Massachusetts Births 2000

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Table of Contents

Massachusetts Births 2000

Page

Appendix

EXECUTIVE SUMMARY

Highlights

- **The infant mortality rate (IMR) is the lowest in Massachusetts history** (4.6 deaths per 1,000 live births). The IMR has declined 34% since 1990.

- **The teen birth rate continues its steady decline of the last ten years**. In 2000, the teen birth rate was 25.8 births per 1,000 females ages 15-19, compared to 26.7 in 1999. The teen birth rate has declined 27% since 1990.

- **Cesarean section delivery rates continue to increase in Massachusetts**. In 2000, 23.8% of all births to Massachusetts residents were delivered by c-section. This is a 6% increase from the 1999 c-section rate.

- **The percentage of women smoking during pregnancy decreased** from 10.7% in 1999 to 9.7% in 2000. The rate of smoking during pregnancy has decreased 50% since 1990 (19.3%).

- **The ten-year trend of increasing numbers of multiple births continues**. The percentage of multiple births increased slightly from 4.2% in 1999 to 4.3% of births in 2000. The percentage of multiple births in Massachusetts has increased 65% since 1990.

- **Disparities by race and ethnicity remain.** Despite decreasing infant mortality overall, there are great disparities in IMRs across racial and ethnic groups. The disparity between black and white infants is greatest, with blacks dying at 3 times the rate of whites. Black infants are also about twice as likely to be of low birthweight than white infants; Hispanic mothers are almost 5 times as likely to be under the age of 20 than white mothers, and lower percentages of black, Hispanic, and Asian mothers receive adequate prenatal care than white mothers.

Number and Rate of Births

The number of births to MA residents rose by about 1% between 1999 and 2000, from 80,866 to 81,582. Since 1990, the number of births in Massachusetts has declined by 12%, and the birth rate has declined by 8% (from 62.1 to 57.2 births per 1,000 females ages 15-44).

Infant Mortality

The infant mortality rate (IMR) in 2000 was 4.6 infant deaths per 1,000 births, as compared to 5.2 in 1999. This is the lowest infant mortality rate in Massachusetts history and represents a 34% decline since 1990.

Decreases in IMRs occurred among white non-Hispanics (4.7 to 3.8) and Hispanics (5.5 to 5.2), while the IMR for black non-Hispanics increased from 12.3 to 12.8 from 1999 to 2000. The IMR for Asians increased from 1.9 to 4.1. Note: the IMR for Asians should be interpreted with caution due to the small number of infant deaths involved.

Overall, decreases in infant mortality occurred among those deaths in the neonatal period (less than 28 days), while 3 more deaths occurred in the post-neonatal period in 2000 than in 1999.

Pregnancy-Associated Mortality

In 2000, 26 pregnancy-associated deaths, including 1 maternal death, occurred in Massachusetts. The pregnancy-associated mortality ratio (PAMR) was 31.4 per 100,000 live births, and the maternal mortality ratio (MMR) was 1.2 per 100,000 live births. Although there was some fluctuation in the PAMR and the MMR between 1990 and 2000, the differences are not statistically significant due to the small number of occurrences.

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

Teen Births

Teen births decreased between 1999 and 2000, from a total of 5,515 births to females ages 15-19 to 5,305 births. The rate in 2000 was 25.8 births per 1,000 females ages 15-19, a 3% decrease from the 1999 rate of 26.7. The teen birth rate in Massachusetts has declined by 27% since 1990.

Low Birthweight

The percentage of births to low birthweight infants (infants weighing less than 5.5 pounds) remained the same as in 1999 (7.1%). Percentages of low birthweight remained the same among race/ethnicity groups between 1999 and 2000, except for black non-Hispanics, who experienced a slight decrease (12.2% to 12.0%) in the past year.

LBW increased slightly among singletons, from 5.0 to 5.1%. The increase occurred among mothers < 35 years of age. LBW decreased slightly among multiples (54.5 % to 53.0%) for the first time in six years. Very low birthweight (VLBW; infants weighing less than 3.3 pounds) remained stable between 1999 and 2000, at 1.4% of infants. Black non-Hispanic infants, who have the highest percentage of VLBW, experienced a small decrease in VLBW from 3.6% in 1999 to 3.4% in 2000.

Preterm Deliveries

The percentage of preterm infants (delivered before the 37th week of gestation) increased from 7.6% to 8.3%. The increase was among white non-Hispanic and black non-Hispanic infants, while Asian and Hispanic preterm rates remained stable. The percentage of preterm infants for white non-Hispanics increased by 10% from 7.1 to 7.8%, and for black non-Hispanics, by 8%, from 11.8% to 12.7%.

The percentage of infants delivered very early (before the 28th week of gestation) remained the same in 2000 as in 1999 (0.6%). As in 1999, the percentage of infants delivered before 28 weeks of gestation among black non-Hispanics in 2000 was more than double that of any other group (2.0%).

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

Continuing the trend of the past 20 years, the percentage of births to white mothers decreased slightly, while the **percentage of births to other race/ethnicity groups increased**, especially among Asians.

In 2000, there was a substantial increase (30%) in births to mothers of Brazilian ethnicity in Massachusetts, from 799 births in 1999 to 1,033 births in 2000.

The percentage of births to non-U.S.-born mothers increased 7% between 1999 and 2000 – from 19.5% to 20.9%. **In 2000, over 1 out of every 5 births to Massachusetts residents was to a mother born outside the continental U.S., Puerto Rico, and the U.S. Territories.**

Smoking

The percentage of women who smoked during pregnancy decreased from 10.7% to 9.7%. Decreases were seen among White non-Hispanics and Black non-Hispanics, groups with the highest prevalence of smoking during pregnancy. Rates for Hispanic and Asian women remained the same.

Prenatal Care

Adequacy of prenatal care decreased slightly from 79.4% in 1999 to 79.1% in 2000. Adequacy of prenatal care is a measure of the timing and number of prenatal care visits, not an assessment of the quality of prenatal care. The current measure used is the Kessner Index.

Cesarean Sections

The cesarean section delivery rates are increasing. The cesarean section rate among births to Massachusetts residents was 23.8%, up 6% from 1999 (22.4%). Increases were among both primary and repeat c-sections. The primary c-section rate increased by 7%, from 16.6% to 17.7%, and the repeat c-section rate increased by 5%, from 71.6% to 75.2%. Accordingly, the rate of vaginal births after cesarean section (VBAC) deliveries decreased substantially, from 28.4% in 1999 to 24.8% in 2000.

Breastfeeding

The rate of mothers breastfeeding or intending to breastfeed increased – from 72.4% in 1999 to 73.8% in 2000. The rate increased for all major race/ethnicity groups, but the largest increase was among black non-Hispanic mothers (3% increase). The rate increased slightly for Asians, from 76.0% to 76.4%.

Public Source of Prenatal Care Payment

The percentage of mothers paying for prenatal care through a public source **increased** from 1999 to 2000 **– from 26.8% to 27.5%.**

Multiple Births

The percentage of multiple births (twins, triplets, and higher order) continues to increase; 4.3% of births in 2000 were multiples. This percentage has risen steadily over the past 10 years (2.6% in 1990). The increase in 2000 is attributable to mothers ages 35 and over (6.7% of these mothers gave birth to multiple infants). The percentage of multiples among births to mothers ages 35+ is almost double the percentage for mothers under age 35.

Comparison of Massachusetts Indicators to U.S.

Massachusetts perinatal health indicators were generally better than those for the U.S. in 2000.

According to final U.S. birth statistics and preliminary U.S. death statistics for 2000 (see glossary for details), comparisons were as follows:

- The **birth rate** for women ages 15-44 in Massachusetts (57.2) was **15% lower** than the U.S. birth rate (67.5).
- The **infant mortality rate (IMR)** in Massachusetts (4.6) was **33% lower** than the U.S. IMR (6.9).
- The **teen birth rate** in Massachusetts (25.8) was **47% lower** than the U.S. teen birth rate (48.5).
- The **cesarean section delivery rate** in Massachusetts (23.8%) was **4% higher** than the U.S. c-section rate (22.9%).
- The **low birthweight** rate in Massachusetts (7.1%) was **7% lower** than the U.S. low birthweight rate (7.6%).

Comparison of Massachusetts Indicators to U.S. (cont.)

- The **percent of women receiving prenatal care in the first trimester** in Massachusetts (83.8%) **was slightly higher** than the U.S. percentage (83.2%).

Special Notes on this Year's Publication

Additions: In this year's publication, one new table and one new figure are provided to give more detailed information on perinatal health in Massachusetts to our readers. Table 8 provides a comparison of recent Massachusetts perinatal health indicators to national Healthy People 2010 Objective targets. Figure 8 provides information on pregnancy-associated deaths and maternal deaths to women in Massachusetts from 1990-2000.

Winchester Hospital Birth Data Not Available: Winchester Hospital failed to collect and report a subset of data on approximately half of the births (approx. 1,180) occurring at Winchester Hospital in 2000. This subset of data included the following information: infant birthweight, infant gestational age, parity, method of delivery, number of prenatal care visits, adequacy of prenatal care, source of prenatal care payment, and breastfeeding. The omission of these data from the Massachusetts birth file resulted in higher percentages of missing data for these indicators than usual. *See Technical Notes in Appendix for more detail on missing data.*

Birth Data Availability

Detailed information on 2000 births in Massachusetts is also 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) 624-5541.

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

CHAPTER 1

BIRTH CHARACTERISTICS

Birth Numbers and Rates

In 2000, 81,582 births occurred to Massachusetts residents (Table 1). This number represents a 12% increase since 1980 (72,591 births). However, since 1990, the number of births to Massachusetts residents has decreased. From 1990 to 2000, the number of births decreased by 12%. The birth rate in 2000 was 57.2 births per 1,000 women of ages 15-44 years. This was 15% below the U.S. birth rate of 67.5 per 1,000 women of the same ages (National Vital Statistics Reports, Vol. 50, No. 5, February 2002, p.2). In Massachusetts, the birth rate has increased by 7% since 1980, but since 1990, it has declined (except for a slight increase – 2% -- between 1996 and 1998). For the fifth year in a row, there were more births to women ages 30 years and above than to women under age 30 (Figure 1).

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

In 2000, 73.6% of births (60,051) were to non-Hispanic white mothers; 11.3% (9,247) were to Hispanic mothers; 7.1% (5,755) were to non-Hispanic black mothers; and 5.7% (4,667) were to Asian mothers (Table 2A). Since 1980, the racial diversity of mothers has increased. From 1980 to 2000, the percentage of births to white women decreased from 91.2 to 85.0, while the percentage of births to black women increased from 6.4 to 7.9, and the percentage of births to mothers of Asian or other races increased over four-fold, from 1.5 to 6.4 (Table 1). Since 1990, the number of births to non-Hispanic white women has declined from 72,456 to 60,051 (1990 data not shown; for 2000 data, see Table 2A).

In 2000, 20.9% of births in Massachusetts were to non-U.S.-born women – those born outside of the continental U.S., Puerto Rico, or U.S. Territories (Table 2A). The percentage of non-U.S.-born mothers varied by race: 92.3% of Asian births were to non-U.S.-born women; 43.5% of Hispanic births were to non-U.S.-born women; 43.1% of non-Hispanic black births were to non-U.S.-born women; and 8.8% of non-Hispanic white births were to non-U.S.-born women. For Hispanic births, besides the 43.5% of mothers born outside of the U.S., 23.7% of mothers were born in Puerto Rico and other U.S. territories.

Mothers born in the 50 U.S. states or D.C. differed from those born outside of the U.S. with regard to many perinatal characteristics (Table 2A). In particular, there were great differences between U.S.-born and non-U.S.-born mothers among black non-Hispanic and Hispanic mothers with regard to teen births, low birthweight, and breastfeeding. For instance, among black non-Hispanic mothers born in the 50 U.S. states or D.C., 13.4% gave birth to low birthweight infants, compared with 10.2% among mothers born outside the continental U.S. and its territories. Among Hispanic mothers, three times as many mothers born in the U.S. or D.C. were under the age of 20 (29.6%) than were non-U.S.-born mothers (9.3%). For Hispanic mothers born in Puerto Rico and other U.S. Territories, the percentage of teen mothers was closer to that of mothers born in the 50 States and D.C (22.4%).

Teen Births

In 2000, there were 5,305 births to women ages 15-19, compared with 5,515 births for this age group in 1999 (Table 1). The number of teen births has steadily decreased since 1990, with an overall decrease of 27% (7,258 teen births in 1990). The teen birth rate (births per 1,000 women ages 15-19) has also steadily decreased since 1990. In 2000, for every 1,000 female residents of Massachusetts ages 15-19, there were 25.8 births, down from 26.7 in 1999. The teen birth rate in Massachusetts decreased by 27% from 1990 to 2000 (Table 1).

Statewide, 2.2% of births were to women under age 18, and 6.6% were to women under the age of 20 (Table 2A). The percentage of births to teenagers varied by race and ethnicity, partially reflecting differences in the percentage of teenage women within each racial/ethnic population group. The highest percentage of births to women under 18 was for Hispanics (7.9%), followed by non-Hispanic blacks (4.1%), Asians (1.8%), and non-Hispanic whites (1.2%) (Table 2A). In maternal ancestry categories, Puerto Ricans and Cambodians had the highest teen birth percentages. For Puerto Rican women, 27% of births were to women under age 20, and 11.8% to women under age 18 (Table 2B). For Cambodians, these percentages were 20.7% and 9.0%, respectively.

Low Birthweight

In 2000, 7.1% of infants born to Massachusetts women were low birthweight – weighing less than 2,500 grams or 5.5 pounds (Table 1). This percentage remained the same as in 1999. The low birthweight rate in Massachusetts was 7% below the national figure of 7.6%.

The percentage of low birthweight births also varied by mother's race and ethnicity. Non-Hispanic black mothers had the highest proportion of low birthweight infants: 12.0%; followed by Hispanic mothers: 8.2%; Asian mothers: 7.3%; and non-Hispanic white mothers: 6.4% (Table 2A). The highest percentages of low birthweight occurred among mothers who identified their ancestries as African-American (13.3%), Haitian (11.6%) West Indian/Caribbean (11.2%), and Puerto Rican (10.0%). The highest percentages of very low birthweight (less than 1,500 grams or 3.3 pounds), occurred among mothers who identified their ancestries as: African-American (3.8%) , Haitian (3.5%), and West Indian/Caribbean (3.1%) (Table 2B).

Prenatal Care

In 2000, almost 80% of women received adequate prenatal care (Table 1). Adequacy of prenatal care is a measure of the timing and number of prenatal care visits. The percentage of adequate prenatal care varied greatly by mother's race and ethnicity. For non-Hispanic white women, 83.2% received adequate prenatal care, in contrast with 65.8% of non-Hispanic black mothers, 67.0% of Hispanic mothers, and 71.6% of Asian mothers (Table 2A). Mothers reporting their ancestries as European and Other Portuguese were the groups most likely to receive adequate prenatal care – 82.3% and 78.1%, respectively. Cambodians and Salvadorans were least likely to receive adequate prenatal care, with only 45.7% of Cambodian and 56.7% of Salvadoran mothers receiving adequate prenatal care (Table 2B).

Beginning with next year's publication (*Massachusetts Births 2001*), adequacy of prenatal care will be measured with the Adequacy of Prenatal Care Utilization (APNCU) Index, developed by Kotelchuck, instead of the Kessner Index. Table 1 provides a preview of adequacy data for 1997-2000 based on the APNCU Index. The values for the APNCU Index are consistently higher than those calculated with the Kessner Index. According to the APNCU Index, 83.3% of women received adequate prenatal care in 2000, in contrast with 79.1% according to the Kessner Index (Table 1).

Statewide, in 2000, 83.8% of women received prenatal care during the first three months of pregnancy. Non-Hispanic white mothers born in the U.S. and Puerto Rico/U.S. territories had

the highest percentage of first trimester care, 88.3% and 87.9% respectively (Table 2A). Cambodian women had the lowest percentage of first trimester care, 55.5% (Table 2B).

Cesarean Section Deliveries

In 2000, 23.8% of births to resident Massachusetts women were delivered by Cesarean section. Non-Hispanic black women had the highest percentage of Cesarean section deliveries, at 24.7%, and Asian women had the lowest percentage, at 19.4% (Table 2A). The highest percentage of Cesarean section deliveries occurred among Brazilian women (33.7%) and the lowest percentage among Cambodian women (7.9%) (Table 2B).

Breastfeeding

In 2000, 73.8% of Massachusetts mothers reported that they were breastfeeding or intending to breastfeed their infants (Table 2A). This represents a 30% increase since 1990 (56.6%, data not shown). The percentage of mothers breastfeeding differed slightly by maternal race and Hispanic ethnicity, with the highest percentage reported among Asians (76.4%) and the lowest among non-Hispanic blacks and non-Hispanic whites (73.3% for each). There was more variation among mothers of different self-identified ancestry groups – the highest rates of breastfeeding were found for Asian Indians (95.8%), Brazilians (93.8%), and Salvadorans (92.1%) (Table 2B). In contrast, only 49.4% of Cambodians and 50.2% of women identifying themselves as "Other Portuguese" reported that they were breastfeeding or intending to breastfeed their infants.

The percentage of mothers breastfeeding or intending to breastfeed increased as mother's age increased. For teens 15-19, the percentage was the lowest, at 58.3%. For women ages 45 and above, the percentage was highest, at 89.7% (Figure 2).

Birth Characteristics in the 30 Largest Massachusetts Cities and Towns

In 2000, among the 30 largest communities in the Commonwealth, the crude birth rates (number of births per 1,000 population) were highest in Lawrence (19.7), Lowell (16.7), Springfield (16.5), and Brockton (16.5). Crude birth rates were lowest in Barnstable (10.1), Newton, and Pittsfield (10.6 in each) (Table 3A). Plymouth had the highest percentage of births to non-Hispanic white mothers, 93.5%. Communities with the highest percentage of births to non-Hispanic black women were: Boston, 30.9%; Brockton, 26.6%; and Springfield, 20.9%. In Lawrence, 73.4% of 2000 births were to Hispanic women. In four other communities, the percentage of births to Hispanic women was over 20%: Springfield, 41.9%; Lynn, 30.7%; Worcester, 23.5%; Boston, 21.7%, and Revere, 20.2% (Table 3A).

Six communities (Boston, Brockton, Chicopee, Fall River, Pittsfield, Springfield) recorded low birthweight percentages that were 25% higher than the statewide average of 7.1%. Adequacy of prenatal care varied by community, with 85% or more of the mothers in Arlington, Brookline, Framingham, Newton, Quincy, and Weymouth receiving adequate prenatal care. In contrast, fewer than 70% of mothers received adequate prenatal care in six communities: Lynn, 60.3%; Pittsfield, 61.8%; Springfield, 62.0%; Lowell, 62.5%; Brockton, 63.1%; and Lawrence, 68.0%. The birth rate for teens was highest in Lawrence (97.6 births per 1,000 females ages 15 to 19

years) and in Springfield (77.2 births per 1,000 females ages 15 to 19 years). These two communities had rates over three times the statewide rate of 25.8. (Table 3A).

In 2000, of the 30 largest communities, three communities had infant mortality rates in excess of 10 deaths per 1,000 live births. The highest infant mortality rates in 2000 occurred in Methuen (13.5 deaths per 1,000 live births), Peabody (11.1 deaths per 1,000 live births), and Fall River (10.1 deaths per 1,000 live births). Infant mortality rates should be interpreted with caution in communities with a small number of infant deaths - none of the 30 largest communities has an average infant mortality rate in excess of 10 deaths per 1,000 live births for the period of 1998 to 2000 (Table 3A).

Birth Characteristics in Community Health Network Areas

Among the 27 Massachusetts Community Health Network Areas (CHNAs), only two had crude birth rates of 15 birth or more per 1,000 population. The Community Partners for Health (Milford) and Greater Lawrence Community Health Network had crude birth rates of 15.5, and 15.4, respectively. Greater Lowell Community Health Network had a crude birth rate of 14.9 births per 1,000 population (Table 3B).

In four CHNAs, Alliance for Community Health (Boston/Chelsea/Revere/Winthrop), Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield), Greater Brockton Community Health Network, and Partners for a Healthier Community (Fall River), greater than 8.0% of the resident births were low birthweight – about 10% higher than the statewide average of 7.1%. In two of the CHNAs, fewer than 70% of mothers received adequate prenatal care: The Community Health Connection (Springfield): 68.2%, and North Shore Community Health Network: 68.9%. (See the Glossary in the Appendix for a description of the CHNAs.)

