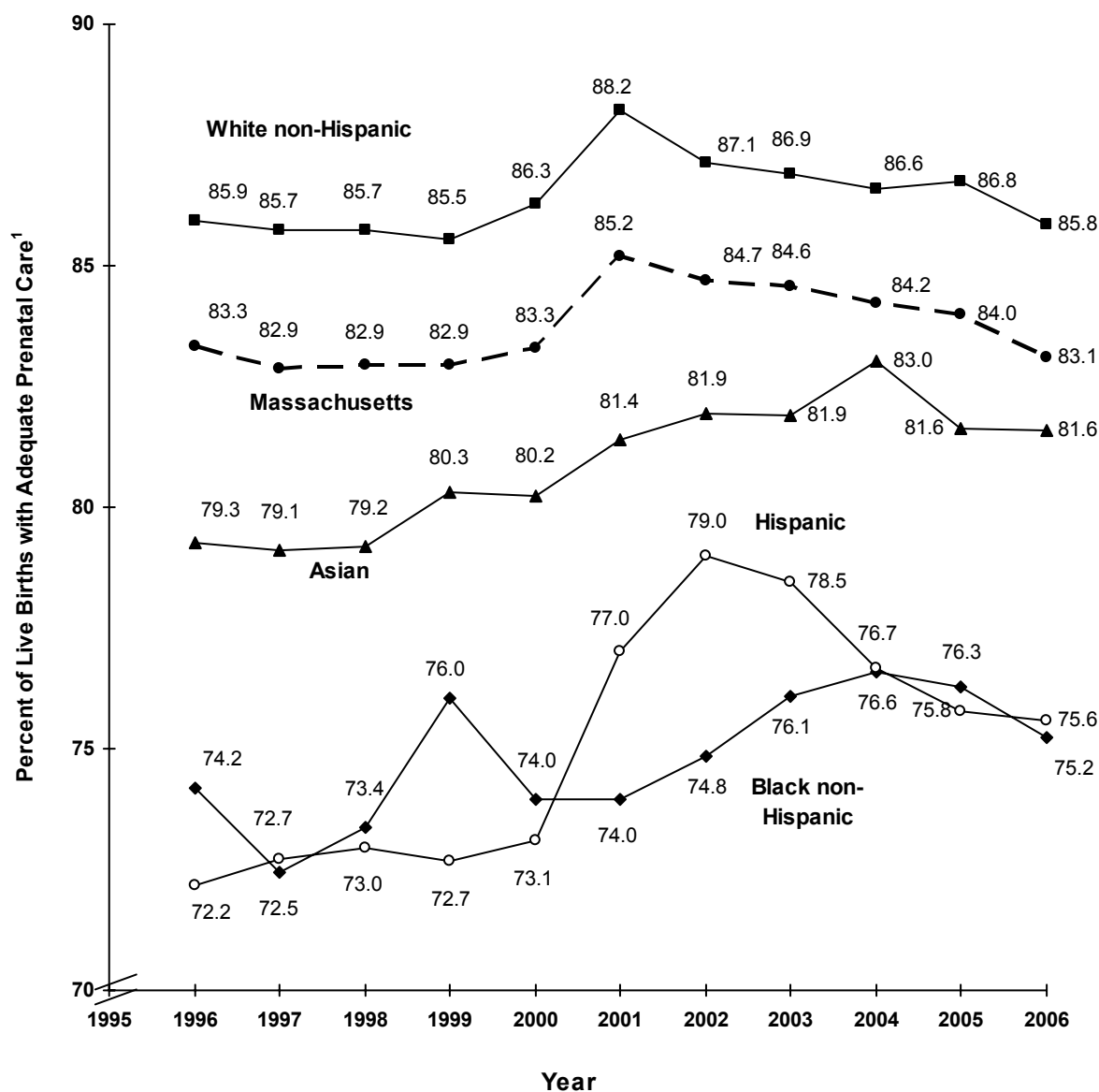
**Figure 4. Percent of Mothers who Reported Smoking During Pregnancy<sup>1</sup> by Mother's  
Race and Hispanic Ethnicity, Massachusetts: 2006**



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 5. Trends in Adequacy of Prenatal Care<sup>1</sup> by Race and Hispanic Ethnicity, Massachusetts: 1996-2006**



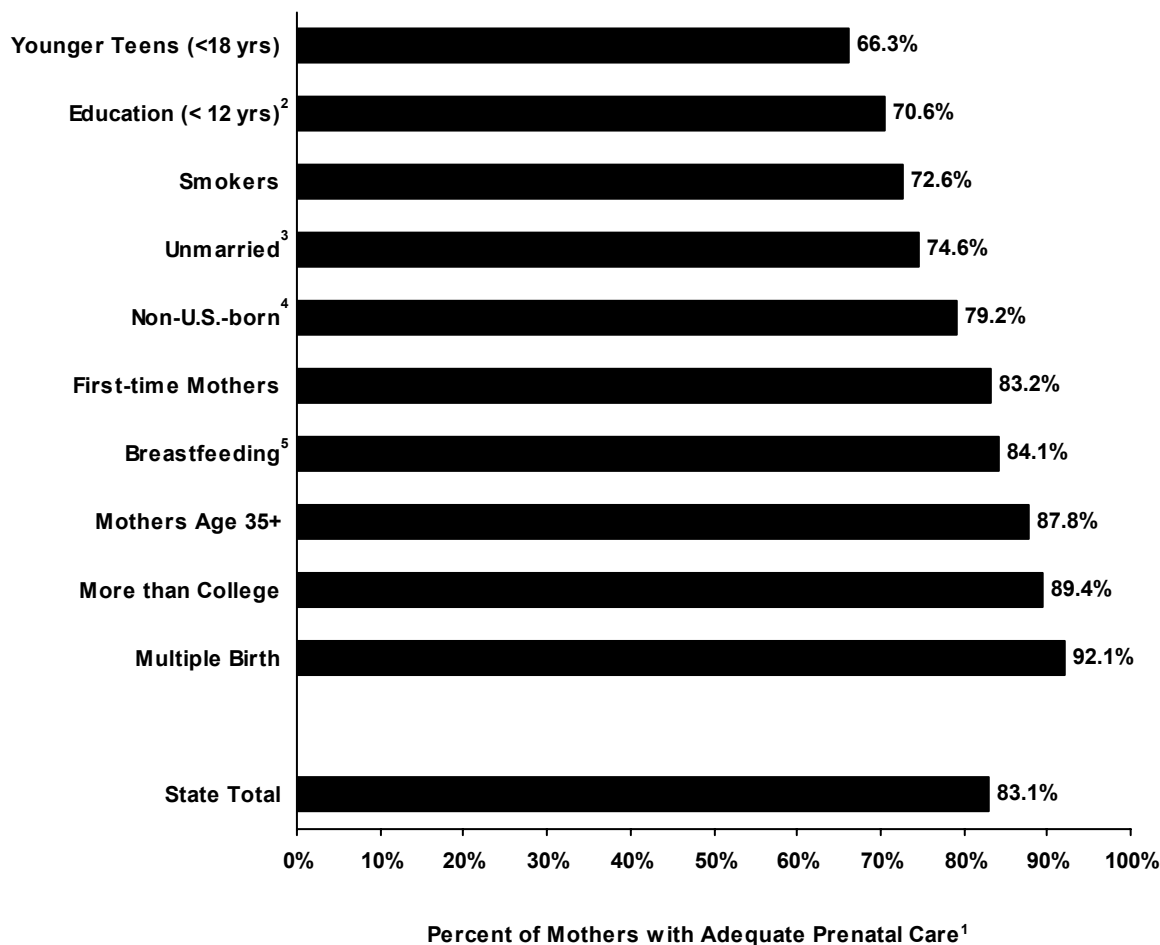
PLEASE NOTE THAT THE VERTICAL SCALE OF GRAPH REPRESENTS A SMALL INTERVAL (from 70% to 90%) FOR PURPOSES OF VISUAL REPRESENTATION.

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 the Adequacy of Prenatal Care Utilization (APNCU) Index. Please note: The APNCU is an assessment of the timing and number of prenatal care visits and not an evaluation of the quality of care delivered.



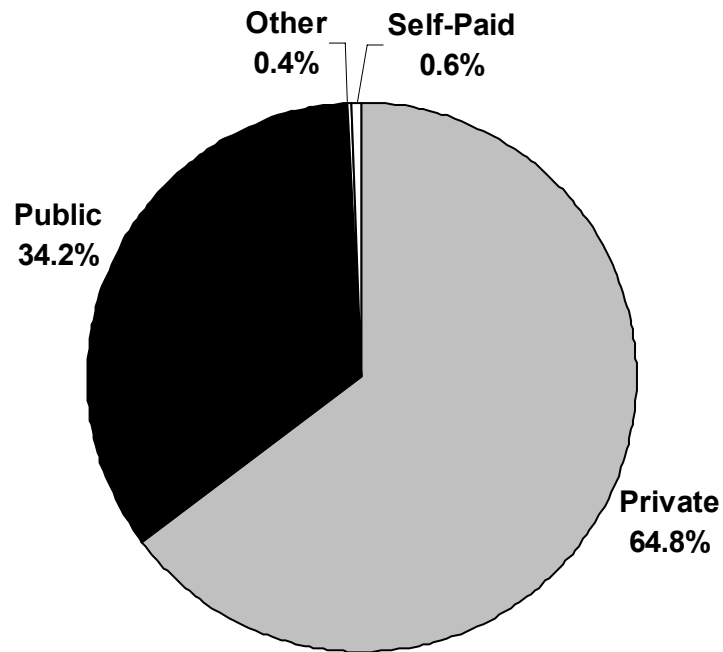
**Figure 6. Adequacy of Prenatal Care<sup>1</sup> by Selected Maternal Characteristics, Massachusetts: 2006**



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Characteristics of interest are not mutually exclusive, except as noted.

1. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Women 20 years of age and older. 3. Marital status at time of birth. 4. Non-U.S.-born includes women born outside of the 50 U.S. states, District of Columbia, and U.S. territories (Puerto Rico, U.S. Virgin Islands, Guam). 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

**Figure 7. Distribution of Prenatal Care Payment Source<sup>1</sup>, Massachusetts: 2006**



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

1. Private: Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance. Public: Government programs including Commonhealth, Healthy Start, Medicaid/MassHealth, and Medicare (may also be HMO or managed care), or free care. Other: Worker's Compensation and other sources.

**Table 11. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race and Hispanic Ethnicity, Massachusetts: 1990-2006**

INFANT MORTALITY (less than one year of age)												
Year	State Total <sup>1</sup>		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other <sup>2</sup>	
	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>
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	-- <sup>4</sup>
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	-- <sup>4</sup>
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	-- <sup>4</sup>
1996	403	5.0	289	4.7	63	11.4	40	5.1	8	2.2	2	-- <sup>4</sup>
1997	425	5.3	294	4.8	64	11.7	55	6.7	10	2.6	2	-- <sup>4</sup>
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	-- <sup>4</sup>
2000	377	4.6	232	3.8	74	12.8	48	5.2	19	4.1	4	-- <sup>4</sup>
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
2003	383	4.8	235	4.1	75	12.7	55	5.6	14	2.7	4	-- <sup>4</sup>
2004	376	4.8	210	3.8	70	11.5	75	7.6	15	2.7	6	3.5
2005	391	5.1	230	4.3	57	9.4	78	7.7	18	3.4	8	4.3
2006	369	4.8	221	4.2	72	11.1	62	5.8	10	1.8	3	-- <sup>4</sup>

NEONATAL MORTALITY (birth to 27 days)												
Year	State Total <sup>1</sup>		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other <sup>2</sup>	
	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>
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	-- <sup>4</sup>
1993	375	4.4	245	3.7	64	10.0	55	6.7	9	2.7	2	-- <sup>4</sup>
1994	349	4.2	240	3.7	58	9.3	40	4.7	7	2.1	4	-- <sup>4</sup>
1995	298	3.6	198	3.1	50	8.5	39	4.8	10	2.9	1	-- <sup>4</sup>
1996	290	3.6	222	3.6	34	6.2	27	3.5	5	1.4	1	-- <sup>4</sup>
1997	323	4.0	228	3.7	44	8.0	43	5.2	7	1.8	1	-- <sup>4</sup>
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	-- <sup>4</sup>
2000	288	3.5	177	2.9	57	9.9	37	4.0	14	3.0	3	-- <sup>4</sup>
2001	308	3.8	190	3.2	56	9.5	49	5.2	10	2.1	3	-- <sup>4</sup>
2002	299	3.7	185	3.2	49	8.2	50	5.2	13	2.4	2	-- <sup>4</sup>
2003	285	3.6	179	3.1	56	9.5	38	3.9	10	1.9	2	-- <sup>4</sup>
2004	291	3.7	167	3.0	51	8.4	57	5.8	12	2.2	4	-- <sup>4</sup>
2005	282	3.7	168	3.1	40	6.6	57	5.8	11	2.1	5	2.7
2006	279	3.6	173	3.3	53	8.2	42	3.9	7	1.3	3	-- <sup>4</sup>

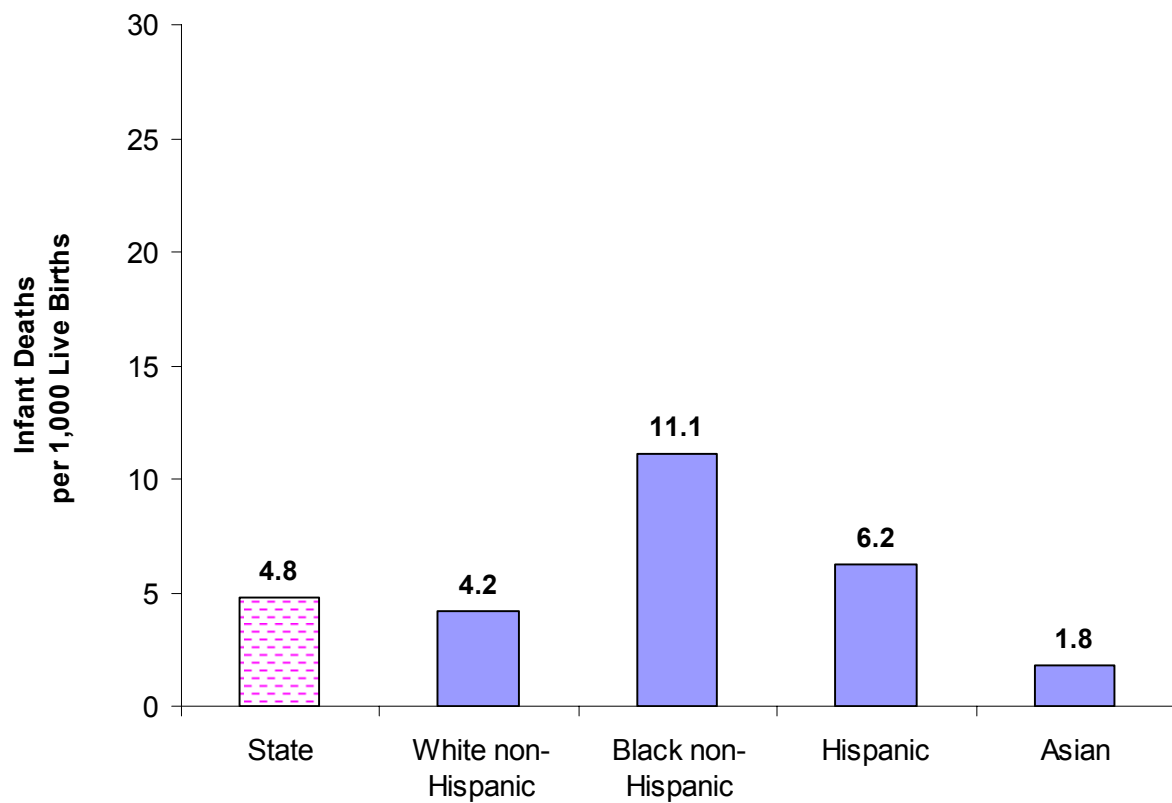
**Table 11 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race and Hispanic Ethnicity, Massachusetts: 1990-2006**

**POST NEONATAL MORTALITY (28-364 days)**

Year	State Total <sup>1</sup>		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other <sup>2</sup>	
	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>	n	Rate <sup>3</sup>
1990	203	2.2	144	2.0	23	3.2	28	3.3	5	1.5	3	-- <sup>4</sup>
1991	176	2.0	115	1.7	29	4.3	27	3.2	4	-- <sup>4</sup>	1	-- <sup>4</sup>
1992	154	1.8	97	1.4	34	5.1	16	1.9	6	1.8	1	-- <sup>4</sup>
1993	148	1.7	101	1.5	20	3.1	22	2.7	4	-- <sup>4</sup>	1	-- <sup>4</sup>
1994	150	1.8	103	1.6	21	3.3	24	2.8	1	-- <sup>4</sup>	1	-- <sup>4</sup>
1995	121	1.5	77	1.2	15	2.6	19	2.3	9	2.6	1	-- <sup>4</sup>
1996	113	1.4	67	1.1	29	5.3	13	1.7	3	-- <sup>4</sup>	1	-- <sup>4</sup>
1997	102	1.3	66	1.1	20	3.7	12	1.5	3	-- <sup>4</sup>	1	-- <sup>4</sup>
1998	99	1.2	69	1.1	12	2.2	15	1.7	3	-- <sup>4</sup>	0	0.0
1999	86	1.1	59	1.0	14	2.4	10	1.1	3	-- <sup>4</sup>	0	0.0
2000	89	1.1	55	0.9	17	2.9	11	1.2	5	1.1	1	-- <sup>4</sup>
2001	99	1.2	55	0.9	15	2.6	20	2.1	5	1.0	4	-- <sup>4</sup>
2002	98	1.2	54	0.9	20	3.4	17	1.8	3	-- <sup>4</sup>	4	-- <sup>4</sup>
2003	98	1.2	56	1.0	19	3.2	17	1.7	4	-- <sup>4</sup>	2	-- <sup>4</sup>
2004	85	1.1	43	0.8	19	3.1	18	1.8	3	-- <sup>4</sup>	2	-- <sup>4</sup>
2005	109	1.4	62	1.2	17	2.8	20	2.0	7	1.3	3	-- <sup>4</sup>
2006	90	1.2	48	0.9	19	2.9	20	1.9	3	-- <sup>4</sup>	0	0.0

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 values of 1-4 are excluded.

**Figure 8. Infant Mortality Rates by Race and Hispanic Ethnicity,  
Massachusetts: 2006**



**Table 12. Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2006**

Municipality <sup>1</sup>	Rank (by pop. size)	Population	Crude Birth Rate <sup>2</sup>	Mother's Race and Ethnicity				Very Low Birthweight (<1500 g)	Low Birthweight (<2500 g)	Gestational Diabetes
				White non- Hispanic	Black non- Hispanic	Hispanic	Asian or Other <sup>4</sup>			
				% <sup>3</sup>	% <sup>3</sup>	% <sup>3</sup>	% <sup>3</sup>			
<b>STATE TOTAL</b>		6,436,940	<b>12.1</b>	<b>68.2</b>	<b>8.3</b>	<b>13.8</b>	<b>9.6</b>	<b>1.3</b>	<b>7.9</b>	<b>3.8</b>
Attleboro	29	43,364	<b>14.0</b>	79.7	5.3	7.1	7.9	1.2	6.4	2.2
Barnstable	25	47,902	<b>10.3</b>	82.9	4.9	5.5	6.7	1.4	7.1	1.2
Boston	1	558,435	<b>14.2</b>	35.5	28.7	22.1	13.7	1.7	9.0	3.2
Brockton	6	100,366	<b>15.3</b>	34.9	40.4	12.2	12.5	2.5	11.5	4.4
Brookline	18	56,422	<b>12.2</b>	69.2	2.6	4.1	24.0	0.3	5.9	3.2
Cambridge	5	101,529	<b>11.3</b>	57.1	13.4	8.3	21.0	1.3	6.4	2.3
Chicopee	21	54,599	<b>11.2</b>	73.8	3.1	18.3	4.7	1.5	7.4	5.6
Fall River	9	92,117	<b>13.2</b>	78.6	5.5	10.1	5.7	1.5	10.5	8.5
Framingham	14	65,651	<b>14.8</b>	67.4	6.4	16.3	10.0	1.0	9.0	2.7
Haverhill	15	60,032	<b>15.1</b>	75.2	4.4	17.0	3.3	2.1	10.5	3.1
Lawrence	12	81,591	<b>17.9</b>	15.8	2.2	78.2	3.8	1.4	7.9	3.5
Leominster	30	42,120	<b>12.6</b>	65.6	10.5	17.5	6.4	1.9	6.0	3.0
Lowell	4	105,749	<b>17.2</b>	46.6	7.4	18.8	27.1	1.5	9.1	5.5
Lynn	8	92,186	<b>16.2</b>	32.6	12.1	47.1	8.1	1.6	8.8	2.8
Malden	17	56,730	<b>14.9</b>	47.8	16.0	9.0	26.9	2.3	7.5	5.5
Medford	22	53,801	<b>12.4</b>	71.6	11.4	5.9	11.1	1.8	7.3	2.9
Methuen	27	44,532	<b>13.0</b>	66.0	3.3	22.5	8.1	1.0	6.8	2.8
New Bedford	7	94,502	<b>15.4</b>	60.7	8.2	23.6	7.5	2.3	10.6	3.4
Newton	11	83,346	<b>9.7</b>	75.2	3.3	6.2	15.3	1.7	7.6	3.6
Peabody	24	50,954	<b>9.9</b>	87.5	2.8	5.2	4.6	1.6	6.3	2.2
Pittsfield	28	43,949	<b>11.3</b>	78.1	8.0	10.5	3.0	0.4	7.5	3.0
Plymouth	20	54,781	<b>13.3</b>	91.2	1.1	2.7	4.9	0.7	6.3	2.9
Quincy	10	90,458	<b>12.8</b>	60.6	5.7	2.8	30.6	1.3	7.1	5.1
Revere	26	45,551	<b>15.1</b>	50.0	3.6	32.8	13.6	1.9	9.5	5.0
Somerville	13	75,372	<b>11.4</b>	61.8	7.9	15.8	14.5	1.2	7.5	3.0
Springfield	3	156,358	<b>16.1</b>	27.7	21.2	47.0	3.9	2.2	10.9	5.5
Taunton	19	56,348	<b>13.9</b>	80.6	7.9	5.4	6.0	1.9	8.6	2.1
Waltham	16	59,564	<b>12.8</b>	53.8	7.9	21.5	16.9	1.3	8.1	3.4
Weymouth	23	53,708	<b>12.2</b>	84.6	4.0	1.5	9.8	2.3	9.3	3.4
Worcester	2	179,839	<b>14.4</b>	58.9	12.7	19.3	9.1	1.3	7.7	4.9

**Table 12 (cont'd). Resident Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2006**

Municipality <sup>1</sup>	Birth					Deaths			
	Adequate Prenatal Care <sup>6</sup>	Public Payment <sup>7</sup> for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate <sup>8</sup>		Neonatal Mortality Rate <sup>8</sup>	
	%	%	%	n	Rate <sup>2</sup>	2006	2004-2006	2006	2004-2006
STATE TOTAL	83.1	34.2	32.2	4,722	21.3	4.8	4.9	3.6	3.7
Attleboro	80.8	21.6	28.1	27	23.8	3.3	4.3	3.3	3.8
Barnstable	86.2	47.4	33.4	29	21.3	-- <sup>5</sup>	2.9	-- <sup>5</sup>	1.4
Boston	82.2	48.1	46.6	568	28.7	5.8	5.6	4.4	4.4
Brockton	75.1	61.3	52.1	156	42.9	7.8	8.3	5.2	6.2
Brookline	92.3	4.5	6.1	4	-- <sup>5</sup>	-- <sup>5</sup>	2.5	-- <sup>5</sup>	2.0
Cambridge	87.1	17.8	16.1	32	8.2	5.2	3.7	4.4	2.8
Chicopee	80.3	50.0	46.8	58	33.4	1.6	4.9	1.6	2.7
Fall River	84.0	64.5	54.1	146	51.6	5.0	5.8	4.1	3.6
Framingham	84.7	41.4	28.2	65	33.3	3.1	5.8	2.1	4.5
Haverhill	87.0	31.5	37.6	73	38.3	6.6	4.6	5.5	3.5
Lawrence	76.6	67.6	66.4	244	80.6	6.2	7.6	4.1	5.5
Leominster	79.1	39.0	38.0	38	30.3	9.4	5.8	7.5	5.1
Lowell	68.5	55.1	52.1	202	50.9	5.0	5.5	4.4	3.7
Lynn	76.6	66.5	55.8	147	47.7	4.7	4.5	4.7	4.3
Malden	84.1	43.7	30.0	28	19.6	8.3	7.2	7.1	6.8
Medford	87.0	28.6	24.1	15	8.4	6.0	5.8	6.0	5.3
Methuen	84.5	28.0	30.0	29	21.9	1.7	3.4	1.7	1.1
New Bedford	76.2	54.9	60.6	207	70.0	8.9	6.9	6.2	4.5
Newton	87.5	9.1	7.5	8	2.3	3.7	4.1	3.7	4.1
Peabody	87.1	31.6	24.8	15	10.5	6.0	3.3	4.0	2.7
Pittsfield	66.0	56.6	52.4	63	49.6	-- <sup>5</sup>	3.2	-- <sup>5</sup>	1.9
Plymouth	88.4	21.9	23.7	30	17.9	5.5	4.3	1.4	1.9
Quincy	88.7	32.1	24.3	22	10.6	3.4	4.0	2.6	2.9
Revere	81.4	61.8	39.8	39	37.0	11.7	8.9	10.2	8.4
Somerville	82.3	40.7	29.0	34	15.7	4.6	4.6	3.5	3.8
Springfield	71.3	72.7	68.7	490	80.7	9.1	8.7	5.5	5.8
Taunton	78.4	42.1	43.5	53	32.5	6.4	5.7	5.1	3.5
Waltham	80.0	30.6	22.8	24	10.3	6.5	2.8	5.2	2.3
Weymouth	88.3	27.8	25.5	27	18.6	9.2	7.8	6.1	6.3
Worcester	73.0	48.5	48.7	242	34.4	5.0	8.5	3.9	6.7

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 2005 Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006 (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. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 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 values of 1-4 are excluded. 6. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. Please see Glossary for definition. 7. Public payment sources include Commonwealth, 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 13. Birth Characteristics by Licensed Maternity Facility<sup>1</sup>, Massachusetts: 2006**

Facility	Location	Occurrence Births <sup>2</sup> (n)	Low Birthweight <sup>3</sup> (%)	Public Payment for Delivery <sup>4</sup> (%)	Adequate Prenatal Care <sup>5</sup> (%)	C-Section <sup>6</sup> (%)
<b>State Total</b>		<b>78,511</b>	<b>7.8</b>	<b>33.5</b>	<b>83.2</b>	<b>32.5</b>
Anna Jaques Hospital	Newburyport	769	5.6	23.9	90.3	29.3
Baystate Medical Center	Springfield	4,291	12.6	48.4	77.8	30.4
Berkshire Medical Center	Pittsfield	741	5.3	45.7	66.7	31.8
Beth Israel Deaconess Medical Center	Boston	4,948	11.1	17.2	96.0	41.2
Beverly Hospital	Beverly	2,024	5.4	29.2	93.9	32.4
Boston Medical Center	Boston	2,586	10.0	86.7	52.9	30.8
Brigham and Women's Hospital	Boston	8,418	10.8	20.4	95.2	32.5
Brockton Hospital	Brockton	1,385	7.4	65.2	82.6	39.1
Cambridge Birth Center	Cambridge	114	-- <sup>7</sup>	17.5	71.9	0.0
Cambridge Hospital	Cambridge	1,310	4.0	74.9	72.3	29.2
Cape Cod Hospital	Barnstable	1,016	6.4	42.5	85.3	30.5
Caritas Good Samaritan Medical Center	Brockton	868	7.7	52.4	61.3	41.6
Caritas Holy Family Hospital And Medical Center	Methuen	1,210	6.1	27.9	82.6	44.0
Caritas St. Elizabeth's Medical Center Of Boston	Boston	1,312	13.4	24.9	80.1	40.4
Charlton Memorial Hospital	Fall River	1,659	7.3	48.5	88.1	34.8
Cooley Dickinson Hospital	Northampton	863	3.5	27.4	90.2	30.6
Emerson Hospital	Concord	1,214	4.4	4.0	84.3	38.3
Fairview Hospital	Great Barrington	126	-- <sup>7</sup>	47.6	79.5	25.4
Falmouth Hospital	Falmouth	552	5.7	35.3	80.2	36.2
Franklin Medical Center	Greenfield	455	2.6	45.3	89.5	22.4
Harrington Memorial Hospital	Southbridge	406	2.5	50.0	86.7	31.3
Heywood Memorial Hospital	Gardner	587	3.7	43.0	81.4	20.6
Holyoke Hospital	Holyoke	573	3.5	69.6	74.9	19.9
Jordan Hospital	Plymouth	728	3.6	29.7	84.1	29.8
Lawrence General Hospital	Lawrence	1,852	5.7	54.3	80.3	33.9
Leominster Hospital	Leominster	1,193	3.0	49.5	80.2	25.6
Lowell General Hospital	Lowell	1,979	6.0	41.0	65.3	32.1
Martha's Vineyard Hospital	Oak Bluffs	156	-- <sup>7</sup>	44.9	87.2	23.1
Mary Lane Hospital	Ware	165	3.0	50.6	75.8	29.1
Massachusetts General Hospital	Boston	3,342	9.0	31.2	87.0	33.4
Melrose-Wakefield Hospital	Melrose	1,293	5.9	26.2	89.7	40.1
Mercy Medical Center	Springfield	1,377	3.6	57.6	79.2	23.2
Metrowest Medical Center-Framingham Union Campus	Framingham	1,903	6.5	38.6	90.0	41.5
Milford Regional Medical Center	Milford	1,019	4.4	22.0	93.1	34.8
Morton Hospital	Taunton	499	4.7	50.1	69.4	37.2
Mount Auburn Hospital	Cambridge	1,871	3.5	18.4	88.9	26.7
Nantucket Cottage Hospital	Nantucket	124	-- <sup>7</sup>	46.8	81.1	20.2



**Table 13 (cont'd). Birth Characteristics by Licensed Maternity Facility<sup>1</sup>, Massachusetts: 2006**

Facility	Location	Occurrence Births <sup>2</sup> (n)	Low Birthweight <sup>3</sup> (%)	Public Payment for Delivery <sup>4</sup> (%)	Adequate Prenatal Care <sup>5</sup> (%)	C-Section <sup>6</sup> (%)
Newton Wellesley Hospital	Newton	3,379	5.9	3.6	78.9	37.2
North Adams Regional Hospital	North Adams	325	6.2	57.7	93.8	24.3
North Shore Birth Center	Beverly	83	0.0	14.5	97.6	0.0
North Shore Medical Center - Salem Hospital	Salem	1,817	5.2	48.2	72.1	31.6
Saint Vincent Hospital	Worcester	1,853	4.3	9.8	93.7	27.4
Saints Memorial Medical Ctr.	Lowell	704	5.6	43.8	81.6	34.7
South Shore Hospital	Weymouth	3,802	6.5	15.1	90.4	40.5
Caritas Norwood Hospital	Norwood	540	3.3	23.6	63.4	34.4
St. Luke's Hospital	New Bedford	1,639	8.4	48.9	76.6	30.3
Sturdy Memorial Hospital	Attleboro	1,064	3.4	14.9	77.9	36.5
Tobey Hospital	Wareham	432	3.2	32.4	90.0	22.3
Tufts-New England Medical Center Hospital	Boston	1,353	28.9	40.6	89.4	41.3
UMASS Memorial Medical Center - West Campus	Worcester	4,346	10.5	38.0	70.3	27.9
Winchester Hospital	Winchester	1,904	5.5	5.3	83.4	36.5
Other Hospitals		5	-- <sup>7</sup>	66.7	60.0	40.0
Home, En route & Doctors' Offices		337	10.3	30.7	62.0	0.0

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

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definition of occurrence births. 3. Less than 2,500 grams (5.5 lbs.) 4. Public payment for delivery includes Medicaid/MassHealth, Commonwealth, Medicare, Healthy Start, other government programs, and free care. 5. Based on the APNCU Index. 6. The percentages provided in this row are based on occurrence births and may differ from data presented elsewhere in this book which are based on resident births. 7. Calculations based on values of 1-4 for medical characteristics of facilities with less than 200 births are suppressed based on Guidelines for Release of Births Data, Center for Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health.