The teen birth rates for the CHNAs of The Community Health Connection (Springfield), Greater Lawrence Community Health Network, and Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield) were the highest in the state. Partners for a Healthier Community (Fall River) had the highest infant mortality rate in 2000: 9.4 deaths per 1,000 live births. Because of the relatively small number of infant deaths, mortality rates in individual CHNAs should be interpreted with caution. Two of the CHNAs (Partners for a Healthier Community (Fall River); Community Wellness Coalition (Worcester); had 3-year average (1998-2000) infant mortality rates that were 35% higher than the state average (Table 3B).

Tobacco Use

In 2000, 9.7% of births were to mothers who reported smoking cigarettes during their pregnancies. This represents a 50% decline from 1990 (19.3%, data not shown), and a decline of 9% from the previous year, 1999 (10.7%, data not shown). Smoking prevalence during pregnancy differed by mother's race and Hispanic ethnicity. Non-Hispanic white women had the highest prevalence of smoking during pregnancy (10.7%), followed by non-Hispanic black women (8.8%), Hispanic women (8.2%), and, finally, Asian women (1.6%) (Figure 3).

The majority (83.4%) of women who gave birth in 2000 were non-smokers prior to pregnancy, and 99.9% of them continued to abstain from smoking during pregnancy (Figure 4). (Ninety-one women started smoking during pregnancy.) A substantial number (5,696) of women quit smoking during pregnancy (42% of all women who smoked prior to pregnancy). Approximately

17% of women who gave birth reported smoking prior to pregnancy. About half of them were "light" smokers (1-10 cigarettes daily); 43% were "moderate" smokers (11-20 cigarettes daily); and 7% were "heavy" smokers (21 or more cigarettes daily). The percentage of women who were able to quit smoking during pregnancy was 57.3% for "light" smokers, 29.4% for "moderate" smokers, and 15.8% for the heaviest smokers (Figure 4). Among moderate and heavy smokers, 78% either quit or reduced their daily number of cigarettes during pregnancy.

Patterns in Number and Rate of Births by Age Group

There has been a marked change in the age distribution of Massachusetts resident mothers since 1980. Approximately 25% of women giving birth were ages 30 years and older in 1980 as compared to 54.5% in 2000. In 2000, there were more births to women ages 30 years and older (44,457) than to women under age 30 years (37,121) (Table 4).

In Massachusetts, the fertility rate (births to women ages 15-44 years per 1,000 women ages 15-44) decreased 8% from 1990 (62.2) to 2000 (57.2) (Table 4). In 2000, the age-specific birth rates were highest for 30-34 year old (107.3 per 1,000) and 25-29 year old mothers (89.6 per 1,000). The birth rates for women ages 30 years and older have increased steadily throughout the 1990s (data not shown).

Since 1990, birth rates have increased for every age group of women ages 30 and above while decreasing for every age group of women under 30 (Table 4). The age groups with the largest increases in birth rates from 1990 to 2000 were women ages 45-49 years (87.5% increase), and women ages 40-44 years (49.3% increase). In 1995, the birth rate for Massachusetts resident women ages 30-44 years surpassed the rate for women younger than age 30 years for the first time in Massachusetts history (Figure 1).

In 2000, there were 25.8 births to teens (ages 15-19 years) per 1,000 females ages 15-19 years in the state. In contrast, the U.S. rate was 48.5 teen births (ages 15-19 years) per 1,000 females ages 15-19 years in the U.S. (National Vital Statistics Report, Vol. 50, No. 5, February, 2002, p. 2). The 2000 Massachusetts teen birth rate was 47% below the 2000 national rate. In 2000, there were 90 births to mothers ages 12-14 years and there were 150 births to women 45 years of age or older (Table 4). *(Please note: 2000 Massachusetts birth rates for women ages 15-19 years in this publication use DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in the Appendix for more information). Furthermore, 1999 birth rates have been re-calculated using 1999 population estimates, and therefore may differ from previously published data. They may also differ from rates given in federal publications that use U.S. Census population estimates).*

Parity

Parity is defined as the total number of live infants ever born to a woman, including the current birth. In 2000, 44.2% of all Massachusetts women who gave birth did so for the first time. One-third (33.7%) had a second child. Approximately 17% of births to teenage women ages 15 to 19 years were a second or higher order birth (Table 5).

In general, for 2000, the likelihood of giving birth to a second or higher-order child increased with increasing mother's age. However, there were exceptions for two age groups. Women in

the two highest age groups, 40-44 and 45+, were slightly less likely to be having a second or higher-order child (71.2%, and 68.7%, respectively) than women ages 35-39 (71.6%) (Table 5).

Plurality

Plurality represents the number of births to a woman produced in the same gestational period. In 2000, 95.7% of all births were singletons, 4.0% were twins and 0.3% were triplets or higher order multiple births (Table 6). The total percentage of multiple births (twins, triplets or more) was 4.3% in 2000. The total percentage of multiple births has increased by 65% since 1990 (2.6%). The increase since 1990 in the percentage of multiple births varies by age. For women under age 35 years, the percentage of multiple births increased from 2.5% in 1990 to 3.6% in 2000, an increase of 44%. Among women ages 35 years and older, the percentage of multiple births increased by 91% from 3.5% in 1990 to 6.7% in 1999 (Table 6).

Education

In 2000, 10.5% of women who gave birth had less than a high school education; 26.4% had a high school diploma or GED; 24.0% had some college education; and 39.2% had at least a college degree. Maternal educational attainment varied by race: 48% of Asian women and 46.1% of non-Hispanic white women had at least a college degree, compared with 15.1% of non-Hispanic black women and 8.5% of Hispanic women with at least a college degree (Table 7).

Women with more education were more likely to receive adequate prenatal care; more likely to breastfeed; more likely to have multiple births; and more likely to be married. They were less likely to smoke during pregnancy and less likely to receive publicly-financed prenatal care (Table 7).

Healthy People 2010 Objectives

Healthy People 2010 (HP2010) sets targets for each measurable objective. In this year's report, a new table (Table 8) presents the most recent Massachusetts data for HP2010 Maternal, Infant, and Child Health objectives, and measures the state's progress toward meeting the targets set for 2010.

Out of 16 objectives presented, Massachusetts 2000 birth data shows that the state has already met the 2010 target for two indicators: the postneonatal mortality rate and the maternal mortality ratio. For most of the objectives (10 total), including: infant mortality rate, perinatal mortality rate, early gestational age (preterm), adequacy of prenatal care, breastfeeding, and smoking during pregnancy, the 2000 Massachusetts indicators are within 25% of the target goals. The four indicators for which Massachusetts is the furthest from the HP2010 targets are: fetal mortality rate, low birthweight, very low birthweight, and primary cesarean sections.

Table 1. Trends in Birth Characteristics, Massachusetts: 1980, 1985, 1990-2000

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

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Data on birthweight and adequacy of prenatal care were not provided for approx. 1,140 resident births from Winchester Hospital.

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

Table 2A. Birth Characteristics by Maternal Race/Hispanic Ethnicity and Birthplace, Massachusetts: 2000

Race and Hispanic Ethnicity (by mother's birthplace)	Births[1]		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breast Feeding[4]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate		First Trimester					
	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**81,582**	**100.0**	**1,829**	**2.2**	**5,395**	**6.6**	**1,090**	**1.4**	**5,711**	**7.1**	**63,109**	**79.1**	**66,952**	**83.8**	**19,086**	**23.8**	**58,188**	**73.8**
U.S. States / D.C.	62,277	76.3	1,412	2.3	4,119	6.6	808	1.3	4,320	7.1	49,688	81.7	52,602	86.4	14,846	24.3	42,509	71.0
Puerto Rico/U.S. Terr.[6]	2,263	2.8	185	8.2	499	22.1	47	2.1	224	9.9	1,548	69.1	1,663	74.2	487	21.8	1,530	68.5
Non-U.S.-Born[7]	17,042	20.9	232	1.4	777	4.6	235	1.4	1,167	6.9	11,873	70.9	12,687	75.6	3,753	22.3	14,149	84.5
Non-Hispanic White	**60,051**	**73.6**	**714**	**1.2**	**2,500**	**4.2**	**675**	**1.1**	**3,780**	**6.4**	**48,820**	**83.2**	**51,551**	**87.8**	**14,474**	**24.6**	**42,287**	**73.3**
U.S. States / D.C.	54,744	91.2	686	1.3	2,374	4.3	619	1.2	3,491	6.5	44,740	83.6	47,253	88.3	13,268	24.8	37,860	72.1
Puerto Rico/U.S. Terr.[6]	34	0.1	1	--[5]	2	--[5]	0	0.0	3	--[5]	29	87.9	29	87.9	5	14.7	27	84.4
Non-U.S.-Born[7]	5,273	8.8	27	0.5	124	2.4	56	1.1	286	5.5	4,051	78.3	4,269	82.4	1,201	23.1	4,400	85.7
Non-Hispanic Black	**5,755**	**7.1**	**237**	**4.1**	**690**	**12.0**	**196**	**3.4**	**690**	**12.0**	**3,729**	**65.8**	**4,046**	**70.9**	**1,415**	**24.7**	**4,182**	**73.3**
U.S. States / D.C.	3,250	56.5	216	6.6	606	18.6	123	3.8	434	13.4	2,115	66.1	2,304	71.5	756	23.4	2,022	62.9
Puerto Rico/U.S. Terr.[6]	22	0.4	0	0.0	3	--[5]	1	--[5]	3	--[5]	15	71.4	16	76.2	3	--[5]	20	95.2
Non-U.S.-Born[7]	2483	43.1	21	0.8	81	3.3	72	2.9	253	10.2	1599	65.3	1726	70.0	656	26.5	2140	86.6
Hispanic	**9,247**	**11.3**	**730**	**7.9**	**1,765**	**19.1**	**135**	**1.5**	**756**	**8.2**	**6,153**	**67.0**	**6,631**	**72.1**	**1,884**	**20.5**	**6,933**	**75.4**
U.S. States / D.C.	3,037	32.8	423	13.9	900	29.6	52	1.7	303	10.0	2,036	67.6	2,201	73.0	579	19.2	1,864	61.9
Puerto Rico/U.S. Terr.[6]	2,189	23.7	184	8.4	491	22.4	45	2.1	217	9.9	1,497	68.9	1,610	74.0	473	21.8	1,475	68.0
Non-U.S.-Born[7]	4021	43.5	123	3.1	374	9.3	38	0.9	236	5.9	2620	65.6	2820	70.5	832	20.7	3594	89.6
Asian	**4,667**	**5.7**	**85**	**1.8**	**217**	**4.6**	**54**	**1.2**	**333**	**7.3**	**3,269**	**71.6**	**3,489**	**76.4**	**890**	**19.4**	**3,476**	**76.4**
U.S. States / D.C.	354	7.6	41	11.6	82	23.2	0	0.0	18	5.2	248	71.1	263	75.1	65	18.6	267	77.4
Puerto Rico/U.S. Terr.[6]	4	--[5]	0	0.0	0	0.0	0	0.0	0	0.0	1	--[5]	1	--[5]	2	--[5]	3	--[5]
Non-U.S.-Born[7]	4309	92.3	44	1.0	135	3.1	54	1.3	315	7.5	3020	71.7	3225	76.5	823	19.5	3206	76.3
Other[8]	**1,536**	**1.9**	**63**	**4.1**	**215**	**14.0**	**23**	**1.5**	**137**	**9.0**	**975**	**64.7**	**1,068**	**70.5**	**363**	**24.0**	**1,165**	**77.4**
U.S. States / D.C.	626	40.8	46	7.3	149	23.8	10	1.6	64	10.5	410	67.5	438	71.9	128	21.1	378	62.1
Puerto Rico/U.S. Terr.[6]	7	0.5	0	0.0	3	--[5]	1	--[5]	1	--[5]	5	71.4	6	85.7	3	--[5]	4	--[5]
Non-U.S.-Born[7]	903	58.8	17	1.9	63	7.0	12	1.3	72	8.0	560	62.6	624	69.4	232	25.8	783	88.0
Unknown[9]	**326**	**0.4**	**0**	**0.0**	**8**	**2.5**	**7**	**3.1**	**15**	**6.6**	**163**	**82.3**	**167**	**84.3**	**60**	**26.0**	**145**	**69.4**

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on all birth characteristics above except teen births were not provided for approx. 1,140 resident births from Winchester Hospital.

1. In the first category, "Births", percentages of race/Hispanic ethnicity are based on state total of births (including births of unknown race/ethnicity), percentages of mother's birthplace categories are based on subtotals of each race/Hispanic ethnicity category. For all other categories, percentages are based on row totals. 2. Very low birthweight: less than 1,500 grams or 3.3 pounds. 3. Low birthweight: less than 2,500 grams or 5.5 pounds. 4. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 5. Calculations based on fewer than five events are excluded. 6. 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. 7. 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. 8. Other: Mothers who designated themselves as American Indian or Other race. 9. Unknown: Mothers who did not indicate a race/ethnicity.

Table 2B. Birth Characteristics by Major Maternal Ancestries, Massachusetts: 2000

Maternal Ancestry	Births[1]		Teen Births				Birthweight				Prenatal Care				Cesarean Section		Breast Feeding[4]	
			<18 Years		<20 Years		Very Low[2]		Low[3]		Adequate		1st Trimester					
	n	%[5]	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
State Total	**81,582**	**100.0**	**1,829**	**2.2**	**5,395**	**6.6**	**1,090**	**1.4**	**5,711**	**7.1**	**63,109**	**79.1**	**66,952**	**83.8**	**19,086**	**23.8**	**58,188**	**73.8**
Puerto Rican	4,520	5.5	533	11.8	1,221	27.0	87	1.9	453	10.0	3,022	67.4	3,266	72.7	917	20.5	2,828	63.1
Dominican	1,632	2.0	83	5.1	230	14.1	13	0.8	101	6.2	1,134	69.7	1,222	75.1	327	20.0	1,371	84.1
Salvadoran	736	0.9	26	3.5	72	9.8	4	--[5]	48	6.5	414	56.7	443	60.6	112	15.2	678	92.1
Other Central American	771	0.9	30	3.9	87	11.3	8	1.0	48	6.2	492	64.5	531	69.4	150	19.5	700	91.1
Other Hispanic[6]	1,588	1.9	58	3.7	155	9.8	23	1.5	106	6.7	1,091	69.5	1,169	74.3	378	24.0	1,356	86.1
Chinese	1,293	1.6	4	--[5]	11	0.9	13	1.0	80	6.3	973	76.5	1,018	80.0	270	21.2	998	78.5
Vietnamese	825	1.0	13	1.6	35	4.2	10	1.2	44	5.4	577	71.0	620	76.2	141	17.3	453	55.5
Cambodian	546	0.7	49	9.0	113	20.7	8	1.5	44	8.1	247	45.7	300	55.5	43	7.9	269	49.4
Asian Indian	861	1.1	0	0.0	0	0.0	9	1.1	80	9.8	623	76.4	666	81.6	200	24.5	782	95.8
Other Asian/PI[7]	1,249	1.5	20	1.6	63	5.0	15	1.2	91	7.4	914	74.6	965	78.6	256	20.9	1,066	86.9
Cape Verdean	773	0.9	37	4.8	117	15.1	11	1.4	73	9.5	469	61.4	515	67.1	171	22.2	571	74.3
Brazilian	1,033	1.3	24	2.3	78	7.6	10	1.0	61	5.9	763	74.3	805	78.4	346	33.7	963	93.8
Other Portuguese	1,313	1.6	32	2.4	115	8.8	7	0.5	87	6.7	1,004	78.1	1,059	82.2	332	25.7	649	50.2
Haitian	1,026	1.3	7	0.7	28	2.7	36	3.5	119	11.6	640	63.6	702	69.0	297	29.0	859	84.0
W. Indian /Carib.[8]	652	0.8	14	2.1	43	6.6	20	3.1	73	11.2	451	69.7	486	74.7	155	23.8	549	84.6
African-American	2,806	3.4	174	6.2	516	18.4	105	3.8	371	13.3	1,826	66.3	1,995	71.8	656	23.5	1,748	62.7
African[9]	865	1.1	4	--[5]	21	2.4	16	1.9	67	7.8	566	65.9	599	69.6	230	26.8	776	90.0
Middle Easterner[10]	876	1.1	3	--[5]	19	2.2	3	--[5]	43	5.0	656	76.8	702	82.2	173	20.2	755	88.2
Native American	254	0.3	18	7.1	45	17.7	2	--[5]	14	5.6	179	72.2	189	76.2	62	25.0	165	66.5
European	13,968	17.1	79	0.6	286	2.0	111	0.8	721	5.3	11,131	82.3	11,792	87.0	3,436	25.3	10,986	81.7

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on all birth characteristics above except teen births were not provided for approx. 1,140 resident births from Winchester Hospital.

1. In the first category, "Births", percentages are based on column total (state total of births, including births for which maternal ancestry is unknown). 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. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed. 5. Calculations based on fewer than five events are excluded. 6. Other Hispanic includes Mexican, Cuban, Colombian, and Other South American. 7. Other Asian and Pacific Islander includes Korean, Filipino, Japanese, Laotian, Thai, Pakistani and Hawaiian. 8. West Indian and Caribbean include Jamaican and Barbadian. 9. African includes Nigerian and other African. 10. Middle Easterner includes Lebanese, Iranian, and Israeli.

Table 3A. Resident Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2000

Municipality	Rank	Population	Crude Birth Rate[2]	Mother's Race and Ethnicity				Very Low Birthweight (<1500 g)	Low Birthweight (<2500 g)
				Non-Hispanic White %[3]	Non-Hispanic Black %[3]	Hispanic %[3]	Asian or Other[4] %[3]	%	%
STATE TOTAL		6,349,097	12.8	73.6	7.1	11.3	7.6	1.4	7.1
Arlington	29	42,389	12.8	85.4	1.8	2.6	9.8	--[5]	4.3
Attleboro	30	42,068	14.8	89.0	2.6	4.5	3.7	1.8	7.1
Barnstable	25	47,821	10.1	88.6	2.9	3.1	5.0	2.3	5.3
Boston	1	589,141	13.7	35.1	30.9	21.7	12.0	2.1	9.0
Brockton	6	94,304	16.5	43.7	26.6	11.5	17.8	2.6	9.9
Brookline	17	57,107	10.8	73.8	2.3	3.6	20.0	--[5]	6.1
Cambridge	5	101,355	10.7	59.5	13.7	9.3	16.6	2.0	7.1
Chicopee	21	54,653	11.1	79.5	2.6	15.2	2.5	2.0	9.5
Fall River	8	91,938	12.9	84.4	5.7	5.5	4.3	1.3	9.4
Framingham	14	66,910	14.8	71.6	4.3	13.5	10.5	1.0	6.1
Haverhill	16	58,969	14.4	82.8	1.7	12.5	3.1	1.6	8.1
Lawrence	13	72,043	19.7	20.7	2.0	73.4	3.7	1.8	7.4
Lowell	4	105,167	16.7	48.2	5.3	17.9	28.5	1.5	7.7
Lynn	9	89,050	16.2	44.1	13.7	30.7	11.4	1.7	7.8
Malden	18	56,340	14.6	55.3	10.8	8.3	25.4	1.5	8.6
Medford	20	55,765	10.8	77.2	9.6	4.0	9.1	1.3	8.3
Methuen	28	43,789	13.5	78.0	--[5]	16.0	5.2	1.9	8.1
New Bedford	7	93,768	14.0	68.1	5.9	17.0	8.2	1.1	7.2
Newton	11	83,829	10.6	85.0	1.7	3.3	9.9	1.9	8.2
Peabody	24	48,129	11.2	87.2	1.5	6.5	4.8	1.9	6.2
Pittsfield	27	45,793	10.6	83.7	7.4	3.1	5.8	1.0	9.1
Plymouth	23	51,701	13.1	93.5	1.5	1.2	3.0	1.3	5.9
Quincy	10	88,025	13.1	68.7	4.1	2.9	22.9	1.6	7.3
Revere	26	47,283	13.3	62.4	4.3	20.2	13.1	1.1	8.4
Somerville	12	77,478	12.0	60.6	10.3	17.1	11.7	1.2	6.9
Springfield	3	152,082	16.5	32.8	20.9	41.9	4.2	1.9	9.1
Taunton	19	55,976	13.7	86.6	3.9	6.0	2.7	1.2	8.4
Waltham	15	59,226	11.5	63.9	7.3	17.0	11.8	0.7	5.6
Weymouth	22	53,988	14.0	88.1	2.5	1.6	4.1	0.9	6.9
Worcester	2	172,648	14.7	54.2	11.3	23.5	10.6	1.8	8.7

Table 3A.(cont'd) Resident Birth Characteristics, 30 Largest Municipalities[1], Massachusetts: 2000

Municipality	Birth					Deaths			
	Adequate Prenatal Care	Public Payment for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[6]		Neonatal Mortality Rate[6]	
	%	%	%	n	Rate[2]	2000	1998-2000	2000	1998-2000
STATE TOTAL	79.1	27.5	26.5	5,305	25.8	4.6	5.0	3.5	3.8
Arlington	86.3	5.7	7.6	6	7.8	0.0	--[5]	0.0	--[5]
Attleboro	78.7	26.9	22.4	47	40.8	--[5]	--[5]	--[5]	--[5]
Barnstable	80.4	32.6	26.4	29	22.5	--[5]	7.5	--[5]	4.1
Boston	76.7	48.6	44.2	785	35.3	6.7	6.6	5.3	5.3
Brockton	63.1	52.6	52.3	218	66.0	5.8	6.5	3.8	5.4
Brookline	90.0	5.9	5.2	6	4.3	0.0	--[5]	0.0	--[5]
Cambridge	80.3	17.4	19.2	27	7.2	--[5]	3.1	--[5]	2.2
Chicopee	73.7	43.9	40.5	56	31.0	--[5]	7.2	--[5]	6.1
Fall River	73.7	55.9	49.4	150	51.5	10.1	8.9	8.4	7.1
Framingham	89.3	25.5	18.7	45	23.4	5.0	4.4	--[5]	4.0
Haverhill	79.4	32.2	30.2	68	37.9	--[5]	4.2	--[5]	3.1
Lawrence	68.0	65.9	63.9	278	97.6	7.1	6.9	5.6	5.2
Lowell	62.5	48.3	47.1	248	63.4	5.7	6.2	5.1	4.5
Lynn	60.3	59.8	50.4	189	63.2	8.3	6.9	6.2	5.0
Malden	79.4	27.8	23.1	26	18.7	--[5]	5.1	--[5]	4.2
Medford	84.4	16.3	15.7	11	6.3	--[5]	4.3	--[5]	3.8
Methuen	77.6	23.5	25.2	35	27.7	13.5	7.1	13.5	6.5
New Bedford	70.8	59.0	54.3	195	65.5	4.6	5.7	--[5]	3.1
Newton	85.6	4.7	6.2	8	2.3	--[5]	2.3	--[5]	--[5]
Peabody	73.4	21.8	18.7	20	15.4	11.1	8.4	--[5]	6.0
Pittsfield	61.8	46.9	42.4	58	42.6	--[5]	--[5]	0.0	--[5]
Plymouth	79.1	19.0	19.4	23	14.6	--[5]	5.4	--[5]	3.4
Quincy	86.0	20.6	18.3	39	20.0	4.3	3.3	--[5]	2.7
Revere	71.8	42.8	31.4	35	28.8	0.0	3.7	0.0	3.2
Somerville	75.0	31.3	29.0	47	22.5	6.5	4.6	5.4	3.9
Springfield	62.0	64.2	63.8	466	77.2	6.0	7.9	3.2	5.0
Taunton	75.3	32.6	33.5	62	37.5	--[5]	5.9	--[5]	3.8
Waltham	81.7	21.0	20.5	16	7.1	--[5]	5.3	--[5]	3.9
Weymouth	87.5	13.2	16.5	19	14.3	--[5]	4.5	--[5]	4.1
Worcester	72.2	46.1	44.2	290	41.9	9.9	8.4	7.1	6.6

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on birthweight, adequacy of prenatal care, and source of prenatal care payment were not provided for approx. 1,140 resident births from Winchester Hospital.