**Table 14. Comparison of Massachusetts Perinatal Health Indicators with Healthy People 2010 Objectives<sup>1</sup>, Massachusetts: 2003-2006**

Healthy People 2010 Objectives (Focus Area 16: Maternal, Infant and Child Health <sup>2</sup> )	HP2010 Target	Massachusetts				Has Massachusetts achieved HP2010 target? ✓ = YES ○ = NO, but within 25% of target ● = NO, > 25% from target
		2003	2004	2005	2006	
<b>Fetal, Infant, and Maternal Deaths</b>						
16-1a. Fetal Mortality Rate <sup>3</sup>	4.1	5.7	5.3	5.5	5.0	○
16-1b. Perinatal Mortality Rate <sup>4</sup>	4.5	5.8	5.8	5.4	5.7	●
16-1c. Infant Mortality Rate <sup>5</sup>	4.5	4.8	4.7	5.1	4.8	○
16-1d. Neonatal Mortality Rate <sup>6</sup>	2.9	3.6	3.7	3.7	3.6	○
16-1e. Postneonatal Mortality Rate <sup>7</sup>	1.2	1.2	1.1	1.4	1.2	✓
16-4. Maternal Mortality Ratio <sup>8</sup>	3.3	4.9	6.3	10.3	8.9	●
<b>Risk Factors</b>						
16-10a. Low Birthweight <sup>9</sup> (%)	5.0	7.6	7.8	7.9	7.9	●
16-10b. Very Low Birthweight <sup>10</sup> (%)	0.9	1.4	1.5	1.4	1.3	●
16-11a. Preterm <sup>11</sup> (%)	7.6	8.7	9.2	9.0	9.0	○
<b>Prenatal Care</b>						
16-6a. Care beginning in first trimester (%)	90.0	83.9	83.5	83.2	82.1	○
16-6b. Early and adequate care <sup>12</sup> (%)	90.0	84.5	84.2	84.0	83.1	○
<b>Obstetrical Care</b>						
16-8. Very Low Birthweight <sup>10</sup> Infants born at Level III Hospitals <sup>13</sup> (%)	90.0	79.1	80.1	78.5	76.8	○
16-9a. Cesarean Sections: Low-Risk <sup>14</sup> Women Giving Birth for the First Time (%)	15.0	25.0	26.7	27.8	28.5	●
16-9b. Cesarean Sections: Low-Risk <sup>14</sup> Women with Prior Cesarean Section (%)	63.0	86.7	87.9	89.8	91.3	●
<b>Breastfeeding</b>						
16-19a. Breastfeeding <sup>15</sup> (%)	75.0	78.1	78.9	79.3	79.9	✓
<b>Prenatal Substance Exposure</b>						
16-17c. Abstinence from Smoking (%)	99.0	92.3	92.6	92.8	92.6	○

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 37<sup>th</sup> 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.

# Appendix



**Table 15. Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2006**

CHNA	Population	Crude Birth Rate <sup>1</sup>	Mother's Race and Ethnicity				Very Low Birthweight (<1500 g) %	Low Birthweight (<2500 g) %
			White non-Hispanic % <sup>3</sup>	Black non-Hispanic % <sup>3</sup>	Hispanic % <sup>3</sup>	Asian or Other <sup>2</sup> % <sup>3</sup>		
<b>STATE TOTAL</b>	<b>6,436,940</b>	<b>12.1</b>	<b>68.2</b>	<b>8.3</b>	<b>13.8</b>	<b>9.6</b>	<b>1.3</b>	<b>7.9</b>
Community Health Network of Berkshire County	131,965	9.4	85.7	3.8	6.2	3.9	1.2	8.1
Upper Valley Health Web (Franklin County)	88,506	9.8	89.9	1.0	4.1	3.7	0.9	5.9
Partnership for Health in Hampshire County (Northampton)	151,801	8.0	83.9	2.0	6.7	7.4	0.5	5.9
The Community Health Connection (Springfield)	299,490	12.7	48.5	14.6	32.6	4.2	1.8	9.6
Community Health Network of Southern Worcester County	119,141	11.1	88.9	1.5	7.2	2.3	1.1	6.9
Community Partners for Health (Milford)	160,521	13.2	90.2	1.2	3.8	4.5	1.5	8.6
Community Health Network of Greater Metro West (Framingham)	379,658	12.8	79.7	2.6	6.9	10.7	0.9	7.4
Community Wellness Coalition (Worcester)	303,669	13.1	67.4	8.7	13.3	10.6	1.1	7.3
Fitchburg/Gardner Community Health Network	261,369	11.8	79.8	3.6	11.4	5.1	1.3	6.5
Greater Lowell Community Health Network	272,893	13.4	65.3	4.6	10.7	19.3	1.3	8.2
Greater Lawrence Community Health Network	195,176	13.7	42.1	2.2	48.7	6.9	1.1	7.4
Greater Haverhill Community Health Network	148,557	12.2	84.8	2.5	9.3	3.4	1.8	9.4
Community Health Network North (Beverly/Gloucester)	119,378	9.4	92.3	1.1	2.4	4.3	0.9	8.4
North Shore Community Health Network	287,352	12.0	61.4	6.8	25.2	6.6	1.3	7.5
Greater Woburn/Concord/Littleton Community Health Network	209,597	10.0	78.1	2.1	3.7	16.0	0.9	6.5
North Suburban Health Alliance (Medford/Malden/Melrose)	257,235	12.8	68.3	9.4	8.9	13.4	1.8	7.6
Greater Cambridge/Somerville Community Health Network	273,883	11.8	67.3	8.2	8.3	16.1	1.1	7.1
West Suburban Health Network (Newton/Waltham)	253,138	10.8	73.9	3.7	9.4	13.0	1.2	7.8
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	711,603	14.3	37.9	23.2	25.1	13.8	1.5	8.7
Blue Hills Community Health Alliance (Greater Quincy)	372,309	11.6	72.2	8.4	2.7	16.6	1.4	7.7
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	161,454	11.9	64.5	2.8	30.3	2.3	1.7	7.0
Greater Brockton Community Health Network	242,404	12.9	61.2	22.4	7.5	8.8	1.9	9.8
South Shore Community Partners in Prevention (Plymouth)	188,787	11.4	94.4	1.1	1.5	2.9	0.9	7.5
Greater Attleboro-Taunton Health & Education Response	252,919	12.3	86.2	4.3	3.7	5.6	1.5	7.8
Partners for a Healthier Community (Fall River)	141,977	11.7	83.7	4.1	7.6	4.5	1.3	9.2
Greater New Bedford Health & Human Services Coalition	199,955	11.9	72.7	5.6	15.0	6.6	2.0	9.6
Cape and Islands Community Health Network	252,204	8.8	85.7	4.2	4.3	5.3	0.9	6.9

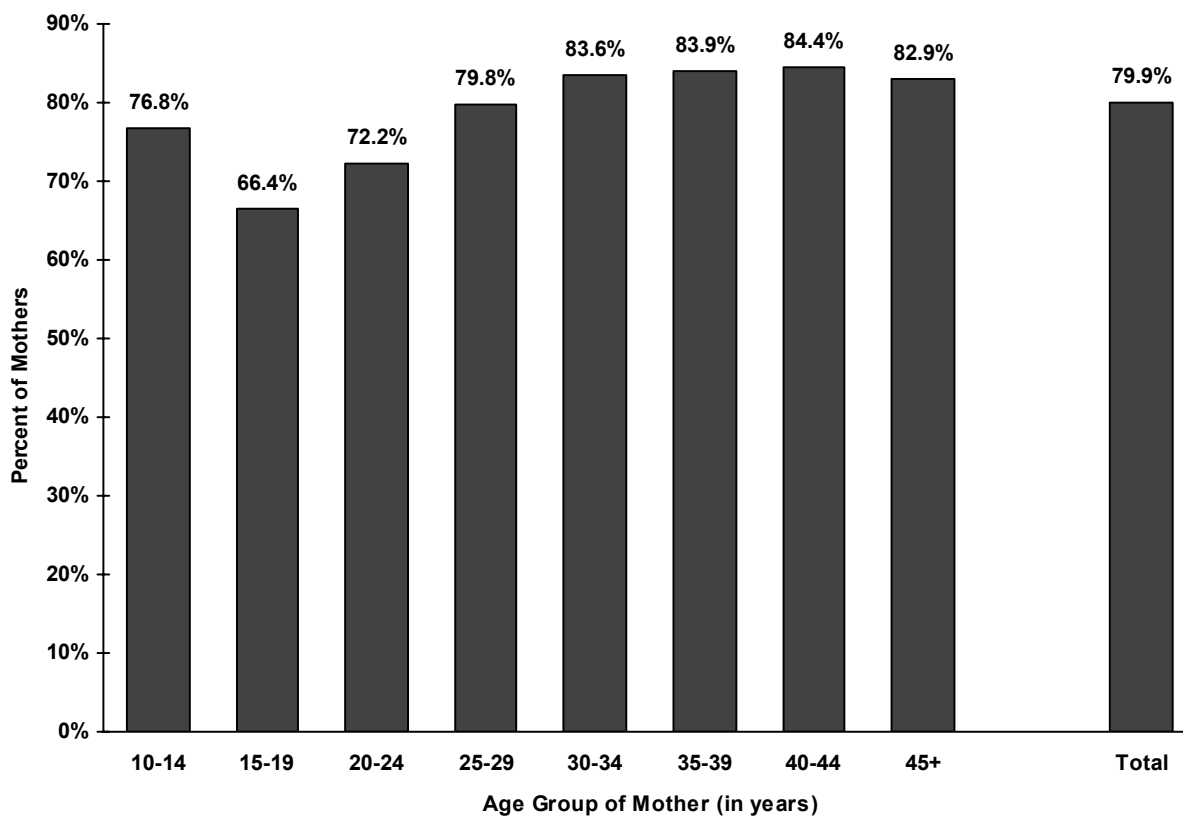
**Table 15 (cont'd) Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2006**

CHNA Number and CHNA	Births					Deaths			
	Adequate Prenatal Care <sup>6</sup>	Public Payment <sup>7</sup> for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate <sup>8</sup>		Neonatal Mortality Rate <sup>8</sup>	
	%	%	%	n	Rate <sup>4</sup>	2006	2004-2006	2006	2004-2006
<b>STATE TOTAL</b>	<b>83.1</b>	<b>34.2</b>	<b>32.2</b>	<b>4,722</b>	<b>21.3</b>	<b>4.8</b>	<b>4.9</b>	<b>3.6</b>	<b>3.7</b>
1. Community Health Network of Berkshire County	76.3	50.5	45.8	24.5	-- <sup>5</sup>	-- <sup>5</sup>	3.7	-- <sup>5</sup>	2.6
2. Upper Valley Health Web (Franklin County)	86.5	39.1	36.6	25.1	1.1	1.1	4.7	1.1	4.3
3. Partnership for Health in Hampshire County (Northampton)	86.3	26.9	26.6	7.3	1.7	1.7	2.5	1.7	1.9
4. The Community Health Connection (Springfield)	74.8	58.4	53.9	53.4	7.1	7.1	7.2	4.5	4.9
5. Community Health Network of Southern Worcester County	82	27.6	33.6	25.4	4.5	4.5	6.1	3.8	5.1
6. Community Partners for Health (Milford)	88	16.3	17.3	12.3	1.9	1.9	3.6	1.9	2.8
7. Community Health Network of Greater Metro West (Framingham)	86.1	19.2	15.8	13.4	3.3	3.3	4.1	2.7	3.3
8. Community Wellness Coalition (Worcester)	76.6	35.1	36.4	25.7	6.3	6.3	7.1	4.3	5.5
9. Fitchburg/Gardner Community Health Network	81.6	32.5	32.4	25.7	4.2	4.2	4.8	3.6	3.4
10. Greater Lowell Community Health Network	75.7	33.5	33.4	27.2	4.6	4.6	4.4	3.8	2.9
11. Greater Lawrence Community Health Network	80.7	44.9	45.4	42.2	4.5	4.5	5.5	3	3.8
12. Greater Haverhill Community Health Network	89	22.9	27.7	24.1	5.5	5.5	4.4	5	3.5
13. Community Health Network North (Beverly/Gloucester)	92.3	22.2	17.5	8.7	2.7	2.7	2.3	2.7	2
14. North Shore Community Health Network	81.9	43.3	36.4	23.2	3.8	3.8	4	3.8	3.4
15. Greater Woburn/Concord/Littleton Community Health Network	86.4	8.8	10.7	5	4.3	4.3	3.3	4.3	3
16. North Suburban Health Alliance (Medford/Malden/Melrose)	86	32.2	24.7	13.2	6.1	6.1	4.9	4.8	4.2
17. Greater Cambridge/Somerville Community Health Network	86.8	21.1	16.5	9.5	3.4	3.4	3.7	2.8	2.9
18. West Suburban Health Network (Newton/Waltham)	86	13.9	11.8	3.8	2.6	2.6	2.4	2.6	2
19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	82.6	47.9	44.2	29.3	5.5	5.5	5.7	4.3	4.5
20. Blue Hills Community Health Alliance (Greater Quincy)	87.6	22.5	19.9	9.3	3.9	3.9	4.7	2.8	3.5
21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	81.1	52.3	48.6	43.6	6.7	6.7	6.9	6.2	5.1
22. Greater Brockton Community Health Network	81.1	41	37.6	23.4	5.1	5.1	5.9	3.5	4.3
23. South Shore Community Partners in Prevention (Plymouth)	89.4	18.7	20.7	12.5	6.5	6.5	5.1	4.2	3.2
24. Greater Attleboro-Taunton Health & Education Response	82.1	24.5	27.5	18.3	1.9	1.9	3.6	2.9	2.6
25. Partners for a Healthier Community (Fall River)	86.2	55.5	46.2	36.9	4.2	4.2	6	3.6	3.5
26. Greater New Bedford Health & Human Services Coalition	80.7	44.4	49.5	39.6	5.9	5.9	5.9	5.9	3.9
27. Cape and Islands Community Health Network	85.2	37.6	31.2	19.4	3.6	3.6	3.8	1.8	1.9

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). 2005 rates are calculated using Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006. (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. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 5. Calculations based on values of 1-4 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.

**Figure 9. Percent of Mothers Breastfeeding or Intending to Breastfeed<sup>1</sup>  
by Age Group<sup>2</sup>, Massachusetts: 2006**

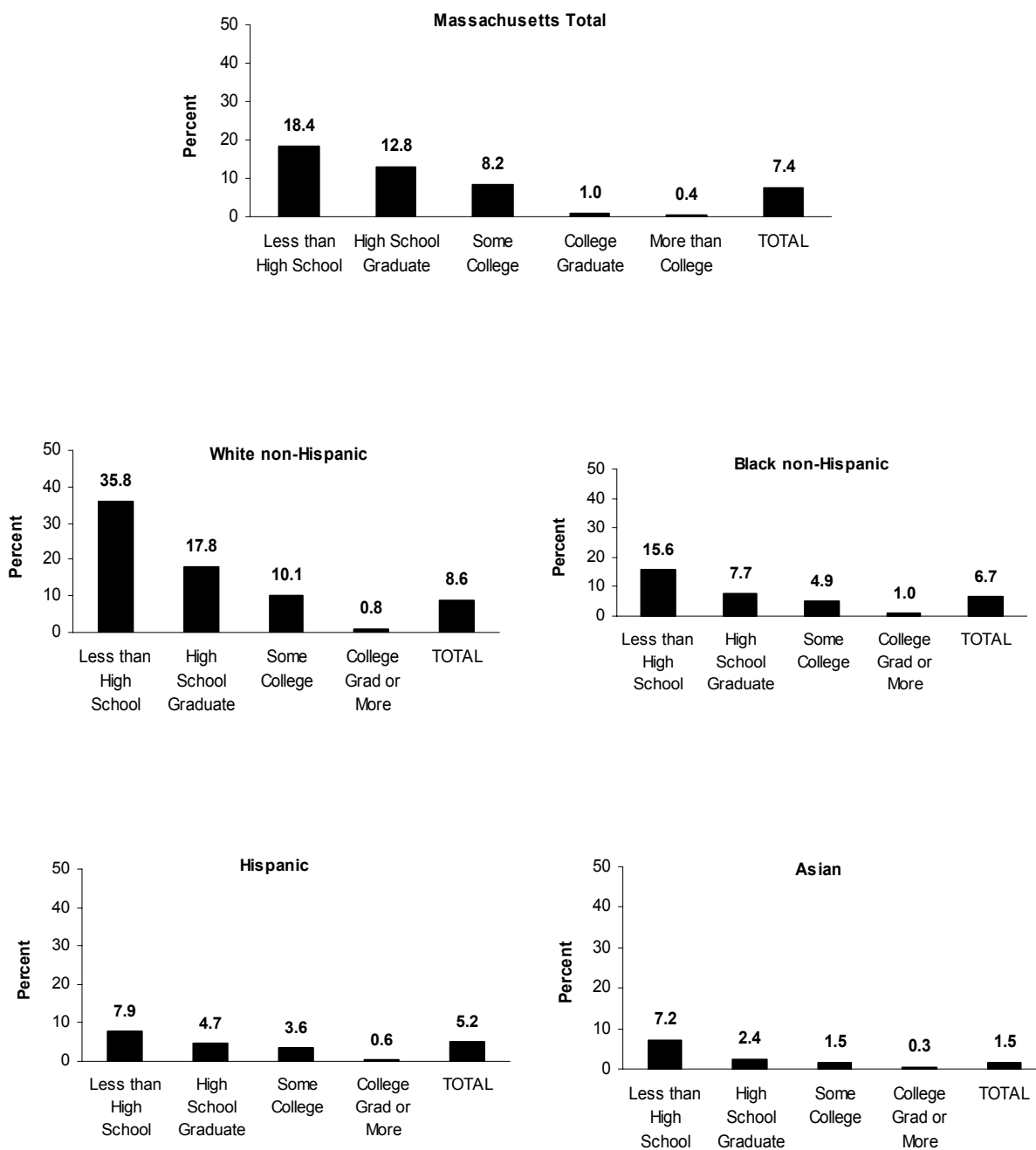


NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.

1. Information about breastfeeding is reported by the mother at the time of the birth.

2. For race-specific breastfeeding rates see Table 2.

**Figure 10. Percent of Mothers who Smoked During Pregnancy<sup>1</sup> by Mother's Race and Hispanic Ethnicity and Educational Attainment, Massachusetts: 2006**



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 parent worksheet. Because smoking is self-reported, data on smoking prevalence should be interpreted cautiously. Mothers with multiples are counted for each birth. Caution should be used with Asian data because of small numbers.



**Figure 11. Distribution of Smoking Status<sup>1</sup> during Pregnancy  
by Smoking Status Prior to Pregnancy, Massachusetts: 2006**

**Smoking  
Status<sup>1</sup>  
Prior to  
Pregnancy:**

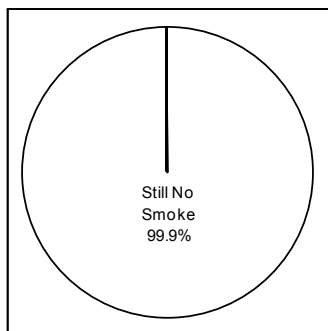
**Non-Smokers**  
**85.9%**  
**(66,615)**

**Light Smokers**  
**8.3%**  
**(6,406)**

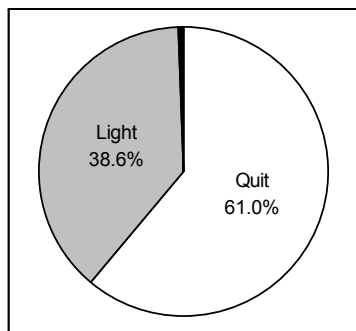
**Moderate Smokers**  
**5.2%**  
**(4,033)**

**Heavy Smokers**  
**0.6%**  
**(493)**

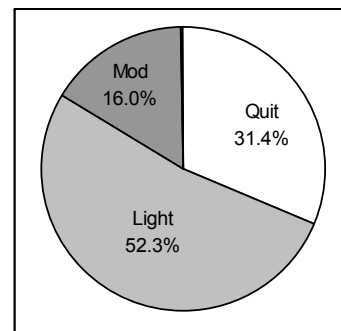
**Smoking  
Status<sup>1</sup>  
During  
Pregnancy:**



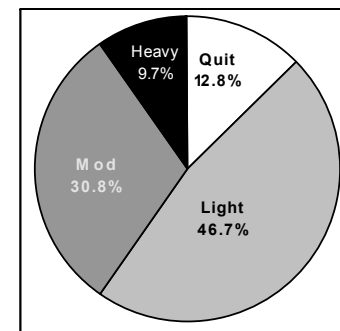
**99.9% of Non-Smokers  
continued not smoking  
(0.1% started smoking)**



**61.0 % of Light Smokers quit  
Smoking  
(0.5% increased)**



**83.7% of Moderate Smokers  
decreased the number of  
cigarettes smoked daily or quit**



**90.3% of Heavy Smokers  
decreased the number of  
cigarettes smoked daily or quit**

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 16. Parity<sup>1</sup> by Age of Mother, Massachusetts: 2006**

<b>Age of Mother (years)</b>		<b>Total Births</b>	<b>1st</b>	<b>2nd</b>	<b>3rd</b>	<b>4th</b>	<b>5th+</b>
STATE TOTAL	n <sup>2</sup>	<b>77,670</b>	<b>34,466</b>	<b>26,818</b>	<b>10,851</b>	<b>3,578</b>	<b>1,819</b>
	% <sup>3</sup>	100.0	44.5	34.6	14.0	4.6	2.3
<b>10-14</b>	n	56	56	0	0	0	0
	%	100.0	100.0	0.0	0.0	0.0	0.0
<b>15-19</b>	n	4,722	4,064	581	63	7	0
	%	100.0	86.2	12.3	1.3	0.1	0.0
<b>20-24</b>	n	12,420	7,096	3,856	1,100	278	69
	%	100.0	57.2	31.1	8.9	2.2	0.6
<b>25-29</b>	n	18,633	8,969	6,093	2,348	838	356
	%	100.0	48.2	32.8	12.6	4.5	1.9
<b>30-34</b>	n	23,611	9,282	9,188	3,514	1,035	551
	%	100.0	39.4	39.0	14.9	4.4	2.3
<b>35-39</b>	n	14,749	4,067	5,860	3,093	1,093	603
	%	100.0	27.6	39.8	21.0	7.4	4.1
<b>40-44</b>	n	3,256	854	1,173	697	310	215
	%	100.0	26.3	36.1	21.5	9.5	6.6
<b>45+</b>	n	213	71	65	36	17	24
	%	100.0	33.3	30.5	16.9	8.0	11.3

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.

**Table 17. Selected Birth Characteristics by Maternal Education, Massachusetts: 2006**

	<u>Less than High School</u>		<u>High School Graduate</u>		<u>Some College</u>		<u>College Graduate</u>		<u>More than College</u>	
	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>	n	% <sup>1</sup>
<b>State Total</b>	<b>8,234</b>	<b>10.6</b>	<b>20,362</b>	<b>26.3</b>	<b>16,700</b>	<b>21.6</b>	<b>20,204</b>	<b>26.1</b>	<b>11,977</b>	<b>15.5</b>
<b>Race</b>										
White non-Hispanic	2,847	5.4	12,040	22.8	11,745	22.2	16,474	31.2	9,772	18.5
Black non-Hispanic	859	13.3	2,486	38.6	1,907	29.6	930	14.4	256	4.0
Hispanic	3,681	34.4	4,094	38.3	1,886	17.6	701	6.6	328	3.1
Asian	511	9.4	962	17.6	738	13.5	1,799	32.9	1,450	26.6
<b>Age</b>										
20-29	4,232	13.7	11,382	36.7	8,215	26.5	5,333	17.2	1,819	5.9
30-39	1,483	3.9	6,321	16.5	7,514	19.6	13,683	35.8	9,265	24.2
40+	139	4.0	616	17.8	640	18.5	1,168	33.8	890	25.8
<b>Non-U.S.-born<sup>2</sup></b>	<b>3,487</b>	<b>42.4</b>	<b>6,391</b>	<b>31.4</b>	<b>3,726</b>	<b>22.3</b>	<b>4,451</b>	<b>22.0</b>	<b>2,829</b>	<b>23.6</b>
<b>Unmarried</b>	<b>6,127</b>	<b>74.4</b>	<b>11,119</b>	<b>54.6</b>	<b>5,814</b>	<b>34.8</b>	<b>1,481</b>	<b>7.3</b>	<b>375</b>	<b>3.1</b>
<b>Publicly-financed prenatal care</b>	<b>6,854</b>	<b>84.7</b>	<b>12,099</b>	<b>60.3</b>	<b>5,243</b>	<b>32.9</b>	<b>1,486</b>	<b>7.4</b>	<b>294</b>	<b>2.5</b>
<b>Very low birthweight<sup>3</sup></b>	<b>110</b>	<b>1.3</b>	<b>359</b>	<b>1.8</b>	<b>231</b>	<b>1.4</b>	<b>228</b>	<b>1.1</b>	<b>91</b>	<b>0.8</b>
<b>Low birthweight<sup>4</sup></b>	<b>759</b>	<b>9.2</b>	<b>1,830</b>	<b>9.0</b>	<b>1,355</b>	<b>8.1</b>	<b>1,372</b>	<b>6.8</b>	<b>793</b>	<b>6.6</b>
<b>Adequate prenatal care<sup>5</sup></b>	<b>5,591</b>	<b>69.3</b>	<b>15,751</b>	<b>78.2</b>	<b>13,911</b>	<b>84.6</b>	<b>17,775</b>	<b>88.5</b>	<b>10,656</b>	<b>89.4</b>
<b>Cesarean section delivery</b>	<b>2,099</b>	<b>25.5</b>	<b>6,323</b>	<b>31.1</b>	<b>5,934</b>	<b>35.7</b>	<b>7,245</b>	<b>35.9</b>	<b>4,226</b>	<b>35.3</b>
<b>Breastfeeding<sup>6</sup></b>	<b>5,451</b>	<b>66.8</b>	<b>14,481</b>	<b>71.8</b>	<b>12,380</b>	<b>77.2</b>	<b>17,751</b>	<b>88.4</b>	<b>10,942</b>	<b>91.9</b>
<b>Multiple births</b>	<b>191</b>	<b>2.3</b>	<b>681</b>	<b>3.3</b>	<b>758</b>	<b>4.5</b>	<b>1,147</b>	<b>5.7</b>	<b>733</b>	<b>6.1</b>
<b>Smoking during pregnancy</b>	<b>1,516</b>	<b>18.4</b>	<b>2,601</b>	<b>12.8</b>	<b>1,376</b>	<b>8.2</b>	<b>197</b>	<b>1.0</b>	<b>45</b>	<b>0.4</b>

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

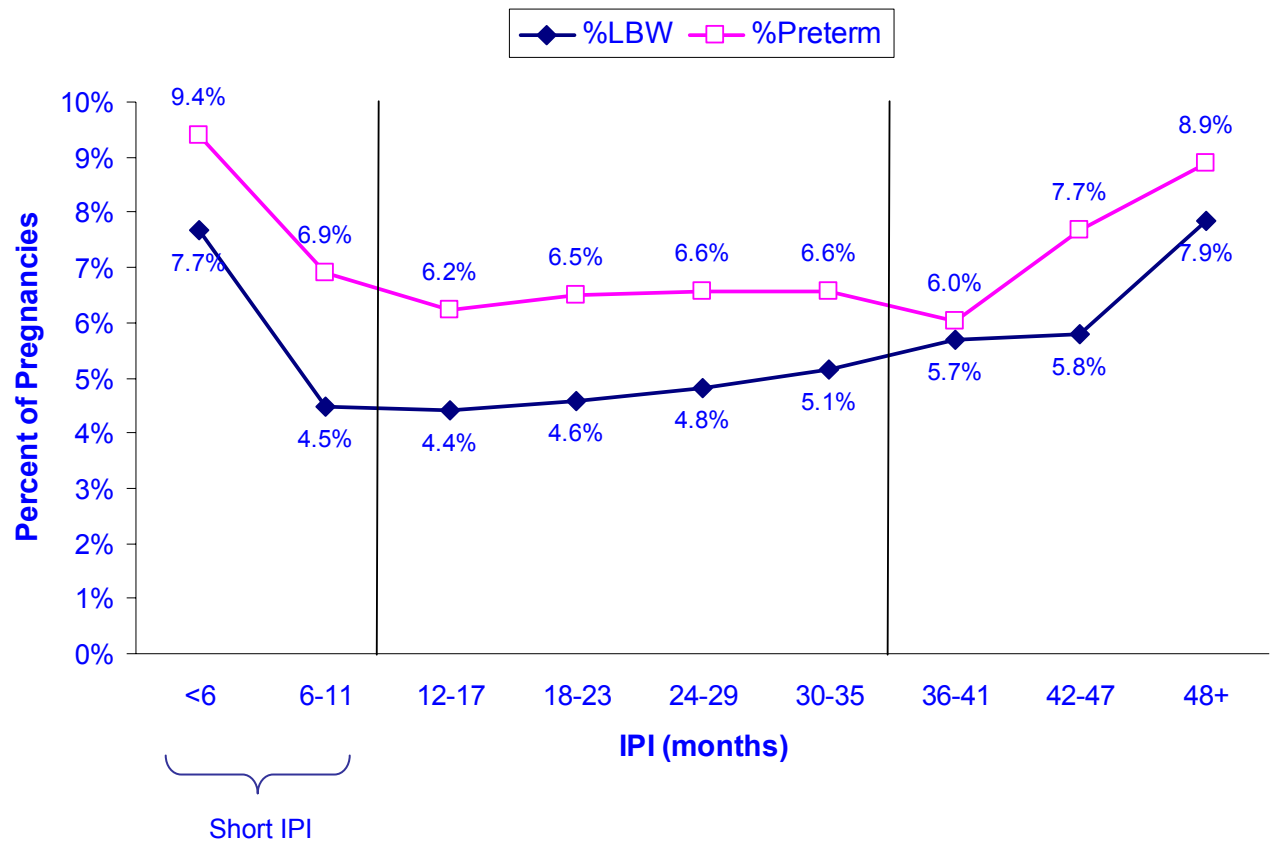
1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on state column totals. 2. Includes women born outside of the 50 U.S. States, Washington D.C., and Puerto Rico/U.S. territories (the U.S. Virgin Islands, and Guam). 3. Very 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 the 2001 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 18. Inter-pregnancy Interval<sup>1</sup> (IPI) and Birth Outcomes -- Pregnancies to Multiparous<sup>2</sup> Mothers, Massachusetts: 2006**

IPI (months)   Pregnancies		Birth Weight (BW)				Gestational Age (GA)			
		Low (<2,500 g)		Very Low (<1,500 g)		Preterm <sup>3</sup> (<37 wk)		Very Early <sup>4</sup> (<28 wk)	
		n	%LBW	n	%VLBW	n	%Preterm	n	%VEGA
<b>State Total</b>	41,024	2,365	<b>5.8%</b>	363	<b>0.9%</b>	3,001	<b>7.3%</b>	176	<b>0.4%</b>
<b>&lt;6</b>	1,813	139	<b>7.7%</b>	24	<b>1.3%</b>	170	<b>9.4%</b>	14	<b>0.8%</b>
<b>6-11</b>	4,697	211	<b>4.5%</b>	38	<b>0.8%</b>	324	<b>6.9%</b>	20	<b>0.4%</b>
<b>12-17</b>	5,913	260	<b>4.4%</b>	36	<b>0.6%</b>	368	<b>6.2%</b>	17	<b>0.3%</b>
<b>18-23</b>	5,260	241	<b>4.6%</b>	31	<b>0.6%</b>	342	<b>6.5%</b>	13	<b>0.2%</b>
<b>24-29</b>	4,439	214	<b>4.8%</b>	30	<b>0.7%</b>	291	<b>6.6%</b>	11	<b>0.2%</b>
<b>30-35</b>	3,341	172	<b>5.1%</b>	17	<b>0.5%</b>	219	<b>6.6%</b>	7	<b>0.2%</b>
<b>36-41</b>	2,472	141	<b>5.7%</b>	28	<b>1.1%</b>	149	<b>6.0%</b>	13	<b>0.5%</b>
<b>42-47</b>	1,955	113	<b>5.8%</b>	19	<b>1.0%</b>	150	<b>7.7%</b>	12	<b>0.6%</b>
<b>48+</b>	11,134	874	<b>7.9%</b>	140	<b>1.3%</b>	988	<b>8.9%</b>	69	<b>0.6%</b>
<b>Short</b>									
<b>0-11</b>	6,510	350	<b>5.4%</b>	62	<b>0.7%</b>	494	<b>27.3%</b>	34	<b>1.9%</b>
<b>12-35</b>	18,953	887	<b>4.7%</b>	114	<b>0.6%</b>	1,220	<b>67.3%</b>	48	<b>2.6%</b>
<b>36+</b>	15,561	1,128	<b>7.3%</b>	187	<b>1.2%</b>	1,287	<b>71.0%</b>	94	<b>5.2%</b>

1. Interpregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times. 3. Also known as premature delivery. 4. Very early gestational age (VEGA) refers to birth delivery before 28 weeks of gestational age and is also known as **extremely preterm** delivery.