1. The 30 largest municipalities are the cities and towns in Massachusetts with the largest populations according to DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in Appendix). 2. Crude birth rates represent the number of births per 1,000 residents; teen birth rates refer to the number of births per 1,000 females ages 15-19. 2000 birth rates are calculated using the DPH 2000 population estimates. 3. Mothers who designated themselves as Asian, American Indian or Other.
4. 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. 5. Calculations based on fewer than 5 events are excluded. 6. Deaths per 1,000 live births.

Table 3B: Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2000

CHNA	Population	Crude Birth Rate[1]	Mother's Race and Ethnicity: Non-Hispanic White % [3]	Non-Hispanic Black % [3]	Hispanic % [3]	Asian or Other[2] % [3]	Very Low Birthweight (<1500 g) %	Low Birthweight (<2500 g) %
STATE TOTAL	6,349,097	12.8	73.6	7.1	11.3	7.6	1.4	7.1
Community Health Network of Berkshire County	134,953	9.0	90.2	3.8	2.7	3.1	0.7	6.0
Upper Valley Health Web (Franklin County)	86,889	10.0	93.0	1.5	2.9	2.1	0.9	6.2
Partnership for Health in Hampshire County (Northampton)	150,077	8.3	87.9	1.4	4.6	5.8	1.4	6.5
The Community Health Connection (Springfield)	291,665	13.5	54.4	13.8	28.2	3.5	1.5	7.5
Community Health Network of Southern Worcester County	113,702	12.2	89.1	0.9	7.9	2.0	1.0	7.3
Community Partners for Health (Milford)	152,117	15.5	95.7	0.6	1.7	1.9	1.2	6.3
Community Health Network of Greater Metro West (Framingham)	374,478	14.7	86.5	1.6	4.9	6.8	1.1	6.4
Community Wellness Coalition (Worcester)	289,834	13.6	67.1	7.6	15.9	9.1	1.4	7.6
Fitchburg/Gardner Community Health Network	250,362	13.1	82.7	2.1	10.8	4.2	1.0	6.5
Greater Lowell Community Health Network	270,083	14.9	72.0	2.7	8.7	16.4	1.4	6.8
Greater Lawrence Community Health Network	182,025	15.4	52.9	1.2	41.2	4.5	1.6	6.6
Greater Haverhill Community Health Network	144,275	12.8	89.7	0.9	6.7	2.6	1.2	7.4
Community Health Network North (Beverly/Gloucester)	118,280	11.2	94.4	1.2	1.1	3.2	0.6	5.6
North Shore Community Health Network	278,839	12.9	70.0	6.5	16.7	6.8	1.4	6.7
Greater Woburn/Concord/Littleton Community Health Network	208,406	12.7	83.5	1.5	2.1	12.4	1.4	6.0
North Suburban Health Alliance (Medford/Malden/Melrose)	261,844	13.0	77.7	6.0	5.7	10.6	1.4	7.8
Greater Cambridge/Somerville Community Health Network	278,402	11.6	70.1	8.1	9.2	12.2	1.5	6.6
West Suburban Health Network (Newton/Waltham)	253,187	11.7	83.7	2.6	5.6	8.1	1.1	6.5
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	746,914	13.6	39.0	25.4	23.3	12.1	1.9	8.7
Blue Hills Community Health Alliance (Greater Quincy)	365,457	12.9	79.7	5.9	2.3	10.5	1.0	6.2
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	159,254	12.0	67.7	2.2	27.2	2.6	1.6	8.3
Greater Brockton Community Health Network	232,260	14.1	68.7	14.2	6.3	10.0	2.1	8.6
South Shore Community Partners in Prevention (Plymouth)	180,609	13.5	94.3	0.9	0.9	2.1	0.9	6.0
Greater Attleboro-Taunton Health & Education Response	242,659	13.9	91.9	2.0	2.8	2.8	1.1	7.4
Partners for a Healthier Community (Fall River)	140,256	11.3	87.9	4.3	4.2	3.3	1.3	8.6
Greater New Bedford Health & Human Services Coalition	195,533	11.6	79.5	3.6	10.2	6.1	1.2	6.8
Cape and Islands Community Health Network	246,737	9.2	89.2	2.3	2.7	4.9	1.5	6.0

Table 3B.(cont'd) Resident Birth Characteristics, Community Health Network Areas (CHNAs), Massachusetts: 2000

CHNA	Births					Deaths			
	Adequate Prenatal Care	Public Payment for Prenatal Care	Unmarried	Teen Mothers 15 to 19 years		Infant Mortality Rate[6]		Neonatal Mortality Rate[6]	
	%	%	%	n	Rate[4]	2000	1998-2000	2000	1998-2000
STATE TOTAL	79.1	27.5	26.5	5,305	25.8	4.6	5.0	3.5	3.8
Community Health Network of Berkshire County	71.1	38.7	36.2	122	25.8	--[5]	2.6	0.0	1.3
Upper Valley Health Web (Franklin County)	75.8	36.8	33.6	79	27.6	--[5]	3.8	--[5]	3.0
Partnership for Health in Hampshire County (Northampton)	84.1	21.1	22.3	56	6.2	4.0	4.5	--[5]	3.4
The Community Health Connection (Springfield)	68.2	48.6	47.7	546	51.9	4.3	6.1	2.3	3.9
Community Health Network of Southern Worcester County	77.8	24.7	30.5	109	29.7	--[5]	6.2	--[5]	5.2
Community Partners for Health (Milford)	88.5	9.7	12.5	66	14.6	4.7	4.8	3.8	3.3
Community Health Network of Greater Metro West (Framingham)	87.9	11.0	10.3	142	14.3	4.0	3.8	3.3	2.9
Community Wellness Coalition (Worcester)	75.3	32.8	32.8	332	32.1	7.1	7.6	5.1	6.0
Fitchburg/Gardner Community Health Network	78.8	24.0	27.1	259	31.6	3.7	4.0	2.8	2.8
Greater Lowell Community Health Network	72.2	26.1	26.8	312	36.4	4.5	5.2	3.7	4.0
Greater Lawrence Community Health Network	73.6	40.2	39.0	319	51.0	6.8	5.5	6.1	4.6
Greater Haverhill Community Health Network	81.5	20.2	20.7	109	25.9	3.3	3.7	2.7	3.1
Community Health Network North (Beverly/Gloucester)	84.8	15.6	15.1	53	14.2	--[5]	3.5	--[5]	2.8
North Shore Community Health Network	68.9	34.7	30.7	257	31.0	7.5	6.1	5.6	4.5
Greater Woburn/Concord/Littleton Community Health Network	85.7	5.8	6.7	30	5.6	4.5	3.0	3.4	2.3
North Suburban Health Alliance (Medford/Malden/Melrose)	83.7	18.3	15.8	76	11.0	2.9	4.2	2.6	3.6
Greater Cambridge/Somerville Community Health Network	81.4	17.2	17.5	87	11.0	4.7	3.7	3.7	3.0
West Suburban Health Network (Newton/Waltham)	85.9	7.4	8.2	29	3.0	3.4	3.0	2.0	2.2
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	76.1	46.1	41.3	922	34.9	5.6	5.8	4.4	4.7
Blue Hills Community Health Alliance (Greater Quincy)	87.9	12.4	13.5	112	11.6	2.8	3.7	2.5	3.2
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	74.1	46.2	43.6	230	39.1	4.2	5.0	3.1	4.2
Greater Brockton Community Health Network	74.0	31.0	33.2	270	32.7	5.8	5.6	4.9	5.1
South Shore Community Partners in Prevention (Plymouth)	86.0	12.3	14.9	83	14.7	4.5	5.2	2.9	4.0
Greater Attleboro-Taunton Health & Education Response	80.5	21.1	20.5	182	23.9	2.1	5.0	1.5	3.6
Partners for a Healthier Community (Fall River)	77.0	47.8	41.2	170	38.3	9.4	8.1	8.2	6.8
Greater New Bedford Health & Human Services Coalition	76.4	43.4	41.4	246	37.7	4.9	5.2	3.5	2.8
Cape and Islands Community Health Network	81.8	27.7	22.2	107	17.4	6.2	5.9	4.8	4.4

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on birthweight, adequacy of prenatal care, and source of prenatal care payment were not provided for approx. 1,140 resident births from Winchester Hospital.

1. Births per 1,000 residents (male and female). 2000 birth rates are calculated using DPH 2000 population estimates, based on U.S. Census 2000 population counts (see Technical Notes in Appendix). 2. Mothers who designated themselves as Asian, American Indian or Other. 3. For the category of Mother's Race and Ethnicity, percentages are calculated based on the state total of resident births, including births for which mother's race/Hispanic ethnicity is unknown. 4. Births per 1,000 female residents ages 15-19. 5. Calculations based on fewer than 5 events are excluded. 6. Deaths per 1,000 live births.

Table 4. Age-Specific and Crude Birth Rates, Massachusetts: 1990 and 2000

Mother's Age	1990 Births[1]	1990 Rate	2000 Births	2000 Rate[2]	Percent Change in Rate
12-14	124	1.3	90	0.7	-46.2
15-19	7,258	35.1	5,305	25.8	-27.9
20-24	18,115	69.5	11,965	58.2	-17.4
25-29	29,913	107.2	19,761	89.6	-16.7
30-34	25,687	93.9	26,873	107.3	16.5
35-39	9,795	40.1	14,686	53.6	33.7
40-44	1,522	6.9	2,748	10.3	49.3
45+	46	0.3[3]	150	0.6	87.5
Birth rate, ages 15-44[4]	92,290	62.2	81,338	57.2	-8.0
Crude Birth Rate[5]	92,461	15.4	81,582	12.8	-16.6

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

Figure 1. Trends in the Number of Births by Mother's Age Group, Massachusetts: 1980-2000

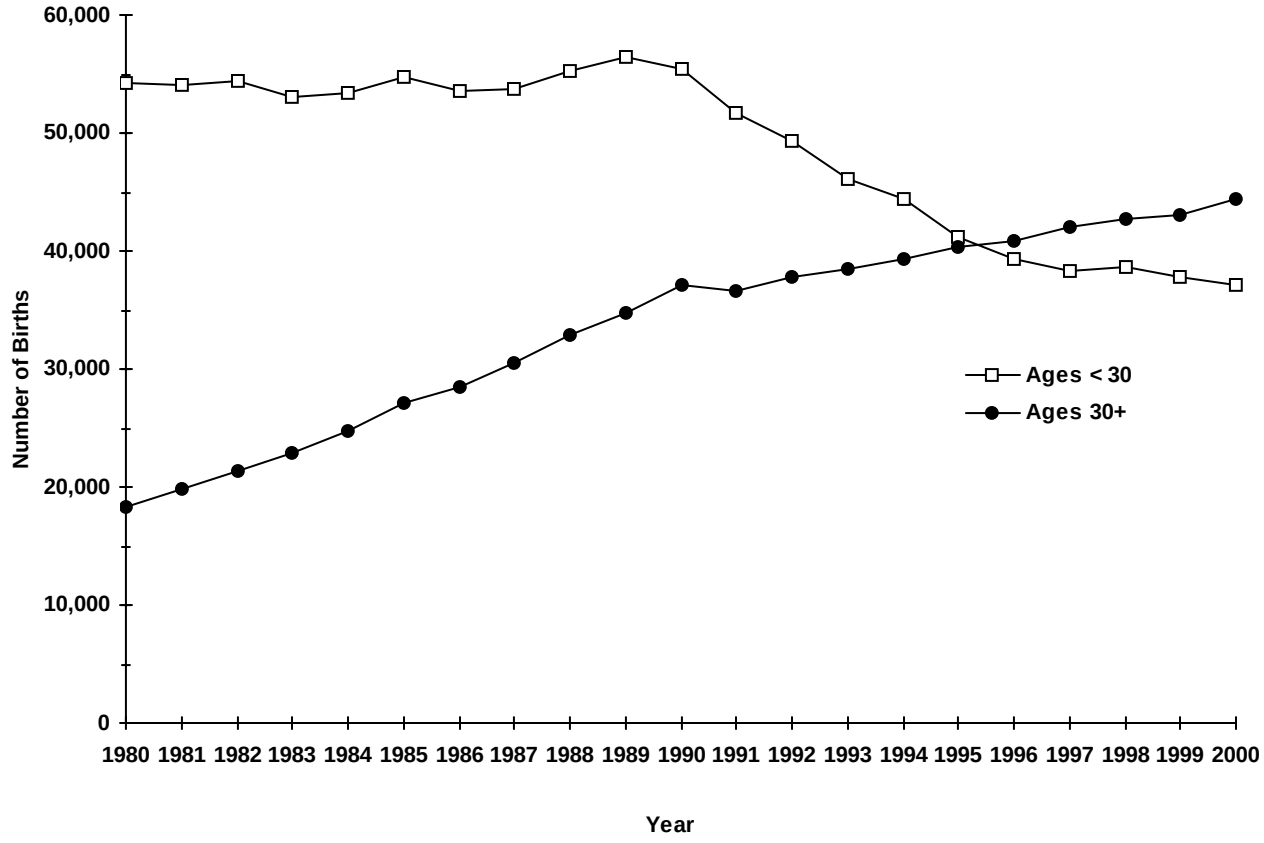
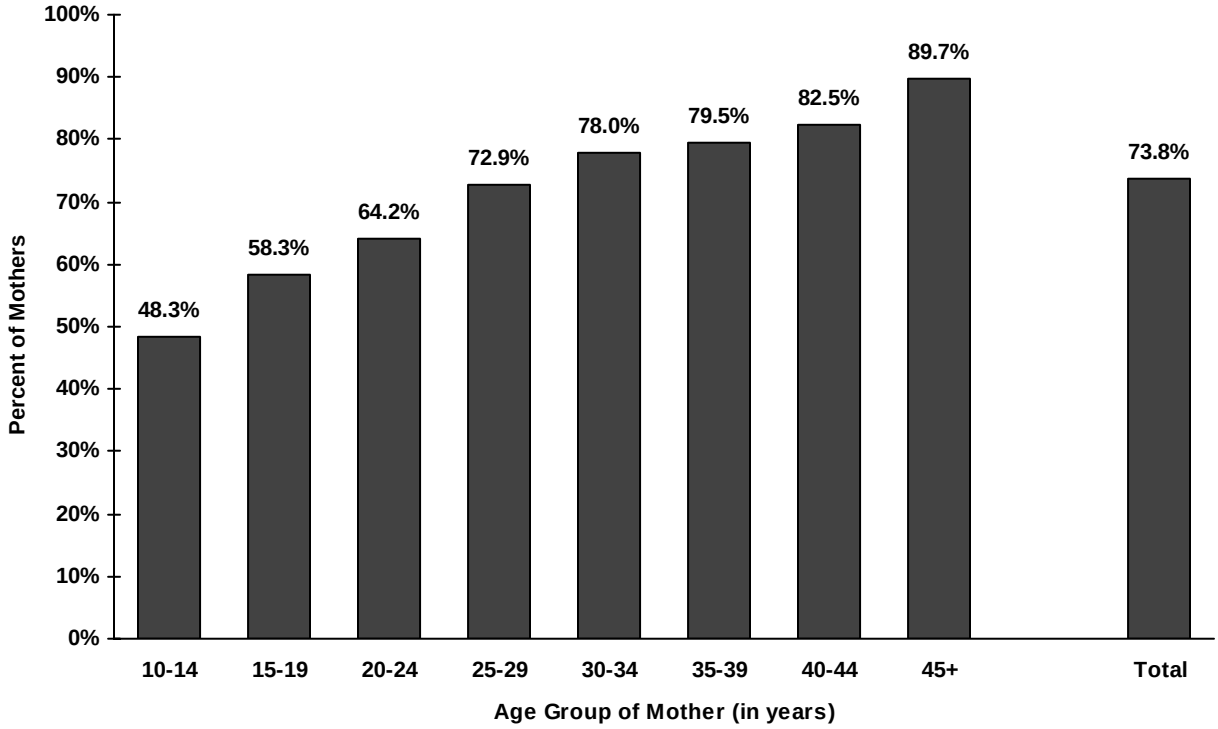
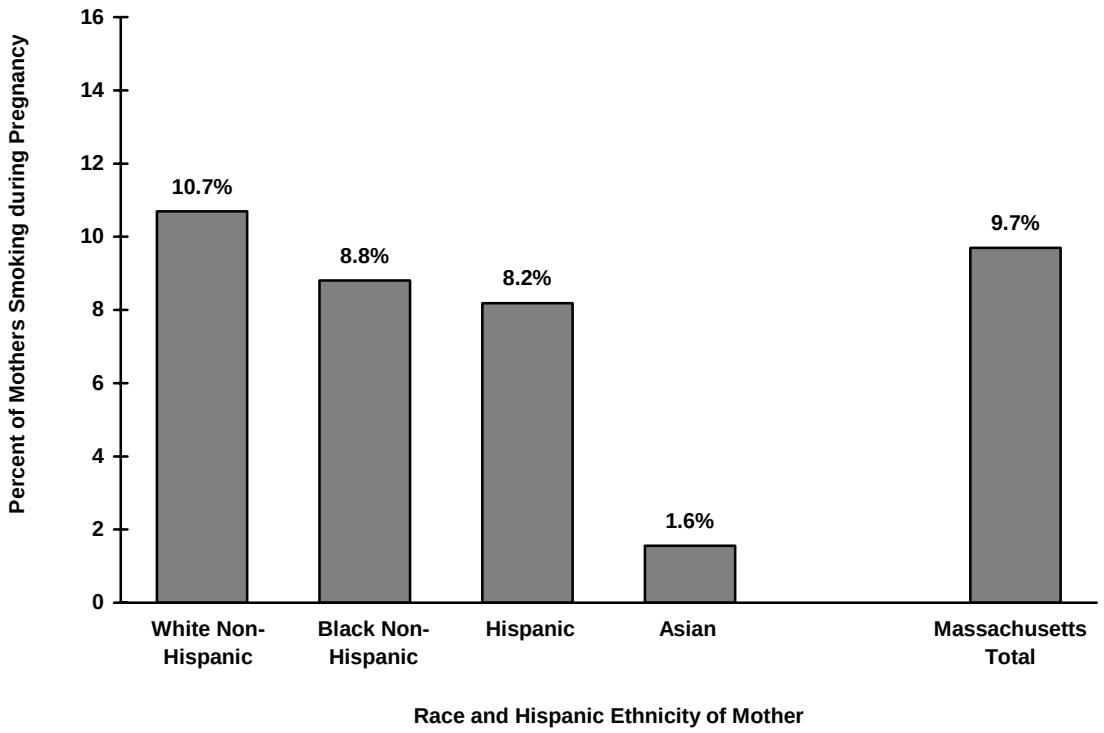


Figure 2. Percent of Mothers Breastfeeding or Intending to Breastfeed[1] by Age Group, Massachusetts [2]: 2000



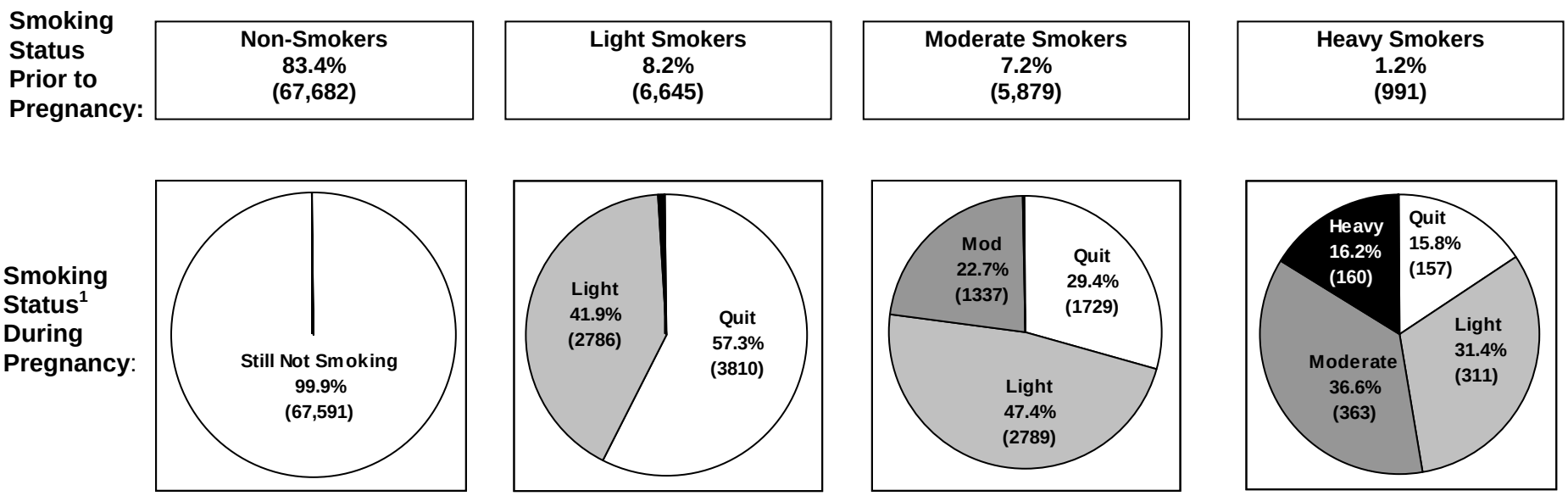
NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Data on breastfeeding were not provided for approx. 1,140 resident births from Winchester Hospital.
1. Information about breastfeeding was reported by the mother at the time the birth certificate was completed.
2. For race-specific breastfeeding rates see Table 2A.

Figure 3. Smoking Prevalence[1] During Pregnancy, by Race and Hispanic Ethnicity of Mother, Massachusetts: 2000



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 by mother. Mothers with more than one delivery are counted for each birth.
NOTE: Maternal smoking is self-reported, usually following childbirth; these data should be interpreted cautiously.

Figure 4. The Distribution of Smoking Status during Pregnancy by Smoking Status Prior to Pregnancy, Massachusetts: 2000



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

57.3% of Light Smokers quit smoking (0.7% increased)

76.9% of Moderate Smokers decreased the number of cigarettes smoked daily or quit (0.4% increased)

83.8% 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.
Not all percentages add up to 100 due to a small number of mothers with unknown smoking status.
1. Light Smokers=1-10 cigarettes daily; Moderate Smokers=11-20 cigarettes daily; Heavy Smokers=21 cigarettes or more daily.

Table 5. Parity[1] by Age of Mother, Massachusetts: 2000

Age of Mother (years)		Total Births	1st	2nd	3rd	4th	5th+
STATE TOTAL	**n[2]**	81,582	35,452	27,025	11,917	3,842	1,984
	%[3]	100.0	44.2	33.7	14.9	4.8	2.5
10-14	**n**	90	87	3	0	0	0
	%	100.0	96.7	3.3	0.0	0.0	0.0
15-19	**n**	5,305	4,381	742	120	24	1
	%	100.0	83.2	14.1	2.3	0.5	0.0
20-24	**n**	11,965	6,401	3,759	1,229	362	101
	%	100.0	54.0	31.7	10.4	3.1	0.9
25-29	**n**	19,761	9,357	6,280	2,601	780	395
	%	100.0	48.2	32.3	13.4	4.0	2.0
30-34	**n**	26,873	10,305	9,888	4,248	1,245	627
	%	100.0	39.2	37.6	16.1	4.7	2.4
35-39	**n**	14,686	4,094	5,384	3,174	1,171	610
	%	100.0	28.4	37.3	22.0	8.1	4.2
40-44	**n**	2,748	778	919	523	249	229
	%	100.0	28.8	34.1	19.4	9.2	8.5
45+	**n**	150	47	50	22	11	20
	%	100.0	31.3	33.3	14.7	7.3	13.3

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Data on parity were not provided for approx. 1,140 resident births from Winchester Hospital.

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 6. Number and Percent Distribution of Births[1] by Plurality and Age, Massachusetts: 1990-2000

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

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

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

Table 7. Selected Birth Characteristics by Maternal Education, Massachusetts: 2000

	Less than High School		High School Graduate		Some College		College Graduate		More than College	
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]
State Total	8,505	10.5	21,414	26.4	19,461	24.0	21,743	26.8	10,081	12.4
Race										
Non-Hispanic White	3,194	5.3	14,177	23.6	14,955	24.9	19,102	31.8	8,565	14.3
Non-Hispanic Black	938	16.3	2,085	36.2	1,857	32.3	640	11.1	232	4.0
Hispanic	3,285	35.5	3,546	38.4	1,622	17.6	538	5.8	250	2.7
Asian	722	15.5	1,018	21.8	680	14.6	1,294	27.8	949	20.4
Age										
20-29	3,869	12.2	11,047	35.0	9,140	28.9	5,798	18.4	1,738	5.5
30-39	1,446	3.5	7,912	19.1	9,373	22.7	15,029	36.3	7,590	18.4
40+	117	4.1	503	17.5	602	20.9	906	31.5	752	26.1
Non-U.S.-born[2]	2,861	33.7	5,274	24.7	3,373	17.3	3,400	15.7	2,069	20.5
Unmarried	6,232	73.3	9,045	42.2	4,906	25.2	1,047	4.8	315	3.1
Publicly-financed prenatal care	6,547	77.7	9,590	45.8	4,407	23.4	942	4.6	197	2.0
Very low birthweight[3]	145	1.7	336	1.6	267	1.4	251	1.2	84	0.8
Low birthweight[4]	806	9.5	1,642	7.8	1,332	7.0	1,309	6.1	605	6.1
Adequate prenatal care	4,943	58.8	15,851	75.3	15,303	80.6	18,249	85.9	8,570	86.7
Cesarean section delivery	1,502	17.8	4,898	23.2	4,902	25.7	5,283	24.8	2,437	24.6
Breastfeeding[5]	4,628	55.1	13,295	63.6	13,552	72.1	17,578	85.4	8,968	90.6
Multiple births	201	2.4	728	3.4	850	4.4	1,132	5.2	589	5.8
Smoking during pregnancy	2,023	23.8	3,520	16.5	1,961	10.1	325	1.5	76	0.8

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

Data on source of payment for prenatal care, birthweight, adequacy of prenatal care, cesarean section deliveries, and breastfeeding were not provided for approx. 1,140 resident births from Winchester Hospital.

1. For state total, race and age categories, percentages are based on row totals. For all other categories, percentages are based on column totals. 2. Includes women born outside of the 50 U.S. States, Washington D.C., and Puerto Rico/U.S. territories (the U.S. Virgin Islands, and Guam). 3. Very low birthweight: less than 1,500 grams or 3.3 pounds. 4. Low birthweight: less than 2,500 grams or 5.5 pounds. 5. Mother was breastfeeding or was intending to breastfeed at the time the birth certificate was completed.

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

Healthy People 2010 Objectives (Focus Area 16: Maternal, Infant and Child Health[2])	HP2010 Target	Massachusetts			*Has Massachusetts achieved HP2010 target?* ✓ = YES ○ = NO, but within 25% of target ● = NO, > 25% from target
		1998	1999	2000	
Fetal, Infant, and Maternal Deaths					
16-1a. Fetal Mortality Rate[3]	4.1	5.4	5.2	5.3	●
16-1b. Perinatal Mortality Rate[4]	4.5	5.9	6.0	5.4	○
16-1c. Infant Mortality Rate[5]	4.5	5.1	5.2	4.6	○
16-1d. Neonatal Mortality Rate[6]	2.9	3.9	4.1	3.5	○
16-1e. Postneonatal Mortality Rate[7]	1.2	1.2	1.1	1.1	✓
16-4. Maternal Mortality Ratio[8]	3.3	3.7	0.0	1.2	✓
Risk Factors					
16-10a. Low Birthweight[9] (%)	5.0	7.0	7.1	7.1	●
16-10b. Very Low Birthweight[10] (%)	0.9	1.3	1.4	1.4	●
16-11a. Preterm[11] (%)	7.6	7.6	7.6	8.3	○
Prenatal Care					
16-6a. Care beginning in first trimester (%)	90	84.3	84.3	83.8	○
16-6b. Early and adequate care[12] (%)	90	82.9	82.9	83.3	○
Obstetrical Care					
16-8. Very Low Birthweight[10] Infants born at Level III Hospitals[13] (%)	90	80.3	82.5	83.4	○
16-9a. Cesarean Sections: Low-Risk[14] Women Giving Birth for the First Time (%)	15	17.6	18.8	20.5	●
16-9b. Cesarean Sections: Low-Risk[14] Women with Prior Cesarean Section (%)	63	63.8	68.8	72.7	○
Breastfeeding					
16-19a. Breastfeeding[15] (%)	75	70.9	72.4	73.8	○
Prenatal Substance Exposure					
16-17c. Abstinence from Smoking (%)	99	88.5	89.3	90.3	○

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

Data on risk factors, prenatal care, obstetrical care, and breastfeeding were not provided for approx. 1,140 resident births occurring at Winchester Hospital in 2000.

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 livebirths. 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 livebirths. 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 (page 98). 9. Less than 2,500 grams, or 5.5 pounds. 10. Less than 1,500 grams, or 3.3 pounds. 11. Born before completion of 37th week of gestation. 12. Based on Adequacy of Prenatal Care Utilization Index (see glossary). 13. Facilities for high-risk deliveries and neonates that can provide care to very small infants, including mechanical ventilation and neonatal surgery and special care for transferred patients and for which a full-time neonatologist serves as the director. 14. "Low-risk"= full term birth, singleton, vertex presentation. 15. HP2010 specifies objective as mother breastfeeding in "early postpartum period." Massachusetts data is based on mother's self-report of current breastfeeding or intention to breastfeed at the time the birth certificate is completed.

CHAPTER 2

INFANT AND MATERNAL MORTALITY

Overall Changes in Infant Mortality Rate

In 2000, there were 377 infant deaths (deaths of children less than one year of age) among Massachusetts residents, 41 fewer infant deaths than in 1999, and **the lowest number of annual infant deaths in Massachusetts history** (Figure 6). The infant mortality rate (IMR) in 2000 was 4.6 deaths per 1,000 live births, a decrease of 12% from the 1999 rate of 5.2, and a 34% decrease since 1990 (Table 9A). **The 2000 IMR is the lowest in Massachusetts history**. The 2000 Massachusetts IMR is 28% below the 2000 U.S. preliminary rate of 6.9 (National Vital Statistics Report, Vol. 49, No. 12, October 9, 2001, p. 4).

Race and Ethnicity Patterns in Infant Mortality Rates

The IMR for whites was 4.0 deaths per 1,000 live births in 2000, a 17% decrease from the 1999 IMR for white infants (Table 9A). The IMR for black infants was 11.7 deaths per 1,000 live births, a 3% increase from the previous year (11.4 in 1999). Since 1980, there has been a substantial decline in IMRs among black and white infants. From 1980 to 2000, the IMR decreased by 59% for whites and 37% for blacks. However, the IMR for black infants was consistently more than twice as high as the IMR for white infants during this time period. For the second year in a row, the disparity in IMR between white and black infants has increased (Figure 5). The 2000 IMR for all 'other' races (including Asian and American Indian) was 3.6, although caution should be used in interpreting this rate since it is based on only 19 deaths.

The Massachusetts death certificate was revised in 1989 to include a Hispanic identifier. This revision enables the calculation of non-Hispanic white, non-Hispanic black, and Hispanic infant mortality rates (Table 9B). Infants born to non-Hispanic black mothers continue to have the highest IMR (12.8 per 1,000 live births). From 1999 to 2000, the IMR for Hispanics declined slightly from 5.5 to 5.2 deaths per 1,000 live births. The 2000 IMR for Hispanic infants is 37% higher than the non-Hispanic white rate and 59% below the non-Hispanic black rate.

Asian infants had a lower mortality rate than both non-Hispanic black and Hispanic infants but higher than for non-Hispanic whites (Table 9B) In 2000, the Asian IMR was 4.1 deaths per 1,000 live births. However, caution should be used when interpreting this rate since it is based on a small number of deaths.

Neonatal and Post Neonatal Mortality Rates

The overall neonatal mortality rate (deaths among infants less than 28 days old) was 3.5 per 1,000 live births in 2000, the lowest neonatal mortality rate in Massachusetts history (Table 9B). As for infant mortality, this decrease did not occur across all race/ethnicity groups. Decreases occurred for non-Hispanic whites and Hispanics, while the rate for non-Hispanic blacks stayed the same, and the rate for Asians increased.

The overall post neonatal mortality rate (deaths among infants between 28 and 364 days old), was 1.1 in 2000, the same as in 1999. The post neonatal mortality rate for non-Hispanic black infants increased from 2.4 in 1999 to 2.9 in 2000. The rate for non-Hispanic black infants is approximately three-fold higher than for all other race/ethnicity groups.

Trends in the Time of Infant Deaths

Since 1990, the percentage of all infant deaths that occurred in the post neonatal period (28-364 days) has declined from 31% to 24% (Figure 7). During the same time period, the percentage of infant deaths that occurred in the early neonatal period (within the first 24 hours after birth) rose from 44% to 52% of all infant deaths.

In 2000, the percentage of infant deaths occurring in the neonatal period (from 1-27 days) decreased slightly from 1999 (from 29.6% to 24.9%), but this decrease is an exception to the 6-year rise in the percentage of deaths during this period. From 1994 to 1999, the percentage of infant deaths occurring in the neonatal period increased from 24% to 30%.

(Cause-specific infant death information will be available in the upcoming report, ***Massachusetts Deaths 2000***.)

Pregnancy-Associated and Maternal Mortality Ratios

There were 26 pregnancy-associated deaths, including 1 maternal death. A pregnancy-associated death is the death of a woman while pregnant or within one year of termination of pregnancy, irrespective of cause. Women who die from a cause related to pregnancy or childbirth either during pregnancy or up to 42 days after pregnancy termination are called maternal deaths and are a subset of pregnancy-associated deaths. (See technical notes for further information).

The pregnancy-associated mortality ratio (PAMR) was 31.4 deaths per 100,000 live births and the maternal mortality ratio (MMR) was 1.2 per 100,000 live births (Figure 8). Since 1990, the annual PAMR fluctuated from a low of 18.0 in 1990 to a high of 31.8 in 1994. However, due to the small number of cases, the differences are not statistically significant.

Table 9A. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race[1], Massachusetts: 1980-2000

INFANT MORTALITY

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

NEONATAL MORTALITY

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

Table 9A (cont'd). Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race[1], Massachusetts: 1980-2000

POST NEONATAL MORTALITY

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

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 1999 are presented in Table 9B. 2. Deaths of infants of unknown race are included in the total calculation. For rate computations, infants of unknown race are allocated into the race categories according to the distribution of births of known race. 3. Other: American Indian and Other races. 4. Rates are expressed per 1,000 live births. 5. Calculations based on fewer than five events are excluded.

Table 9B. Trends in Infant, Neonatal, and Post Neonatal Mortality, by Race and Hispanic Ethnicity, Massachusetts: 1990-2000

INFANT MORTALITY

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

NEONATAL MORTALITY

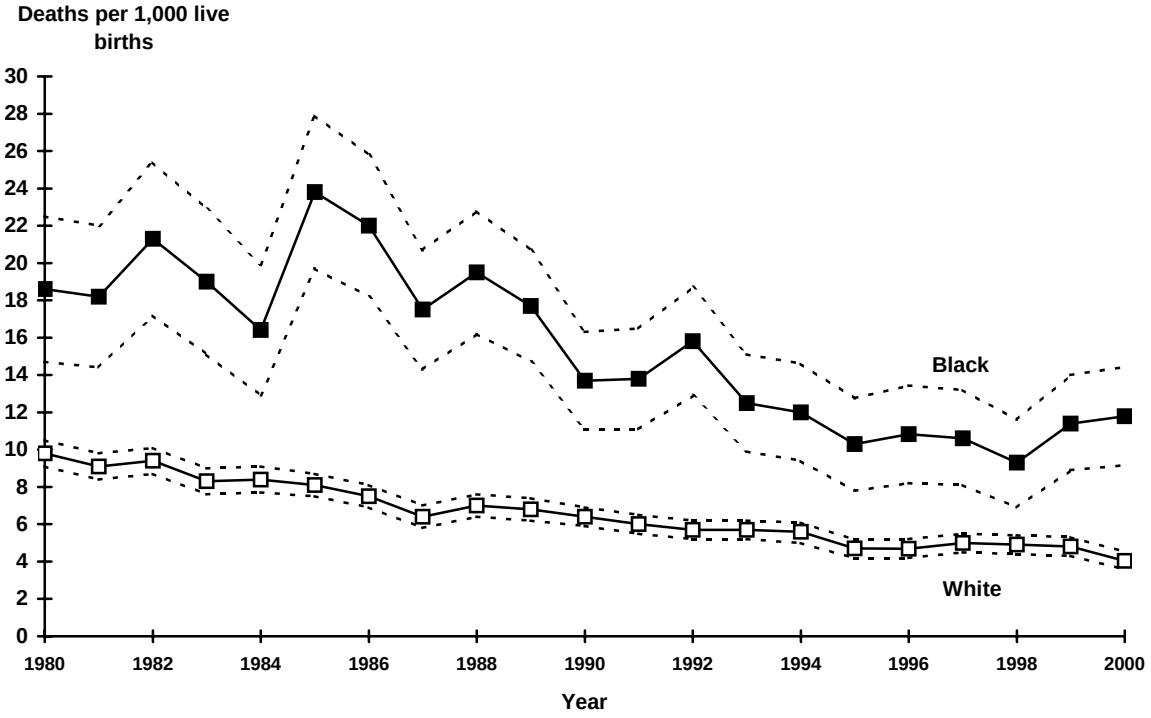
	State Total[1]		Non-Hispanic White		Non-Hispanic Black		Hispanic		Asian		Other[2]	
Year	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]	n	Rate[3]
1990	446	4.8	298	4.1	75	10.5	49	5.8	19	5.5	5	5.5
1991	401	4.5	266	3.9	72	10.7	53	6.2	10	3.0	0	0.0
1992	415	4.8	274	4.0	76	11.4	51	6.0	10	3.0	4	--[4]
1993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