**Figure 12. Inter-pregnancy Interval (IPI)<sup>1</sup> vs. LBW<sup>2</sup> and Preterm<sup>3</sup> Pregnancies to Multiparous Mothers<sup>4</sup>, Massachusetts: 2006**



**NOTE:** Short IPIs (less than 12 months) and IPIs over 35 months were associated with higher proportions on low birthweight and premature deliveries.

Percentages are calculated based on pregnancies to mothers who gave birth to their 2<sup>nd</sup> or later child in 2006 and with known values for the characteristic(s) of interest, unless otherwise stated.

1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Low birthweight: less than 2,500 grams or 5.5 pounds. 3. Preterm delivery is defined as gestational age less than 37 weeks. It is also known as premature delivery. 4. Multiparous is defined as having given birth two or more times.

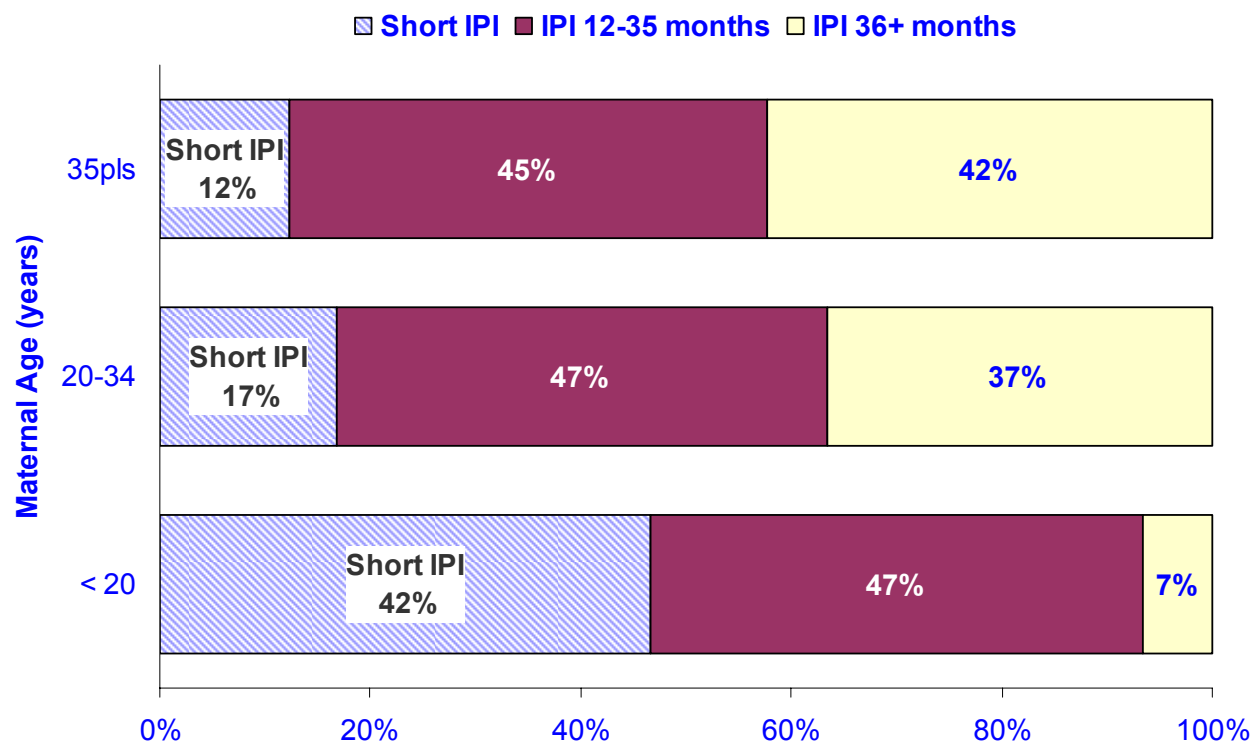
**Table 19. Inter-pregnancy Interval<sup>1</sup> (IPI) by Maternal Characteristics Pregnancies to Multiparous Mothers<sup>2</sup>, Massachusetts: 2006**

	Total Pregnancies Parity >1		IPI					
			Short  < 12 months		12-35 months		36+ months	
	n	%	n	%	n	%	n	%
State Total <sup>3</sup>	41,024	100%	6,510	15.9%	18,953	46.2%	15,561	37.9%
Age								
< 20	606	1.5%	282	46.5%	284	46.9%	40	6.6%
20-34	27,975	68.2%	4,692	16.8%	13,034	46.6%	10,249	36.6%
35pls	12,443	30.3%	1,536	12.3%	5,635	45.3%	5,272	42.4%
Race Ethnicity								
White non-Hispanic	27,578	67.2%	4,556	16.5%	14,054	51.0%	8,968	32.5%
Black non-Hispanic	3,593	8.8%	526	14.6%	1,174	32.7%	1,893	52.7%
Hispanics	6,177	15.1%	918	14.9%	2,139	34.6%	3,120	50.5%
Asian non-Hispanic	2,659	6.5%	354	13.3%	1,210	45.5%	1,095	41.2%
Education								
High School or less	15,591	38.0%	2,384	15.3%	5,782	37.1%	7,425	47.6%
BA or Assoc	19,552	47.7%	3,137	16.0%	9,562	48.9%	6,853	35.1%
More than college	5,820	14.2%	980	16.8%	3,580	61.5%	1,260	21.6%
Delivery Payment Source								
Public	14,290	34.8%	2,306	16.1%	5,114	35.8%	6,870	48.1%
Private	25,643	62.5%	4,028	15.7%	13,313	51.9%	8,302	32.4%
Region of Residence								
Western MA	4,934	12.0%	783	15.9%	2,229	45.2%	1,922	39.0%
Central MA	5,555	13.5%	925	16.7%	2,604	46.9%	2,026	36.5%
Northeast MA	8,498	20.7%	1,374	16.2%	3,805	44.8%	3,319	39.1%
Metrowest MA	8,905	21.7%	1,371	15.4%	4,763	53.5%	2,771	31.1%
Southeast MA	8,069	19.7%	1,321	16.4%	3,561	44.1%	3,187	39.5%
Boston Region	5,063	12.3%	736	14.5%	1,991	39.3%	2,336	46.1%
Town of Residence <sup>4</sup>			Top 10		Top 10		Top 10	
			Fitchburg (20.5%)		Needham (64.1%)		Everett (56.2%)	
			Weymouth (20.2%)		Arlington (61.5%)		Chelsea (55.4%)	
			Barnstable (19.1%)		Natick (59.6%)		Randolph (54.0%)	
			Lowell (18.7%)		Brookline (56.0%)		Lynn (50.4%)	
			Lawrence (18.4%)		Franklin (54.8%)		Taunton (50.3%)	
			Haverhill (18.2%)		Plymouth (53.7%)		Lawrence (48.9%)	
			Holyoke (18.0%)		Newton (53.6%)		Brockton (48.4%)	
			Worcester (17.9%)		North Attleboro (52.9%)		New Bedford (48.2%)	
			Medford (17.6%)		Cambridge (52.7%)		Revere (48.0%)	
			Chicopee (17.4%)		Shrewsbury (51.6%)		Boston (46.6%)	

1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times. 3. State total includes pregnancies with known IPI.

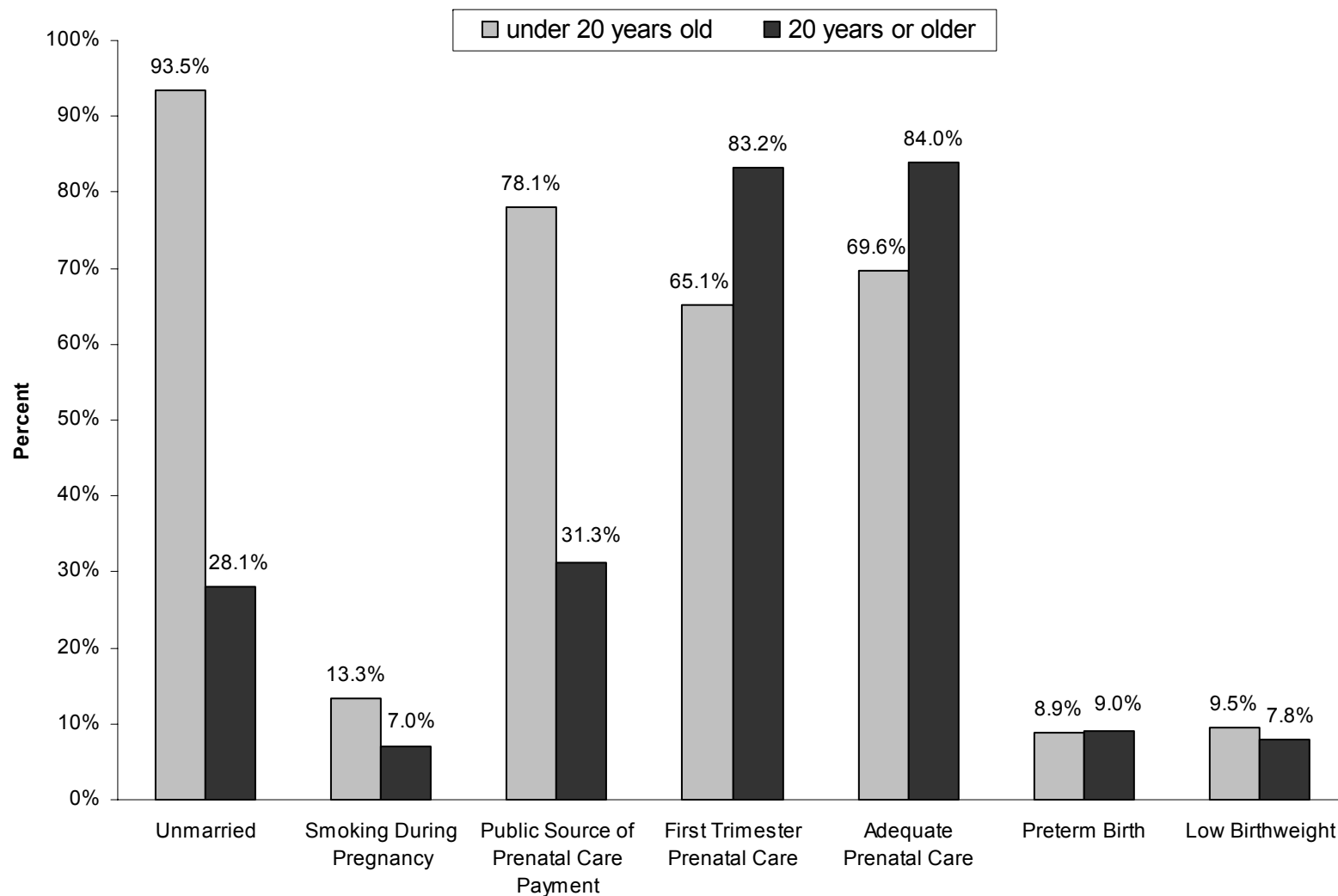
4. Among towns with at least 200 mothers giving birth to their 2<sup>nd</sup> or later child.

**Figure 13. Inter-pregnancy Interval (IPI)<sup>1</sup> Distribution by Maternal Age -- Pregnancies to Multiparous Mothers<sup>2</sup>, Massachusetts: 2006**



1. Inter-pregnancy Interval (IPI) is the time in months between the date of last menstrual period of current pregnancy and the date of previous live birth. 2. Multiparous is defined as having given birth two or more times.

**Figure 14. Comparison of Teen vs. Adult Births, Selected Characteristics, Massachusetts: 2006**

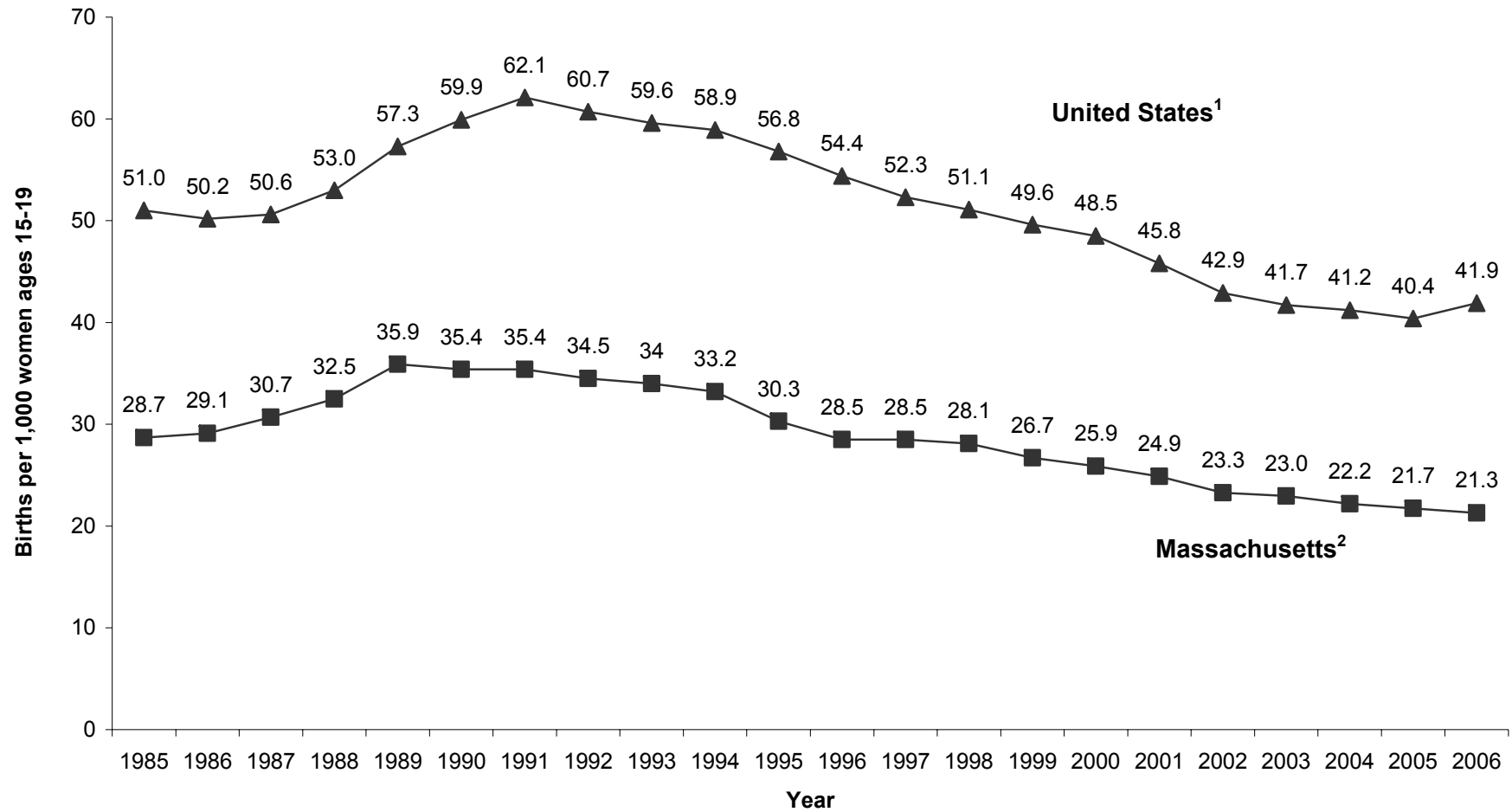


NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Three age groups are used for "teen births": 10-14, 15-19, and <20. The "10-14" group, refers to young teens, and the "15-19" group is the age group referred to as teens by the Centers for Disease Control and Prevention. For this publication, "<20" is used when comparing young women with "adult" women.

Definitions: 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 15. Trend in Birth Rates Among Women Ages 15-19, Massachusetts and the United States: 1985-2006**



Teen birth rate is the 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) and intercensal population estimates based on MISER (Massachusetts Institute for Social and Economic Research) population estimates for 1991 through 1998. 1999 rates are calculated using the 1999 DPH Massachusetts population estimates and Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2000-2005, released October 2006 (see Technical Notes in Appendix). PLEASE NOTE: DIFFERENCES BETWEEN THESE RATES AND PREVIOUSLY PUBLISHED DATA REFLECT UPDATES IN POPULATION ESTIMATES.

Table 20. Resident Teen Birth Characteristics, 30 Largest Municipalities<sup>1</sup>, Massachusetts: 2006

Municipality	Total Population Rank	Female Population, age 15-19	Number of Teen Births	Teen Birth Rate <sup>2</sup>	Mother's Race and Hispanic Ethnicity (% of teen births)			
					White non-Hispanic	Black non-Hispanic	Hispanic	Asian or other <sup>3</sup>
<b>State Total</b>		<b>208,824</b>	<b>4,722</b>	<b>21.3</b>	<b>44.6</b>	<b>12.9</b>	<b>35.6</b>	<b>7.0</b>
Attleboro	29	1,134	27	23.8	77.8	7.4	14.8	0.0
Barnstable	25	1,360	29	21.3	69.0	10.3	6.9	13.8
Boston	1	19,770	568	28.7	9.9	41.9	34.3	13.9
Brockton	6	3,638	156	42.9	32.7	32.1	18.6	16.7
Brookline	18	1,451	4	-- <sup>5</sup>	-- <sup>5</sup>	-- <sup>5</sup>	-- <sup>5</sup>	-- <sup>5</sup>
Cambridge	5	3,923	32	8.2	21.9	43.8	31.3	3.1
Chicopee	21	1,738	58	33.4	62.1	1.7	34.5	1.7
Fall River	9	2,829	146	51.6	71.9	5.5	13.0	9.6
Framingham	14	1,955	65	33.3	41.5	10.8	44.6	3.1
Haverhill	15	1,908	73	38.3	61.6	2.7	35.6	0.0
Lawrence	12	3,027	244	80.6	9.8	0.4	86.9	2.9
Leominster	30	1,254	38	30.3	52.6	10.5	34.2	2.6
Lowell	4	3,966	202	50.9	27.2	3.0	34.7	35.2
Lynn	8	3,084	147	47.7	20.4	10.2	60.5	8.2
Malden	17	1,430	28	19.6	35.7	32.1	21.4	10.7
Medford	22	1,776	15	8.4	33.3	20.0	33.3	13.3
Methuen	27	1,327	29	21.9	55.2	0.0	41.4	3.4
New Bedford	7	2,955	207	70.1	41.6	7.2	44.4	6.8
Newton	11	3,500	8	2.3	62.5	12.5	25.0	0.0
Peabody	24	1,432	15	10.5	86.7	0.0	13.3	0.0
Pittsfield	28	1,270	63	49.6	69.8	12.7	15.9	1.6
Plymouth	20	1,672	30	17.9	96.7	0.0	3.3	0.0
Quincy	10	2,078	22	10.6	54.6	18.2	9.1	18.2
Revere	26	1,053	39	37.0	38.5	0.0	41.0	20.5
Somerville	13	2,170	34	15.7	55.9	8.8	35.3	0.0
Springfield	3	6,074	490	80.7	10.0	23.9	64.9	1.0
Taunton	19	1,631	53	32.5	66.0	7.5	20.8	5.7
Waltham	16	2,340	24	10.3	20.8	20.8	50.0	8.3
Weymouth	23	1,452	27	18.6	85.2	3.7	0.0	11.1
Worcester	2	7,036	242	34.4	57.0	6.6	33.5	2.9

Table 20 (cont'd). Resident Teen Birth Characteristics, 30 Largest Municipalities, Massachusetts: 2006

Municipality	Public Payment for Prenatal Care <sup>4</sup> (%)	Unmarried (%)	Low Birthweight <sup>6</sup> (%)	Preterm <sup>7</sup> (%)	Adequacy of Prenatal Care <sup>8</sup>			
					Adequate Intensive	Adequate Basic	Intermediate	Inadequate
<b>State Total</b>	78.1	93.4	9.5	8.8	32.1	37.8	9.5	20.5
Attleboro	59.1	96.3	3.7	3.7	42.3	26.9	0.0	30.8
Barnstable	72.4	82.8	3.5	6.9	31.0	48.3	10.3	10.3
Boston	78.8	96.7	10.2	8.6	25.5	46.2	12.5	15.8
Brockton	87.7	94.9	12.8	14.1	35.9	32.7	7.1	24.4
Brookline	25.0	100.0	25.0	0.0	0.0	75.0	0.0	25.0
Cambridge	65.6	90.6	6.3	6.3	37.5	28.1	9.4	25.0
Chicopee	78.6	89.7	8.6	12.3	28.6	50.0	7.1	14.3
Fall River	90.1	94.5	8.2	4.1	62.1	17.9	1.4	18.6
Framingham	76.9	81.5	10.8	7.7	45.3	35.9	7.8	10.9
Haverhill	68.5	91.8	21.9	16.4	47.2	27.8	8.3	16.7
Lawrence	84.6	92.6	10.7	11.1	26.2	43.4	12.7	17.6
Leominster	73.0	89.5	2.6	7.9	26.3	47.4	2.6	23.7
Lowell	80.9	97.0	8.9	9.9	25.2	34.2	12.4	28.2
Lynn	88.9	89.0	5.5	3.4	24.7	33.6	13.7	28.1
Malden	70.4	92.9	7.1	10.7	32.1	35.7	3.6	28.6
Medford	50.0	80.0	0.0	0.0	33.3	40.0	6.7	20.0
Methuen	65.5	89.7	10.3	10.3	44.8	31.0	3.5	20.7
New Bedford	71.1	93.2	10.6	7.7	26.3	45.9	9.8	18.0
Newton	50.0	100.0	12.5	12.5	37.5	25.0	25.0	12.5
Peabody	86.7	86.7	6.7	6.7	42.9	35.7	14.3	7.1
Pittsfield	83.9	92.1	12.7	9.5	11.1	39.7	31.7	17.5
Plymouth	60.0	96.7	10.0	10.0	33.3	40.0	6.7	20.0
Quincy	63.6	90.9	13.6	9.1	31.8	50.0	0.0	18.2
Revere	78.9	87.2	5.1	7.7	38.5	20.5	5.1	35.9
Somerville	81.8	91.2	21.2	5.9	26.5	35.3	2.9	35.3
Springfield	93.6	96.1	9.4	9.8	27.3	37.4	8.3	27.1
Taunton	80.4	100.0	7.6	7.6	20.8	45.3	13.2	20.8
Waltham	70.8	83.3	16.7	20.8	54.2	20.8	0.0	25.0
Weymouth	70.4	96.3	11.1	7.4	18.5	48.1	7.4	25.9
Worcester	75.9	93.8	9.5	7.4	28.5	40.1	15.3	16.1

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 the Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October 2006 (see Technical Notes in Appendix). 2. Birth rates represent the number of births per 1,000 females ages 15-19. Birth rates for cities and towns were calculated using MDPH population estimates for 2005, which are the most up-to-date information available on the number of persons by age, race, and sex at the sub-state level. 3. Mothers who designated themselves as Asian, American Indian, or Other. 4. See Glossary under "Prenatal Care Payment Source." 5. Calculations based on values of 1-4 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 21. Trends in Infant, Neonatal, and Post Neonatal Mortality by Race<sup>1</sup>, Massachusetts: 1980-2006**

<b>INFANT MORTALITY (less than one year of age)</b>								
<b>Year</b>	<b>State Total<sup>2</sup></b>		<b>White</b>		<b>Black</b>		<b>Asian/Other<sup>3</sup></b>	
	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate</b>
<b>1980</b>	748	10.3	655	9.8	87	18.6	5	4.6
<b>1981</b>	710	9.6	616	9.1	85	18.2	8	6.1
<b>1982</b>	764	10.1	656	9.4	102	21.3	5	3.3
<b>1983</b>	682	9.0	579	8.3	89	19.0	12	7.4
<b>1984</b>	699	8.9	601	8.4	82	16.4	13	7.5
<b>1985</b>	745	9.1	608	8.1	126	23.8	11	6.1
<b>1986</b>	695	8.4	560	7.5	123	22.0	11	4.6
<b>1987</b>	608	7.2	486	6.4	110	17.5	12	4.5
<b>1988</b>	693	7.9	546	7.0	133	19.5	13	3.8
<b>1989</b>	697	7.6	549	6.8	131	17.7	17	4.8
<b>1990</b>	649	7.0	519	6.4	106	13.7	24	6.5
<b>1991</b>	577	6.5	461	6.0	102	13.8	14	3.9
<b>1992</b>	569	6.5	438	5.7	114	15.8	17	4.7
<b>1993</b>	523	6.2	423	5.7	87	12.5	13	3.5
<b>1994</b>	499	6.0	407	5.6	81	12.0	11	2.9
<b>1995</b>	419	5.1	333	4.7	65	10.3	21	5.5
<b>1996</b>	403	5.0	329	4.7	65	10.8	8	2.0
<b>1997</b>	425	5.3	349	5.0	66	10.6	10	2.4
<b>1998</b>	414	5.1	345	4.9	59	9.3	10	2.3
<b>1999</b>	418	5.2	334	4.8	75	11.4	9	1.9
<b>2000</b>	377	4.6	280	4.0	76	11.7	19	3.6
<b>2001</b>	407	5.0	314	4.5	77	11.7	16	3.0
<b>2002</b>	397	4.9	306	4.5	74	11.1	17	2.9
<b>2003</b>	383	4.8	290	4.3	78	11.8	15	2.6
<b>2004</b>	376	4.8	285	4.3	75	11.1	15	2.5
<b>2005</b>	391	5.1	308	4.8	63	9.3	20	3.5
<b>2006</b>	369	4.8	283	4.4	75	10.5	10	1.7

**Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race<sup>1</sup>, Massachusetts: 1980-2006**

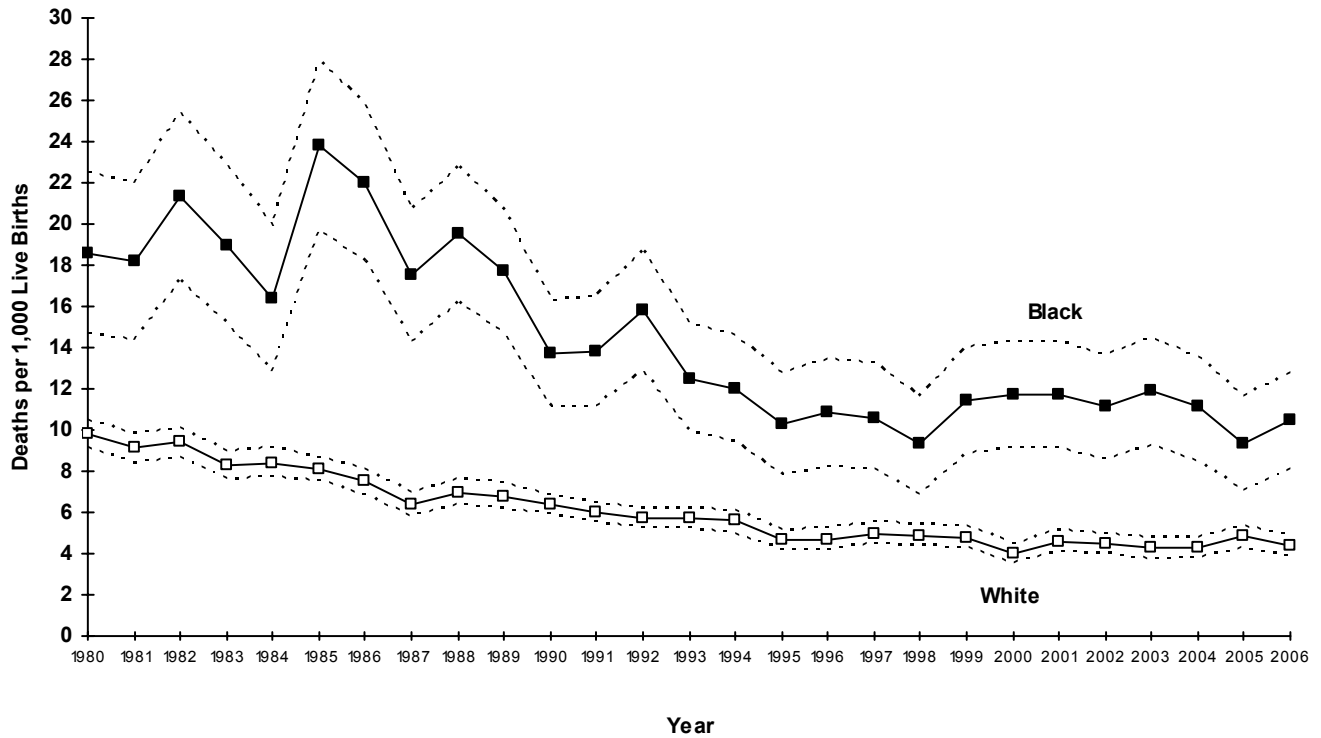
<b>NEONATAL MORTALITY (birth to 27 days)</b>								
<b>Year</b>	<b>State Total<sup>2</sup></b>		<b>White</b>		<b>Black</b>		<b>Asian/Other<sup>3</sup></b>	
	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>
<b>1980</b>	550	7.6	483	7.2	62	13.3	5	4.6
<b>1981</b>	510	6.9	442	6.5	59	12.4	5	3.8
<b>1982</b>	573	7.6	494	7.1	75	15.7	3	-- <sup>5</sup>
<b>1983</b>	482	6.3	411	5.9	63	13.4	7	4.3
<b>1984</b>	472	6.0	411	5.8	49	9.8	8	4.6
<b>1985</b>	538	6.6	447	6.0	85	16.0	5	2.8
<b>1986</b>	478	5.8	383	5.2	89	15.9	5	2.1
<b>1987</b>	432	5.1	343	4.6	80	12.7	9	3.4
<b>1988</b>	477	5.4	383	4.9	87	12.8	6	1.8
<b>1989</b>	479	5.2	376	4.7	95	12.8	8	2.3
<b>1990</b>	446	4.8	347	4.3	80	10.3	9	5.1
<b>1991</b>	401	4.5	319	4.1	72	9.8	10	2.8
<b>1992</b>	415	4.8	325	4.3	79	10.9	11	3.1
<b>1993</b>	375	4.4	300	4.1	66	9.5	9	2.4
<b>1994</b>	349	4.2	280	3.8	60	8.9	9	2.4
<b>1995</b>	298	3.6	237	3.3	50	7.9	11	2.9
<b>1996</b>	290	3.6	249	3.5	35	5.8	5	1.2
<b>1997</b>	323	4.0	271	3.9	45	7.2	7	1.7
<b>1998</b>	315	3.9	261	3.7	47	7.4	7	1.6
<b>1999</b>	332	4.1	265	3.8	61	9.3	6	1.3
<b>2000</b>	288	3.5	214	3.1	58	8.9	14	2.7
<b>2001</b>	308	3.8	239	3.5	59	9.0	10	1.9
<b>2002</b>	299	3.7	235	3.4	51	7.6	13	2.2
<b>2003</b>	285	3.6	217	3.2	58	8.8	10	1.8
<b>2004</b>	291	3.7	224	3.4	54	8.0	13	2.2
<b>2005</b>	282	3.7	226	3.5	45	6.6	11	1.9
<b>2006</b>	279	3.6	215	3.3	56	7.8	7	1.2

**Table 21 (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality by Race<sup>1</sup>, Massachusetts: 1980-2006**

<b>POST NEONATAL MORTALITY (28-364 days)</b>								
<b>Year</b>	<b>State Total<sup>2</sup></b>		<b>White</b>		<b>Black</b>		<b>Asian/Other<sup>3</sup></b>	
	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>	<b>n</b>	<b>Rate<sup>4</sup></b>
<b>1980</b>	198	2.7	172	2.6	25	5.3	0	0.0
<b>1981</b>	200	2.7	174	2.6	26	5.8	3	-- <sup>5</sup>
<b>1982</b>	191	2.5	162	2.3	27	5.6	2	-- <sup>5</sup>
<b>1983</b>	200	2.7	168	2.4	26	5.6	5	3.1
<b>1984</b>	227	2.9	190	2.6	33	6.6	5	2.9
<b>1985</b>	207	2.5	161	2.1	41	7.8	6	3.3
<b>1986</b>	217	2.6	177	2.3	34	6.1	6	2.5
<b>1987</b>	176	2.1	143	1.8	30	4.8	3	-- <sup>5</sup>
<b>1988</b>	216	2.5	163	2.1	46	6.7	7	2.0
<b>1989</b>	218	2.4	173	2.1	36	4.9	9	2.5
<b>1990</b>	203	2.2	172	2.1	26	3.4	5	1.4
<b>1991</b>	176	2.0	142	1.8	30	4.1	4	-- <sup>5</sup>
<b>1992</b>	154	1.8	113	1.5	35	4.8	6	1.7
<b>1993</b>	148	1.7	123	1.7	21	3.0	4	-- <sup>5</sup>
<b>1994</b>	150	1.8	127	1.7	21	3.1	2	-- <sup>5</sup>
<b>1995</b>	121	1.5	96	1.3	15	2.4	10	2.6
<b>1996</b>	113	1.4	80	1.1	30	5.0	3	-- <sup>5</sup>
<b>1997</b>	102	1.3	78	1.1	21	3.4	3	-- <sup>5</sup>
<b>1998</b>	99	1.2	84	1.2	12	1.9	3	-- <sup>5</sup>
<b>1999</b>	86	1.1	69	1.0	14	2.1	3	-- <sup>5</sup>
<b>2000</b>	89	1.1	66	0.9	18	2.8	5	1.0
<b>2001</b>	99	1.2	75	1.1	18	2.7	6	1.1
<b>2002</b>	98	1.2	71	1.0	23	3.4	4	-- <sup>5</sup>
<b>2003</b>	98	1.2	73	1.1	20	3.0	5	0.9
<b>2004</b>	85	1.1	61	0.9	21	3.1	3	-- <sup>5</sup>
<b>2005</b>	109	1.4	82	1.3	18	2.7	7	1.6
<b>2006</b>	90	1.2	68	1.1	19	2.6	3	-- <sup>5</sup>

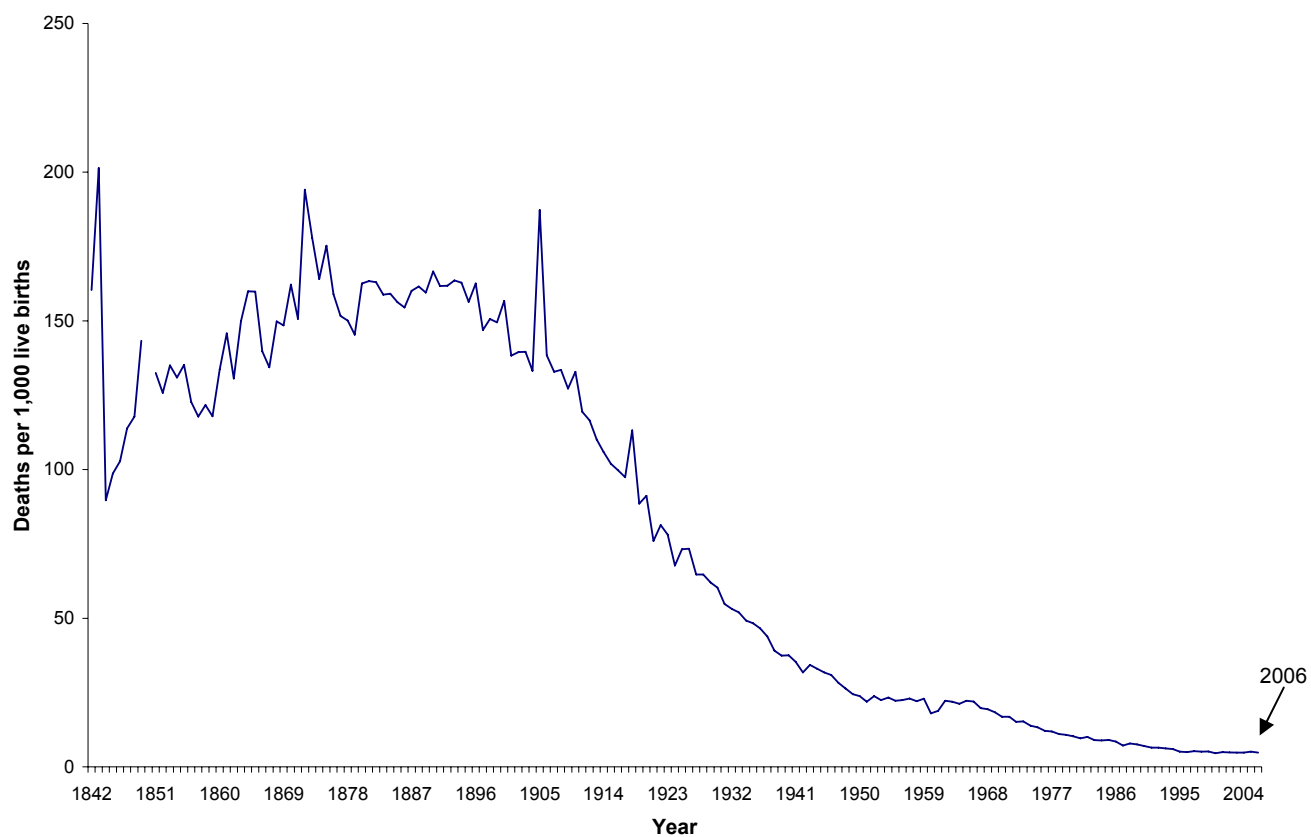
1. Hispanic origin could not be identified from the Massachusetts death certificate before 1989; thus, Hispanic trend data are not available. Most Hispanics are included in the race category of White. Hispanic infant mortality data for the years 1990 through 2005 are presented in Table 11. 2. Deaths 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 values of 1-4 are excluded.

**Figure 16. Infant Mortality Rates and 95% Confidence Intervals<sup>1</sup> by Race<sup>2</sup>,  
Massachusetts: 1980-2006<sup>3</sup>**



1. See Technical Notes 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 1986, the race classifications do not include ethnicity; most Hispanics are included in the race category of whites.

**Figure 17. Infant Mortality Rates, Massachusetts: 1842-2006<sup>1</sup>**



1. Data not available for 1850.



**Figure 18. Trends in the Timing of Infant Deaths, Massachusetts: 1990-2006**

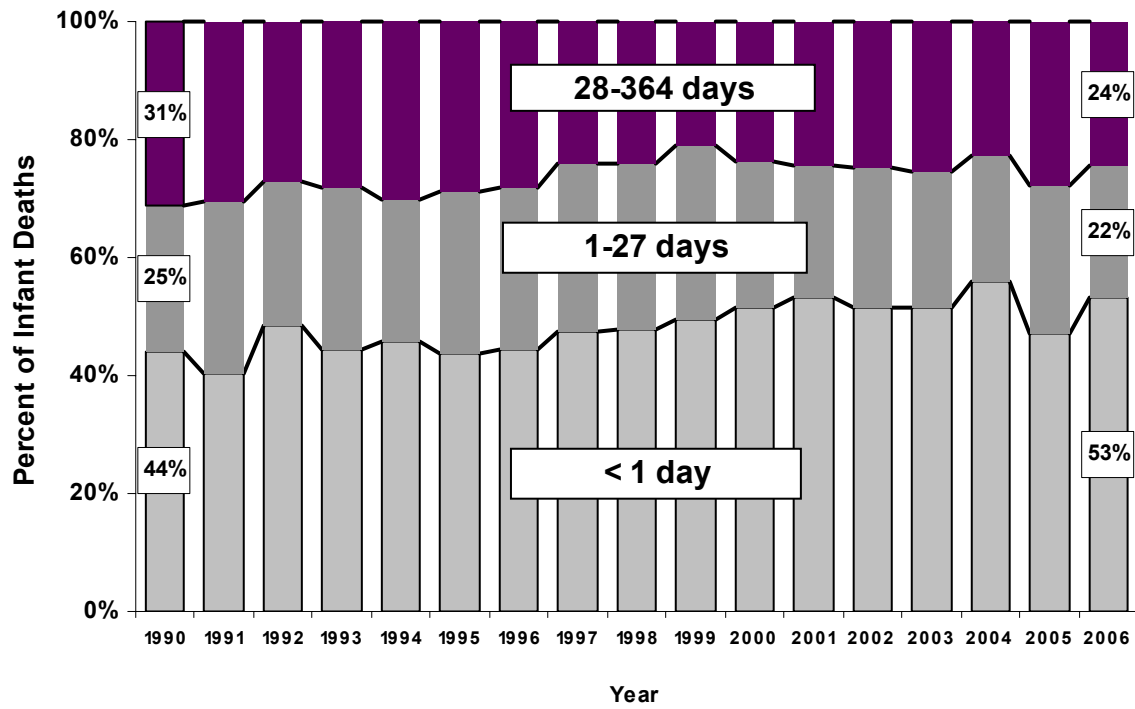
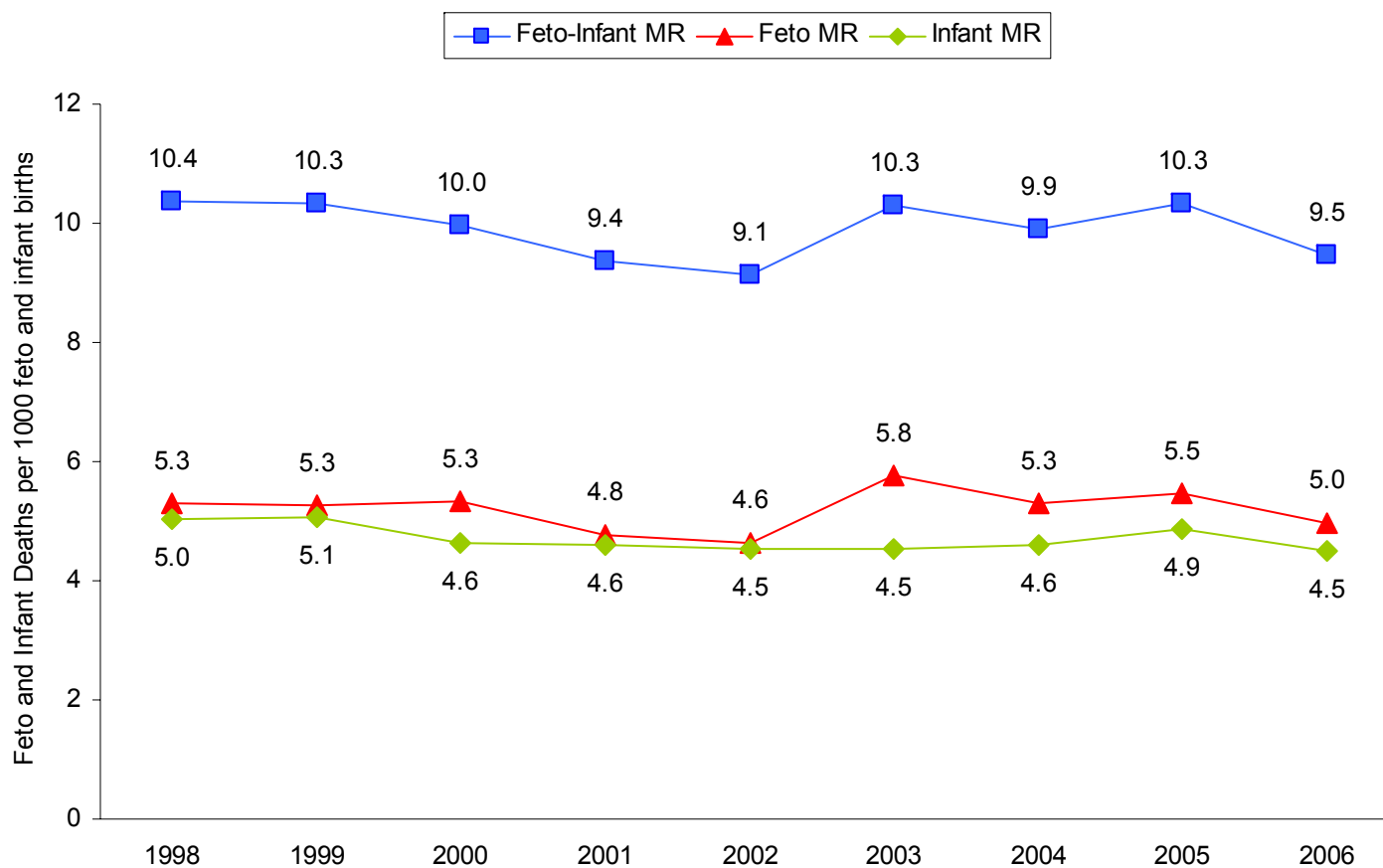


Table 22. Feto-Infant Mortality Rate<sup>1</sup> by Birthweight, Massachusetts: 1999-2006

Birthweight (in grams)	1999	2000	2001	2002	2003	2004	2005	2006
<b>&lt;500</b>	962.8	943.2	940.2	938.3	943.5	923.1	912.0	910.9
<b>500-749</b>	576.5	544.1	500.0	487.0	525.5	523.4	561.8	564.7
<b>750-999</b>	170.8	247.2	182.2	146.9	188.6	220.7	157.7	187.8
<b>1,000-1,249</b>	104.9	112.4	125.4	83.0	131.4	142.9	124.1	100.7
<b>1,250-1,499</b>	64.4	65.8	84.6	84.6	95.8	67.7	74.4	73.6
<b>1,500-1,999</b>	53.9	35.2	41.8	40.3	38.3	31.3	38.0	37.2
<b>2,000-2,499</b>	10.8	15.2	15.3	12.2	11.9	16.4	14.8	12.8
<b>2,500-4,000</b>	2.4	2.4	2.2	2.6	2.5	2.3	2.5	2.4
<b>4,001+</b>	1.8	2.3	1.5	1.5	1.7	2.5	1.3	2.5
<b>Unknown birthweight (N)</b>	(26)	(34)	(37)	(23)	(17)	(30)	(19)	(11)
<b>State Feto-Infant Rate</b>	<b>10.3</b>	<b>9.9</b>	<b>9.7</b>	<b>9.1</b>	<b>10.3</b>	<b>9.5</b>	<b>10.1</b>	<b>9.3</b>

<sup>1</sup> Fetal and Infant deaths per 1,000 live births plus fetal deaths.

**Figure 19. Feto-Infant Mortality Rate, Massachusetts: 1998-2006**



**NOTE:**

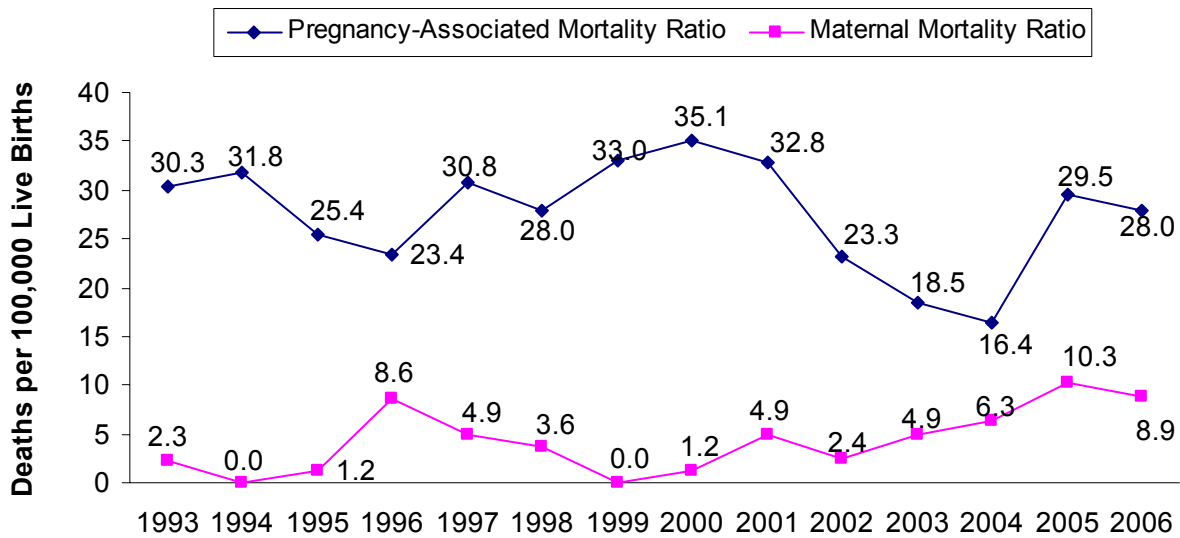
Calculation of Infant Mortality Rate in this section differs from previous section in the inclusion of fetal deaths in the denominator.

Total Feto, Infant, and Feto-Infant Mortality Rates include cases with unknown birthweight. The Fetal Mortality Rate and Infant Mortality Rate may not add up to the Feto-Infant Mortality Rate due to rounding.

**Table 23. Fetal and Infant Deaths by Birthweight and Gestational Age, Massachusetts: 1998-2006**

<u>Year</u>	<u>Fetals</u> ( <u>&lt;24 wks or</u> <u>&lt;500 grams</u> )	<u>Fetals</u> ( <u>&gt;=24 wks and</u> <u>&gt;= 500 grams</u> )	<u>Infants</u> ( <u>&lt;24 wks or</u> <u>&lt;500 grams</u> )	<u>Infants</u> ( <u>&gt;=24 wks and</u> <u>&gt;= 500 grams</u> )	<u>Total</u>
1998	216 (25.5%)	219 (25.8%)	183 (21.6%)	230 (27.1%)	848 (100.0%)
1999	214 (25.4%)	215 (25.6%)	196 (23.3%)	216 (25.7%)	841 (100.0%)
2000	203 (25.1%)	234 (28.9%)	168 (20.7%)	205 (25.3%)	810 (100.0%)
2001	174 (22.0%)	214 (27.1%)	197 (24.9%)	206 (26.0%)	791 (100.0%)
2002	165 (22.3%)	210 (28.3%)	185 (25.0%)	181 (24.4%)	741 (100.0%)
2003	218 (26.3%)	246 (29.6%)	189 (22.8%)	177 (21.3%)	830 (100.0%)
2004	177 (22.7%)	240 (30.8%)	182 (23.3%)	181 (23.2%)	780 (100.0%)
2005	210 (26.3%)	213 (26.7%)	174 (21.8%)	201 (25.2%)	798 (100.0%)
2006	178 (24.1%)	210 (28.5%)	173 (23.4%)	177 (24.0%)	738 (100.0%)

**Figure 20. Trends in Pregnancy-Associated<sup>1</sup> and Maternal Mortality<sup>2</sup>, Massachusetts: 1993-2006**



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

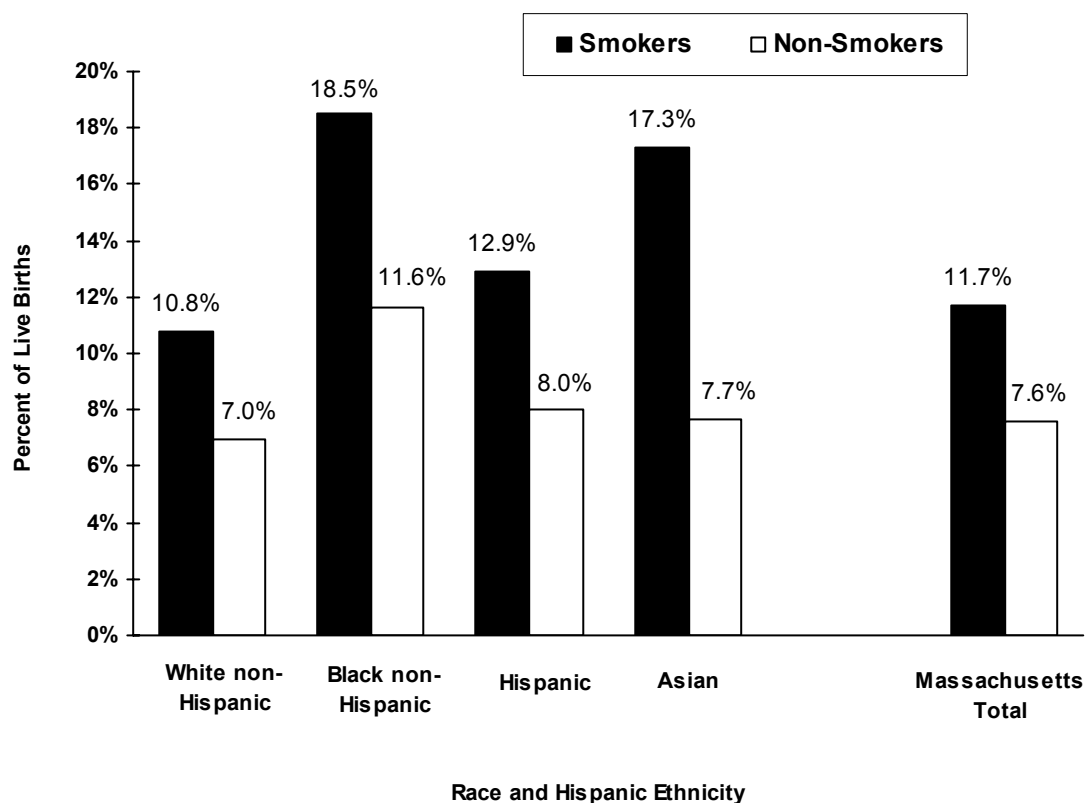
1. Pregnancy-associated death is defined as the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. The pregnancy-associated mortality ratio is the number of pregnancy-associated deaths per 100,000 live occurrence births (see Definition of Rates and 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.)

**Table 24. Number of Pregnancy-Associated<sup>1</sup> and Maternal Deaths<sup>2</sup>, Massachusetts: 1995-2006**

Year	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Pregnancy-Associated Deaths <sup>1</sup>	21	19	25	23	27	29	27	19	15	13	23	22
Maternal Deaths <sup>2</sup>	1	7	4	3	0	1	4	2	4	5	8	7

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.)

**Figure 21. Low Birthweight<sup>1</sup> Among Smoking and Nonsmoking<sup>2</sup> Mothers, by Race and Hispanic Ethnicity, Massachusetts: 2006**



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 on the Parent Worksheet of the Birth Certificate; 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 Parent Worksheet of the Birth Certificates.

**Table 25. Low Birthweight (LBW)<sup>1</sup> by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2006**

<b>Mother's Age (in years)</b>	<b>Total LBW Infants</b>		<b>White non- Hispanic</b>		<b>Black non- Hispanic</b>		<b>Hispanic</b>		<b>Asian</b>		<b>Other<sup>4</sup></b>		<b>Unknown<sup>5</sup></b>
	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>	<b>%<sup>3</sup></b>	<b>n</b>
<b>State Total<sup>2</sup></b>	<b>6,150</b>	<b>7.9</b>	<b>3,799</b>	<b>7.2</b>	<b>806</b>	<b>12.5</b>	<b>895</b>	<b>8.4</b>	<b>436</b>	<b>8.0</b>	<b>204</b>	<b>10.2</b>	<b>10</b>
<b>&lt;18</b>	158	11.0	47	9.1	24	11.2	71	12.1	7	11.1	9	18.0	0
<b>18-19</b>	293	8.8	130	8.1	48	11.9	93	8.3	8	9.5	14	10.4	0
<b>20-24</b>	1,049	8.5	496	7.4	164	11.5	295	9.0	47	8.2	45	10.2	2
<b>25-29</b>	1,380	7.4	805	6.7	195	11.6	214	7.6	104	7.2	58	9.9	4
<b>30-34</b>	1,702	7.2	1,165	6.6	192	13.0	132	7.2	172	8.1	39	8.6	2
<b>35-39</b>	1,216	8.3	916	7.8	130	13.7	69	8.0	74	7.5	27	10.5	0
<b>40+</b>	347	10.0	239	8.9	49	16.6	21	10.1	24	11.9	12	16.0	2

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. 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 26. Adequacy of Prenatal Care Utilization<sup>1</sup>: Summary and Component Indices, Massachusetts: 2006**

	Adequate Total <sup>2</sup>		Adequate Intensive <sup>3</sup>		Adequate Basic <sup>3</sup>		Intermediate <sup>3</sup>		Inadequate <sup>3</sup>		Unknown <sup>3</sup>
	n	%	n	%	n	%	n	%	n	%	n
<b><u>Summary Index<sup>4</sup></u></b>											
Adequacy of Prenatal Care Utilization	63,781	83.1	30,190	39.3	33,591	43.8	6,075	7.9	6,908	9.0	906
<b><u>Component Indices<sup>4</sup></u></b>											
Adequacy of Initiation	70,408	91.7	30,259	39.4	40,149	52.3	4,018	5.2	2,338	3.0	906
Adequacy of Received Services (Visits)	69,184	90.1	34,384	44.8	34,800	45.3	6,657	8.7	923	1.2	906

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 the Adequacy of Prenatal Care Utilization (APNCU) Index. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic categories. 3. For definitions of these categories, please see the Technical Notes in the Appendix. 4. For an explanation of the APNCU Index (summary index) and its component indices, please see Technical Notes in the Appendix.