POST NEONATAL MORTALITY

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

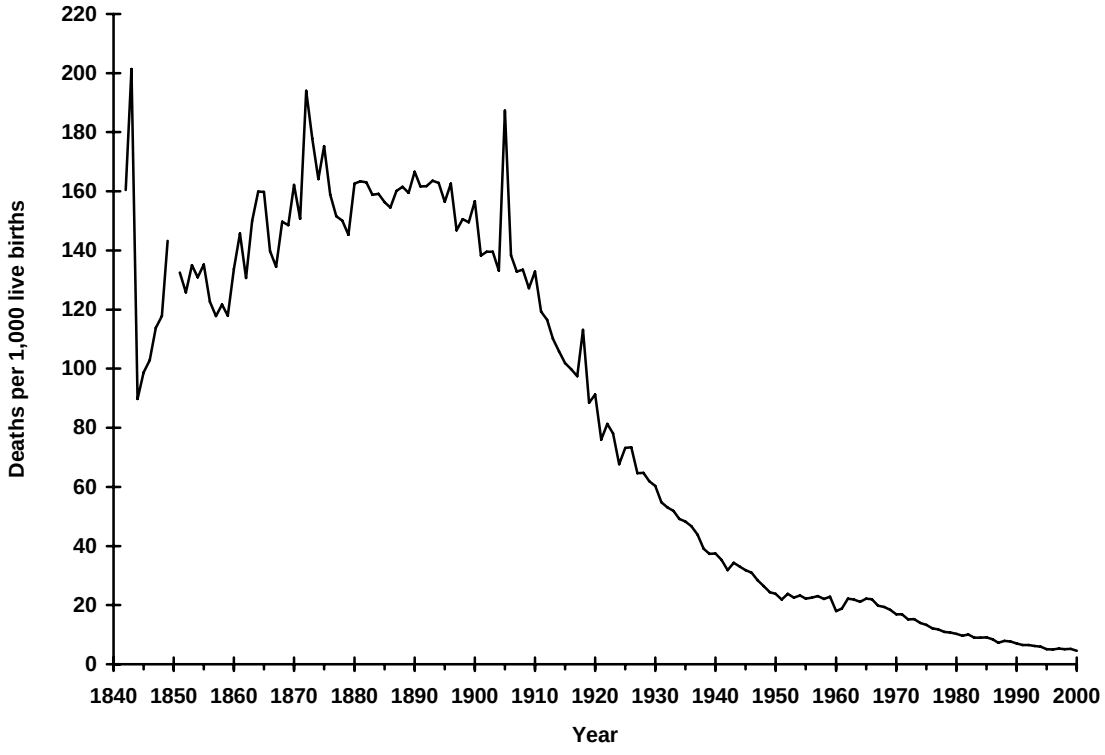
1. Deaths of infants of unknown race are included in the total calculation. For rate computations, births of infants of unknown race are allocated into the race categories according to the distribution of births of known race. 2. Other: American Indian and Other races. 3. Rates are expressed per 1,000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

Figure 5. Infant Mortality Rates and 95% Confidence Intervals[1] by Race[2], Massachusetts: 1980-2000



1. See Appendix for explanation
2. For rate computations, infant births of unknown race are allocated into race categories according to the distribution of the births of known race.
3. On tables and graphs which include data prior to June 1986, the race classifications do not include ethnicity; most Hispanics are

Figure 6. Infant Mortality Rates, Massachusetts: 1842-2000[1]



1. Data not available for 1850.

Figure 7. Trends in the Timing of Infant Deaths, 1990-2000

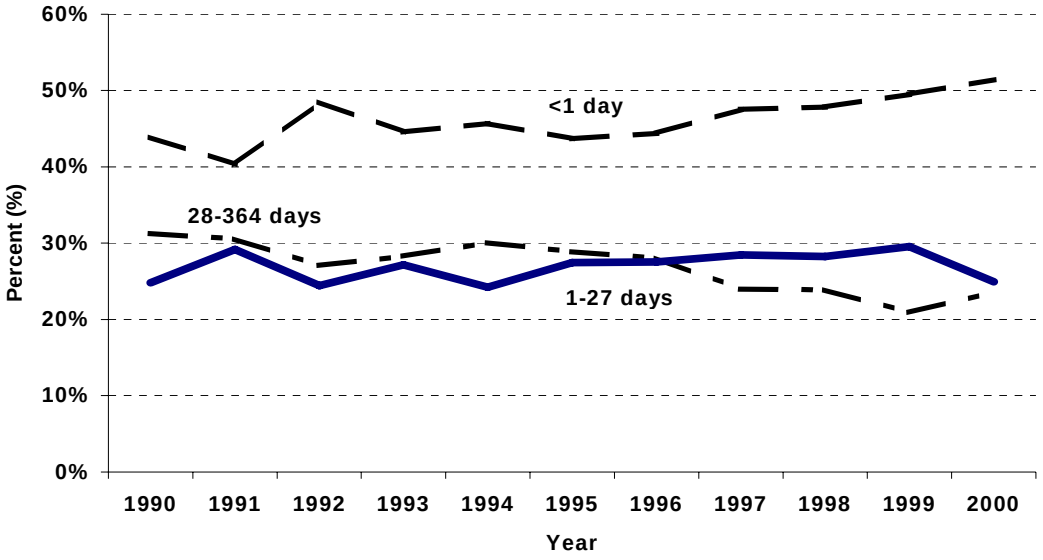
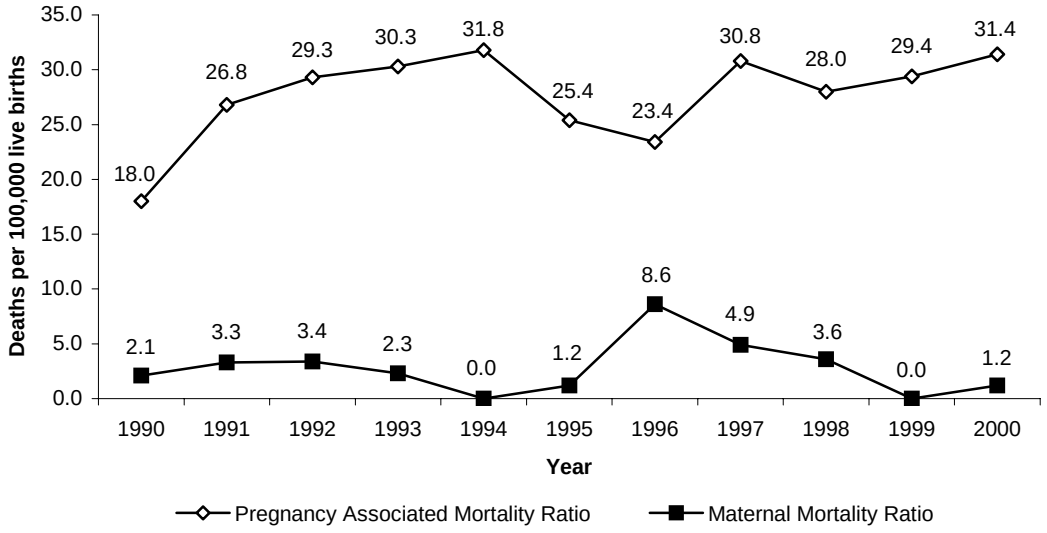


Figure 8. Trends in Pregnancy-Associated[1] and Maternal Mortality[2], Massachusetts: 1990-2000



Number of Pregnancy-Associated[1] and Maternal Deaths[2], 1990-2000

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

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

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

CHAPTER 3

BIRTHWEIGHT AND GESTATIONAL AGE

Overall Birthweight Distribution

In 2000, 7.1% (5,711) of infants were low birthweight (less than 2,500 grams or 5.5 pounds), and 11.6% were 4,000 grams (8.8 pounds) or more (Table 10). The low birthweight rate in Massachusetts was 7% below the U.S. rate of 7.6% (National Vital Statistics Reports, Vol. 50, No. 5, February 2002, p.2). The low birthweight rate in 2000 was the same as the previous year (7.1%). In 2000, 1.4% (1,090) of infants born to Massachusetts resident women were very low birthweight (less than 1,500 grams or 3.3 pounds), which was also equal to the 1999 rate (1.4%) (Table 10).

Patterns of Birthweight by Race and Ethnicity

The proportion of low birthweight infants varied by mother's race and ethnicity (Table 11). Non-Hispanic black women had the highest proportion of low birthweight infants: 12.0%; Hispanic mothers delivered 8.2% low birthweight infants; Asian mothers, 7.3% low birthweight infants; and non-Hispanic white mothers delivered 6.4% low birthweight infants. The proportion of low birthweight deliveries remained the same as in 1999 for all race/ethnicity groups except the rate for non-Hispanic blacks, which decreased slightly, from 12.2% to 12.0%.

The proportion of very low birthweight infants also varied by mother's race and ethnicity. Non-Hispanic black women had the highest proportion of very low birthweight infants: 3.4%; compared with 1.5% of Hispanics, 1.2% of Asians, and 1.1% of white non-Hispanics (Table 10).

Non-Hispanic white mothers delivered the highest proportion of high birthweight infants: 14.9% weighed 4,000 grams or more.

The Massachusetts low birthweight rate for non-Hispanic black women, 12.0%, was lower than the U.S. rate for all black women, 13.0%. The rate of low birthweight for Massachusetts Hispanic women (8.2%) was higher than the corresponding 2000 U.S. rate of 6.4% (National Vital Statistics Report, Vol. 50, No. 5, February 2002, p. 2). This may be due to differences in the composition of the Hispanic population between Massachusetts and the nation as a whole. In Massachusetts, the Hispanic population is comprised mainly of Puerto Ricans, Dominicans, and Central Americans. The U.S. Hispanic population has a much greater percentage of Mexicans and Cubans who have relatively low rates of low birthweight. The Massachusetts low birthweight rate for Puerto Ricans was 10.0% in 2000 (Table 2B).

Birthweight and Age of Mother

In general, the relation between mother's age and percentage low birthweight follows a "U-shaped" distribution: the percentage of low birthweight deliveries is highest among women under age 20 years or over age 35 years, and lowest among women between the ages of 25 to 34 years (Table 11). However, the distribution of low birthweight across age groups for Non-Hispanic black women is unlike that of other groups. Non-Hispanic black women delivered higher percentages of low birthweight infants than other race/ethnicity groups for women in age groups of 18 to 39 years.

Birthweight and Smoking

Cigarette smoking during pregnancy increases the likelihood of delivering a low birthweight infant. During 2000 in Massachusetts, 10.7% of smoking mothers delivered low birthweight infants while only 6.7% of infants to non-smoking mothers were low birthweight. Approximately 1 out of 6 (17.0%) black women who smoked during their pregnancy delivered a low birthweight infant (Figure 9).

Low Birthweight and Plurality

The percentage of low birthweight (LBW) and very low birthweight (VLBW) rises dramatically for twins and higher order births. In 2000, 5.1% of singleton births were LBW, whereas 50.0% of twins, and 92.5% of higher order births were LBW (Table 12). Similarly, 0.9% of singletons, 8.9% of twins, and 35.0% of higher order births were VLBW. The percentage of VLBW singleton infants remained approximately the same from 1990 to 2000, while LBW increased slightly in this group: 4.7% in 1990 to 5.1% in 2000. The percentage of VLBW and LBW deliveries for twins decreased slightly from 1999 to 2000.

Preterm Deliveries

In 2000, 8.3% (6,582) of infants born to Massachusetts resident women were preterm (premature), born before the mother had completed the 37th week of pregnancy (Table 13). The percentage of premature infants increased slightly from 1999 (7.6%) to 2000 (8.3%).

The proportion of preterm births varied by mother's race and ethnicity. Non-Hispanic black women had the highest proportion of preterm infants, 12.7%. Hispanic women had 8.6% preterm deliveries; non-Hispanic white women, 7.8%; and Asian women had the lowest, 7.4% (Table 13).

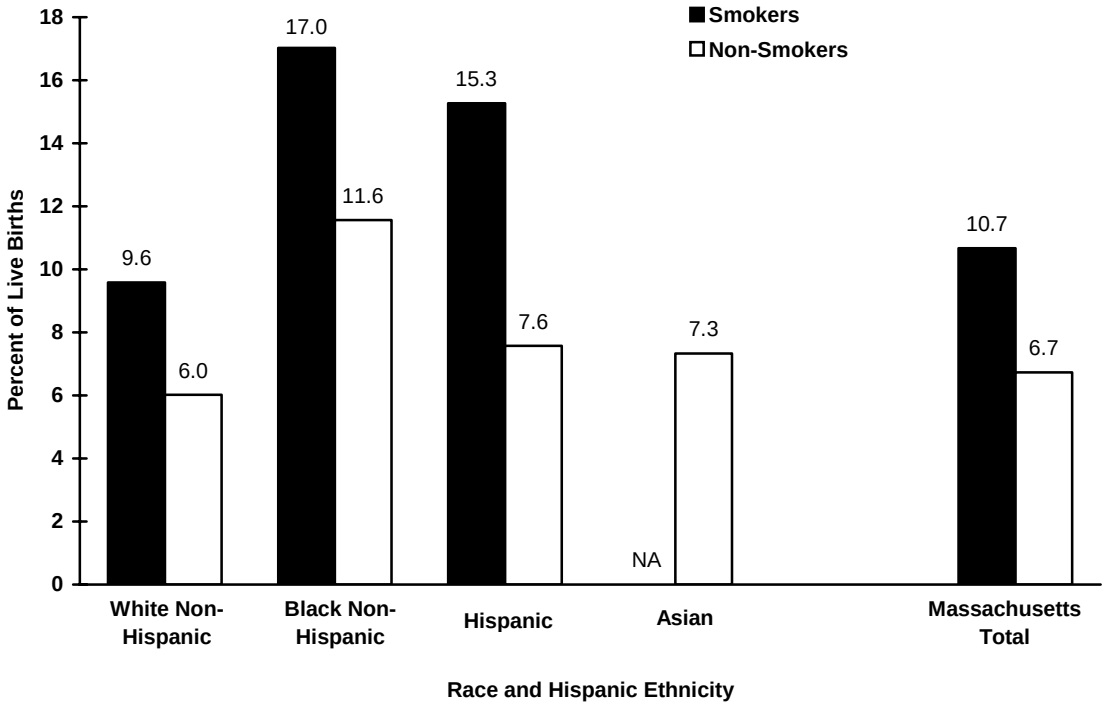
Table 10. Births by Birthweight, Race and Hispanic Ethnicity, Massachusetts: 2000

Birthweight (in grams)	Total		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown
	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n	%[1]	n
State Total	81,582	100.0	60,051	100.0	5,755	100.0	9,247	100.0	4,667	100.0	1,536	100.0	326
<500	118	0.1	60	0.1	33	0.6	14	0.2	5	0.1	3	--[2]	3
500-999	423	0.5	252	0.4	85	1.5	55	0.6	20	0.4	9	0.6	2
1000-1499	549	0.7	363	0.6	78	1.4	66	0.7	29	0.6	11	0.7	2
1500-1999	1,165	1.4	796	1.3	135	2.3	146	1.6	53	1.1	33	2.1	2
2000-2499	3,456	4.2	2,309	3.8	359	6.2	475	5.1	226	4.8	81	5.3	6
2500-2999	11,776	14.4	7,697	12.8	1,129	19.6	1,644	17.8	1,016	21.8	262	17.1	28
3000-3499	28,433	34.9	20,130	33.5	2,114	36.7	3,621	39.2	1,923	41.2	572	37.2	73
3500-3999	24,818	30.4	19,456	32.4	1,368	23.8	2,442	26.4	1,051	22.5	420	27.3	81
4000-4499	7,953	9.7	6,603	11.0	350	6.1	639	6.9	226	4.8	107	7.0	28
4500-4999	1,395	1.7	1,165	1.9	74	1.3	110	1.2	22	0.5	21	1.4	3
>=5000	152	0.2	124	0.2	8	0.1	13	0.1	6	0.1	1	--[2]	0
Unknown	1,344	1.6	1,096	1.8	22	0.4	22	0.2	90	1.9	16	1.0	98
VLBW[3] (0-1499 g)	1,090	1.4	675	1.1	196	3.4	135	1.5	54	1.2	23	1.5	7
LBW[4] (0-2499 g)	5,711	7.1	3,780	6.4	690	12.0	756	8.2	333	7.3	137	9.0	15

NOTE: Percentages for detailed birthweight rows ("<500" through "Unknown") are calculated based on all births including those with unknown birthweight. Percentages for VLBW and LBW rows are calculated based on births with known birthweights only.
Data on birthweight were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. Percentages are based on column totals. 2. Calculations based on fewer than five events are excluded. 3. VLBW: Very Low Birthweight. 4. LBW: Low Birthweight.

Figure 9. Low Birthweight[1] Among Smoking and Nonsmoking[2] Mothers, by Race and Hispanic Ethnicity, Massachusetts: 2000



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Maternal smoking is self-reported, usually following childbirth; these data should be interpreted cautiously.
Data on birthweight were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

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

Table 11. Low Birthweight[1] by Maternal Age, Race and Hispanic Ethnicity, Massachusetts: 2000

Mother's Age (in years)	Total LBW Infants		White non-Hispanic		Black non-Hispanic		Hispanic		Asian		Other		Unknown
	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n	%[3]	n
State Total[2]	5,711	7.1	3,780	6.4	690	12.0	756	8.2	333	7.3	137	9.0	15
<18	181	9.9	60	8.5	33	13.9	76	10.4	8	9.4	4	--[4]	0
18-19	316	8.9	130	7.4	54	11.9	97	9.4	14	10.7	20	13.2	1
20-24	870	7.3	427	6.4	133	10.2	238	8.3	41	7.8	30	7.3	1
25-29	1,295	6.7	815	5.9	174	11.9	175	7.6	96	6.8	32	8.6	3
30-34	1,656	6.3	1,265	5.9	159	11.9	107	7.1	96	6.2	22	6.6	7
35-39	1,120	7.8	875	7.2	106	14.3	50	7.9	60	8.1	26	15.5	3
40+	273	9.6	208	8.9	31	15.7	13	10.2	18	12.0	3	--[4]	0

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Data on birthweight were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. Low Birthweight: less than 2,500 grams or 5.5 pounds at birth. 2. State totals include women of unknown age. 3. Percentages are based upon the number of low birthweight infants divided by the total births in each age and race/ethnicity category. 4. Calculations based on fewer than five events are excluded.