**Table 27. Adequacy of Prenatal Care<sup>1</sup> by Selected Characteristics, Massachusetts: 2006**

	<u>Adequate Total<sup>2</sup></u>		<u>Adequate Intensive</u>		<u>Adequate Basic</u>		<u>Intermediate</u>		<u>Inadequate</u>		<u>Unknown</u>
	n	%	n	%	n	%	n	%	n	%	n
<u>State Total</u>	<b>63,781</b>	<b>83.1%</b>	<b>30,190</b>	<b>39.3%</b>	<b>33,591</b>	<b>43.8%</b>	<b>6,075</b>	<b>7.9%</b>	<b>6,908</b>	<b>9.0%</b>	<b>906</b>
<b>Maternal Demographics</b>											
<u>Age</u>											
<18	937	66.3%	431	30.5%	506	35.8%	128	9.1%	349	24.7%	21
18-19	2,356	71.1%	1,081	32.6%	1,275	38.5%	320	9.7%	639	19.3%	28
20-24	9,214	75.3%	4,289	35.1%	4,925	40.3%	1,151	9.4%	1,868	15.3%	187
25-29	15,212	82.6%	7,111	38.6%	8,101	44.0%	1,558	8.5%	1,645	8.9%	218
30-34	20,244	86.6%	9,364	40.1%	10,880	46.6%	1,772	7.6%	1,356	5.8%	239
35-39	12,822	87.9%	6,254	42.9%	6,568	45.0%	942	6.5%	819	5.6%	166
40+	2,989	87.3%	1,653	48.3%	1,336	39.0%	204	6.0%	231	6.7%	45
<u>Educational Attainment</u>											
< high school	5,591	69.3%	2,772	34.4%	2,819	35.0%	859	10.7%	1,615	20.0%	169
high school	15,751	78.2%	7,457	37.0%	8,294	41.2%	1,924	9.5%	2,474	12.3%	213
some college	13,911	84.6%	6,925	42.1%	6,986	42.5%	1,140	6.9%	1,383	8.4%	266
college	17,775	88.5%	8,024	40.0%	9,751	48.6%	1,377	6.9%	923	4.6%	129
more than college	10,656	89.4%	4,951	41.6%	5,705	47.9%	768	6.4%	491	4.1%	62
<u>Race/Ethnicity</u>											
Hispanic	7,980	75.6%	3,752	35.5%	4,228	40.0%	1,091	10.3%	1,489	14.1%	136
White non-Hispanic	45,062	85.8%	21,491	40.9%	23,571	44.9%	3,880	7.4%	3,551	6.8%	482
Black non-Hispanic	4,728	75.2%	2,215	35.2%	2,513	40.0%	526	8.4%	1,032	16.4%	166
Asian	4,435	81.6%	2,017	37.1%	2,418	44.5%	408	7.5%	593	10.9%	33
Other	1,542	79.1%	695	35.7%	847	43.5%	168	8.6%	239	12.3%	46
<u>Birthplace</u>											
U.S. States/D.C.	45,889	84.9%	21,901	40.5%	23,988	44.4%	4,032	7.5%	4,134	7.6%	600
Puerto Rico/U.S. Terr.	1,549	75.1%	713	34.6%	836	40.5%	216	10.5%	297	14.4%	17
Non-U.S.-Born	16,339	79.2%	7,572	36.7%	8,767	42.5%	1,827	8.9%	2,475	12.0%	288
<b>Pregnancy-Related Factors</b>											
<u>Parity<sup>3</sup></u>											
1	28,393	83.2%	13,146	38.5%	15,247	44.7%	2,655	7.8%	3,098	9.1%	320
2-3	31,272	83.9%	14,925	40.1%	16,347	43.9%	2,990	8.0%	2,990	8.0%	417
4+	4,068	76.7%	2,099	39.6%	1,969	37.1%	427	8.0%	812	15.3%	90
<u>Smoking<sup>4</sup></u>											
Yes	4,113	72.6%	2,139	37.7%	1,974	34.8%	497	8.8%	1,058	18.7%	74
No	59,617	83.9%	28,021	39.4%	31,596	44.5%	5,574	7.8%	5,840	8.2%	782
<b>Birth Outcomes</b>											
<u>Plurality</u>											
Singleton	60,596	82.7%	27,418	37.4%	33,178	45.3%	5,987	8.2%	6,722	9.2%	841
Multiple birth	3,185	92.1%	2,772	80.1%	413	11.9%	88	2.5%	186	5.4%	65
<u>Birthweight</u>											
<500 g	90	84.9%	82	77.4%	8	7.5%	4	-- <sup>5</sup>	12	11.3%	14
500-1,499 g	750	86.9%	664	76.9%	86	10.0%	24	2.8%	89	10.3%	58
1,499-2,499 g	4,283	85.8%	3,418	68.5%	865	17.3%	182	3.6%	527	10.6%	117
2,500-3,999 g	52,586	82.7%	23,656	37.2%	28,930	45.5%	5,220	8.2%	5,743	9.0%	586
4,000+ g	6,027	83.8%	2,340	32.5%	3,687	51.3%	641	8.9%	526	7.3%	66
<u>Gestational Age</u>											
<28 weeks	387	84.3%	356	77.6%	31	6.8%	18	3.9%	54	11.8%	40
<37 weeks	5,858	86.9%	5,041	74.7%	817	12.1%	228	3.4%	658	9.8%	210
37-42 weeks	57,891	82.8%	25,134	35.9%	32,757	46.8%	5,836	8.3%	6,227	8.9%	622

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 the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories.

2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

**Table 28. Adequacy of Prenatal Care<sup>1</sup> Initiation by Selected Characteristics, Massachusetts: 2006**

	<u>Adequate Total<sup>2</sup></u>		<u>Adequate Intensive</u>		<u>Adequate Basic</u>		<u>Intermediate</u>		<u>Inadequate</u>		<u>Unknown</u>
	n	%	n	%	n	%	n	%	n	%	n
<u>State Total</u>	<b>70,408</b>	<b>91.7%</b>	<b>30,259</b>	<b>39.4%</b>	<b>40,149</b>	<b>52.3%</b>	<b>4,018</b>	<b>5.2%</b>	<b>2,338</b>	<b>3.0%</b>	<b>906</b>
<b>Maternal Demographics</b>											
<u>Age</u>											
<18	1,082	76.5%	366	25.9%	716	50.6%	213	15.1%	119	8.4%	21
18-19	2,717	82.0%	973	29.4%	1,744	52.6%	393	11.9%	205	6.2%	28
20-24	10,490	85.8%	4,036	33.0%	6,454	52.8%	1,120	9.2%	623	5.1%	187
25-29	16,912	91.8%	7,272	39.5%	9,640	52.3%	928	5.0%	575	3.1%	218
30-34	22,154	94.8%	10,040	43.0%	12,114	51.8%	754	3.2%	464	2.0%	239
35-39	13,839	94.9%	6,168	42.3%	7,671	52.6%	472	3.2%	272	1.9%	166
40+	3,206	93.6%	1,400	40.9%	1,806	52.7%	138	4.0%	80	2.3%	45
<u>Educational Attainment</u>											
< high school	6,542	81.1%	2,023	25.1%	4,519	56.0%	986	12.2%	537	6.7%	169
high school	17,886	88.8%	7,321	36.3%	10,565	52.4%	1,459	7.2%	804	4.0%	213
some college	15,148	92.2%	6,414	39.0%	8,734	53.1%	817	5.0%	469	2.9%	266
college	19,241	95.8%	9,235	46.0%	10,006	49.8%	485	2.4%	349	1.7%	129
more than college	11,486	96.4%	5,222	43.8%	6,264	52.6%	261	2.2%	168	1.4%	62
<u>Race/Ethnicity</u>											
Hispanic	9,152	86.7%	3,541	33.5%	5,611	53.1%	936	8.9%	472	4.5%	136
White non-Hispanic	49,295	93.9%	21,872	41.7%	27,423	52.2%	2,033	3.9%	1,165	2.2%	482
Black non-Hispanic	5,306	84.4%	2,224	35.4%	3,082	49.0%	575	9.1%	405	6.4%	166
Asian	4,887	89.9%	1,864	34.3%	3,023	55.6%	348	6.4%	201	3.7%	33
Other	1,732	88.9%	739	37.9%	993	50.9%	125	6.4%	92	4.7%	46
<u>Birthplace</u>											
U.S. States/D.C.	50,304	93.1%	22,249	41.2%	28,055	51.9%	2,426	4.5%	1,325	2.5%	600
Puerto Rico/U.S. Terr.	1,786	86.6%	699	33.9%	1,087	52.7%	194	9.4%	82	4.0%	17
Non-U.S.-Born	18,314	88.7%	7,310	35.4%	11,004	53.3%	1,398	6.8%	929	4.5%	288
<b>Pregnancy-Related Factors</b>											
<u>Parity<sup>3</sup></u>											
1	31,259	91.5%	13,458	39.4%	17,801	52.1%	1,785	5.2%	1,102	3.2%	320
2-3	34,559	92.8%	14,974	40.2%	19,585	52.6%	1,751	4.7%	942	2.5%	417
4+	4,539	85.5%	1,794	33.8%	2,745	51.7%	478	9.0%	290	5.5%	90
<u>Smoking<sup>4</sup></u>											
Yes	4,695	82.8%	1,700	30.0%	2,995	52.8%	575	10.1%	398	7.0%	74
No	65,657	92.4%	28,532	40.2%	37,125	52.3%	3,441	4.8%	1,933	2.7%	782
<b>Birth Outcomes</b>											
<u>Plurality</u>											
Singleton	67,131	91.6%	28,778	39.3%	38,353	52.3%	3,903	5.3%	2,271	3.1%	841
Multiple birth	3,277	94.7%	1,481	42.8%	1,796	51.9%	115	3.3%	67	1.9%	65
<u>Birthweight</u>											
<500 g	95	89.6%	36	34.0%	59	55.7%	3	-- <sup>5</sup>	8	7.5%	14
500-1,499 g	776	89.9%	358	41.5%	418	48.4%	58	6.7%	29	3.4%	58
1,499-2,499 g	4,495	90.0%	2,037	40.8%	2,458	49.2%	301	6.0%	196	3.9%	117
2,500-3,999 g	58,269	91.7%	24,866	39.1%	33,403	52.6%	3,359	5.3%	1,921	3.0%	586
4,000+ g	6,724	93.5%	2,944	40.9%	3,780	52.5%	294	4.1%	176	2.4%	66
<u>Gestational Age</u>											
<28 weeks	407	88.7%	181	39.4%	226	49.2%	28	6.1%	24	5.2%	40
<37 weeks	6,118	90.7%	2,806	41.6%	3,312	49.1%	380	5.6%	246	3.6%	210
37-42 weeks	64,246	91.8%	27,436	39.2%	36,810	52.6%	3,630	5.2%	2,078	3.0%	622

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 the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in Appendix for definitions of Index and its categories. 2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

**Table 29. Adequacy of Prenatal Care<sup>1</sup> Visits by Selected Characteristics, Massachusetts: 2006**

	<u>Adequate Total<sup>2</sup></u>		<u>Adequate Intensive</u>		<u>Adequate Basic</u>		<u>Intermediate</u>		<u>Inadequate</u>		<u>Unknown</u>
	n	%	n	%	n	%	n	%	n	%	n
<u>State Total</u>	69,184	90.1%	34,384	44.8%	34,800	45.3%	6,657	8.7%	923	1.2%	906
<b>Maternal Demographics</b>											
<u>Age</u>											
<18	1,216	86.0%	647	45.8%	569	40.2%	166	11.7%	32	2.3%	21
18-19	2,856	86.2%	1,466	44.2%	1,390	41.9%	383	11.6%	76	2.3%	28
20-24	10,636	86.9%	5,334	43.6%	5,302	43.3%	1,360	11.1%	237	1.9%	187
25-29	16,489	89.5%	8,121	44.1%	8,368	45.4%	1,698	9.2%	228	1.2%	218
30-34	21,332	91.3%	10,237	43.8%	11,095	47.5%	1,843	7.9%	197	0.8%	239
35-39	13,466	92.3%	6,765	46.4%	6,701	46.0%	988	6.8%	129	0.9%	166
40+	3,182	92.9%	1,807	52.8%	1,375	40.2%	219	6.4%	23	0.7%	45
<u>Educational Attainment</u>											
< high school	6,816	84.5%	3,684	45.7%	3,132	38.8%	1,050	13.0%	199	2.5%	169
high school	17,645	87.6%	8,896	44.2%	8,749	43.4%	2,145	10.6%	359	1.8%	213
some college	15,016	91.4%	7,800	47.5%	7,216	43.9%	1,239	7.5%	179	1.1%	266
college	18,538	92.3%	8,657	43.1%	9,881	49.2%	1,429	7.1%	108	0.5%	129
more than college	11,057	92.8%	5,278	44.3%	5,779	48.5%	787	6.6%	71	0.6%	62
<u>Race/Ethnicity</u>											
Hispanic	9,166	86.8%	4,657	44.1%	4,509	42.7%	1,247	11.8%	147	1.4%	136
White non-Hispanic	47,828	91.1%	23,671	45.1%	24,157	46.0%	4,128	7.9%	537	1.0%	482
Black non-Hispanic	5,526	87.9%	2,815	44.8%	2,711	43.1%	624	9.9%	136	2.2%	166
Asian	4,905	90.2%	2,396	44.1%	2,509	46.2%	461	8.5%	70	1.3%	33
Other	1,722	88.4%	824	42.3%	898	46.1%	195	10.0%	32	1.6%	46
<u>Birthplace</u>											
U.S. States/D.C.	49,039	90.7%	24,345	45.0%	24,694	45.7%	4,372	8.1%	644	1.2%	600
Puerto Rico/U.S. Terr.	1,769	85.8%	881	42.7%	888	43.1%	254	12.3%	39	1.9%	17
Non-U.S.-Born	18,370	89.0%	9,152	44.3%	9,218	44.7%	2,031	9.8%	240	1.2%	288
<b>Pregnancy-Related Factors</b>											
<u>Parity<sup>3</sup></u>											
1	30,903	90.5%	15,114	44.3%	15,789	46.2%	2,905	8.5%	338	1.0%	320
2-3	33,557	90.1%	16,704	44.8%	16,853	45.2%	3,243	8.7%	452	1.2%	417
4+	4,672	88.0%	2,544	47.9%	2,128	40.1%	505	9.5%	130	2.4%	90
<u>Smoking<sup>4</sup></u>											
Yes	4,876	86.0%	2,719	48.0%	2,157	38.1%	588	10.4%	204	3.6%	74
No	64,253	90.5%	31,631	44.5%	32,622	45.9%	6,065	8.5%	713	1.0%	782
<b>Birth Outcomes</b>											
<u>Plurality</u>											
Singleton	65,836	89.8%	31,461	42.9%	34,375	46.9%	6,567	9.0%	902	1.2%	841
Multiple birth	3,348	96.8%	2,923	84.5%	425	12.3%	90	2.6%	21	0.6%	65
<u>Birthweight</u>											
<500 g	95	89.6%	86	81.1%	9	8.5%	4	-- <sup>5</sup>	7	6.6%	14
500-1,499 g	813	94.2%	721	83.5%	92	10.7%	25	2.9%	25	2.9%	58
1,499-2,499 g	4,687	93.9%	3,771	75.5%	916	18.3%	210	4.2%	95	1.9%	117
2,500-3,999 g	57,092	89.8%	27,116	42.7%	29,976	47.2%	5,733	9.0%	724	1.1%	586
4,000+ g	6,448	89.6%	2,657	36.9%	3,791	52.7%	679	9.4%	67	0.9%	66
<u>Gestational Age</u>											
<28 weeks	416	90.6%	383	83.4%	33	7.2%	18	3.9%	25	5.4%	40
<37 weeks	6,356	94.2%	5,492	81.4%	864	12.8%	257	3.8%	131	1.9%	210
37-42 weeks	62,787	89.8%	28,872	41.3%	33,915	48.5%	6,388	9.1%	779	1.1%	622

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 the Adequacy of Prenatal Care Utilization (APNCU) Index. See Glossary and Technical Notes in the Appendix for definitions of Index and its categories.

2. Adequate Total is the sum of Adequate Intensive and Adequate Basic. 3. Parity is the number of live births including this birth. 4. Smoking during pregnancy is self-reported by the mother and should be interpreted with caution. 5. Calculations based on values of 1-4 are excluded.

**Table 30. Birth Characteristics by Race and Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2006**

Race/Ethnicity and Payment Source	Births <sup>1</sup>		Teen Births				Birthweight			
	n	%	<18 Years		<20 Years		Very Low <sup>2</sup>		Low <sup>3</sup>	
	n	%	n	%	n	%	n	%	n	%
<b>STATE TOTAL<sup>4</sup></b>	<b>77,670</b>	<b>100.0</b>	<b>1,435</b>	<b>1.8</b>	<b>4,778</b>	<b>6.2</b>	<b>1,041</b>	<b>1.3</b>	<b>6,150</b>	<b>7.9</b>
Public	26,009	34.2	1,073	4.1	3,672	14.1	403	1.5	2,296	8.8
Medicaid <sup>5</sup>	18,973	25.0	818	4.3	2,782	14.7	318	1.7	1,759	9.3
Other Public <sup>6</sup>	7,036	9.3	255	3.6	890	12.6	85	1.2	537	7.6
Private <sup>7</sup>	49,280	64.8	325	0.7	984	2.0	526	1.1	3,499	7.1
<b>White non-Hispanic</b>	<b>52,975</b>	<b>100.0</b>	<b>519</b>	<b>1.0</b>	<b>2,115</b>	<b>4.0</b>	<b>590</b>	<b>1.1</b>	<b>3,799</b>	<b>7.2</b>
Public	11,827	22.9	335	2.8	1,464	12.4	164	1.4	984	8.3
Medicaid <sup>5</sup>	8,992	17.4	275	3.1	1,170	13.0	133	1.5	781	8.7
Other Public <sup>6</sup>	2,835	5.5	60	2.1	294	10.4	31	1.1	203	7.2
Private <sup>7</sup>	39,293	76.1	172	0.4	591	1.5	362	0.9	2,577	6.6
<b>Black non-Hispanic</b>	<b>6,452</b>	<b>100.0</b>	<b>215</b>	<b>3.3</b>	<b>620</b>	<b>9.6</b>	<b>220</b>	<b>3.4</b>	<b>806</b>	<b>12.5</b>
Public	3,847	60.6	164	4.3	485	12.6	110	2.9	461	12.0
Medicaid <sup>5</sup>	2,995	47.2	143	4.8	399	13.3	89	3.0	380	12.7
Other Public <sup>6</sup>	852	13.4	21	2.5	86	10.1	21	2.5	81	9.5
Private <sup>7</sup>	2,435	38.4	43	1.8	117	4.8	83	3.4	294	12.1
<b>Hispanic</b>	<b>10,696</b>	<b>100.0</b>	<b>588</b>	<b>5.5</b>	<b>1,709</b>	<b>16.0</b>	<b>131</b>	<b>1.2</b>	<b>895</b>	<b>8.4</b>
Public	7,809	73.3	491	6.3	1,470	18.8	96	1.2	644	8.2
Medicaid <sup>5</sup>	5,011	47.0	325	6.5	990	19.8	66	1.3	432	8.6
Other Public <sup>6</sup>	2,798	26.3	166	5.9	480	17.2	30	1.1	212	7.6
Private <sup>7</sup>	2,749	25.8	85	3.1	213	7.7	30	1.1	225	8.2
<b>Asian</b>	<b>5,469</b>	<b>100.0</b>	<b>63</b>	<b>1.2</b>	<b>147</b>	<b>2.7</b>	<b>52</b>	<b>1.0</b>	<b>436</b>	<b>8.0</b>
Public	1,383	25.4	44	3.2	112	8.1	15	1.1	108	7.8
Medicaid <sup>5</sup>	1,087	19.9	41	3.8	101	9.3	15	1.4	88	8.1
Other Public <sup>6</sup>	296	5.4	3	-- <sup>8</sup>	11	3.7	0	0.0	20	6.8
Private <sup>7</sup>	4,035	74.0	17	0.4	30	0.7	35	0.9	320	7.9
<b>Other<sup>9</sup></b>	<b>1,995</b>	<b>100.0</b>	<b>50</b>	<b>2.5</b>	<b>185</b>	<b>9.3</b>	<b>47</b>	<b>2.4</b>	<b>204</b>	<b>10.2</b>
Public	1,137	59.9	39	3.4	141	12.4	18	1.6	99	8.7
Medicaid <sup>5</sup>	883	46.5	34	3.9	122	13.8	15	1.7	78	8.8
Other Public <sup>6</sup>	254	13.4	5	2.0	19	7.5	3	-- <sup>8</sup>	21	8.3
Private <sup>7</sup>	746	39.3	8	1.1	33	4.4	16	2.1	80	10.7

**Table 30 (cont'd) Birth Characteristics by Race/Hispanic Ethnicity and Source of Prenatal Care Payment, Massachusetts: 2006**

Race/Ethnicity and Payment Source	Prenatal Care				Cesarean Section		Breastfeeding <sup>11</sup>	
	Adequate <sup>10</sup>		Began 1st Trimester					
	n	%	n	%	n	%	n	%
<b>STATE TOTAL<sup>4</sup></b>	<b>63,781</b>	<b>83.1</b>	<b>63,326</b>	<b>82.1</b>	<b>25,901</b>	<b>33.4</b>	<b>61,076</b>	<b>79.9</b>
Public	18,949	73.9	18,124	70.4	7,481	28.8	18,899	72.7
Medicaid <sup>5</sup>	14,001	74.7	13,457	71.7	5,497	29.0	13,440	70.9
Other Public <sup>6</sup>	4,948	71.7	4,667	67.1	1,984	28.2	5,459	77.6
Private <sup>7</sup>	43,401	88.4	43,649	88.7	17,606	35.8	41,334	83.9
<b>White non-Hispanic</b>	<b>45,062</b>	<b>85.8</b>	<b>45,310</b>	<b>85.8</b>	<b>18,443</b>	<b>34.9</b>	<b>40,639</b>	<b>78.2</b>
Public	8,947	76.3	8,582	73.0	3,637	30.8	7,688	65.0
Medicaid <sup>5</sup>	6,839	76.6	6,533	73.1	2,739	30.5	5,559	61.9
Other Public <sup>6</sup>	2,108	75.2	2,049	72.6	898	31.7	2,129	75.1
Private <sup>7</sup>	34,900	89.2	35,399	90.2	14,127	36.0	32,347	82.3
<b>Black non-Hispanic</b>	<b>4,728</b>	<b>75.2</b>	<b>4,539</b>	<b>71.9</b>	<b>2,143</b>	<b>33.3</b>	<b>5,172</b>	<b>80.7</b>
Public	2,592	69.5	2,483	66.4	1,171	30.5	2,963	77.1
Medicaid <sup>5</sup>	2,070	71.3	2,005	68.9	896	30.0	2,300	76.8
Other Public <sup>6</sup>	522	63.3	478	57.5	275	32.4	663	77.9
Private <sup>7</sup>	2,080	86.4	1,998	82.7	929	38.2	2,138	87.9
<b>Hispanic</b>	<b>7,980</b>	<b>75.6</b>	<b>7,675</b>	<b>72.4</b>	<b>2,998</b>	<b>28.1</b>	<b>8,821</b>	<b>82.6</b>
Public	5,582	72.6	5,364	69.4	1,991	25.5	6,292	80.6
Medicaid <sup>5</sup>	3,633	73.3	3,555	71.5	1,338	26.7	4,087	81.6
Other Public <sup>6</sup>	1,949	71.3	1,809	65.5	653	23.4	2,205	78.9
Private <sup>7</sup>	2,332	85.3	2,245	81.9	968	35.3	2,429	88.4
<b>Asian</b>	<b>4,435</b>	<b>81.6</b>	<b>4,241</b>	<b>77.9</b>	<b>1,642</b>	<b>30.0</b>	<b>4,746</b>	<b>86.8</b>
Public	991	72.6	883	64.5	330	23.9	985	71.2
Medicaid <sup>5</sup>	782	72.7	705	65.3	260	23.9	756	69.5
Other Public <sup>6</sup>	209	72.3	178	61.6	70	23.6	229	77.4
Private <sup>7</sup>	3,422	85.0	3,339	82.9	1,301	32.3	3,724	92.3
<b>Other<sup>9</sup></b>	<b>1,542</b>	<b>79.1</b>	<b>1,524</b>	<b>77.5</b>	<b>655</b>	<b>32.9</b>	<b>1,668</b>	<b>87.1</b>
Public	834	74.5	808	72.1	351	30.9	965	84.9
Medicaid <sup>5</sup>	675	77.4	656	75.2	263	29.8	733	83.1
Other Public <sup>6</sup>	159	64.1	152	61.3	88	34.6	232	91.3
Private <sup>7</sup>	647	87.2	650	87.6	271	36.3	675	90.5

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 "Births" column, percentages are based on race/ethnicity category totals (in column). For all other characteristics, percentages are based on the total number of births for the race/ethnicity by payment source for the row. 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. Total births do not equal Public + Private because Workers' Compensation, self-paid, and other are in the state total but not shown in the table. 5. Medicaid/MassHealth. 6. Other Public: Commonwealth, Healthy Start, Medicare, other government programs, and free care. 7. Private: commercial indemnity plans or commercial managed care organizations (HMO, PPO, IPP, or IPA). 8. Calculations based on values of 1-4 are excluded. 9. Other: Mothers who designated their race as American Indian or "Other." 10. Based on the Adequacy of Prenatal Care Utilization (APNCU) Index. 11. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

**Table 31. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility<sup>1</sup>, All Births, Massachusetts: 2006**

Facility	Occurrence Births <sup>2</sup>	Total		Primary C-Section <sup>2</sup>		Repeat C-Sections		VBACs <sup>2</sup>	
		N	% <sup>3,4</sup>	N	% <sup>3,5</sup>	N	% <sup>3,6</sup>	N	% <sup>7</sup>
<b>State Total</b>	<b>78,511</b>	<b>26,141</b>	<b>33.3</b>	<b>16,062</b>	<b>23.8</b>	<b>10,079</b>	<b>91.9</b>	<b>887</b>	<b>8.1</b>
Anna Jaques Hospital	769	225	29.3	140	20.7	85	90.4	9	9.6
Baystate Medical Center	4,291	1,299	30.4	778	21.1	521	88.2	70	11.8
Berkshire Medical Center	741	236	31.8	146	22.7	90	92.8	7	7.2
Beth Israel Deaconess Medical Center	4,948	2,038	41.2	1,344	32.1	694	91.8	62	8.2
Beverly Hospital	2,024	656	32.4	410	23.5	246	88.5	32	11.5
Boston Medical Center	2,586	795	30.8	465	20.7	330	98.2	6	1.8
Brigham and Women's Hospital	8,418	2,729	32.5	1,705	23.6	1,024	87.5	146	12.5
Brockton Hospital	1,385	541	39.1	349	29.7	192	91.9	17	8.1
Cambridge Hospital	1,310	381	29.2	223	19.8	158	87.3	23	12.7
Cape Cod Hospital	1,016	310	30.5	195	21.9	115	92.0	10	8.0
Caritas Good Samaritan Medical Center	868	361	41.6	221	30.4	140	99.3	1	-- <sup>8</sup>
Caritas Holy Family Hospital and Medical Center	1,210	533	44.0	324	32.6	209	97.2	6	2.8
Caritas Norwood Hospital	540	186	34.4	104	23.0	82	94.3	5	5.7
Caritas St. Elizabeth's Medical Center of Boston	1,312	529	40.4	317	29.4	212	92.2	18	7.8
Charlton Memorial Hospital	1,659	578	34.8	343	24.1	235	99.2	2	-- <sup>8</sup>
Cooley Dickinson Hospital	863	264	30.6	170	22.6	94	84.7	17	15.3
Emerson Hospital	1,214	465	38.3	291	28.6	174	87.9	24	12.1
Fairview Hospital	126	32	25.4	22	19.0	10	100.0	0	0.0
Falmouth Hospital	552	198	36.2	118	25.3	80	100.0	0	0.0
Franklin Medical Center	455	102	22.4	56	14.0	46	82.1	10	17.9
Harrington Memorial Hospital	406	127	31.3	71	20.3	56	98.2	1	-- <sup>8</sup>
Heywood Memorial Hospital	587	121	20.6	61	11.8	60	88.2	8	11.8
Holyoke Hospital	573	114	19.9	73	13.9	41	87.2	6	12.8
Jordan Hospital	728	217	29.8	133	20.8	84	93.3	6	6.7
Lawrence General Hospital	1,852	628	33.9	326	21.1	302	99.3	2	-- <sup>8</sup>
Leominster Hospital	1,193	305	25.6	170	16.2	135	95.1	7	4.9
Lowell General Hospital	1,979	636	32.1	397	23.1	239	92.6	19	7.4
Martha's Vineyard Hospital	156	36	23.1	22	15.5	14	100.0	0	0.0
Mary Lane Hospital	165	48	29.1	25	17.7	23	95.8	1	-- <sup>8</sup>
Massachusetts General Hospital	3,342	1,115	33.4	722	25.0	393	86.6	61	13.4
Melrose-Wakefield Hospital	1,293	518	40.1	300	27.9	218	99.5	1	-- <sup>8</sup>
Mercy Medical Center	1,377	319	23.2	191	15.5	128	89.5	15	10.5

**Table 31 (cont'd). Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility<sup>1</sup>, All Births, Massachusetts: 2006**

Facility	Occurrence Births <sup>2</sup>	Total		Primary C-Section <sup>2</sup>		Repeat C-Sections		VBACs <sup>2</sup>	
		N	% <sup>3,4</sup>	N	% <sup>3,5</sup>	N	% <sup>3,6</sup>	N	% <sup>7</sup>
Metrowest Medical Center-Framingham Union Campus	1,903	789	41.5	476	29.9	313	100.0	0	0.0
Milford Regional Medical Center	1,019	355	34.8	211	24.2	144	97.3	4	-- <sup>8</sup>
Morton Hospital	499	184	37.2	99	24.2	85	100.0	0	0.0
Mount Auburn Hospital	1,871	499	26.7	349	20.7	150	82.0	33	18.0
Nantucket Cottage Hospital	124	25	20.2	18	15.4	7	100.0	0	0.0
Newton Wellesley Hospital	3,379	1,258	37.2	748	26.4	510	93.1	38	6.9
North Adams Regional Hospital	325	79	24.3	45	15.6	34	94.4	2	-- <sup>8</sup>
North Shore Medical Center - Salem Hospital	1,817	574	31.6	363	22.8	211	92.5	17	7.5
Saint Vincent Hospital	1,853	508	27.4	314	19.5	194	80.2	48	19.8
Saints Memorial Medical Center	704	244	34.7	157	25.5	87	97.8	2	-- <sup>8</sup>
South Shore Hospital	3,802	1,541	40.5	965	30.4	576	91.7	52	8.3
St. Luke's Hospital	1,639	496	30.3	280	19.8	216	97.7	5	2.3
Sturdy Memorial Hospital	1,064	388	36.5	225	25.3	163	94.2	10	5.8
Tobey Hospital	432	96	22.3	51	13.4	45	91.8	4	-- <sup>8</sup>
Tufts-New England Medical Center Hospital	1,353	559	41.3	375	32.4	184	94.8	10	5.2
UMASS Memorial Medical Center - West Campus	4,346	1,212	27.9	760	19.8	452	88.8	57	11.2
Winchester Hospital	1,904	690	36.5	412	25.5	278	99.3	2	-- <sup>8</sup>

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

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births, primary and repeat Cesarean sections, and VBACs. The percentages provided in this table are based on occurrence births, and may differ from data which are based on resident births, presented elsewhere in this book. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Percentage of total Cesarean sections= (total Cesarean births/all births) x 100. 5. Percentage primary Cesarean sections= (primary Cesarean sections/all births-repeat Cesarean sections-VBACs) x 100. 6. Percentage repeat Cesarean sections= (repeat Cesarean sections/ (repeat Cesarean sections + VBACs)) x 100. 7. Percentage VBACs= (VBAC deliveries/ (repeat Cesarean sections + VBAC)) x 100. 8. Calculations based on values of 1-4 are excluded.

**Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2006**

Facility <sup>1</sup>	<u>First Birth</u>			<u>Second or Later Birth without prior C-section</u>			<u>Second or Later Birth with prior C-section</u>		
	Births <sup>2</sup>	C-section		Births <sup>2</sup>	C-section		Births <sup>2</sup>	C-section	
		n	% <sup>3</sup>		n	% <sup>3</sup>		n	% <sup>3</sup>
<b>State Total</b>	<b>33,811</b>	<b>10,829</b>	<b>32.0</b>	<b>30,553</b>	<b>3,036</b>	<b>9.9</b>	<b>10,393</b>	<b>9,525</b>	<b>91.6</b>
Anna Jaques Hospital	334	93	27.8	311	21	6.8	92	83	90.2
Baystate Medical Center	1,729	472	27.3	1,730	165	9.5	550	480	87.3
Berkshire Medical Center	310	106	34.2	310	28	9.0	96	89	92.7
Beth Israel Deaconess Medical Center	2,199	890	40.5	1,691	186	11.0	719	658	91.5
Beverly Hospital	854	298	34.9	820	60	7.3	261	229	87.7
Boston Medical Center	1,068	296	27.7	1,130	129	11.4	316	312	98.7
Brigham and Women's Hospital	3,622	1,035	28.6	3,074	281	9.1	1,029	890	86.5
Brockton Hospital	608	260	42.8	542	70	12.9	203	186	91.6
Cambridge Hospital	675	171	25.3	430	41	9.5	181	158	87.3
Cape Cod Hospital	447	127	28.4	392	35	8.9	121	111	91.7
Caritas Good Samaritan Medical Center	309	138	44.7	394	64	16.2	132	131	99.2
Caritas Holy Family Hospital and Medical Center	478	212	44.4	480	78	16.3	209	203	97.1
Caritas Norwood Hospital	243	80	32.9	206	22	10.7	83	78	94.0
Caritas St. Elizabeth's Medical Center of Boston	567	207	36.5	436	51	11.7	210	192	91.4
Charlton Memorial Hospital	702	230	32.8	685	94	13.7	224	222	99.1
Cooley Dickinson Hospital	408	134	32.8	320	24	7.5	111	94	84.7
Emerson Hospital	499	208	41.7	473	49	10.4	192	168	87.5
Fairview Hospital	55	17	30.9	61	5	8.2	10	10	100.0
Falmouth Hospital	211	71	33.6	235	32	13.6	77	77	100.0
Franklin Medical Center	199	36	18.1	188	12	6.4	56	46	82.1
Harrington Memorial Hospital	172	48	27.9	173	19	11.0	55	54	98.2
Heywood Memorial Hospital	241	53	22.0	270	6	2.2	64	56	87.5
Holyoke Hospital	251	55	21.9	262	16	6.1	47	41	87.2
Jordan Hospital	339	104	30.7	283	19	6.7	90	84	93.3
Lawrence General Hospital	772	211	27.3	727	81	11.1	297	295	99.3
Leominster Hospital	516	102	19.8	516	51	9.9	138	131	94.9
Lowell General Hospital	827	264	31.9	854	103	12.1	254	235	92.5
Martha's Vineyard Hospital	86	18	20.9	52	2	-- <sup>4</sup>	14	14	100.0
Mary Lane Hospital	73	14	19.2	68	11	16.2	24	23	95.8
Massachusetts General Hospital	1,537	498	32.4	1,198	113	9.4	427	370	86.7
Melrose-Wakefield Hospital	581	216	37.2	460	61	13.3	214	213	99.5
Mercy Medical Center	570	134	23.5	648	51	7.9	135	120	88.9
Metrowest Medical Center-Framingham Union Campus	852	379	44.5	687	56	8.2	301	301	100.0
Milford Regional Medical Center	437	153	35.0	405	43	10.6	142	138	97.2
Morton Hospital	223	71	31.8	175	19	10.9	85	85	100.0
Mount Auburn Hospital	964	259	26.9	666	56	8.4	179	147	82.1



**Table 32. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2006**

Facility <sup>1</sup>	<u>First Birth</u>			<u>Second or Later Birth without prior C-section</u>			<u>Second or Later Birth with prior C-section</u>		
	Births <sup>2</sup>	C-section		Births <sup>2</sup>	C-section		Births <sup>2</sup>	C-section	
		n	% <sup>3</sup>		n	% <sup>3</sup>		n	% <sup>3</sup>
Nantucket Cottage Hospital	59	14	23.7	58	4	-- <sup>4</sup>	7	7	100.0
Newton Wellesley Hospital	1,443	542	37.6	1,234	93	7.5	532	494	92.9
North Adams Regional Hospital	142	34	23.9	133	6	4.5	36	34	94.4
North Shore Medical Center - Salem Hospital	777	248	31.9	758	77	10.2	219	202	92.2
Saint Vincent Hospital	823	218	26.5	736	60	8.2	231	183	79.2
Saints Memorial Medical Ctr.-St. John's Campus	324	116	35.8	277	31	11.2	87	85	97.7
South Shore Hospital	1,550	622	40.1	1,416	165	11.7	608	556	91.4
St. Luke's Hospital	651	189	29.0	743	80	10.8	211	206	97.6
Sturdy Memorial Hospital	443	166	37.5	410	34	8.3	169	159	94.1
Tobey Hospital	181	32	17.7	188	13	6.9	49	45	91.8
Tufts-New England Medical Center Hospital	558	216	38.7	483	83	17.2	169	159	94.1
UMASS Memorial Medical Center - West Campus	1,982	505	25.5	1,678	159	9.5	462	409	88.5
Winchester Hospital	774	266	34.4	754	76	10.1	264	262	99.2

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

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. See Glossary for definitions of occurrence births. 3. The percentage of Cesarean births reported is not adjusted for risk factors such as mother's age, birthweight, or complications of labor and delivery, which would influence the number of procedures in a particular facility. Caution should be used when comparing unadjusted percentages. 4. Calculations based on values of 1-4 are excluded.

**Table 33. Birth Characteristics<sup>1</sup>: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

Community	Occurrence Births <sup>2</sup>	Resident Births <sup>3</sup>	Low Birthweight <sup>4</sup>	Teen Births (15-19 years)	Infant Deaths <sup>5</sup>	Neonatal Deaths <sup>6</sup>	Fetal Deaths <sup>7</sup>
<b>STATE TOTAL</b>	<b>78,511</b>	<b>77,670</b>	<b>6,150</b>	<b>4,722</b>	<b>369</b>	<b>279</b>	<b>388</b>
Abington	1	226	25	--	1	1	--
Acton	2	194	13	--	1	1	--
Acushnet	0	95	--	5	0	0	--
Adams	0	88	14	7	0	0	--
Agawam	0	245	11	10	0	0	0
Alford	0	2	0	0	0	0	0
Amesbury	0	228	15	13	2	2	--
Amherst	6	184	7	9	0	0	--
Andover	2	269	20	--	0	0	--
Aquinnah (Gay Head)	0	5	--	--	0	0	0
Arlington	3	568	40	--	0	0	--
Ashburnham	1	64	5	--	0	0	--
Ashby	0	31	--	--	0	0	--
Ashfield	0	14	--	0	0	0	0
Ashland	1	247	18	7	1	1	--
Athol	2	153	11	18	0	0	--
Attleboro	1,065	606	39	27	2	2	--
Auburn	3	170	12	7	2	2	0
Avon	0	48	--	--	0	0	0
Ayer	0	93	10	--	1	1	--
Barnstable	1,020	492	35	29	0	0	--
Barre	0	53	0	--	1	1	--
Becket	0	11	0	0	0	0	--
Bedford	0	115	8	--	0	0	--
Belchertown	1	160	15	5	1	1	--
Bellingham	1	208	17	--	0	0	--
Belmont	0	266	17	--	1	1	0
Berkley	1	55	0	--	0	0	0
Berlin	0	34	--	0	0	0	0
Bernardston	1	22	--	--	0	0	--
Beverly	2,107	399	33	6	2	2	--
Billerica	1	447	35	13	1	1	--
Blackstone	0	110	10	13	1	1	0
Blandford	0	7	--	--	0	0	0
Bolton	0	50	10	0	0	0	0
Boston	22,015	7,912	710	568	46	35	39
Bourne	0	189	8	11	1	0	--
Boxborough	0	48	--	0	0	0	0
Boxford	0	60	--	--	0	0	--
Boylston	0	60	6	0	0	0	0
Braintree	1	409	30	12	1	0	--
Brewster	0	60	1	--	0	0	0
Bridgewater	1	234	11	10	0	0	--
Brimfield	1	37	--	0	1	1	0

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

Community	Occurrence Births <sup>2</sup>	Resident Births <sup>3</sup>	Low Birthweight <sup>4</sup>	Teen Births (15-19 years)	Infant Deaths <sup>5</sup>	Neonatal Deaths <sup>6</sup>	Fetal Deaths <sup>7</sup>
Brockton	2,258	1,538	177	156	12	8	9
Brookfield	0	25	--	--	0	0	--
Brookline	1	691	41	--	0	0	--
Buckland	2	14	0	0	0	0	0
Burlington	0	265	18	--	2	2	--
Cambridge	3,305	1,145	73	32	6	5	--
Canton	0	204	16	--	1	1	--
Carlisle	1	30	6	0	0	0	0
Carver	0	120	9	6	1	1	0
Charlemont	0	8	--	--	0	0	0
Charlton	2	140	11	6	1	1	0
Chatham	0	35	--	0	0	0	0
Chelmsford	0	361	27	--	5	4	--
Chelsea	3	752	59	79	2	2	--
Cheshire	0	35	--	--	0	0	0
Chester	0	16	0	0	0	0	0
Chesterfield	0	15	0	0	0	0	0
Chicopee	1	611	45	58	1	1	5
Chilmark	2	12	0	0	0	0	0
Clarksburg	0	14	7	--	0	0	0
Clinton	0	198	15	17	0	0	--
Cohasset	0	74	6	0	0	0	0
Colrain	1	13	0	--	0	0	0
Concord	1,216	124	--	0	0	0	--
Conway	0	20	--	--	0	0	0
Cummington	0	3	0	0	0	0	0
Dalton	1	58	6	--	0	0	0
Danvers	1	235	11	6	0	0	--
Dartmouth	0	238	27	10	4	4	0
Dedham	0	276	25	5	0	0	--
Deerfield	2	47	--	--	0	0	0
Dennis	1	109	10	9	0	0	0
Dighton	0	65	--	--	1	0	0
Douglas	0	121	7	5	1	0	0
Dover	0	43	--	0	0	0	0
Dracut	1	375	27	14	2	1	--
Dudley	0	91	7	6	0	0	0
Dunstable	0	20	0	0	0	0	0
Duxbury	0	114	6	5	0	0	--
East Bridgewater	0	152	15	7	1	1	--
East Brookfield	0	21	--	--	0	0	0
East Longmeadow	0	129	13	--	1	1	0
Eastham	0	36	--	--	0	0	0
Easthampton	2	143	--	11	0	0	--
Easton	0	230	20	--	0	0	--
Edgartown	0	40	0	--	0	0	0
Egremont	0	7	0	0	0	0	0

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

<b>Community</b>	<b>Occurrence Births<sup>2</sup></b>	<b>Resident Births<sup>3</sup></b>	<b>Low Birthweight<sup>4</sup></b>	<b>Teen Births (15-19 years)</b>	<b>Infant Deaths<sup>5</sup></b>	<b>Neonatal Deaths<sup>6</sup></b>	<b>Fetal Deaths<sup>7</sup></b>
Erving	0	25	--	0	0	0	0
Essex	0	31	--	--	0	0	0
Everett	1	640	59	37	4	3	6
Fairhaven	0	156	10	8	0	0	--
Fall River	1,664	1,212	127	146	6	5	8
Falmouth	554	271	28	21	0	0	--
Fitchburg	3	625	47	91	4	2	--
Florida	0	14	0	0	0	0	0
Foxborough	0	169	15	--	0	0	--
Framingham	1,905	971	87	65	3	2	5
Franklin	2	372	32	--	0	0	--
Freetown	0	79	12	5	3	1	0
Gardner	590	259	13	23	0	0	0
Georgetown	0	81	9	0	0	0	0
Gill	0	7	--	0	0	0	0
Gloucester	1	308	27	19	0	0	--
Goshen	0	4	0	0	0	0	0
Gosnold	0	0	0	0	0	0	0
Grafton	0	259	19	6	1	1	--
Granby	0	44	--	--	0	0	0
Granville	0	14	0	--	0	0	0
Great Barrington	127	44	--	--	0	0	--
Greenfield	456	186	17	19	0	0	--
Groton	2	102	--	0	0	0	0
Groveland	0	67	--	0	0	0	0
Hadley	0	39	5	--	0	0	0
Halifax	0	67	--	--	1	1	0
Hamilton	0	93	13	--	0	0	0
Hampden	0	29	--	0	0	0	0
Hancock	0	13	--	0	0	0	0
Hanover	1	150	14	0	0	0	--
Hanson	0	92	6	--	1	1	0
Hardwick	0	32	--	--	0	0	0
Harvard	0	30	0	0	0	0	0
Harwich	0	100	7	--	0	0	0
Hatfield	1	17	0	0	0	0	0
Haverhill	8	904	95	73	6	5	7
Hawley	0	2	0	0	0	0	0
Heath	1	7	0	0	0	0	0
Hingham	1	238	7	--	0	0	0
Hinsdale	0	18	--	--	0	0	0
Holbrook	1	134	7	9	1	1	0
Holden	0	179	8	--	2	0	0
Holland	0	19	--	--	0	0	0
Holliston	0	159	9	--	0	0	0
Holyoke	577	656	53	143	7	6	--
Hopedale	1	60	--	0	0	0	0

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

<b>Community</b>	<b>Occurrence Births<sup>2</sup></b>	<b>Resident Births<sup>3</sup></b>	<b>Low Birthweight<sup>4</sup></b>	<b>Teen Births (15-19 years)</b>	<b>Infant Deaths<sup>5</sup></b>	<b>Neonatal Deaths<sup>6</sup></b>	<b>Fetal Deaths<sup>7</sup></b>
Hopkinton	0	172	5	--	1	0	--
Hubbardston	0	36	--	--	0	0	0
Hudson	0	229	18	10	0	0	--
Hull	1	100	11	--	1	1	0
Huntington	0	26	--	--	0	0	0
Ipswich	0	122	9	--	0	0	0
Kingston	0	135	16	--	1	1	0
Lakeville	0	134	18	5	0	0	0
Lancaster	1	73	6	--	1	1	0
Lanesborough	0	22	--	0	0	0	0
Lawrence	1,857	1,460	115	244	9	6	7
Lee	2	47	1	--	0	0	--
Leicester	0	101	10	6	1	1	0
Lenox	0	26	0	--	0	0	0
Leominster	1,195	532	32	38	5	4	5
Leverett	1	8	0	0	0	0	0
Lexington	0	189	6	--	0	0	0
Leyden	0	5	0	--	0	0	0
Lincoln	0	85	--	--	0	0	0
Littleton	0	115	9	--	0	0	--
Longmeadow	0	130	12	0	0	0	0
Lowell	2,685	1,817	165	202	9	8	8
Ludlow	0	199	16	16	4	4	0
Lunenburg	0	98	6	--	0	0	--
Lynn	3	1491	131	147	7	7	7
Lynnfield	0	79	11	0	1	1	0
Malden	2	843	63	28	7	6	5
Manchester-by-the-Sea	0	43	--	0	0	0	0
Mansfield	0	278	18	6	0	0	--
Marblehead	0	192	10	0	0	0	--
Marion	1	49	5	--	0	0	0
Marlborough	2	569	57	28	6	5	--
Marshfield	0	292	26	11	3	2	0
Mashpee	0	138	9	13	3	2	--
Mattapoisett	0	37	--	--	0	0	0
Maynard	2	173	17	--	0	0	0
Medfield	0	116	7	0	0	0	0
Medford	4	665	48	15	4	4	--
Medway	0	143	11	--	0	0	--
Melrose	1,293	293	12	--	3	2	--
Mendon	1	54	--	--	1	1	0
Merrimac	1	59	--	--	1	1	0
Methuen	1,213	577	39	29	1	1	--
Middleborough	3	268	32	20	3	2	--
Middlefield	0	4	0	--	0	0	0
Middleton	0	68	--	0	0	0	0
Milford	1,021	435	42	13	2	1	5

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

Community	Occurrence Births <sup>2</sup>	Resident Births <sup>3</sup>	Low Birthweight <sup>4</sup>	Teen Births (15-19 years)	Infant Deaths <sup>5</sup>	Neonatal Deaths <sup>6</sup>	Fetal Deaths <sup>7</sup>
Millbury	0	123	--	5	1	0	0
Millis	0	100	6	--	0	0	0
Millville	0	36	--	--	0	0	0
Milton	0	296	17	--	0	0	--
Monroe	0	2	0	0	0	0	0
Monson	0	67	--	--	0	0	0
Montague	6	88	--	--	0	0	--
Monterey	0	6	0	0	0	0	0
Montgomery	0	3	--	0	0	0	0
Mount Washington	0	0	0	0	0	0	0
Nahant	0	24	--	0	0	0	0
Nantucket	127	145	5	--	0	0	--
Natick	5	427	26	--	1	1	--
Needham	3	325	14	0	0	0	--
New Ashford	0	1	0	0	0	0	0
New Bedford	1,641	1,460	154	207	13	9	7
New Braintree	0	6	0	0	0	0	0
New Marlborough	0	11	0	--	0	0	--
New Salem	0	8	0	0	0	0	0
Newbury	1	70	7	--	1	1	0
Newburyport	771	180	18	11	0	0	0
Newton	3,381	812	62	8	3	3	--
Norfolk	0	103	6	--	1	0	--
North Adams	325	182	18	20	0	0	--
North Andover	0	297	20	6	2	1	0
North Attleboro	0	363	27	8	0	0	0
North Brookfield	0	46	--	6	0	0	0
North Reading	0	141	17	0	0	0	0
Northampton	871	219	15	11	0	0	--
Northborough	0	136	9	--	1	1	--
Northbridge	2	221	25	11	1	1	0
Northfield	0	24	--	--	0	0	0
Norton	0	202	14	6	0	0	0
Norwell	0	104	11	0	0	0	0
Norwood	544	364	30	10	2	1	0
Oak Bluffs	156	52	--	--	0	0	0
Oakham	0	17	0	0	0	0	0
Orange	2	91	0	11	0	0	0
Orleans	0	17	0	0	0	0	0
Otis	0	10	--	--	0	0	0
Oxford	2	161	6	12	0	0	0
Palmer	1	124	7	15	1	0	--
Paxton	2	57	1	--	0	0	0
Peabody	0	504	32	15	3	2	--
Pelham	0	7	0	0	0	0	0
Pembroke	0	213	16	7	0	0	--

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

Community	Occurrence Births <sup>2</sup>	Resident Births <sup>3</sup>	Low Birthweight <sup>4</sup>	Teen Births (15-19 years)	Infant Deaths <sup>5</sup>	Neonatal Deaths <sup>6</sup>	Fetal Deaths <sup>7</sup>
Pepperell	2	118	11	5	1	1	0
Peru	0	8	0	0	0	0	0
Petersham	1	8	0	0	0	0	0
Phillipston	0	19	--	--	0	0	0
Pittsfield	741	497	37	63	0	0	5
Plainfield	0	6	0	--	0	0	0
Plainville	0	119	9	5	0	0	--
Plymouth	732	729	46	30	4	1	5
Plympton	0	28	6	0	0	0	0
Princeton	1	21	--	0	0	0	0
Provincetown	0	15	--	0	0	0	0
Quincy	1	1,161	82	22	4	3	--
Randolph	1	421	37	18	1	1	5
Raynham	1	139	12	--	0	0	0
Reading	2	255	11	--	0	0	0
Rehoboth	0	104	--	--	1	0	0
Revere	1	686	65	39	8	7	--
Richmond	0	6	0	0	0	0	0
Rochester	0	53	5	0	0	0	0
Rockland	0	205	15	6	3	2	--
Rockport	0	45	--	--	1	1	0
Rowe	0	4	0	0	0	0	0
Rowley	0	64	9	--	0	0	0
Royalston	0	15	0	--	0	0	0
Russell	2	21	--	0	0	0	0
Rutland	0	101	7	--	1	1	--
Salem	1,819	523	35	28	2	2	--
Salisbury	0	64	5	7	0	0	0
Sandisfield	0	3	0	0	0	0	0
Sandwich	0	192	15	7	2	0	0
Saugus	0	263	20	7	1	1	--
Savoy	0	4	0	0	0	0	0
Scituate	0	162	11	--	1	1	0
Seekonk	0	119	8	--	1	1	0
Sharon	0	140	15	--	0	0	--
Sheffield	0	21	0	--	0	0	0
Shelburne	0	14	0	0	0	0	0
Sherborn	0	27	--	0	0	0	0
Shirley	0	72	--	--	0	0	0
Shrewsbury	1	396	31	--	3	2	--
Shutesbury	1	14	0	0	0	0	0
Somerset	0	178	12	8	2	1	--
Somerville	4	863	64	34	4	3	--
South Hadley	1	140	12	--	0	0	0
Southampton	0	42	--	--	0	0	0

**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

<b>Community</b>	<b>Occurrence Births<sup>2</sup></b>	<b>Resident Births<sup>3</sup></b>	<b>Low Birthweight<sup>4</sup></b>	<b>Teen Births (15-19 years)</b>	<b>Infant Deaths<sup>5</sup></b>	<b>Neonatal Deaths<sup>6</sup></b>	<b>Fetal Deaths<sup>7</sup></b>
Southborough	0	120	6	0	2	2	--
Southbridge	407	265	27	36	2	2	--
Southwick	0	74	--	--	0	0	0
Spencer	0	122	8	7	1	0	--
Springfield	5,679	2,523	274	490	23	14	16
Sterling	0	74	6	0	0	0	0
Stockbridge	1	16	--	--	0	0	0
Stoneham	2	202	16	--	2	1	0
Stoughton	2	298	37	7	0	0	--
Stow	0	81	--	--	0	0	0
Sturbridge	1	85	--	--	0	0	0
Sudbury	2	160	8	0	0	0	0
Sunderland	0	26	--	--	0	0	0
Sutton	2	96	5	0	0	0	--
Swampscott	1	139	6	0	0	0	0
Swansea	0	131	--	--	1	0	0
Taunton	502	784	67	53	5	4	9
Templeton	0	77	5	6	0	0	--
Tewksbury	1	313	20	6	0	0	1
Tisbury	0	48	--	--	0	0	0
Tolland	0	1	0	0	0	0	0
Topsfield	0	54	--	0	0	0	0
Townsend	1	83	--	--	0	0	--
Truro	0	14	--	0	0	0	0
Tyngsborough	1	120	9	--	0	0	0
Tyringham	0	2	0	0	0	0	0
Upton	1	81	6	--	0	0	0
Uxbridge	0	180	16	5	0	0	0
Wakefield	0	262	24	5	0	0	0
Wales	0	20	0	--	0	0	0
Walpole	0	258	13	--	1	1	--
Waltham	0	764	62	24	5	4	6
Ware	167	133	--	13	1	1	--
Wareham	436	213	11	18	0	0	--
Warren	1	45	--	--	0	0	0
Warwick	0	6	0	0	0	0	0
Washington	0	7	--	--	0	0	0
Watertown	1	403	36	7	0	0	0
Wayland	0	129	6	0	0	0	--
Webster	1	211	14	13	1	1	--
Wellesley	1	273	31	--	0	0	0
Wellfleet	0	12	--	0	1	1	0
Wendell	0	11	--	0	1	1	0
Wenham	0	30	--	0	0	0	0
West Boylston	0	51	--	--	2	1	--
West Bridgewater	0	59	5	0	0	0	0



**Table 33 (cont'd). Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2006**

Community	Occurrence Births <sup>2</sup>	Resident Births <sup>3</sup>	Low Birthweight <sup>4</sup>	Teen Births (15-19 years)	Infant Deaths <sup>5</sup>	Neonatal Deaths <sup>6</sup>	Fetal Deaths <sup>7</sup>
West Brookfield	0	33	6	--	0	0	0
West Newbury	0	39	--	0	0	0	0
West Springfield	0	351	29	29	2	2	--
West Stockbridge	0	9	--	--	0	0	0
West Tisbury	2	18	0	--	0	0	--
Westborough	1	252	19	--	0	0	--
Westfield	2	419	19	28	1	1	--
Westford	0	204	17	--	0	0	--
Westhampton	0	14	0	--	0	0	0
Westminster	0	73	--	5	0	0	0
Weston	0	76	7	0	0	0	0
Westport	0	143	11	--	0	0	--
Westwood	0	160	9	0	0	0	0
Weymouth	3,803	654	61	27	6	4	0
Whately	0	9	--	0	0	0	--
Whitman	1	196	6	11	1	0	0
Wilbraham	0	97	7	--	0	0	0
Williamsburg	0	25	--	--	0	0	0
Williamstown	1	54	--	0	0	0	0
Wilmington	0	255	21	5	0	0	0
Winchendon	1	121	8	11	0	0	--
Winchester	1,907	212	10	--	1	1	--
Windsor	0	4	0	0	0	0	0
Winthrop	0	148	6	--	1	0	0
Woburn	1	465	35	11	5	5	--
Worcester	6,210	2,596	201	242	13	10	17
Worthington	0	9	0	0	0	0	0
Wrentham	0	137	11	--	0	0	--
Yarmouth	1	225	19	18	1	1	--
Unknown	0	0	0	0	0	0	--

-- Due to small numbers for births (n=1-4), exact count not provided.

1. Values of 1-4 for medical characteristics of communities with less than 200 births are suppressed based on Guidelines for Release of Birth Data, Bureau of Health Information, Statistics, Research and Evaluation, Massachusetts Department of Public Health. 2. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 3. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 4. Less than 2,500 grams (5.5 lbs.). 5. Death of a child whose age is less than one year. 6. Death of a child whose age is less than 28 days. 7. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. When the number of fetal deaths is between 1 and 4, it is suppressed.

**Table 34. Birth Characteristics: Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2006**

County	Occurrence Births <sup>1</sup>	Resident Births <sup>2</sup>			Deaths		
		Number	Low Birthweight <sup>3</sup>	Teen Births (15-19 years)	Infant Deaths <sup>4</sup>	Neonatal Deaths <sup>5</sup>	Fetal Deaths <sup>6</sup>
<b>STATE TOTAL</b>	78,511	77,670	6,150	4,722	369	279	388
Barnstable	1,576	1,905	143	113	8	4	7
Berkshire	1,198	1,240	100	110	0	0	13
Bristol	4,874	6,637	570	514	39	27	37
Dukes	160	175	-- <sup>7</sup>	10	0	0	-- <sup>8</sup>
Essex	7,785	9,062	720	627	39	33	41
Franklin	473	675	39	48	1	1	7
Hampden	6,263	5,792	499	805	41	30	29
Hampshire	1,049	1,234	73	66	2	2	6
Middlesex	15,736	17,795	1,335	609	79	66	84
Nantucket	127	145	5	-- <sup>7</sup>	0	0	--
Norfolk	4,361	7,696	592	145	18	12	33
Plymouth	3,436	5,908	513	313	34	23	28
Suffolk	22,019	9,498	840	690	57	44	44
Worcester	9,454	9,908	717	668	51	37	55

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, or city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. 7. Births between 1-4 are suppressed. 8. When the number of fetal deaths is between 1-4, it is suppressed.

**Table 35. Birth Characteristics, Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs), Massachusetts: 2006**

Community Health Network Area	Occurrence Births <sup>1</sup>	Resident Births <sup>2</sup>			Deaths		
		Number	LBW <sup>3</sup>	Teen Births (15-19 years)	Infant <sup>4</sup>	Neonatal <sup>5</sup>	Fetal <sup>6</sup>
<b>STATE TOTAL</b>	<b>78,511</b>	<b>77,670</b>	<b>6,150</b>	<b>4,722</b>	<b>369</b>	<b>279</b>	<b>388</b>
Community Health Network of Berkshire County	1,198	1,240	100	110	0	0	13
Upper Valley Health Web (Franklin County)	476	870	51	71	1	1	9
Partnership for Health in Hampshire County (Northampton)	1,049	1,208	71	62	2	2	6
The Community Health Connection (Springfield)	5,682	3,815	364	558	27	17	20
Community Health Network of Southern Worcester County	415	1,321	91	99	6	5	6
Community Partners for Health (Milford)	1,031	2,117	182	62	6	4	12
Community Health Network of Greater Metro West (Framingham)	1,918	4,854	357	142	17	13	27
Community Wellness Coalition (Worcester)	6,216	3,992	293	276	25	17	20
Fitchburg/Gardner Community Health Network	1,797	3,073	200	225	14	11	21
Greater Lowell Community Health Network	2,689	3,657	300	244	17	14	19
Greater Lawrence Community Health Network	3,072	2,671	198	280	12	8	12
Greater Haverhill Community Health Network	781	1,816	171	110	10	9	10
Community Health Network North (Beverly/Gloucester)	2,108	1,125	94	34	3	3	-- <sup>7</sup>
North Shore Community Health Network	1,824	3,450	257	203	14	13	16
Greater Woburn/Concord/Littleton Community Health Network	3,127	2,097	135	28	9	9	13
North Suburban Health Alliance (Medford/Malden/Melrose)	1,304	3,301	250	94	20	16	16
Greater Cambridge/Somerville Community Health Network	3,313	3,245	230	78	11	9	8
West Suburban Health Network (Newton/Waltham)	3,385	2,729	214	39	8	7	10
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	22,020	10,189	881	694	57	44	48
Blue Hills Community Health Alliance (Greater Quincy)	4,352	4,327	334	97	17	12	13
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	580	1,927	135	249	13	12	9
Greater Brockton Community Health Network	2,264	3,115	306	206	16	11	17
South Shore Community Partners in Prevention (Plymouth)	733	2,145	161	74	14	9	11
Greater Attleboro-Taunton Health & Education Response	1,572	3,117	242	142	13	9	15
Partners for a Healthier Community (Fall River)	1,664	1,664	153	160	9	6	11
Greater New Bedford Health & Human Services Coalition	2,078	2,380	228	258	20	14	12
Cape and Islands Community Health Network	1,863	2,225	152	127	8	4	9

1. Births occurring in a geographical place (state, city/town) regardless of the residency of the mother. See Glossary for more details. 2. Births to mothers who report their usual place of residence as a particular geographical place (state, city/town). See Glossary for more details. 3. Less than 2,500 grams (5.5 lbs.). 4. Death of a child whose age is less than one year. 5. Death of a child whose age is less than 28 days. 6. A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more. 7. When the number of fetal deaths is between 1-4, it is suppressed.