Table 12. Low Birthweight by Plurality, Massachusetts: 1990-2000

Age Group	Year	Singleton				Multiples												Total Births			
						Twin				Triplets or more				Total Multiples							
		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]		VLBW[1]		LBW[2]	
		n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%	n	%
All Ages	**1990**	752	0.8	4,224	4.7	189	8.2	1,075	46.8	28	28.3	88	88.9	217	9.1	1,163	48.5	969	1.1	5,387	5.8
	1991	752	0.9	4,045	4.7	223	9.8	1,079	47.3	26	29.2	75	84.3	249	10.5	1,154	48.7	1,001	1.1	5,199	5.9
	1992	656	0.8	3,959	4.7	192	8.3	1,062	45.7	39	29.8	116	88.5	231	9.4	1,178	48.0	887	1.0	5,137	5.9
	1993	673	0.8	3,919	4.8	216	9.2	1,105	47.1	73	36.0	178	87.7	289	11.3	1,283	50.4	962	1.1	5,202	6.2
	1994	687	0.8	4,015	5.0	223	9.5	1,122	47.9	66	30.8	198	92.5	289	11.3	1,320	51.6	976	1.2	5,335	6.4
	1995	674	0.9	3,867	4.9	227	9.4	1,128	46.6	63	31.8	179	90.4	290	11.1	1,307	49.9	964	1.2	5,174	6.4
	1996	657	0.9	3,674	4.8	227	8.8	1,264	49.1	45	24.5	167	90.8	272	9.9	1,431	51.9	929	1.2	5,105	6.4
	1997	731	0.9	3,938	5.1	292	10.3	1,439	50.5	75	28.6	240	91.6	367	11.8	1,679	54.0	1,098	1.4	5,617	7.0
	1998	690	0.9	3,819	4.9	298	9.6	1,570	50.7	82	28.5	266	92.4	380	11.2	1,836	54.2	1,070	1.3	5,655	7.0
	1999	731	0.9	3,869	5.0	324	10.3	1,617	51.6	65	26.5	222	90.6	389	11.5	1,839	54.5	1,120	1.4	5,708	7.1
	2000	722	0.9	3,886	5.1	284	8.9	1,603	50.0	84	35.0	222	92.5	368	10.7	1,825	53.0	1,090	1.4	5,711	7.1
Ages < 35	**1990**	646	0.8	3,666	4.6	164	8.5	915	47.3	21	30.0	62	88.6	185	9.2	977	48.8	831	1.0	4,643	5.7
	1991	647	0.9	3,499	4.7	189	10.2	898	48.3	25	32.9	65	85.5	214	11.1	963	49.8	861	1.1	4,462	5.8
	1992	551	0.8	3,378	4.6	166	8.8	870	46.0	29	28.7	92	91.1	195	9.8	962	48.3	746	1.0	4,340	5.8
	1993	561	0.8	3,307	4.7	168	9.2	881	48.2	56	35.9	136	87.2	224	11.3	1,017	51.2	785	1.1	4,324	6.0
	1994	567	0.8	3,397	5.0	181	9.9	891	48.5	47	28.7	150	91.5	228	11.4	1,041	52.0	795	1.1	4,438	6.3
	1995	543	0.8	3,187	4.9	196	11.0	852	47.9	52	36.9	135	95.7	248	12.9	987	51.4	791	1.2	4,174	6.2
	1996	501	0.8	2,937	4.7	194	10.2	944	49.9	32	27.1	111	94.1	226	11.2	1,055	52.5	727	1.1	3,992	6.1
	1997	566	0.9	3,179	5.1	214	11.0	1,030	53.0	46	27.1	153	90.0	260	12.3	1,183	55.9	826	1.3	4,362	6.8
	1998	540	0.9	3,086	4.9	248	11.4	1,148	52.5	60	35.3	153	90.0	308	13.1	1,301	55.2	848	1.3	4,387	6.8
	1999	569	0.9	3,082	5.0	231	10.8	1,124	52.6	49	32.9	138	92.6	280	12.3	1,262	55.2	849	1.3	4,344	6.8
	2000	555	0.9	3,096	5.1	204	9.4	1,097	50.7	49	38.0	125	96.9	253	11.0	1,222	53.3	808	1.3	4,318	6.9
Ages 35+	**1990**	106	1.0	558	5.1	25	6.8	160	43.8	7	24.1	26	89.7	32	8.1	186	47.2	138	1.2	744	6.6
	1991	105	1.0	545	5.0	34	8.1	181	42.9	1	--[3]	10	76.9	35	8.0	191	43.9	140	1.2	736	6.4
	1992	104	0.9	580	5.0	26	6.0	192	44.4	10	33.3	24	80.0	36	7.8	216	46.8	140	1.2	796	6.6
	1993	112	0.9	612	5.1	48	9.3	224	43.4	17	36.2	42	89.4	65	11.5	266	47.2	177	1.4	878	7.0
	1994	120	1.0	618	4.9	42	8.3	231	45.6	19	38.0	48	96.0	61	11.0	279	50.1	181	1.4	897	6.9
	1995	130	1.0	679	5.1	31	4.8	276	43.0	11	19.3	44	77.2	42	6.0	320	45.8	172	1.2	999	7.2
	1996	156	1.1	737	5.4	33	4.9	320	47.1	13	19.7	56	84.8	46	6.2	376	50.5	202	1.4	1,113	7.7
	1997	165	1.1	759	5.2	78	8.6	409	45.3	29	31.5	87	94.6	107	10.8	496	49.9	272	1.7	1,255	8.1
	1998	150	1.0	733	4.8	50	5.5	422	46.2	22	18.6	113	95.8	72	7.0	535	51.8	222	1.4	1,268	7.8
	1999	162	1.0	787	5.0	93	9.3	493	49.5	16	16.7	84	87.5	109	10.0	577	52.8	271	1.6	1,364	8.2
	2000	167	1.0	790	4.9	80	7.7	506	48.6	35	31.5	97	87.4	115	10.0	603	52.3	282	1.6	1,393	8.1

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on birthweight were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. VLBW: Very Low Birthweight. 2. LBW: Low Birthweight. 3. Calculations based on fewer than five events are excluded.

Table 13. Births by Gestational Age[1], Race and Hispanic Ethnicity, Massachusetts: 2000

Gestational Age	Total		Non-Hispanic White		Non-Hispanic Black		Hispanic		Asian		Other[3]		Unknown
(weeks completed)	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n	%[2]	n
State Total	81,582	100.0	60,051	100.0	5,755	100.0	9,247	100.0	4,667	100.0	1,536	100.0	326
<20	17	0.0	5	0.0	5	0.1	2	--[7]	3	--[7]	1	--[7]	1
20-23	142	0.2	81	0.1	37	0.6	17	0.2	3	--[7]	2	--[7]	2
24-27	342	0.4	189	0.3	71	1.2	51	0.6	20	0.4	9	0.6	2
28-31	722	0.9	499	0.8	96	1.7	89	1.0	20	0.4	15	1.0	3
32-35	2,980	3.7	2,111	3.5	316	5.5	361	3.9	141	3.0	46	3.0	5
36	2,379	2.9	1,704	2.8	201	3.5	270	2.9	149	3.2	48	3.1	7
37-39[4]	32,925	40.4	23,823	39.7	2,505	43.5	3,842	41.5	2,038	43.7	630	41.0	87
40	28,228	34.6	21,135	35.2	1,676	29.1	3,189	34.5	1,621	34.7	509	33.1	98
41	10,298	12.6	7,795	13.0	684	11.9	1,093	11.8	515	11.0	193	12.6	18
42	1,483	1.8	1,071	1.8	115	2.0	210	2.3	54	1.2	31	2.0	2
43	53	0.1	36	0.1	6	0.1	7	0.1	2	--[7]	1	--[7]	1
44+	43	0.1	33	0.1	1	--[7]	5	0.1	3	--[7]	1	--[7]	0
Unknown[5]	1,970	2.4	1,569	2.6	42	0.7	111	1.2	98	2.1	50	3.3	100
Very early gestation, <28 weeks	501	0.6	275	0.5	113	2.0	70	0.8	26	0.6	12	0.8	5
Preterm, <37 weeks[6]	6,582	8.3	4,589	7.8	726	12.7	790	8.6	336	7.4	121	8.1	20

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

Data on gestational age were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

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

CHAPTER 4

ADEQUACY OF PRENATAL CARE

IMPORTANT TECHNICAL NOTES:

Change in Adequacy of Prenatal Care Indicator to Begin with *Massachusetts Births 2001*:

Beginning with next year's publication (*Massachusetts Births 2001*), adequacy of prenatal care will be measured with the Adequacy of Prenatal Care Utilization Index (APNCU) instead of the currently-used Kessner Index. The APNCU 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. (Please see Technical Notes for more information.)

Changes in Adequacy of Prenatal Care Calculations during the 1990s.

There have been two significant changes in the calculation of the Adequacy of Prenatal Care, using the Kessner Index. It is a measure of the timing and number of prenatal care visits, not an assessment of the quality of prenatal care. Until 1996, the month of the first prenatal care visit was recorded on the birth certificate. Starting in 1996, the new birth certificate records the exact date of the first visit. This change reduced the estimated number of women receiving prenatal care in the first trimester.

The second important change related to adequacy of prenatal care took place in 1998. Adjustments in the calculation of Adequacy of Care were made in order to make Massachusetts data more comparable to the calculations recommended by the National Center for Health Statistics. Thus, although trend data are provided in Figure 10, readers should consider data prior to 1996 separately from data for 1996 to the present.

Changes in Adequacy of Prenatal Care, 1980-1995. In 1980, 82.7% of white women and 73.2% of black women received adequate prenatal care (Figure10). The percentage of white women receiving adequate prenatal care remained fairly constant during the 1980s. In contrast, the proportion of black women receiving adequate care declined from approximately seven out of ten women (73.2%) in 1980 to six out of ten women in 1985 but has been increasing since 1989. The percentage of black women receiving adequate prenatal care rose from 60.0% in 1990 to 70.7% in 1995. The percentage of white women receiving adequate prenatal care rose from 82.5% in 1990 to 85.7% in 1995. (Note that because there was not a separate Hispanic origin question asked on the birth certificate prior to June 1986, Hispanics are counted within the race categories of black and white for all time trend tables. For reference, when a separate Hispanic origin question is asked in addition to a race question, most Hispanics classify themselves as "white" or "other" race.)

Adequacy of Prenatal Care, White and Black Women: 1996-2000. In 2000, the percentage of white women receiving adequate prenatal care was 80.9% (Figure 10).

This was equal to the percentage of white women receiving adequate prenatal care in 1999 (80.9%). In 2000, 65.4% of black women received adequate prenatal care, a 4% decrease from 1999 (67.8%) and equivalent to the percentage of black women receiving adequate prenatal care in 1996 (65.6%). The trend for adequacy of prenatal care for white women appears more consistent over the years 1996 through 2000 than the trend for black women over the same time period (Figure 10).

Adequacy of Prenatal Care and Low Birthweight

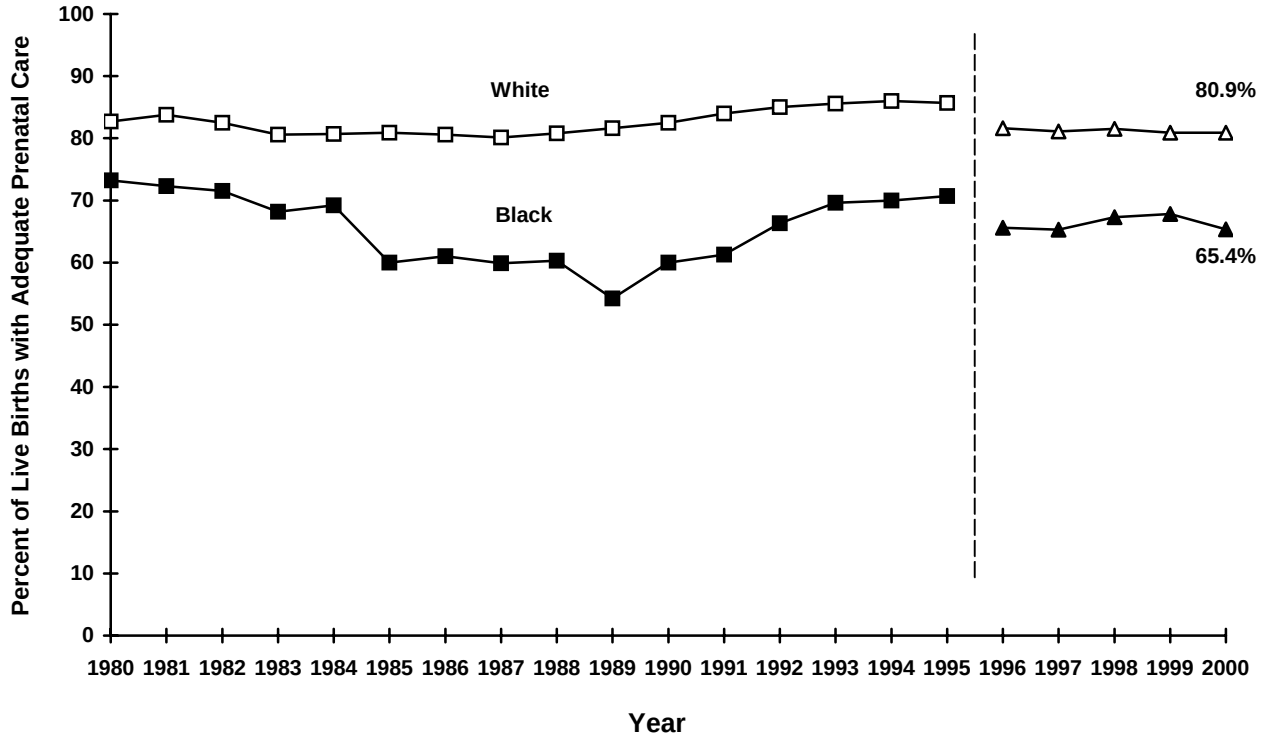
The percentage of low birthweight deliveries declined with increased adequacy of prenatal care statewide. The percentage of low birthweight births to women receiving adequate prenatal care was 6.7%; for women receiving intermediate prenatal care, it was 8.4%; and for women receiving late or no prenatal care, it was 9.1%. When adequacy of prenatal care is examined by race/ethnicity, non-Hispanic black mothers had the highest percentage of low birthweight infants within all adequacy categories in 2000 (Table 14). Among women who received late or no prenatal care, 7.9% of the infants born to non-Hispanic white women were low birthweight; 11.9% of infants born to non-Hispanic black women were low birthweight; 10.9% of the infants born to Hispanic women were low birthweight; and among Asian mothers who received late or no prenatal care, 6.8% of their infants were low birthweight (Table 14).

In contrast, 7.0% of Massachusetts women who received adequate prenatal care delivered low birthweight infants (Table 14). For women receiving adequate prenatal care, the low birthweight rate was 6.4% for non-Hispanic white women, 12.0% for non-Hispanic black women, 8.2% for Hispanic women, and 7.2% for Asian women.

Adequacy of Prenatal Care in Selected Population Groups

Adequacy of prenatal care increased with age of the mother. Among women who were less than 18 years of age at delivery, only 55.1% received adequate prenatal care. Among women who were 35 years of age or older at delivery, 83.4% received adequate prenatal care (Figure 11). Other selected population groups that had lower than the state average of adequate prenatal care (79.1%) included: women ages 20 years or older with fewer than 12 years of education (60.5%); unmarried women (65.9%); mothers who smoked during pregnancy (67.9%); and non-U.S.-born mothers (70.8%). First-time mothers and mothers who reported that they were breastfeeding or planning to breastfeed had slightly higher percentages of prenatal care adequacy than the statewide rate, 80.1% and 80.6% respectively.

Figure 10. Trends in Adequacy of Prenatal Care[1,2] by Race[3], Massachusetts: 1980-2000



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Data on adequacy of prenatal care were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. Due to changes beginning in 1996 in the collection of information on Adequacy of Prenatal Care, caution should be used when comparing these data over time. 2. 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.

Table 14. Low Birthweight by Adequacy of Prenatal Care, Race and Hispanic Ethnicity, Massachusetts: 2000

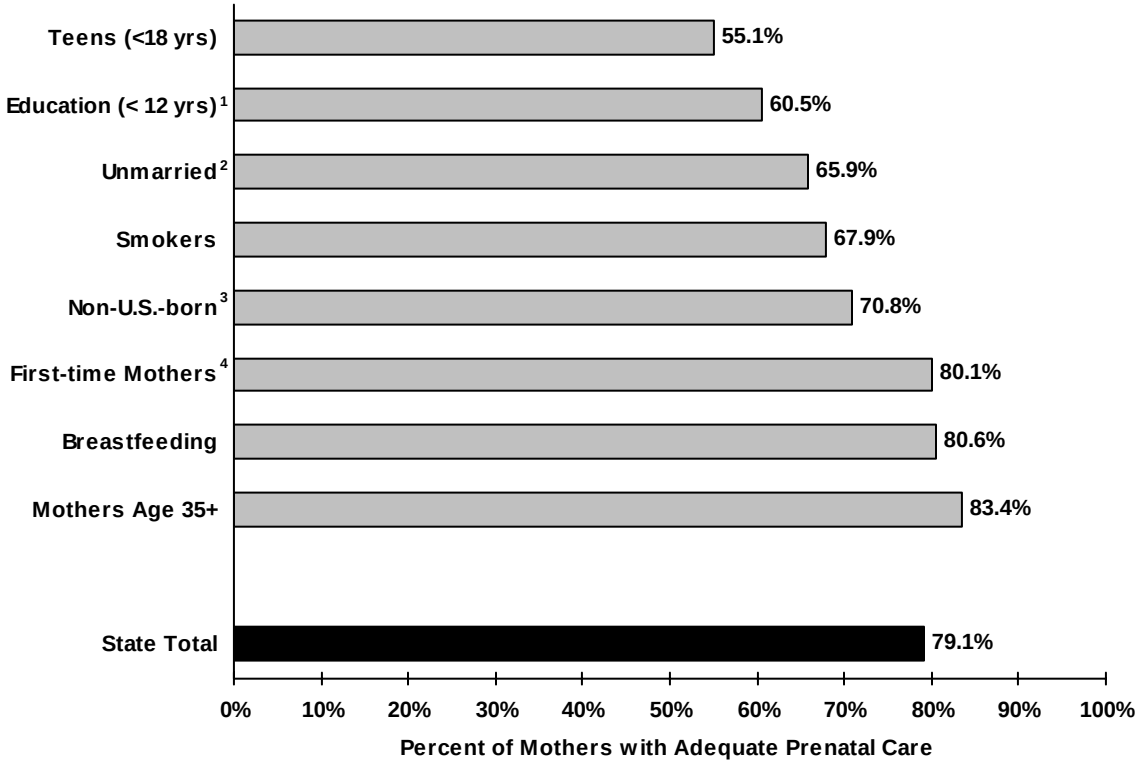
Race, Ethnicity, and Birthweight		Total[1]	Adequacy of Prenatal Care[2]		
			Adequate	Intermediate	Late/None
STATE TOTAL	Total Births	79,813	63,109	13,855	2,849
	# LBW[3]	5,634	4,205	1,169	260
	% LBW	7.0	6.7	8.4	9.1
White non- Hispanic	Total Births	58,696	48,820	8,499	1,377
	# LBW[3]	3,731	2,943	679	109
	% LBW	6.4	6.0	8.0	7.9
Black non-Hispanic	Total Births	5,670	3,729	1,444	497
	# LBW[3]	679	447	173	59
	% LBW	12.0	12.0	12.0	11.9
Hispanic	Total Births	9,178	6,153	2,400	625
	# LBW[3]	749	490	191	68
	% LBW	8.2	8.0	8.0	10.9
Asian	Total Births	4,563	3,269	1,074	220
	# LBW[3]	327	233	79	15
	% LBW	7.2	7.1	7.4	6.8
Other	Total Births	1,508	975	411	122
	# LBW[3]	134	81	46	7
	% LBW	8.9	8.3	11.2	5.7
Unknown	Total Births	198	163	27	8
	# LBW[3]	14	11	1	2

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

Data on adequacy of prenatal care were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. All data are based on the 79,813 births with known Adequacy of Prenatal Care data. 2. A detailed explanation of the levels of prenatal care is presented in the Glossary. 3. Low birthweight: less than 2,500 grams or 5.5 pounds.

Figure 11. Adequacy of Prenatal Care for Selected Population Characteristics, Massachusetts: 2000



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on adequacy of prenatal care and breastfeeding were not provided for approx. 1,140 resident births from Winchester Hospital.

1. Women 20 years of age and older. 2. Marital status at time of birth. 3. 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). 4. Mother was or was intending to

CHAPTER 5

PRENATAL CARE SOURCE OF PAYMENT

Prenatal Care Payment Source

In 2000, 71.3% of all Massachusetts women had their prenatal care paid for by private sources (commercial indemnity plans, commercial managed care organizations (HMO, PPO/IPP/IPA, etc.), or other private insurance (Figure 12)). Public entitlement programs, including Commonhealth, Medicaid/MassHealth and Healthy Start (a Massachusetts-funded program), covered the prenatal care expenses for 27.5% of Massachusetts women who gave birth in 2000. This represents a slight increase in the percentage of women whose prenatal care was funded by a public source since 1999 (26.8%). An additional 0.6% of women paid for their prenatal care themselves.

Characteristics of Women Who Use Publicly Financed and Privately Insured Prenatal Care

Maternal and birth characteristics vary according to whether prenatal care was financed through public programs or through private insurance. Differences in characteristics between those served by public programs and those covered by private insurance may reflect different levels of risk rather than the quality of care received. Among women whose prenatal care was funded by Medicaid/MassHealth, 19.5% were under the age of 20. In contrast, only 2.3% of women whose prenatal care was privately insured were under age 20 (Table 15).

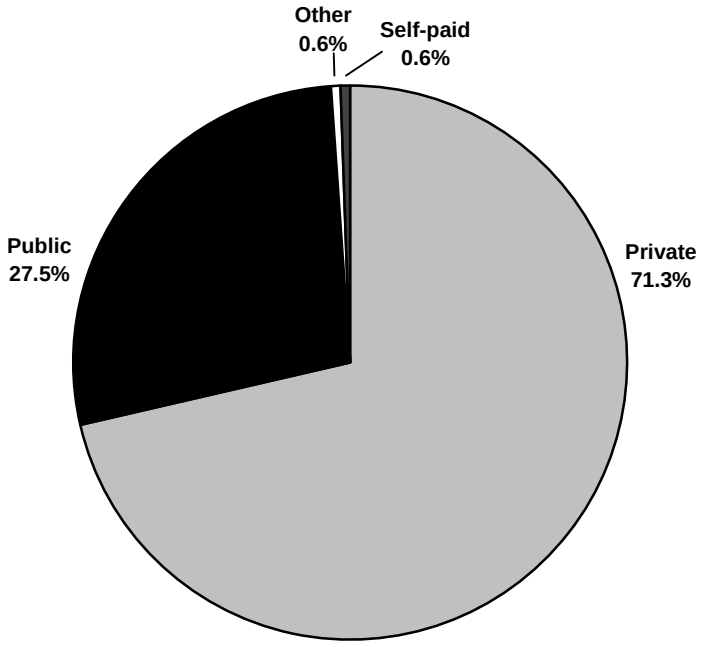
Women whose prenatal care was publicly funded had a higher proportion of low birthweight deliveries (8.6%) than women whose prenatal care was privately insured (6.3%). This difference can be seen within all race/ethnicity groups (Table 15).