## TECHNICAL NOTES

### Data Availability

This publication and other Department of Public Health publications and materials can be accessed on the Internet at:

<http://www.state.ma.us/dph/pubstats.htm>

Detailed information on 2006 births in Massachusetts, as well as access to other Department of Public Health data, is available on the Department's free, Internet-accessible data warehouse, **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 617-624-5629.

### Data Cautions

#### Limitations of small numbers:

Cells in some tables in this publication, and particularly those tables specific to the individual cities and towns, contain small numbers. Rates and proportions based on less than five observations are suppressed, and trends based upon small numbers should be interpreted cautiously.

#### Differences with previously published data

Numbers and rates in this publication may differ from those contained in previous reports because of updated birth and death files, or release of the most up-to-date population estimates for a given year (see Technical Note #4 for details on population files).

#### Self-reported data

Many items used in this publication, such as maternal smoking, education, and race/ethnicity are self-reported, and are subject to the usual limitations of this type of information.

### Changes in the Collection of Race And Ethnicity Information

#### Assignment of an Infant's Race/Ethnicity

Prior to 1989, the race/ethnicity of an infant was assigned by combining information on the race/ethnicity of the mother and the race/ethnicity of the father. Since 1989, Massachusetts has followed the recommendation of the National Center for Health Statistics of classifying births according to the self-reported race/ethnicity of the mother. Therefore, beginning in 1989, the race/ethnicity of an infant is identical to the self-reported race/ethnicity of the infant's mother.

#### Addition of Information on Hispanic Ethnicity

Beginning in 1986, an identifier for Hispanic ethnicity was added to the birth certificate; in 1989, an identifier for Hispanic ethnicity was added to the death certificate. Prior to these changes, most infants and mothers of Hispanic ethnicity were included with whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

The following table is from the Parent Worksheet for the birth certificate:

MOTHER'S ANCESTRY Please mark the *one* category that *best describes* the mother's ancestry of ethnic heritage:

HISPANIC/LATINA		AFRICAN/AFRICAN AMERICAN	
1 <input type="checkbox"/> Puerto Rican	7 <input type="checkbox"/> Other Central American (specify) _____	29 <input type="checkbox"/> African-American/ Afro-American	
2 <input type="checkbox"/> Dominican		30 <input type="checkbox"/> Nigerian	
3 <input type="checkbox"/> Mexican	8 <input type="checkbox"/> Other South American (specify) _____	31 <input type="checkbox"/> Other African specify): _____	
4 <input type="checkbox"/> Cuban			
5 <input type="checkbox"/> Colombian	9 <input type="checkbox"/> Other Hispanic/Latina (specify): _____		
6 <input type="checkbox"/> Salvadoran			
ASIAN/PACIFIC ISLANDER		MIDDLE EASTERN	
10 <input type="checkbox"/> Chinese	17 <input type="checkbox"/> Laotian	32 <input type="checkbox"/> Lebanese	
11 <input type="checkbox"/> Vietnamese	18 <input type="checkbox"/> Pakistani	33 <input type="checkbox"/> Iranian	
12 <input type="checkbox"/> Cambodian	19 <input type="checkbox"/> Thai	34 <input type="checkbox"/> Israeli	
13 <input type="checkbox"/> Asian Indian	20 <input type="checkbox"/> Hawaiian	35 <input type="checkbox"/> Other Middle Eastern (specify): _____	
14 <input type="checkbox"/> Korean	21 <input type="checkbox"/> Other Asian/Pacific Islander(specify) _____		
15 <input type="checkbox"/> Filipino		AMERICAN ANCESTRY	
16 <input type="checkbox"/> Japanese		36 <input type="checkbox"/> Native American/ American Indian (specify tribe/affiliation): _____	
PORTUGUESE SPEAKING		37 <input type="checkbox"/> American	
22 <input type="checkbox"/> Cape Verdean	24 <input type="checkbox"/> Other Portuguese (specify): _____		
23 <input type="checkbox"/> Brazilian		EUROPEAN and OTHER ancestries	
WEST INDIAN/CARIBBEAN ISLANDER		38 <input type="checkbox"/> European (specify): _____	
25 <input type="checkbox"/> Haitian	28 <input type="checkbox"/> Other West Indian/Caribbean Islander (specify): _____	39 <input type="checkbox"/> Other (specify): _____	
26 <input type="checkbox"/> Jamaican			
27 <input type="checkbox"/> Barbadian			

We have eliminated the "Other-" categories from the mothers ancestry groups and replaced them with the specific ancestries within these groups, which had counts greater than or equal to 300 (such as Guatemalan and Honduran from "Other Central American" and Portuguese from the "Other Portuguese").

## Population Estimates

In *Massachusetts Births 2006*, we have used two sources for population denominators to calculate population-based rates. For state level birth rates including: the birth rate, teen birth rate, teen birth rates by race and Hispanic ethnicity, age-specific birth rates, and the crude birth rate, we used the latest available population for 2006 from the National Center for Health Statistics (NCHS). This file, referred to as the MARS (Modified Age, Race/Ethnicity, and Sex) file, produced by NCHS and the Census Bureau Population Estimates Program, includes data by single year or age, sex, race and Hispanic ethnicity in the five mutually exclusive categories used by the Department: White Non-Hispanic, Black Non-Hispanic, Asian Non-Hispanic, American Indian/Alaska Native Non-Hispanic, and Hispanic. These estimates are not available for geographic levels below the county.

For city and town rates, we have used population estimates for 2005, which are the most up-to-date population estimates available by age, race, and sex at the sub-county level. If the population in your community increased from 2005 to 2006, the rates listed may **overestimate**

the actual rate. If the population in your community declined from 2005 to 2006, the rates given in the publication may **underestimate** the actual rate. As soon as new population data are available, revised rates will be posted on MassCHIP, the Department's online database (<http://masschip.state.ma.us>).

#### Note on Population Estimate Changes Due to Readjustment for Boston and Medford

In 2006, the cities of Boston and Medford challenged the Census Bureau's population estimates for their cities. Boston disagreed with the estimates that showed Boston had lost 30,000 in population since 2000. The Census Bureau accepted much of that challenge and increased the city's estimated population for 2005 from 559,034 to 596,638, an increase of 37,604 or 6.7%. The Census Bureau accepted Medford's challenge and increased its estimate for 2005 from 53,523 to 55,798, an increase of 2,275 or 4.3%. The combined population increase for the two cities was 39,879. One impact of these adjustments was an increase in the state's female teen population of 12,111. Since the Census Bureau's 2006 population estimates are based upon their (final) 2005 estimates, this means that the 2006 teen population is 13,540 larger than the original 2005 estimate. Refer to Table A for the statewide age, race, and sex population distribution.

#### Source for 2006 Population Estimates

National Center for Health Statistics. Estimates of the July 1, 2000-July 1, 2006, United States resident population from the Vintage 2006 postcensal series by year, county, age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. Available on the Internet from:

<http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm>. August 16, 2006.

#### Source for 2005 Population Estimates

Massachusetts Department of Public Health, Bureau of Health Information, Statistics, Research, and Evaluation, Division of Research and Epidemiology. Massachusetts Department of Public Health Modified Age, Race/Ethnicity, and Sex (MMARS00-05) which is based upon 2005 estimates produced by the National Center for Health Statistics in collaboration with the Census Bureau's Population Estimation Program. October 2006. Available on the Internet from: <http://masschip.state.ma.us>.

For additional information about population and MDPH estimation methods, refer to the Technical Notes in the report, *Massachusetts Births 2005*, which can be downloaded from the following website:

<http://www.mass.gov/dph/pubstats.htm>

**Table A. 2006 Massachusetts Population Estimates<sup>1</sup> by Age Group, Gender, Race and Hispanic Ethnicity<sup>2</sup> (mutually exclusive)**

Age Group	Total	White Non-Hispanic	Black Non-Hispanic	Native American Non-Hispanic	Asian Non-Hispanic	Hispanic
<b>Female</b>						
0 to 4	189,978	136,627	18,319	412	11,802	22,818
5 to 9	189,761	141,447	15,068	476	10,564	22,206
10 to 14	200,305	151,048	15,927	521	9,888	22,921
15 to 19	221,338	169,061	17,636	660	10,881	23,100
20 to 24	225,199	169,542	17,207	706	14,972	22,772
25 to 29	207,128	149,436	15,120	580	17,696	24,296
30 to 34	207,614	151,316	14,693	482	18,710	22,413
35 to 39	240,320	187,155	15,444	536	15,651	21,534
40 to 44	263,911	214,812	16,025	626	12,978	19,470
45 to 49	263,514	222,242	14,463	668	10,640	15,501
50+	1,110,920	993,016	45,778	2,059	30,886	39,181
<b>All Females</b>	<b>3,319,988</b>	<b>2,685,702</b>	<b>205,680</b>	<b>7,726</b>	<b>164,668</b>	<b>256,212</b>
<b>Male</b>						
0 to 4	197,885	142,226	19,459	448	12,270	23,482
5 to 9	197,851	148,376	15,607	460	10,322	23,086
10 to 14	210,675	159,547	16,672	551	9,868	24,037
15 to 19	225,473	172,362	17,785	634	10,636	24,056
20 to 24	223,697	167,362	17,484	674	13,389	24,788
25 to 29	208,183	148,370	15,556	545	16,667	27,045
30 to 34	206,636	150,242	13,701	527	18,677	23,489
35 to 39	233,466	181,694	14,170	496	16,229	20,877
40 to 44	254,852	207,541	15,010	624	13,129	18,548
45 to 49	251,673	213,437	13,325	684	10,111	14,116
50+	906,814	810,772	35,175	27,683	1,906	31,278
<b>All Males</b>	<b>3,117,205</b>	<b>2,501,929</b>	<b>193,944</b>	<b>33,326</b>	<b>133,204</b>	<b>254,802</b>
<b>Total</b>						
0 to 4	387,863	278,853	37,778	860	24,072	46,300
5 to 9	387,612	289,823	30,675	936	20,886	45,292
10 to 14	410,980	310,595	32,599	1,072	19,756	46,958
15 to 19	446,811	341,423	35,421	1,294	21,517	47,156
20 to 24	448,896	336,904	34,691	1,380	28,361	47,560
25 to 29	415,311	297,806	30,676	1,125	34,363	51,341
30 to 34	414,250	301,558	28,394	1,009	37,387	45,902
35 to 39	473,786	368,849	29,614	1,032	31,880	42,411
40 to 44	518,763	422,353	31,035	1,250	26,107	38,018
45 to 49	515,187	435,679	27,788	1,352	20,751	29,617
50+	2,017,734	1,803,788	80,953	29,742	32,792	70,459
<b>State Total</b>	<b>6,437,193</b>	<b>5,187,631</b>	<b>399,624</b>	<b>41,052</b>	<b>297,872</b>	<b>511,014</b>

1. National Center for Health Statistics. Estimates of the July 1, 2000-July 1, 2006, United States resident population from the Vintage 2006 postcensal series by year, county, age, sex, race, and Hispanic origin, prepared under a collaborative arrangement with the U.S. Census Bureau. Available on the Internet from: <http://www.cdc.gov/nchs/about/major/dvs/popbridge/popbridge.htm>. August 16, 2006. 2. Persons of Hispanic ethnicity are NOT included in the race categories. These estimates are used to calculate state-wide population based rates in published in this report.

## Change In Measurement Of Adequacy Of Prenatal Care

Change in Adequacy of Prenatal Care Indicator since *Massachusetts Births 2001*: (This discussion is based on excerpts from “An Overview of the APNCU Index” by Milton Kotelchuck, Sept. 1994, available online at: [http://www.mchlibrary.info/databases/HSNRCPDFs/Overview\\_APCUIndex.pdf](http://www.mchlibrary.info/databases/HSNRCPDFs/Overview_APCUIndex.pdf). Accessed December 2003).

Beginning with *Massachusetts Births 2001*, adequacy of prenatal care is being measured using a new method. The Adequacy of Prenatal Care Utilization (APNCU) Index, developed by Dr. Milton Kotelchuck, has replaced the Kessner Index, which had been used in the *Advanced Data Births* and *Massachusetts Births* series. The APNCU Index is the standard used in *Healthy People 2010* and by the majority of states. It improves upon the Kessner Index in various ways, the most important being the ability to distinguish between inadequate prenatal care due to the timing of initiation and inadequate care due to insufficient prenatal care visits. The APNCU Index also improves upon the Kessner Index by correcting some of its principal faults. First, the APNCU Index more accurately assesses adequacy of visits for term pregnancies; the Kessner Index characterizes 9 or more visits as adequate, due to an early computer database limitation, which only allowed for a single-digit number to record prenatal care visits. Other faults of the Kessner Index include its bias towards measurement of adequacy of initiation of care, and its various computational algorithms due to inadequate initial documentation.

Table 1 of this report provides a comparison of data on adequacy of prenatal care from 1996-2006 as measured by these two separate indices. Below are the definitions for the APNCU Index categories and its two component indices (initiation and received services), and the definition of the Kessner Index categories. Also below is a short summary of the major differences in classification of adequacy of prenatal care using the Kessner Index and the APNCU Index.

The APNCU Index characterizes prenatal care (PNC) utilization by measuring two distinct components of prenatal care -- adequacy of initiation and adequacy of received services (visits). Each of these components is measured as an independent index, and the APNCU Index is a summary of these 2 component indices. As with the Kessner Index, the APNCU Index does not assess quality of the prenatal care that is delivered, only its utilization.

### Adequacy of Prenatal Care Utilization (APNCU) Index: Definition of Categories

Category	Month Prenatal Care Began	% of Expected <sup>1</sup> Prenatal Care Visits
Adequate Intensive	1, 2, 3, or 4	110% or more
Adequate Basic	1, 2, 3, or 4	80 – 109%
Intermediate	1, 2, 3, or 4	50 – 79%
Inadequate	Month 5 or later	Less than 50%
Unknown	Prenatal care information not recorded	

<sup>1</sup> The number of “expected” visits is determined based on standards set by the American College of Obstetricians and Gynecologists (ACOG).



## **Component Indices of the APNCU Index: Definitions of Categories**

### Component Indices and Summary Index

The first component index is "Adequacy of Initiation," which describes the adequacy of when prenatal care began during pregnancy. The assumption underlying this scale is that the earlier PNC begins the better. The month or trimester prenatal care begins is widely used as a measure to assess the adequacy of timing of initiation of PNC, since it accurately and succinctly describes when PNC begins. The APNCU Index uses this measure to determine the "adequacy of initiation."

The second component index, "Adequacy of Received Services" (visits), characterizes the adequacy of received PNC visits during the time period after prenatal care is begun until the delivery. This component attempts to characterize if the woman received the appropriate number of prenatal care visits for the time period in which she received PNC services. [The appropriate number of visits is based on recommendations of the American College of Obstetricians and Gynecologists for an uncomplicated pregnancy. For example, a woman beginning prenatal care during the first month of pregnancy who delivers during the 40th week of gestation (and has no complications with her pregnancy) should receive 14 visits].

The two component indices are measured independently from one another, and can be used as separate indices, since the policy and practice issues underlying whether women are beginning care early and whether they are receiving the recommended amount of visits may be quite distinct. However, because of the popularity and utility of using one overall adequacy of PNC index, the two component indices are combined into a single summary index – the "Adequacy of Prenatal Care Utilization (APNCU) Index."

### **Index Categories**

Both component indices and the summary index (APNCU Index) characterize PNC as one of five categories: "adequate intensive," "adequate basic," "intermediate," "inadequate," or "unknown." The category "adequate basic" refers to the minimum recommended level of care (for a pregnancy with no complications), while "adequate intensive" refers to a level of care exceeding recommended standards. The sum of the "adequate basic" and "adequate intensive" categories is the total adequacy score. In addition, the "inadequate" category can be subdivided to isolate those women who received no PNC. [For definitions of categories, please see the Technical Notes in the Appendix.]

[For more detail on the methodology of the APNCU Index, please call the Bureau of Health Information, Statistics, Research & Evaluation at 617-624-5600].

### Adequacy of Initiation Index

Category	Month Prenatal Care Began
Adequate Intensive	1 or 2
Adequate Basic	3 or 4
Intermediate	5 or 6
Inadequate	Month 7 or later, or no PNC
Unknown	Prenatal care initiation information not recorded

### Adequacy of Received Services (Visits) Index

Category	% of Expected Prenatal Care Visits
Adequate Intensive	110% or more
Adequate Basic	80 – 109%
Intermediate	50 – 79%
Inadequate	Less than 50%
Unknown	Information on prenatal care visits not recorded

### Kessner Index of Adequacy of Prenatal Care: Definition of Categories

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
Inadequate	1	1-4
	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

### Summary of Major Differences in Categorization of Adequacy of Prenatal Care between the Kessner Index and the APNCU Index

The two different methods used in the Kessner Index and APNCU Index to calculate adequacy of prenatal care can result in differences in how each one classifies adequacy of prenatal care. These differences only occur under certain conditions, not in all cases (see "Explanation" column).

The Kessner Index classifies prenatal care as...	... but the APNCU Index classifies prenatal care as ...	Explanation
Intermediate	Adequate Basic	This is primarily due to the fact that the APNCU Index allows for prenatal care in the 4 <sup>th</sup> month of pregnancy to be considered adequate if the mother received 80-109% of expected visits, whereas the Kessner Index only allows for care begun in the first trimester (months 1-3) to be considered adequate.
Intermediate	Inadequate	This is primarily due to the fact that the APNCU categorizes any prenatal care beginning after month 4 as "inadequate" whereas the Kessner Index allows for care beginning in months 5 or 6 with 5 or more visits to be "intermediate."
Adequate	Intermediate	This is primarily due to the consideration of "expected" visits (based on when the mother initiated care and the length of gestation) using the APNCU Index, which bases expected visits on the ACOG recommendations, which can be as high as 14 visits if a gestational period is 40 weeks, whereas the Kessner Index considers 9 visits sufficient in all cases.
Adequate	Adequate Intensive	The APNCU Index added an "Adequate Intensive" category, which is not used in the Kessner Index. This allows analysis of situations in which more than normal care is received (e.g. women with high risk conditions, pregnancy complications).

## Tests of Statistical Significance

Since the 2005 report, statistics presented in the text section have been tested to determine whether they differ significantly from a target statistic. For example, the number of births in 2006 was compared with the number of births in 2005, to determine whether their difference could have occurred by chance. When a difference is unlikely to have occurred by chance, it is referred to as “significant.”

Note that with respect to statistical difference, the language in the reports beginning with 2005 differs from that of past reports, and caution must be used when comparing the text of previous reports with this year's report.

In testing for statistical significance, we have used the testing methods from the National Center for Health Statistics (NCHS). These methods are presented in the following document:

National Vital Statistics Reports, Volume 52, Number 10

Births: Final Data for 2002

by Joyce A. Martin, M.P.H.; Brady E. Hamilton, Ph.D.; Paul D. Sutton, Ph.D.; Stephanie J. Ventura, M.A.; Fay Menacker, Dr. P.H.; and Martha L. Munson, M.S.;

From the Division of Vital Statistics, NCHS.

Technical Notes, “Significance testing” section beginning on page 110.

This document is available from the following website:

<http://www.cdc.gov/nchs/products/pubs/pubd/nvsr/52/52-23.htm>

For comparisons of more than 100 events, whether they are rates, proportions, or numbers, the binomial distribution is assumed, and confidence intervals are examined to see whether they overlap (Refer to the “Confidence Intervals and Infant Mortality Rates” section in this Appendix for an explanation of using confidence intervals to determine statistical significance.) When the number of events is less than 100, a Poisson distribution is assumed, and confidence intervals are constructed based upon the Poisson distribution. For more details and exact formulas for calculating confidence intervals or other tests of statistical significance, refer to the publication listed above.

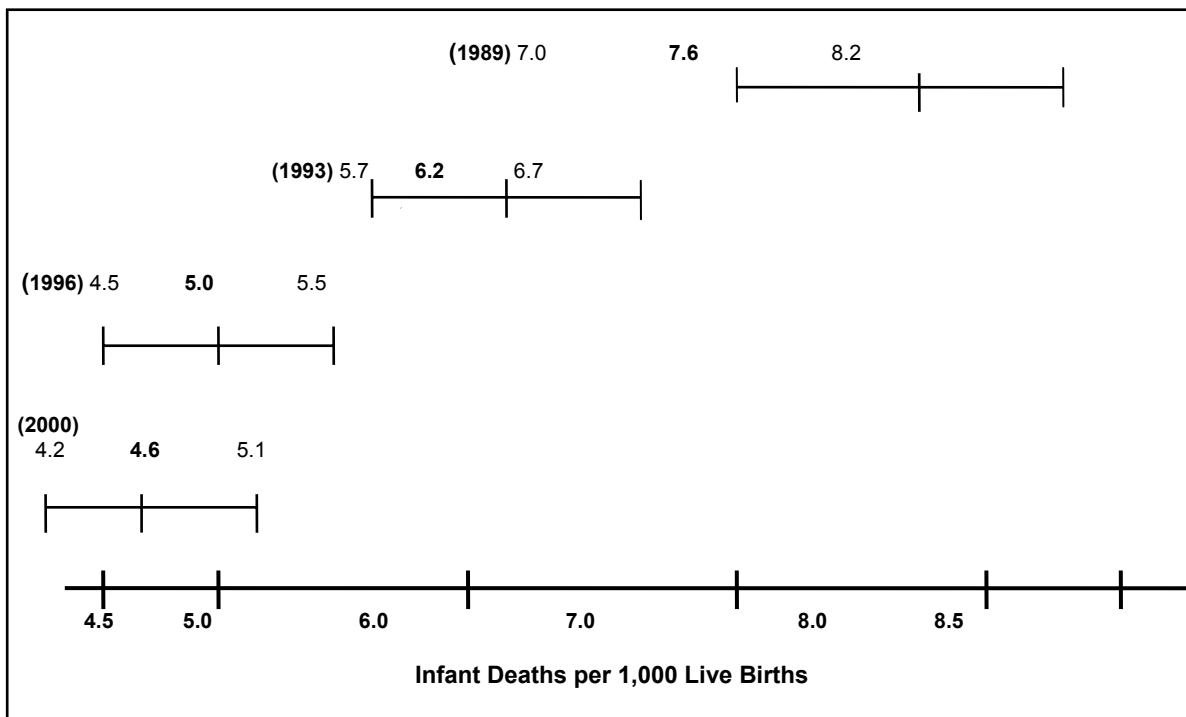
When two statistics are determined to differ significantly, they then are referred to in the text with language expressing differences, such as “higher” and “lower”, or “increased” and “decreased”. Otherwise, differences which are not significant are reported as having “no change” or “no statistical difference.”

## CONFIDENCE INTERVALS AND INFANT MORTALITY RATES

Beginning with the 1992 Advance Data: Births publication, 95% confidence intervals were added to the calculation of infant mortality rates (IMRs). The confidence interval (CI) provides a measure of stability of the IMR and a basis for comparing rates to determine if they are statistically different. Rates can be compared for the same group in different years, or for different groups in the same year. The width of the CI reflects the stability of the IMR. For example, a narrow CI reflects high stability, and a wide interval reflects low stability. If the CIs around two IMRs being compared do not overlap, the difference between the two rates is statistically significant. The following table and chart illustrate the concept of statistically significant differences using actual data from 1989, 1993, 1996, and 2000.

**Comparison of Infant Mortality Rates and Confidence Intervals for Selected Years**

<u>Year</u>	<u>IMR (per 1,000 births)</u>	<u>95% Confidence Interval</u>
1989	7.6	(7.0-8.2)
1993	6.2	(5.7-6.7)
1996	5.0	(4.5-5.5)
2000	4.6	(4.2-5.1)



The difference between the 1993 IMR and 1996 IMR is statistically significant – the confidence intervals do not overlap. The same is true for the differences between the 1989 IMR and each annual IMR for 1993, 1996, and 2000. However, the difference between the 1996 and 2000 IMRs is not statistically significant, since their confidence intervals overlap.

**Table 36. 95% Confidence Intervals for Infant Mortality Rates by Race and Hispanic Ethnicity, Massachusetts: 1990-2006**

Year	<u>Total<sup>1</sup></u>		<u>White non-Hispanic</u>		<u>Black non-Hispanic</u>		<u>Hispanic</u>		<u>Asian</u>	
	n	Rate <sup>2</sup> (95% CI)	n	Rate <sup>2</sup> (95% CI)	n	Rate <sup>2</sup> (95% CI)	n	Rate <sup>2</sup> (95% CI)	n	Rate <sup>2</sup> (95% CI)
1990	649	7.0 (6.5, 7.5)	442	6.1 (5.5, 6.7)	98	13.7 (11.0, 16.4)	77	9.1 (7.1, 11.1)	24	7.0 (4.2, 10.0)
1991	577	6.5 (6.0, 7.0)	381	5.5 (4.9, 6.1)	101	15.0 (12.1, 17.9)	80	9.4 (7.3, 11.5)	14	4.2 (2.0, 6.4)
1992	569	6.5 (6.0, 7.0)	371	5.5 (4.9, 6.1)	110	16.4 (13.4, 19.4)	67	7.9 (6.0, 9.8)	16	4.9 (2.5, 7.3)
1993	523	6.2 (5.7, 6.7)	346	5.3 (4.7, 5.9)	84	13.1 (10.3, 15.9)	77	9.3 (7.2, 11.4)	13	3.9 (1.8, 6.0)
1994	499	6.0 (5.4, 6.5)	343	5.3 (4.7, 5.9)	79	12.6 (9.8, 15.4)	64	7.6 (5.7, 9.4)	8	2.4 (0.7, 4.0)
1995	419	5.1 (4.6, 5.6)	275	4.4 (3.8, 4.9)	65	11.1 (8.4, 13.8)	58	7.2 (5.3, 9.0)	19	5.5 (3.0, 8.0)
1996	403	5.0 (4.5, 5.5)	289	4.7 (4.1, 5.2)	63	11.4 (8.6, 14.2)	40	5.1 (3.5, 6.7)	8	2.2 (0.7, 3.7)
1997	425	5.3 (4.8, 5.8)	294	4.8 (4.2, 5.3)	64	11.7 (8.8, 14.5)	55	6.7 (4.9, 8.4)	10	2.6 (1.0, 4.2)
1998	414	5.1 (4.6, 5.6)	294	4.6 (4.1, 5.2)	64	10.6 (7.9, 13.3)	55	6.7 (5.0, 8.4)	10	2.7 (1.0, 4.3)
1999	418	5.2 (4.7, 5.7)	285	4.7 (4.2, 5.3)	72	12.3 (9.5, 15.1)	49	5.5 (4.0, 7.1)	8	1.9 (0.6, 3.3)
2000	377	4.6 (4.2, 5.1)	232	3.8 (3.4, 4.3)	74	12.8 (9.9, 15.7)	48	5.2 (3.7, 6.6)	19	4.1 (2.2, 5.9)
2001	407	5.0 (4.5, 5.5)	245	4.1 (3.6, 4.7)	71	12.1 (9.3, 14.9)	69	7.3 (5.6, 9.1)	15	3.1 (1.6, 4.7)
2002	397	4.9 (4.4, 5.4)	239	4.1 (3.6, 4.6)	69	11.6 (8.9, 14.3)	67	7.0 (5.3, 8.7)	16	3.0 (1.5, 4.5)
2003	383	4.8 (4.3, 5.3)	235	4.1 (3.6, 4.6)	75	12.7 (9.8, 15.5)	55	5.6 (4.1, 7.1)	14	2.7 (1.3, 4.1)
2004	376	4.7 (4.3, 5.3)	210	3.8 (3.3, 4.3)	70	11.5 (8.9, 14.2)	75	7.6 (5.9, 9.4)	15	2.7 (1.4, 4.1)
2005	391	5.1 (4.6, 5.6)	230	4.3 (3.7, 4.9)	57	9.4 (7.0, 11.8)	78	7.8 (6.0, 9.5)	18	3.4 (1.8, 5.0)
2006	369	4.8 (4.3, 5.2)	221	4.2 (3.6, 4.7)	72	11.1 (8.6, 13.7)	62	5.8 (4.4, 7.2)	10	1.8 (0.7, 3.0)

1. Deaths of infants of unknown race are excluded except for 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. Rates are expressed per 1,000 live births.

In 2006, the black non-Hispanic infant mortality rate was 11.1 deaths per 1,000 live births (95% CI: 8.6, 13.7), which was more than two times greater than the white non-Hispanic infant mortality rate of 4.2 (95% CI: 3.6, 4.7). The difference in these two rates was statistically significant. The rate of infant mortality for black non-Hispanics was also significantly elevated compared with Hispanics (95% CI: 4.4, 7.2) and Asians (95% CI: 0.7, 3.0) in 2006.

## Definition Of Rates And Ratios

### Age-Specific Birth Rate

The number of children born to women in a specific age group divided by the population of women in that specific age group, multiplied by 1,000.

$$\text{Age-Specific Birth Rate} = \frac{\text{Number of births to females ages X to Y years}}{\text{Number of females ages X to Y years in the population}} \times 1,000$$

### Birth Rate

(See Age-Specific Birth Rate, Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

### Cesarean Section Rates

$$\text{Total C-section Rate} = \frac{\text{Number of C-section births}}{\text{Number of occurrence births}} \times 100$$

$$\text{Primary C-section Rate} = \frac{\text{Number of primary C-section births}}{[\text{Number of occurrence births} - (\text{number of repeat C-section births} + \text{VBACs})]} \times 100$$

$$\text{Repeat C-section Rate} = \frac{\text{Number of repeat C-section births}}{(\text{Number of repeat C-section births} + \text{number of VBACs})} \times 100$$

$$\text{VBAC Rate} = \frac{\text{Number of VBACs}}{(\text{Number of repeat C-section births} + \text{number of VBACs})} \times 100$$

### Crude Birth Rate

$$\text{Crude Birth Rate} = \frac{\text{Number of resident live births}}{\text{Total resident population}} \times 1,000$$

### Fertility Rate (sometimes referred to as "Birth Rate")

$$\text{Fertility Rate} = \frac{\text{Number of births to females ages 15-44 years}}{\text{Number of females ages 15-44 years in the population}} \times 1,000$$

### Fetal Mortality Rate

$$\text{Fetal Mortality Rate} = \frac{\text{Number of fetal deaths}}{\text{Number of fetal deaths plus live births in the same year}} \times 1,000$$

### Feto-Infant Mortality Rate

$$\text{Feto-Infant Mortality Rate} = \frac{\text{Number of fetal deaths} + \text{Number of infant deaths}}{\text{Number of fetal deaths} + \text{live births in the same year}} \times 1,000$$

(Refer to the definitions of Fetal Mortality Rate and Infant Mortality Rate for more details.)