Similarly, women whose prenatal care was publicly financed were less likely to receive adequate prenatal care. This was true overall and within each race/ethnicity group. For example, only 56.1% of non-Hispanic black women whose prenatal care was publicly financed received adequate prenatal care, while 79.8% of non-Hispanic black women with private insurance received adequate prenatal care (Table 15). Only 68.8% of non-Hispanic white women with publicly financed prenatal care received adequate care, while 86.3% of non-Hispanic white women with private insurance received adequate prenatal care.

In all race/ethnicity groups, women whose prenatal care was publicly financed were less likely to deliver by Cesarean section. Overall, the Cesarean section rate was 19.9% for women with publicly funded prenatal care and 25.4% for women with private insurance (Table 15). Asian women with publicly funded prenatal care had the lowest Cesarean section rate,14.0%, as compared to Asian women with privately funded prenatal care, who had a Cesarean section rate of 21.5%.

Women whose prenatal care was publicly funded were less likely to report breastfeeding or an intent to breastfeed than women who had private insurance. Among Asian women, for example, 56.8% of those whose prenatal care was publicly funded reported an intent to breastfeed compared to 83.6% among those whose prenatal care was privately financed (Table 15).

Figure 12. Distribution of Prenatal Care Payment Source[1], Massachusetts: 2000



NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on source of prenatal care payment were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

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 15. Birth Characteristics by Source of Prenatal Care Payment, Race and Hispanic Ethnicity, Massachusetts: 2000

Race, Ethnicity, and Payment Source	Births[1]		Teen Births				Birthweight			
			<18 Years		<20 Years		Very Low[2]		Low[3]	
	n	%	n	%	n	%	n	%	n	%
STATE TOTAL[4]	81,582	100.0	1,829	2.2	5,395	6.6	1,090	1.4	5,711	7.1
Public	21,715	27.5	1,319	6.1	3,955	18.2	337	1.6	1,860	8.6
Medicaid[5]	19,141	24.2	1,248	6.5	3,736	19.5	302	1.6	1,680	8.8
Other Public[6]	2,574	3.3	71	2.8	219	8.5	35	1.4	180	7.0
Private[7]	56,305	71.3	467	0.8	1,297	2.3	676	1.2	3,575	6.3
Non-Hispanic White	60,051	100.0	714	1.2	2,500	4.2	675	1.1	3,780	6.3
Public	9,876	17.1	400	4.1	1,545	15.6	117	1.2	749	7.6
Medicaid[5]	8,927	15.5	380	4.3	1,473	16.5	109	1.2	698	7.8
Other Public[6]	949	1.6	20	2.1	72	7.6	8	0.8	51	5.4
Private[7]	47,271	81.9	294	0.6	865	1.8	500	1.1	2,812	5.9
Non-Hispanic Black	5,755	100.0	237	4.1	690	12.0	196	3.4	690	12.0
Public	3,262	57.0	190	5.8	567	17.4	99	3.0	402	12.3
Medicaid[5]	2,823	49.4	176	6.2	535	19.0	85	3.0	351	12.4
Other Public[6]	439	7.7	14	3.2	32	7.3	14	3.2	51	11.6
Private[7]	2,355	41.2	43	1.8	114	4.8	89	3.8	265	11.3
Hispanic	9,247	100.0	730	7.9	1,765	19.1	135	1.5	756	8.2
Public	6,455	70.0	617	9.6	1,515	23.5	96	1.5	548	8.5
Medicaid[5]	5,526	60.0	587	10.6	1,415	25.6	85	1.5	488	8.8
Other Public[6]	929	10.1	30	3.2	100	10.8	11	1.2	60	6.5
Private[7]	2,615	28.4	97	3.7	221	8.5	33	1.3	192	7.3
Asian	4,667	100.0	85	1.8	217	4.6	54	1.2	333	7.1
Public	1,210	26.6	68	5.6	165	13.6	10	0.8	79	6.5
Medicaid[5]	1,121	24.6	65	5.8	158	14.1	10	0.9	74	6.6
Other Public[6]	89	2.0	3	--[8]	7	7.9	0	0.0	5	5.6
Private[7]	3,287	72.2	15	0.5	47	1.4	43	1.3	244	7.4
Other[9]	1,536	100.0	63	4.1	215	14.0	23	1.5	137	8.9
Public	894	59.2	44	4.9	162	18.1	14	1.6	81	9.1
Medicaid[5]	737	48.8	40	5.4	154	20.9	13	1.8	69	9.4
Other Public[6]	157	10.4	4	--[8]	8	5.1	1	--[8]	12	7.6
Private[7]	588	39.0	18	3.1	49	8.3	9	1.5	54	9.2

Table 15 (cont'd). Birth Characteristics by Source of Prenatal Care Payment, Race, and Hispanic Ethnicity, Massachusetts: 2000

Race, Ethnicity, and Payment Source	Prenatal Care: Adequate n	Adequate %	Began 1st Trimester n	Began 1st Trimester %	Cesarean Section n	Cesarean Section %	Breastfeeding[10] n	Breastfeeding[10] %
STATE TOTAL[4]	63,109	79.1	66,952	83.8	19,086	23.8	58,188	73.8
Public	13,849	64.3	15,020	69.5	4,314	19.9	13,655	63.1
Medicaid[5]	12,348	64.9	13,376	70.2	3,750	19.7	11,512	60.3
Other Public[6]	1,501	59.3	1,644	64.4	564	21.9	2,143	83.3
Private[7]	47,611	84.9	50,184	89.5	14,275	25.4	43,848	78.0
Non-Hispanic White	48,820	83.2	51,551	87.8	14,474	24.6	42,287	73.3
Public	6,760	68.8	7,239	73.6	1,998	20.3	5,411	54.9
Medicaid[5]	6,084	68.5	6,516	73.3	1,765	19.8	4,688	52.6
Other Public[6]	676	71.8	723	76.7	233	24.6	723	76.3
Private[7]	40,620	86.3	42,792	90.8	12,053	25.6	36,429	77.2
Non-Hispanic Black	3,729	65.8	4,046	70.9	1,415	24.7	4,182	73.3
Public	1,795	56.1	2,031	62.8	718	22.1	2,193	67.5
Medicaid[5]	1,623	58.3	1,817	64.8	617	21.9	1,829	65.0
Other Public[6]	172	41.5	214	50.0	101	23.0	364	83.1
Private[7]	1,874	79.8	1,952	83.1	678	28.9	1,918	81.5
Hispanic	6,153	67.0	6,631	72.1	1,884	20.5	6,933	75.4
Public	4,087	63.6	4,425	68.8	1,211	18.8	4,685	72.8
Medicaid[5]	3,574	65.0	3,870	70.2	1,044	19.0	3,846	69.9
Other Public[6]	513	55.3	555	59.9	167	18.0	839	90.3
Private[7]	1,995	76.7	2,127	81.7	645	24.7	2,147	82.4
Asian	3,269	71.6	3,489	76.4	890	19.4	3,476	76.4
Public	665	55.4	723	60.1	170	14.0	687	56.8
Medicaid[5]	611	54.9	666	59.8	150	13.4	614	54.8
Other Public[6]	54	62.1	57	64.0	20	22.5	73	82.0
Private[7]	2,549	77.7	2,707	82.5	706	21.5	2,745	83.6
Other[9]	975	64.7	1,068	70.5	363	24.0	1,165	77.4
Public	531	59.9	590	66.2	211	23.7	669	74.9
Medicaid[5]	453	61.8	503	68.5	171	23.3	530	72.0
Other Public[6]	78	51.0	87	55.4	40	25.5	139	88.5
Private[7]	430	73.6	461	78.8	148	25.4	475	81.2

NOTE: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated.
Data on all indicators except for teen births were not provided for approx. 1,140 resident births occurring at Winchester Hospital.

1. In the "Births" category, percentages are based on race/ethnicity totals (group column). For all other categories, percentages are based on Birth totals (row total) excluding unknowns for each characteristic. 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 does not equal Public + Private. Other categories of prenatal care payment are also included in Total: Workers' Compensation, self-paid, and other. 5. Medicaid/MassHealth. 6. Other Public: Commonhealth, Healthy Start, Medicare, other government programs, and free care. 7. Private: commercial indemnity plans or commercial managed care org. (HMO, PPO, IPP, or IPA). 8. Calculations based on fewer than five events are excluded. 9 Other: Mothers who designated their race as American Indian or Other. 10. Mother was intending to breastfeed at the time the birth certificate was completed.

CHAPTER 6

CESAREAN SECTION DELIVERIES BY HOSPITAL

Cesarean Section[1] Delivery by Facility

Cesarean section was the method of delivery for 23.9% of the 2000 occurrence births, up 6% from the 1999 rate of 22.6% and up 14% from the 1998 rate of 21.0% (Table 16). Calculations are based on births with known method of delivery. Note: facility-specific highlights in this chapter focus on facilities with at least 40 births in the category of interest. Data for all facilities are provided in Tables 16 and 17.

Facilities with Cesarean section delivery rates of less than 20% were: Heywood Hospital (15.3%, 86 Cesarean section deliveries performed); Tobey Hospital (17.1%,75 Cesarean section deliveries performed); Saint Vincent Hospital (18.1%, 332 C-section deliveries performed); Lawrence General Hospital (18.5%, 259 C-section deliveries performed); Berkshire Medical Center (19.2%; 149 C-section deliveries performed); and Deaconess-Waltham Hospital (19.9%; 60 C-sections performed). Fourteen hospitals had Cesarean section delivery rates of 25% or more (Beth Israel Deaconess Medical Center, Brigham and Women's Hospital, Cambridge Hospital, Caritas Good Samaritan Medical Center, Holy Family Hospital and Medical Center, Jordan Hospital, Melrose-Wakefield Hospital, Morton Hospital, Nantucket Cottage Hospital, New England Medical Center Hospital, Newton-Wellesley Hospital, South Shore Hospital, St. Elizabeth's Medical Center of Boston, and Sturdy Memorial Hospital). There were ten such hospitals in 1999.

Primary Cesarean section delivery rates were lowest at Heywood Hospital, Tobey Hospital, Lawrence General Hospital, Berkshire Medical Center, and Mercy Hospital, ranging from 11.0% for Heywood Hospital to 13.9% for Mercy Hospital. Primary Cesarean section delivery rates were over 20% at seven hospitals: St. Elizabeth's Medical Center, Beth Israel Deaconess Medical Center, Holy Family Hospital and Medical Center, South Shore Hospital, New England Medical Center Hospital, and Newton-Wellesley Hospital (Table 16).

Repeat Cesarean section delivery rates were lowest at Saint Vincent Hospital (58.7%) and Cape Cod Hospital (61.7%). Hospitals with high rates of repeat Cesarean section deliveries include: North Shore Medical Center – Salem Hospital (91.2%), South Shore Hospital (89.8%), Massachusetts General Hospital (88.3%), and Metrowest Medical Center (85.0%) (Table 16).

Cesarean Section Deliveries for Singleton Births

Cesarean section was the method of delivery for 24.5% of singleton births to mothers who gave birth to their first child in a Massachusetts licensed maternity facility in 2000 (Table 17). Deaconess-Waltham Hospital, Lawrence Memorial Hospital, and Heywood Hospital: 16.2%, 16.0% and 16.2% respectively. Holy Family Hospital and Medical Center, Nantucket Cottage Hospital, and Sturdy Memorial Hospital had the highest rates: 31.7%, 40.0%, and 30.2% respectively.

[1] Percentages of delivery by method in Table 16 are calculated in following manner:

- Percentage of total Cesarean sections = (Total Cesarean Births / All Births) x 100.
- Percentage primary Cesarean sections = (Primary Cesarean Sections / (All Births - Repeat Cesarean Sections - VBACs)) x 100.
- Percentage repeat Cesarean sections = (Repeat Cesarean Sections / (Repeat Cesarean Sections + VBACs)) x 100.
- Percentage of vaginal birth after Cesarean section delivery, that is, VBACs = (VBAC deliveries / (Repeat Cesarean Sections + VBAC)) x 100. Please note: the sum of the percentages of repeat Cesarean section deliveries + VBACs = 100% of all deliveries of mothers with a prior Cesarean section.

Cesarean section was the method of delivery for 7.4% of singleton births to mothers having their second or later birth who had no prior Cesarean section. Berkshire Medical Center, Heywood Hospital and Tobey Hospital had the lowest rates: 4.6%, 4.8% and 3.3% respectively (Table 17). Boston Medical Center and Mary Lane Hospital had the highest rates: 13.2% and 12.5% respectively. Cesarean section was the method of delivery for 74.3% of the singleton births to mothers having their second or later birth who had prior Cesarean sections. Heywood Hospital and Saint Vincent Hospital had the lowest rates: 54.9% and 57.6%. South Shore and Massachusetts General Hospital had the highest rates: 89% and 88.3.7% respectively (Table 17).

Vaginal Birth after Cesarean Section (VBAC) Deliveries

In 2000, among women with a previous Cesarean section, 24.7% (2,139) had a vaginal birth after a Cesarean section delivery (VBAC) (Table 16). In 1999, 28.2% (2,461) had a VBAC, and in 1998, 32.7% (2,823) had a VBAC. In 1996, the VBAC rate was 34.0%; in 1995, the VBAC rate was 31.6%; in 1994, 30.2%; in 1993, 27.4%; in 1992, 24.8%; in 1991, 24.1%; and in 1990, 22.3% (trend data not shown).

Since the sum of the percentage of repeat cesarean section deliveries and VBACs equals 100% of all births to mothers with a prior Cesarean section, facilities with the lowest repeat Cesarean section delivery rates had the highest VBAC rates. In total, only two hospitals had VBAC rates over 40%, compared to four in 1999 and thirteen in 1998. The two hospitals with VBAC rates over 40% in 2000 are Heywood Hospital and Saint Vincent Hospital.

Table 16. Cesarean Section Deliveries and Vaginal Births after Cesarean Section (VBACs) by Licensed Maternity Facility[1], All Births, Massachusetts: 2000

Facility	Occurrence Births[2]	Total C-Sections		Primary C-Section[2]		Repeat C-Section[2]		VBACs[2]	
		n	%[3,4]	n	%[3,5]	n	%[3,6]	n	%[7]
STATE TOTAL	**82,673**	**19,390**	**23.9**	**12,865**	**17.8**	**6,525**	**75.3**	**2,139**	**24.7**
Anna Jaques Hospital	899	200	22.2	127	15.7	73	83.0	15	17.0
Baystate Medical Center	4,923	1,060	22.1	678	16.0	382	69.0	172	31.0
Berkshire Medical Center	775	149	19.2	87	12.6	62	75.6	20	24.4
Beth Israel Deaconess Medical Center	4,876	1,395	28.6	954	22.4	441	71.7	174	28.3
Beverly Hospital	2,508	502	20.0	317	14.2	185	67.8	88	32.2
Boston Medical Center	1,794	443	24.7	306	19.0	137	74.9	46	25.1
Brigham and Women's Hospital	10,042	2,514	25.1	1,759	19.7	755	69.6	330	30.4
Brockton Hospital	1,661	342	20.6	237	15.6	105	75.0	35	25.0
Cambridge Hospital	759	196	25.8	123	18.4	73	79.3	19	20.7
Cape Cod Hospital	977	215	22.0	128	15.3	87	61.7	54	38.3
Caritas Good Samaritan Medical Center	759	190	25.0	112	17.0	78	76.5	24	23.5
Caritas Norwood Hospital	628	155	24.7	108	18.9	47	81.0	11	19.0
Charlton Memorial Hospital	1,651	353	21.4	224	15.0	129	81.1	30	18.9
Cooley Dickinson Hospital	899	187	20.8	128	15.8	59	64.8	32	35.2
Deaconess-Waltham Hospital	301	60	19.9	38	13.9	22	78.6[8]	6	21.4[8]
Emerson Hospital	1,510	370	24.5	224	17.0	146	76.0	46	24.0
Fairview Hospital	156	37	23.7	23	17.0	14	66.7[8]	7	33.3[8]
Falmouth Hospital	651	144	23.5	90	16.6	54	76.1	17	23.9
Franklin Medical Center	498	101	20.3	68	15.2	33	66.0	17	34.0
Hale Hospital	313	70	22.4	48	16.8	22	81.5[8]	5	18.5[8]
Harrington Memorial Hospital	443	101	22.8	55	14.3	46	79.3	12	20.7
Heywood Hospital	561	86	15.3	56	11.0	30	56.6	23	43.4
Holy Family Hospital and Medical Center	1,371	369	26.9	275	21.9	94	83.2	19	16.8
Holyoke Hospital	396	97	24.6	63	17.9	34	81.0	8	19.0
Jordan Hospital	783	206	26.4	132	19.4	74	73.3	27	26.7
Lawrence General Hospital	1,400	259	18.5	147	11.7	112	81.2	26	18.8
Leominster Hospital	1,403	311	22.2	175	14.3	136	79.5	35	20.5
Lowell General Hospital	2,144	431	20.1	282	14.5	149	76.0	47	24.0
Martha's Vineyard Hospital	107	25	23.4	16	16.7	9	81.8[8]	2	--[9]
Mary Lane Hospital	196	46	23.5	27	16.4	19	61.3	12	38.7

Table 16 (cont'd). Cesarean Section Deliveries and Vaginal Births After Cesarean Section (VBACs) by Licensed Maternity Facility[1], All Births, Massachusetts: 2000

Facility	Occurrence Births[2]	Total C-Sections		Primary C-Section[2]		Repeat C-Section[2]		VBACs[2]	
		n	%[3,4]	n	%[3,5]	n	%[3,6]	n	%[7]
Massachusetts General Hospital	3,228	706	21.9	518	17.2	188	88.3	25	11.7
Melrose-Wakefield Hospital	2,048	571	27.9	369	20.7	202	75.4	66	24.6
Mercy Hospital	977	195	20.0	123	13.9	72	77.4	21	22.6
Metrowest Medical Center-Framingham Union Campus	2,468	561	22.7	368	16.4	193	85.0	34	15.0
Milford-Whitinsville Regional Hospital	774	183	23.6	135	19.3	48	65.8	25	34.2
Morton Hospital	637	174	27.9	90	17.6	84	75.0	28	25.0
Mount Auburn Hospital	1,313	302	23.0	212	17.9	90	70.9	37	29.1
Nantucket Cottage Hospital	96	31	32.3	24	27.0	7	100.0	0	0.0
New England Medical Center Hospital	1,587	406	25.6	295	20.5	111	75.0	37	25.0
Newton Wellesley Hospital	3,321	885	26.7	605	20.3	280	83.3	56	16.7
North Adams Regional Hospital	318	69	21.7	37	13.7	32	68.1	15	31.9
North Shore Medical Center - Salem Hospital	1,701	393	23.1	238	15.5	155	91.2	15	8.8
Saint Vincent Hospital	1,841	332	18.1	241	14.3	91	58.7	64	41.3
Saints Memorial Medical Ctr.-St. John's Campus	682	158	23.2	109	17.5	49	83.1	10	16.9
South Shore Hospital	3,883	1,088	28.0	772	21.9	316	89.8	36	10.2
St. Elizabeth's Medical Center of Boston	1,791	538	30.1	352	22.8	186	75.0	62	25.0
St. Luke's Hospital	1,557	385	24.9	247	18.1	138	77.5	40	22.5
Sturdy Memorial Hospital	1,209	348	28.8	200	19.6	148	78.3	41	21.7
Tobey Hospital	487	75	17.1	45	11.4	30	71.4	12	28.6
UMass Memorial Medical Center-West Campus	4,360	1,070	24.5	689	17.9	381	75.4	124	24.6
Winchester Hospital	2,477	305	23.6	188	16.3	117	81.3	27	18.8

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Deaconess-Waltham Hospital closed to births on October 1, 2000.

Data on method of delivery were not provided for approx. 1,180 occurrence births from Winchester Hospital.

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 presented elsewhere in this book which are based on resident 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. 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)) x100. 7. Percentage VBACs= (VBAC deliveries/(repeat Cesarean sections + VBAC)) x 100. 8. This percentage is based on less than 40 total births and should be interpreted with caution. 9. Calculations based on fewer than five events are excluded.