### Infant Mortality Rate (IMR)

The death rate among infants less than one year old per 1,000 live births.

$$\text{Infant Mortality Rate} = \frac{\text{Number of resident deaths of infants less than one year old in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Inter-pregnancy Interval (IPI)

Inter-pregnancy interval is the time, in months, between the date of last menstrual period of current pregnancy and the date of previous live birth. IPI is calculated for each mother currently giving birth to their second or later child.

$$\% \text{Short IPI} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI} < 12 \text{ months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

$$\% \text{ IPI } 12 \text{ to } 35 \text{ months} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI between 12 and 35 months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

$$\% \text{ IPI } 36+ \text{ months} = \frac{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child with IPI } \geq 36 \text{ months}}{\text{Number of mothers giving birth to their 2}^{\text{nd}} \text{ or later child in the same year}} \times 100$$

### Maternal Mortality Ratio (MMR)

The number of maternal deaths per 100,000 live occurrence births. The term "ratio" is used instead of "rate" in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Maternal Mortality Ratio (MMR)} = \frac{\text{Number of maternal deaths}}{\text{Number of occurrence live births in the same year}} \times 100,000$$



### Neonatal Mortality Rate (NMR)

The death rate among infants less than 28 days of age per 1,000 live births.

$$\text{Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants less than 28 days of age in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Perinatal Mortality Rate

$$\text{Perinatal Mortality Rate} = \frac{\text{Number of fetal deaths from 28 weeks gestation plus infant deaths (less than 7 days old)}}{\text{Number of fetal deaths plus live births in the same year}} \times 1,000$$

### Post Neonatal Mortality Rate

The death rate among infants 28 days of age to less than one year old per 1,000 live births.

$$\text{Post Neonatal Mortality Rate} = \frac{\text{Number of resident deaths of infants 28 days of age to less than one year of age in a year}}{\text{Number of resident live births in the same year}} \times 1,000$$

### Pregnancy-Associated Mortality Ratio (PAMR)

The number of pregnancy-associated deaths per 100,000 live occurrence births. The term "ratio" is used instead of rate in this report because the numerator includes some maternal deaths that were not related to live-born infants and thus were not included in the denominator.

$$\text{Pregnancy-Associated Mortality Ratio (PAMR)} = \frac{\text{Number of pregnancy-associated deaths}}{\text{Number of occurrence live births in the same year}} \times 100,000$$

### Teen Birth Rate

$$\text{Teen birth rate} = \frac{\text{Number of births to females ages 15-19 years old}}{\text{Number of females ages 15-19 years old in the population}} \times 1,000$$

### Total Rate of Change

Total rate of change between two numbers or rates is expressed as a percentage in this report (e.g. The Massachusetts birth rate decreased by 12% from 1990 to 1996.):

$$\frac{P_n - P_o}{P_o} \times 100$$

where,  $P_n$  = rate during later time period  
 $P_o$  = rate during earlier time period

**Table A1. Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

TOWN NAME	COUNTY	CHNA	POPULATION	TOWN NAME	COUNTY	CHNA	POPULATION
Abington	Plymouth	22	16,305	Concord	Middlesex	15	16,858
Acton	Middlesex	15	20,539	Conway	Franklin	2	1,902
Acushnet	Bristol	26	10,535	Cummington	Hampshire	3	986
Adams	Berkshire	1	8,456	Dalton	Berkshire	1	6,697
Agawam	Hampden	4	28,547	Danvers	Essex	14	25,999
Alford	Berkshire	1	400	Dartmouth	Bristol	26	31,371
Amesbury	Essex	12	16,617	Dedham	Norfolk	18	23,681
Amherst	Hampshire	3	34,721	Deerfield	Franklin	2	4,786
Andover	Essex	11	32,838	Dennis	Barnstable	27	15,914
Aquinnah (Gay Head)	Dukes	27	362	Dighton	Bristol	24	6,648
Arlington	Middlesex	17	41,273	Douglas	Worcester	6	7,861
Ashburnham	Worcester	9	5,970	Dover	Norfolk	18	5,634
Ashby	Middlesex	9	2,926	Dracut	Middlesex	10	28,805
Ashfield	Franklin	2	1,824	Dudley	Worcester	5	10,787
Ashland	Middlesex	7	15,431	Dunstable	Middlesex	10	3,142
Athol	Worcester	2	11,690	Duxbury	Plymouth	23	14,655
Attleboro	Bristol	24	43,364	East Bridgewater	Plymouth	22	13,832
Auburn	Worcester	8	16,393	East Brookfield	Worcester	5	2,111
Avon	Norfolk	22	4,345	East Longmeadow	Hampden	4	14,845
Ayer	Middlesex	9	7,212	Eastham	Barnstable	27	5,550
Barnstable	Barnstable	27	47,902	Easthampton	Hampshire	3	15,994
Barre	Worcester	9	5,375	Easton	Bristol	22	22,995
Becket	Berkshire	1	1,783	Edgartown	Dukes	27	3,934
Bedford	Middlesex	15	12,486	Egremont	Berkshire	1	1,355
Belchertown	Hampshire	3	13,897	Erving	Franklin	2	1,542
Bellingham	Norfolk	6	15,735	Essex	Essex	13	3,342
Belmont	Middlesex	17	23,453	Everett	Middlesex	16	37,100
Berkley	Bristol	24	6,352	Fairhaven	Bristol	26	16,223
Berlin	Worcester	9	2,683	Fall River	Bristol	25	92,117
Bernardston	Franklin	2	2,237	Falmouth	Barnstable	27	33,620
Beverly	Essex	13	39,833	Fitchburg	Worcester	9	40,514
Billerica	Middlesex	10	39,812	Florida	Berkshire	1	666
Blackstone	Worcester	6	9,051	Foxborough	Norfolk	7	16,288
Blandford	Hampden	4	1,266	Frammingham	Middlesex	7	65,651
Bolton	Worcester	9	4,428	Franklin	Norfolk	6	30,748
Boston	Suffolk	19	558,435	Freetown	Bristol	26	8,963
Bourne	Barnstable	27	19,355	Gardner	Worcester	9	20,955
Boxborough	Middlesex	15	5,032	Georgetown	Essex	12	8,023
Boxford	Essex	12	8,162	Gill	Franklin	2	1,392
Boylston	Worcester	8	4,253	Gloucester	Essex	13	30,671
Braintree	Norfolk	20	33,658	Goshen	Hampshire	3	956
Brewster	Barnstable	27	10,242	Gosnold	Dukes	27	86
Bridgewater	Plymouth	22	25,769	Grafton	Worcester	8	16,783
Brimfield	Hampden	5	3,627	Granby	Hampshire	3	6,332
Brockton	Plymouth	22	100,366	Granville	Hampden	4	1,644
Brookfield	Worcester	5	3,096	Great Barrington	Berkshire	1	7,440
Brookline	Norfolk	19	56,422	Greenfield	Franklin	2	17,888
Buckland	Franklin	2	1,995	Groton	Middlesex	9	10,396
Burlington	Middlesex	15	23,265	Groveland	Essex	12	6,591
Cambridge	Middlesex	17	101,529	Hadley	Hampshire	3	4,820
Canton	Norfolk	20	21,481	Halifax	Plymouth	23	7,805
Carlisle	Middlesex	15	4,823	Hamilton	Essex	13	8,334
Carver	Plymouth	23	11,552	Hampden	Hampden	4	5,312
Charlemont	Franklin	2	1,387	Hancock	Berkshire	1	1,018
Charlton	Worcester	5	12,447	Hanover	Plymouth	23	14,077
Chatham	Barnstable	27	6,833	Hanson	Plymouth	23	9,915
Chelmsford	Middlesex	10	33,728	Hardwick	Worcester	9	2,655
Chelsea	Suffolk	19	34,128	Harvard	Worcester	9	6,116
Cheshire	Berkshire	1	3,356	Harwich	Barnstable	27	12,673
Chester	Hampden	21	1,320	Hatfield	Hampshire	3	3,280
Chesterfield	Hampshire	3	1,271	Haverhill	Essex	12	60,032
Chicopee	Hampden	21	54,599	Hawley	Franklin	2	345
Chilmark	Dukes	27	944	Heath	Franklin	2	805
Clarksburg	Berkshire	1	1,663	Hingham	Plymouth	20	21,470
Clinton	Worcester	9	13,997	Hinsdale	Berkshire	1	1,811
Cohasset	Norfolk	20	7,219	Holbrook	Norfolk	22	10,765
Colrain	Franklin	2	1,858	Holden	Worcester	8	16,571

**Table A1 (cont'd). Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

TOWN NAME	COUNTY	CHNA	POPULATION	TOWN NAME	COUNTY	CHNA	POPULATION
Holland	Hampden	5	2,529	New Marlborough	Berkshire	1	1,522
Holliston	Middlesex	7	13,830	New Salem	Franklin	2	986
Holyoke	Hampden	21	41,089	Newbury	Essex	12	6,990
Hopedale	Worcester	6	6,234	Newburyport	Essex	12	17,395
Hopkinton	Middlesex	7	14,048	Newton	Middlesex	18	83,346
Hubbardston	Worcester	9	4,340	Norfolk	Norfolk	7	10,506
Hudson	Middlesex	7	18,847	North Adams	Berkshire	1	14,031
Hull	Plymouth	20	11,279	North Andover	Essex	11	27,137
Huntington	Hampshire	21	2,180	North Attleboro	Bristol	24	28,078
Ipswich	Essex	13	13,285	North Brookfield	Worcester	5	4,812
Kingston	Plymouth	23	12,435	North Reading	Middlesex	16	13,930
Lakeville	Plymouth	24	10,618	Northampton	Hampshire	3	28,803
Lancaster	Worcester	9	7,069	Northborough	Worcester	7	14,652
Lanesborough	Berkshire	1	2,951	Northbridge	Worcester	6	14,184
Lawrence	Essex	11	81,591	Northfield	Franklin	2	3,226
Lee	Berkshire	1	5,882	Norton	Bristol	24	19,106
Leicester	Worcester	8	10,953	Norwell	Plymouth	20	10,382
Lenox	Berkshire	1	5,149	Norwood	Norfolk	20	28,472
Leominster	Worcester	9	42,120	Oak Bluffs	Dukes	27	3,794
Leverett	Franklin	2	1,769	Oakham	Worcester	9	1,892
Lexington	Middlesex	15	30,452	Orange	Franklin	2	7,659
Leyden	Franklin	2	815	Orleans	Barnstable	27	6,459
Lincoln	Middlesex	15	7,935	Otis	Berkshire	1	1,391
Littleton	Middlesex	15	8,561	Oxford	Worcester	5	13,710
Longmeadow	Hampden	4	15,556	Palmer	Hampden	4	12,895
Lowell	Middlesex	10	105,749	Paxton	Worcester	8	4,556
Ludlow	Hampden	21	21,835	Peabody	Essex	14	50,954
Lunenburg	Worcester	9	10,008	Pelham	Hampshire	3	1,415
Lynn	Essex	14	92,186	Pembroke	Plymouth	23	18,069
Lynnfield	Essex	14	11,540	Pepperell	Middlesex	9	11,386
Malden	Middlesex	16	56,730	Peru	Berkshire	1	836
Manchester	Essex	13	5,332	Petersham	Worcester	2	1,282
Mansfield	Bristol	24	22,933	Phillipston	Worcester	2	1,753
Marblehead	Essex	14	20,285	Pittsfield	Berkshire	1	43,949
Marion	Plymouth	26	5,316	Plainfield	Hampshire	3	600
Marlborough	Middlesex	7	37,163	Plainville	Norfolk	7	7,994
Marshfield	Plymouth	23	24,879	Plymouth	Plymouth	23	54,781
Mashpee	Barnstable	27	14,159	Plympton	Plymouth	23	2,777
Mattapoisett	Plymouth	26	6,477	Princeton	Worcester	9	3,520
Maynard	Middlesex	7	10,221	Provincetown	Barnstable	27	3,444
Medfield	Norfolk	7	12,328	Quincy	Norfolk	20	90,458
Medford	Middlesex	16	53,801	Randolph	Norfolk	20	32,552
Medway	Norfolk	6	12,780	Raynham	Bristol	24	13,428
Melrose	Middlesex	16	26,366	Reading	Middlesex	16	23,161
Mendon	Worcester	6	5,743	Rehoboth	Bristol	24	11,229
Merrimac	Essex	12	6,350	Revere	Suffolk	19	45,551
Methuen	Essex	11	44,532	Richmond	Berkshire	1	1,618
Middleborough	Plymouth	24	21,153	Rochester	Plymouth	26	5,295
Middlefield	Hampshire	3	549	Rockland	Plymouth	23	17,842
Middleton	Essex	11	9,077	Rockport	Essex	13	7,761
Milford	Worcester	6	27,523	Rowe	Franklin	2	350
Millbury	Worcester	8	13,443	Rowley	Essex	12	5,832
Millis	Norfolk	7	7,949	Royalston	Worcester	2	1,366
Millville	Worcester	6	2,938	Russell	Hampden	4	1,723
Milton	Norfolk	20	26,243	Rutland	Worcester	9	7,406
Monroe	Franklin	2	100	Salem	Essex	14	41,647
Monson	Hampden	4	8,744	Salisbury	Essex	12	8,264
Montague	Franklin	2	8,416	Sandisfield	Berkshire	1	830
Monterey	Berkshire	1	959	Sandwich	Barnstable	27	20,707
Montgomery	Hampden	4	743	Saugus	Essex	14	26,867
Mt. Washington	Berkshire	1	135	Savoy	Berkshire	1	724
Nahant	Essex	14	3,591	Scituate	Plymouth	20	18,119
Nantucket	Nantucket	27	10,095	Seekonk	Bristol	24	13,660
Natick	Middlesex	7	31,895	Sharon	Norfolk	20	17,269
Needham	Norfolk	18	28,445	Sheffield	Berkshire	1	3,360
New Ashford	Berkshire	1	247	Shelburne	Franklin	2	2,054
New Bedford	Bristol	26	94,502	Sherborn	Middlesex	7	4,220
New Braintree	Worcester	9	1,090	Shirley	Middlesex	9	7,361

**Table A1 (cont'd). Population Estimates<sup>1</sup> for Massachusetts Communities: 2005**

TOWN NAME	COUNTY	CHNA	POPULATION	TOWN NAME	COUNTY	CHNA	POPULATION
Shrewsbury	Worcester	8	33,171	Warwick	Franklin	2	763
Shutesbury	Franklin	2	1,843	Washington	Berkshire	1	546
Somerset	Bristol	25	18,564	Watertown	Middlesex	17	32,255
Somerville	Middlesex	17	75,372	Wayland	Middlesex	7	13,015
South Hadley	Hampshire	3	17,071	Webster	Worcester	5	16,853
Southampton	Hampshire	3	5,828	Wellesley	Norfolk	18	26,975
Southborough	Worcester	7	9,511	Wellfleet	Barnstable	27	2,821
Southbridge	Worcester	5	17,503	Wendell	Franklin	2	1,035
Southwick	Hampden	4	9,512	Wenham	Essex	13	4,643
Spencer	Worcester	5	12,087	West Boylston	Worcester	8	7,708
Springfield	Hampden	4	156,358	West Bridgewater	Plymouth	22	6,819
Sterling	Worcester	9	7,761	West Brookfield	Worcester	5	3,896
Stockbridge	Berkshire	1	2,256	West Newbury	Essex	12	4,301
Stoneham	Middlesex	16	21,594	West Springfield	Hampden	4	27,938
Stoughton	Norfolk	22	26,782	West Stockbridge	Berkshire	1	1,450
Stow	Middlesex	7	6,159	West Tisbury	Dukes	27	2,666
Sturbridge	Worcester	5	8,825	Westborough	Worcester	7	18,781
Sudbury	Middlesex	7	17,035	Westfield	Hampden	21	40,432
Sunderland	Franklin	2	3,853	Westford	Middlesex	10	21,369
Sutton	Worcester	6	8,974	Westhampton	Hampshire	3	1,566
Swampscott	Essex	14	14,283	Westminster	Worcester	9	7,358
Swansea	Bristol	25	16,243	Weston	Middlesex	18	11,591
Taunton	Bristol	24	56,348	Westport	Bristol	25	15,053
Templeton	Worcester	9	7,474	Westwood	Norfolk	18	13,902
Tewksbury	Middlesex	10	28,990	Weymouth	Norfolk	20	53,708
Tisbury	Dukes	27	3,819	Whately	Franklin	2	1,584
Tolland	Hampden	4	446	Whitman	Plymouth	22	14,424
Topsfield	Essex	13	6,178	Wilbraham	Hampden	4	13,960
Townsend	Middlesex	9	9,273	Williamsburg	Hampshire	3	2,433
Truro	Barnstable	27	2,162	Williamstown	Berkshire	1	8,276
Tyngsborough	Middlesex	10	11,297	Wilmington	Middlesex	15	21,431
Tyringham	Berkshire	1	352	Winchendon	Worcester	9	10,085
Upton	Worcester	6	6,374	Winchester	Middlesex	15	21,139
Uxbridge	Worcester	6	12,377	Windsor	Berkshire	1	858
Wakefield	Middlesex	16	24,553	Winthrop	Suffolk	19	17,067
Wales	Hampden	5	1,818	Woburn	Middlesex	15	37,074
Walpole	Norfolk	7	23,067	Worcester	Worcester	8	179,839
Waltham	Middlesex	18	59,564	Worthington	Hampshire	3	1,291
Ware	Hampshire	3	9,988	Wrentham	Norfolk	7	11,066
Wareham	Plymouth	26	21,274	Yarmouth	Barnstable	27	24,663
Warren	Worcester	5	5,040				

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006.

**Table A2. Population Estimates<sup>1</sup> for Massachusetts Community Health Network Areas (CHNA) and Counties: 2005**

CHNA	POPULATION	COUNTY	POPULATION
1. Community Health Network of Berkshire County	131,965	Barnstable	226,505
2. Upper Valley Health Web (Franklin County)	88,506	Berkshire	131,965
3. Partnership for Health in Hampshire County (Northampton)	151,801	Bristol	547,711
4. The Community Health Connection (Springfield)	299,490	Dukes	15,605
5. Community Health Network of Southern Worcester County	119,141	Essex	750,463
6. Community Partners for Health (Milford)	160,521	Franklin	72,415
7. Community Health Network of Greater Metro West (Framingham)	379,658	Hampden	466,739
8. Community Wellness Coalition (Worcester)	303,669	Hampshire	153,981
9. Fitchburg/Gardner Community Health Network	261,369	Middlesex	1,464,179
10. Greater Lowell Community Health Network	272,893	Nantucket	10,095
11. Greater Lawrence Community Health Network	195,176	Norfolk	656,472
12. Greater Haverhill Community Health Network	148,557	Plymouth	497,687
13. Community Health Network North (Beverly/Gloucester)	119,378	Suffolk	655,181
14. North Shore Community Health Network	287,352	Worcester	787,943
15. Greater Woburn/Concord/Littleton Community Health Network	209,597		
16. North Suburban Health Alliance (Medford/Malden/Melrose)	257,235	<b>STATE</b>	<b>6,436,940</b>
17. Greater Cambridge/Somerville Community Health Network	273,883		
18. West Suburban Health Network (Newton/Waltham)	253,138		
19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	711,603		
20. Blue Hills Community Health Alliance (Greater Quincy)	372,309		
21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	161,454		
22. Greater Brockton Community Health Network	242,404		
23. South Shore Community Partners in Prevention (Plymouth)	188,787		
24. Greater Attleboro-Taunton Health & Education Response	252,919		
25. Partners for a Healthier Community (Fall River)	141,977		
26. Greater New Bedford Health & Human Services Coalition	199,955		
27. Cape and Islands Community Health Network	252,204		

1. Massachusetts (Department of Public Health) Modified Age, Race/Ethnicity, & Sex Estimates 2005 (MMARS05), released October, 2006.

## GLOSSARY

### Adequacy of Prenatal Care Utilization (APNCU) Index

The Adequacy of Prenatal Care Utilization Index, developed by Dr. Milton Kotelchuck, is the measure used in this publication to classify the adequacy of prenatal care received by Massachusetts resident mothers. *(Please note: Prior to the *Births 2001* publication, the Kessner Index was used to measure adequacy of prenatal care; please see definition for Kessner Index below.)* The APNCU Index has five categories (adequate intensive, adequate basic, intermediate, inadequate, and unknown), based on the month of pregnancy in which prenatal care begins and the percent of expected prenatal care visits for the time period during which a woman receives prenatal care services. Please see Technical Notes for more details.

### Birthweight

The weight of an infant recorded at the time of delivery. It may be recorded in either pounds/ounces or grams. If recorded in pounds/ounces, it is converted to grams for use in this report.

1 pound = 453.6 grams

1,000 grams = 2 pounds and 3 ounces

### Birthweight Categories

Normal birthweight (NBW):	An infant's weight of 2,500 grams (approximately 5.5 pounds) or more recorded at birth.
Low birthweight (LBW):	An infant's weight of less than 2,500 grams (5.5 pounds) recorded at birth.
Very low birthweight (VLBW):	An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

### Cesarean Section or C-Section

Primary: A mother's first Cesarean section delivery.

Repeat: A Cesarean delivery that has been preceded by at least one Cesarean delivery.

### Community Health Network Areas (CHNAs)

The Department of Public Health, in collaboration with health service providers, coalition members, and interested citizens, has designated 27 areas for community health planning. It is the Department's intention to foster in each of these areas the development of Community Health Networks – consortia of health care providers, human service agencies, schools, churches, youth, parents, elders, advocacy groups, and individual consumers – to address the health needs of the community. These community coalitions will participate in monitoring outcomes and progress of strategies and responses to those health needs.

It is hoped the Networks will mobilize around key health issues impacting the community, promote prevention efforts, enhance access to care, provide opportunities for more collaboration among agencies, and create a client-centered, outcome-oriented health service delivery system. Community Health Networks will also promote efficiency in service delivery by working to reduce duplication and overlap, and by identifying gaps in service.

A Community Health Network Area (CHNA) is defined as an aggregation of cities and towns. In

the current publication, we have presented some data by CHNA. To determine which cities and towns make up a particular CHNA, Table A1 provides the appropriate CHNA code for each city and town. The data published in this volume reflect the definitions of CHNAs instituted in January 1997 and the corresponding CHNA names.

#### Confidence Intervals

The confidence interval (CI) for the infant mortality rate (IMR) is a range of values that has a 95% chance of including the underlying risk of an infant death. Observed rates are subject to statistical variation; even if the underlying risk of infant death is identical in two subpopulations, the observed IMRs for the subpopulations may differ because of random variation. The confidence interval describes the precision of observed IMR as an estimate of the underlying risk of infant death, with a wider interval indicating less certainty about this estimate. The width of the interval reflects the size of the subpopulation and the number of infant deaths; smaller subpopulations with fewer infant deaths lead to wider confidence intervals.

#### Death Cohort Linked File or Linked Birth and Infant Death File – Death Cohort

All infant deaths occurring in a specific year have been linked to their corresponding birth certificates, whether the birth occurred during the same year or in the previous one. This is in contrast to a birth cohort linked file, in which infant deaths may have occurred in the same year or in the year following the year of birth.

#### Delivery

A delivery may consist of one or more live born or stillborn fetuses. The number of deliveries in a given period will be equal to or less than the number of births because multiple births (twins, triplets or higher-order births) are counted as single deliveries.

#### EOHHS Regions

The six regions delineated by the commonwealth's Executive Office of Health and Human Services and used by the Department of Public Health for statistical, care coordination and administrative purposes. The regions - Western, Central, Northeast, Metro West, Boston and Southeast - are based on geographical groupings of cities and towns.

#### Ethnicity

Also known as mothers ancestry. See the section in the Technical Notes of the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

#### Fetal Death

A stillbirth delivered, extracted or expelled at 20 weeks gestation or more or weighs 350 grams or more.

#### Feto-Infant Mortality Rate

The combined number of fetal deaths and infant deaths per 1,000 live births and fetal deaths.

#### Healthy Start

A Massachusetts-funded program providing services and financing for prenatal care to low-income pregnant women who lack health insurance, but do not qualify for Medicaid.

#### Infant

A child whose age is less than one year (365 days).

### Infant Death

Death of a child whose age is less than one year.

### Kessner Index (Adequacy of Prenatal Care)

A measure of adequacy of prenatal care, used in *Advance Data: Births and Massachusetts Births* publications prior to 2001. The Kessner Index classifies prenatal care as one of 5 categories (adequate, intermediate, inadequate, no prenatal care, and unknown), based on the trimester in which prenatal care began and the number of prenatal visits. The classification adjusts for gestational age to allow for proper classification of premature births, and is as follows:

Category	Trimester Care Began	Number of Visits
Adequate	1	9 or more
Intermediate	1	5-8
	2	5 or more
	1	1-4
Inadequate	2	1-4
	3	1 or more
No prenatal care	--	0
Unknown	Unknown	Unknown

### Live Birth

A live birth is any infant who breathes or shows any other evidence of life (such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles) after separation from the mother's uterus, regardless of the duration of gestation.

### Low Birthweight (LBW)

See Birthweight Categories.

### Maternal Death

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.

### Mother's Birthplace

In this publication, birth characteristics are presented according to mother's birthplace: those who were born in the 50 states and District of Columbia, or "U.S. States / D.C."; those who were born in Puerto Rico, the US Virgin Islands, and Guam, or "Puerto Rico/U.S. Territories"; and those who were born outside of the U.S. and Puerto Rico/U.S. territories, or "Non-U.S.-Born".

### Neonatal

Infants under 28 days of age.

### Neonatal Death

Death of a child whose age is less than 28 days.

### Non-U.S.-Born Women

See Mother's Birthplace.



#### Occurrence Birth

A birth occurring in the Commonwealth of Massachusetts, regardless of the residency of the mother. For individual cities/towns, an occurrence birth represents any birth occurring in that city/town, regardless of the residence of the mother. See Resident Birth.

#### Parity

The total number of live infants ever born to a woman, including the current birth.

#### Perinatal

Referring to the time period immediately before and after birth (28 weeks of gestation to 7 days after birth).

#### Perinatal Death

Death to a fetus of 28 weeks gestation or older or a live-born infant less than 7 days old.

#### Plurality

The number of births to a woman produced in the same gestational period. A singleton is the birth of one infant; twins represent the births of two infants, etc.

#### Post Neonatal

A child whose age is at least 28 days, but less than one year.

#### Post Neonatal Death

Death of a child whose age is at least 28 days, but less than one year.

#### Prenatal Care Source of Payment

Categories used in this publication include:

*Public* = Government programs including Commonwealth, Healthy Start, Medicaid/MassHealth, and Medicare (may be HMO or managed care), or free care;

*Private* = Commercial indemnity plan, commercial managed care (HMO, PPO, IPP, IPA, and other), or other private insurance;

*Other* = Worker's Compensation and other sources;

*Self-paid*.

#### Pregnancy-Associated Death

The death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause.

#### Race

See the section in the Technical Notes in the Appendix entitled: "Changes in the Collection of Race and Ethnicity Information."

#### Resident Birth

The birth of an infant whose mother reports that her usual place of residence is in Massachusetts. In Massachusetts, a resident is a person with a permanent address in one of the 351 cities or towns. Vital statistics data may be presented in terms either of residence or occurrence. All data in this publication are resident data unless otherwise stated. Resident data include all events that occur to residents of the Commonwealth, wherever they occur. Occurrence data include all events that occur within the state, whether to residents or nonresidents. There is an exchange agreement among the 50 states, District of Columbia,

Puerto Rico, Virgin Islands, Guam, and Canadian provinces that provides for exchange of copies of birth and death records. These records are used for statistical purposes only, and allow each state or province to track the births and deaths of its residents.

Vaginal Birth After Cesarean (VBAC)

A vaginal delivery of an infant to a mother who has had at least one prior Cesarean section delivery.

Very Low Birthweight (VLBW)

An infant's weight of less than 1,500 grams (3.3 pounds) recorded at birth.

# Massachusetts Birth Certificate: 2006

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The Commonwealth of Massachusetts  
DEPARTMENT OF PUBLIC HEALTH  
REGISTRY OF VITAL RECORDS AND STATISTICS  
STANDARD CERTIFICATE OF LIVE BIRTH

STATE USE ONLY

1. RECORD NUMBER  <b>768283</b>	3 PLACE OF BIRTH	3C. CITY/TOWN			3D. REGISTERED NUMBER			
1A. CERTIFICATE NUMBER (DPH USE ONLY)		3B. COUNTY						
2. FACILITY NUMBER		3A. FACILITY NAME-IF NOT IN FACILITY, NUMBER AND STREET						
	C H I L D	NAME	4A. FIRST	4B. MIDDLE	4C. LAST			
		5. SEX	6A. PLURALITY	6B. BIRTH ORDER	7. TIME			
		8. DATE OF BIRTH (Month, Day, Year)						
	C E R T I F I E R	9A. NAME		9B. TITLE				
		9C. CERTIFIER TYPE		9D. LICENSE NUMBER				
		9E. NUMBER AND STREET		9F. CITY/TOWN	9G. STATE	9H. ZIP CODE		
	M O T H E R	NAME	10A. FIRST	10B. MIDDLE	10C. LAST	10D. MAIDEN SURNAME		
		BIRTHPLACE	11A. CITY/TOWN	11B. STATE/COUNTRY		12. DATE OF BIRTH (Month, Day, Year)		
		RESIDENCE (Do not use mailing address)	13A. NUMBER AND STREET	13B. CITY/TOWN	13C. COUNTY	13D. STATE 13E. ZIP CODE		
	F A T H E R	NAME	14A. FIRST	14B. MIDDLE	14C. LAST			
22A. SOCIAL SECURITY CARD		BIRTHPLACE	15A. CITY/TOWN	15B. STATE/COUNTRY		16. DATE OF BIRTH (Month, Day, Year)		
INITIALS		17A. I (WE) CERTIFY THAT THE PERSONAL INFORMATION APPEARING ABOVE IS TRUE AND CORRECT.				17B. RELATIONSHIP TO CHILD		
22B. RESIDENT COPY	I N F O R M A N T	17C. DATE SIGNED (Month, Day, Year)		17D. MAILING ADDRESS (If different from item # 13 above)	NUMBER AND STREET	CITY	STATE	ZIP CODE
INITIALS		18. DATE OF RECORD (Month, Day, Year)		19. SUPPLEMENT FILED (Month, Day, Year)		20. CLERK/REGISTRAR		
1. OCCURRENCE		21. DPH USE ONLY						



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