Table 17. Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility[1] and Number of Previous Births, Massachusetts: 2000

Facility	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
	Births[2]	C-section		Births[2]	C-section		Births[2]	C-section	
		n	%[3]		n	%[3]		n	%[3]
STATE TOTAL	**34,819**	**8,539**	**24.5**	**34,536**	**2,569**	**7.4**	**8,178**	**6,078**	**74.3**
Anna Jaques Hospital	388	96	24.7	397	21	5.3	86	71	82.6
Baystate Medical Center	1,833	411	22.4	2,227	183	8.2	516	348	67.4
Berkshire Medical Center	308	59	19.2	370	17	4.6	80	62	77.5
Beth Israel Deaconess Medical Center	1,992	566	28.4	1,925	157	8.2	547	384	70.2
Beverly Hospital	1,030	213	20.7	1,134	70	6.2	260	173	66.5
Boston Medical Center	767	180	23.5	802	106	13.2	171	127	74.3
Brigham and Women's Hospital	4,383	1,072	24.5	3,880	302	7.8	994	672	67.6
Brockton Hospital	730	170	23.3	750	53	7.1	140	105	75.0
Cambridge Hospital	388	99	25.5	269	18	6.7	88	69	78.4
Cape Cod Hospital	413	100	24.2	399	18	4.5	137	83	60.6
Caritas Good Samaritan Medical Center	265	72	27.2	376	26	6.9	97	73	75.3
Caritas Norwood Hospital	274	82	29.9	288	22	7.6	58	47	81.0
Charlton Memorial Hospital	676	144	21.3	770	49	6.4	147	117	79.6
Cooley Dickinson Hospital	427	106	24.8	371	17	4.6	87	57	65.5
Deaconess-Waltham Hospital	142	23	16.2	121	9	7.4	26	20	76.9[4]
Emerson Hospital	710	175	24.6	567	30	5.3	180	136	75.6
Fairview Hospital	73	18	24.7	60	5	8.3	19	14	73.7[4]
Falmouth Hospital	240	67	27.9	290	19	6.6	67	50	74.6
Franklin Medical Center	190	44	23.2	242	16	6.6	50	33	66.0
Hale Hospital	124	32	25.8	152	12	7.9	27	22	81.5[4]
Harrington Memorial Hospital	189	42	22.2	189	10	5.3	56	44	78.6
Heywood Hospital	228	37	16.2	272	13	4.8	51	28	54.9
Holy Family Hospital and Medical Center	616	195	31.7	603	52	8.6	109	90	82.6
Holyoke Hospital	168	47	28.0	184	16	8.7	41	33	80.5
Jordan Hospital	325	95	29.2	348	30	8.6	96	70	72.9
Lawrence General Hospital	652	104	16.0	587	30	5.1	132	106	80.3
Leominster Hospital	575	129	22.4	632	34	5.4	167	132	79.0
Lowell General Hospital	853	186	21.8	1,051	73	6.9	190	143	75.3
Martha's Vineyard Hospital	50	13	26.0	44	1	--[5]	11	9	81.8[4]
Mary Lane Hospital	77	16	20.8	88	11	12.5	31	19	61.3[4]

Table 17 (cont'd). Cesarean Section Deliveries for Singleton Births by Licensed Maternity Facility and Number of Previous Births, Massachusetts: 2000

Facility	First Birth			Second or Later Birth without prior C-section			Second or Later Birth with prior C-section		
	Births[2]	C-section		Births[2]	C-section		Births[2]	C-section	
		n	%[3]		n	%[3]		n	%[3]
Massachusetts General Hospital	1,668	332	19.9	1,201	101	8.4	205	181	88.3
Melrose-Wakefield Hospital	788	234	29.7	923	91	9.9	261	195	74.7
Mercy Hospital	380	86	22.6	486	29	6.0	91	70	76.9
Metrowest Medical Center-Framingham Union Campus	1,269	278	21.9	893	52	5.8	211	177	83.9
Milford-Whitinsville Regional Hospital	352	97	27.6	330	22	6.7	73	48	65.8
Morton Hospital	236	62	26.3	266	22	8.3	109	81	74.3
Mount Auburn Hospital	656	166	25.3	494	36	7.3	123	86	69.9
Nantucket Cottage Hospital	50	20	40.0	39	4	--[5]	7	7	100.0[4]
New England Medical Center Hospital	608	144	23.7	666	56	8.4	133	98	73.7
Newton Wellesley Hospital	1,317	427	32.4	1,531	121	7.9	330	274	83.0
North Adams Regional Hospital	128	26	20.3	139	9	6.5	47	32	68.1
North Shore Medical Center - Salem Hospital	685	148	21.6	795	59	7.4	156	141	90.4
Saint Vincent Hospital	789	172	21.8	851	49	5.8	151	87	57.6
Saints Memorial Medical Ctr.-St. John's Campus	341	87	25.5	268	18	6.7	55	45	81.8
South Shore Hospital	1,869	533	28.5	1,502	128	8.5	327	291	89.0
St. Elizabeth's Medical Center of Boston	763	223	29.2	689	67	9.7	237	175	73.8
St. Luke's Hospital	620	161	26.0	722	72	10.0	173	133	76.9
Sturdy Memorial Hospital	490	148	30.2	506	39	7.7	181	140	77.3
Tobey Hospital	174	34	19.5	212	7	3.3	41	30	73.2
UMass Memorial Medical Center-West Campus	1,839	446	24.3	1,794	128	7.1	472	348	73.7
Winchester Hospital	560	122	21.8	539	38	7.1	129	102	79.1

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Deaconess-Waltham Hospital was closed to births on October 1, 2000.

Data on method of delivery were not provided for approx. 1,180 occurrence births from Winchester Hospital.

1. A licensed maternity facility is a medical unit licensed by the Commonwealth for the care of women during pregnancy and childbirth. 2. Occurrence births (See Glossary for definition.) 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. This percentage is based on less than 40 total births and should be interpreted with caution. 5. Calculations based on fewer than five events are excluded.

CHAPTER 7

BIRTHS BY HOSPITAL AND COMMUNITY

In 2000, 82,673 births occurred in Massachusetts, a decrease of 12% since 1990 *(The percentages and rates provided in Tables 16, 17, and 18 are based on occurrence births and differ from data presented elsewhere in this report, which are based on resident births).*

Low Birthweight Variation by Facility

In 2000, at least 10% of the births at seven hospitals were low birthweight. These hospitals were: Baystate Medical Center, Beth Israel Deaconess Medical Center, Boston Medical Center, Brigham and Women's Hospital, New England Medical Center, St. Elizabeth's Medical Center of Boston, and UMass Memorial Medical Center West Campus (Table 18).

Publicly Funded Delivery Variation by Facility

In four hospitals, 50% or more of the deliveries were paid with public funds: Boston Medical Center (87.3%), Lawrence General Hospital (56.9%), Mercy Hospital (50.7%), and Hale Hospital (55.6%) (Table 18). In four facilities, less than 10% of deliveries were paid with public funds: Emerson Hospital, Newton Wellesley Hospital, South Shore Hospital, and Winchester Hospital.

Prenatal Care Adequacy Variation by Facility

In 2000, the facilities with the lowest reported rate of adequacy of prenatal care among their delivery mothers (i.e.< 65%) were: Boston Medical Center (45.2%), Berkshire Medical Center (64.1%), Cambridge Birth Center (60.3 %), Cambridge Hospital (59.1%), Caritas Good Samaritan Medical Center (62.6%), Heywood Hospital (63.0%) and North Shore Medical Center - Salem Hospital (53.1%).

Table 18. Birth Characteristics by Licensed Maternity Facility[1], Massachusetts: 2000

Facility	Location	Occurrence Births[2] (n)	Low Birthweight (%)	Public Payment for Delivery[3] (%)	Adequate Prenatal Care (%)
STATE TOTAL[4]		**82,673**	**7.1**	**26.9**	**79.0**
Anna Jaques Hospital	Newburyport	899	4.0	15.9	83.4
Baystate Medical Center	Springfield	4,923	10.3	43.1	70.6
Berkshire Medical Center	Pittsfield	775	5.8	36.0	64.1
Beth Israel Deaconess Medical Center	Boston	4,876	12.0	16.5	77.4
Beverly Hospital	Beverly	2,508	4.7	26.8	82.5
Boston Medical Center	Boston	1,794	11.0	87.3	45.2
Brigham and Womens Hospital	Boston	10,042	10.3	17.6	96.9
Brockton Hospital	Brockton	1,661	6.7	48.1	65.4
Cambridge Birth Center	Cambridge	73	0.0	33.3	60.3
Cambridge Hospital	Cambridge	759	2.0	46.0	59.1
Cape Cod Hospital	Barnstable	977	3.6	30.5	85.4
Caritas Good Samaritan Medical Center	Brockton	759	5.4	33.3	62.6
Caritas Norwood Hospital	Norwood	628	2.9	13.9	89.0
Charlton Memorial Hospital	Fall River	1,651	6.9	40.3	78.5
Cooley Dickinson Hospital	Northampton	899	2.4	20.2	87.7
Deaconess-Waltham Hospital	Waltham	301	3.0	25.6	83.7
Emerson Hospital	Concord	1,510	3.4	3.7	84.4
Fairview Hospital	Great Barrington	156	--[5]	34.8	81.8
Falmouth Hospital	Falmouth	651	3.6	27.9	76.6
Franklin Medical Center	Greenfield	498	4.2	41.4	79.7
Hale Hospital	Haverhill	313	5.4	55.6	72.5
Harrington Memorial Hospital	Southbridge	443	2.7	39.8	81.9
Heywood Hospital	Gardner	561	2.3	36.1	63.0
Holy Family Hospital and Medical Center	Methuen	1,371	4.7	20.6	70.5
Holyoke Hospital	Holyoke	396	4.3	45.7	75.6
Jordan Hospital	Plymouth	783	3.6	24.5	69.8
Lawrence General Hospital	Lawrence	1,400	5.1	56.9	73.5
Leominster Hospital	Leominster	1,403	3.6	32.3	79.4
Lowell General Hospital	Lowell	2,144	5.1	33.2	65.6
Martha's Vineyard Hospital	Oak Bluffs	107	--[5]	45.8	83.2

Table 18. (cont'd) Births Characteristics by Licensed Maternity Facility[1], Massachusetts: 2000

Facility	Location	Occurrence Births[2] (n)	Low Birthweight (%)	Public Payment for Delivery[3] (%)	Adequate Prenatal Care (%)
Mary Lane Hospital	Ware	196	4.1	40.3	71.8
Massachusetts General Hospital	Boston	3,228	8.7	34.6	68.0
Melrose-Wakefield Hospital	Melrose	2,048	4.7	15.4	88.1
Mercy Hospital	Springfield	977	3.4	50.7	70.8
Metrowest Medical Center-Framingham Union Campus	Framingham	2,468	5.3	17.6	93.0
Milford-Whitinsville Regional Hospital	Milford	774	2.7	15.4	88.1
Morton Hospital	Taunton	637	4.2	38.7	74.1
Mount Auburn Hospital	Cambridge	1,313	3.8	15.6	84.9
Nantucket Cottage Hospital	Nantucket	96	--[5]	25.0	73.4
New England Medical Center Hospital	Boston	1,587	21.2	33.8	76.5
Newton Wellesley Hospital	Newton	3,321	4.2	1.3	84.1
North Adams Regional Hospital	North Adams	318	3.5	44.7	84.0
North Shore Birth Center	Beverly	78	0.0	11.5	84.4
North Shore Medical Center - Salem Hospital	Salem	1,701	3.4	32.2	53.1
Saint Vincent Hospital	Worcester	1,841	4.4	19.5	80.4
Saints Memorial Medical Ctr.-St. John's Campus	Lowell	682	3.7	32.0	68.2
South Shore Hospital	Weymouth	3,883	4.3	6.2	91.2
St. Elizabeth's Medical Center of Boston	Boston	1,791	10.7	18.2	85.7
St. Luke's Hospital	New Bedford	1,557	6.0	49.7	75.1
Sturdy Memorial Hospital	Attleboro	1,209	2.9	19.7	79.1
The Birthplace At Wellesley	Wellesley	88	0.0	0.0	75.3
Tobey Hospital	Wareham	487	3.3	33.0	73.5
Umass Memorial Medical Center-West Campus	Worcester	4,360	11.1	30.9	73.7
Winchester Hospital[6]	Winchester	2,477	4.6	5.9	84.6
All Other Hospitals		10	--[5]	25.0	50.0
Home Births, Enroute, Other		285	11.1	28.7	52.2

NOTES: All percentages are calculated based on only those births with known values for the characteristic(s) of interest, unless otherwise stated. Boston Regional Medical Center closed to births on February 6, 1999. Name change: Caritas Good Samaritan Medical Center from Good Samaritan Medical Center.
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. Public payment for delivery includes Medicaid/Masshealth, Commonhealth, Medicare, Healthy Start, other government programs, and free care.

4. 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. 5. Calculations based on values of 1-4 for medical characteristics of facilities with less than 200 births are suppressed based Guidelines for Release of Births Data, Bureau of Health Statistics, Research and Evaluation, Massachusetts Department of Public Health. 6. Data on birth characteristics in this table were not provided for approx. 1,180 occurrence births from Winchester Hospital.

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
STATE TOTAL	**82,673**	**81,582**	**5,711**	**5,395**	**377**	**288**
Abington	1	214	18	9	4	4
Acton	2	247	10	1	1	1
Acushnet	0	102	6	9	1	0
Adams	1	93	--[1]	9	0	0
Agawam	0	285	13	9	2	1
Alford	1	3	0	0	0	0
Amesbury	0	194	14	12	0	0
Amherst	3	161	10	6	2	1
Andover	0	338	10	2	0	0
Aquinnah (Gay Head)	1	5	0	0	0	0
Arlington	3	541	22	6	0	0
Ashburnham	0	49	--[1]	1	0	0
Ashby	0	34	--[1]	2	0	0
Ashfield	1	21	0	1	0	0
Ashland	1	244	24	5	3	2
Athol	0	132	--[1]	19	1	0
Attleboro	1210	621	44	47	1	1
Auburn	1	176	10	6	0	0
Avon	0	46	--[1]	3	0	0
Ayer	1	136	11	8	3	2
Barnstable	978	481	25	30	4	3
Barre	0	68	--[1]	2	0	0
Becket	0	16	--[1]	2	0	0
Bedford	0	168	14	0	1	1
Belchertown	2	171	11	5	0	0
Bellingham	2	220	7	7	1	1
Belmont	1	278	19	1	3	3
Berkley	0	75	--[1]	1	0	0
Berlin	0	31	--[1]	0	0	0
Bernardston	0	16	0	1	0	0
Beverly	2586	520	25	22	2	1
Billerica	3	514	23	18	4	4
Blackstone	0	104	--[1]	5	0	0
Blandford	0	8	0	1	0	0
Bolton	0	69	0	0	0	0
Boston	23363	8079	727	805	54	43
Bourne	0	247	13	9	3	3
Boxborough	0	61	--[1]	0	0	0
Boxford	0	73	--[1]	0	0	0
Boylston	0	41	--[1]	0	0	0
Braintree	1	417	22	10	0	0

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Brewster	0	52	--[1]	1	1	1
Bridgewater	1	299	17	11	3	3
Brimfield	0	38	5	4	0	0
Brockton	2426	1559	154	219	9	6
Brookfield	0	25	5	4	0	0
Brookline	1	614	37	6	0	0
Buckland	0	14	0	1	0	0
Burlington	2	297	10	1	2	1
Cambridge	2157	1085	76	27	4	3
Canton	1	265	15	2	0	0
Carlisle	1	47	--[1]	0	0	0
Carver	0	123	6	8	1	1
Charlemont	0	15	0	1	0	0
Charlton	0	156	12	3	0	0
Chatham	0	38	--[1]	0	0	0
Chelmsford	2	443	31	12	3	2
Chelsea	1	682	54	91	3	2
Cheshire	0	39	--[1]	2	0	0
Chester	0	12	0	1	0	0
Chesterfield	0	15	--[1]	1	0	0
Chicopee	0	605	57	59	2	1
Chilmark	0	2	0	0	0	0
Clarksburg	0	9	0	0	0	0
Clinton	3	173	15	14	0	0
Cohasset	1	87	--[1]	1	0	0
Colrain	1	12	--[1]	0	0	0
Concord	1512	176	10	2	2	2
Conway	1	11	0	0	0	0
Cummington	0	4	--[1]	0	0	0
Dalton	0	57	--[1]	5	1	0
Danvers	0	235	13	6	3	2
Dartmouth	0	264	22	18	0	0
Dedham	0	301	21	3	2	2
Deerfield	1	43	--[1]	0	0	0
Dennis	1	115	8	9	0	0
Dighton	0	65	--[1]	1	0	0
Douglas	0	126	5	4	0	0
Dover	0	58	--[1]	0	0	0
Dracut	1	375	16	16	0	0
Dudley	0	128	14	8	1	0
Dunstable	0	45	0	1	0	0
Duxbury	0	189	13	4	0	0
East Bridgewater	0	155	17	2	2	2
East Brookfield	0	21	--[1]	1	0	0
East Longmeadow	0	154	7	6	0	0

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Eastham	0	39	--[1]	1	1	0
Easthampton	1	169	16	12	0	0
Easton	0	266	12	3	0	0
Edgartown	0	40	--[1]	1	0	0
Egremont	0	6	0	0	0	0
Erving	0	18	--[1]	0	0	0
Essex	0	36	--[1]	1	0	0
Everett	0	495	30	20	3	3
Fairhaven	0	130	8	3	1	1
Fall River	1654	1187	112	154	12	10
Falmouth	653	286	20	20	0	0
Fitchburg	5	566	41	94	3	2
Florida	0	6	--[1]	1	0	0
Foxborough	1	230	15	3	3	3
Framingham	2471	991	60	45	5	4
Franklin	3	523	34	3	2	2
Freetown	0	85	--[1]	0	0	0
Gardner	561	224	10	31	2	2
Georgetown	0	103	--[1]	3	1	0
Gill	0	11	0	0	0	0
Gloucester	1	335	20	26	0	0
Goshen	0	6	0	0	0	0
Gosnold	0	1	0	0	0	0
Grafton	1	212	10	5	0	0
Granby	0	56	--[1]	3	0	0
Granville	0	19	0	0	0	0
Great Barrington	160	51	--[1]	2	0	0
Greenfield	498	204	19	22	0	0
Groton	1	156	18	0	0	0
Groveland	0	68	7	2	0	0
Hadley	2	45	5	1	2	2
Halifax	0	93	6	3	0	0
Hamilton	0	102	6	1	0	0
Hampden	0	39	--[1]	1	0	0
Hancock	0	6	0	1	0	0
Hanover	0	156	8	2	1	0
Hanson	1	128	7	9	0	0
Hardwick	0	23	--[1]	0	0	0
Harvard	0	44	--[1]	0	0	0
Harwich	0	102	--[1]	3	0	0
Hatfield	0	18	0	0	0	0
Haverhill	314	848	68	68	4	4
Hawley	0	2	0	0	0	0
Heath	0	10	--[1]	1	0	0
Hingham	0	291	12	2	0	0

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Hinsdale	0	10	0	1	0	0
Holbrook	0	139	11	1	0	0
Holden	0	167	16	4	0	0
Holland	0	23	0	2	0	0
Holliston	0	199	15	1	1	0
Holyoke	398	663	62	138	2	2
Hopedale	0	84	--[1]	1	0	0
Hopkinton	1	227	13	2	1	1
Hubbardston	0	59	5	1	0	0
Hudson	1	250	21	9	0	0
Hull	0	107	9	3	0	0
Huntington	0	22	0	0	0	0
Ipswich	1	121	12	4	0	0
Kingston	0	178	9	3	1	1
Lakeville	0	130	9	11	0	0
Lancaster	2	73	--[1]	3	2	1
Lanesborough	0	32	--[1]	0	0	0
Lawrence	1400	1416	104	284	10	8
Lee	0	45	--[1]	2	0	0
Leicester	0	117	5	8	1	1
Lenox	2	40	--[1]	1	0	0
Leominster	1403	589	35	64	1	1
Leverett	1	10	0	1	0	0
Lexington	0	303	15	3	0	0
Leyden	0	2	0	0	0	0
Lincoln	0	106	14	0	0	0
Littleton	0	135	6	1	0	0
Longmeadow	0	139	6	1	0	0
Lowell	2830	1761	134	251	10	9
Ludlow	0	169	11	10	0	0
Lunenburg	1	111	5	3	0	0
Lynn	2	1446	112	194	12	9
Lynnfield	0	126	7	0	1	1
Malden	0	823	67	26	1	1
Manchester-by-the-Sea	0	45	--[1]	0	0	0
Mansfield	1	414	28	6	1	0
Marblehead	0	240	8	0	2	2
Marion	0	43	--[1]	0	3	3
Marlborough	4	617	43	36	2	2
Marshfield	0	357	21	7	1	0
Mashpee	1	152	17	4	1	0
Mattapoisett	0	61	6	1	0	0
Maynard	0	174	16	4	1	1
Medfield	1	151	10	1	0	0
Medford	3	605	46	11	2	2

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Medway	0	211	19	3	2	2
Melrose	2049	383	25	6	0	0
Mendon	0	61	5	1	0	0
Merrimac	0	78	8	0	0	0
Methuen	1372	592	47	35	8	8
Middleborough	0	251	13	14	0	0
Middlefield	0	3	0	0	0	0
Middleton	0	81	5	3	0	0
Milford	776	375	25	20	3	2
Millbury	0	142	12	9	1	0
Millis	1	118	6	3	0	0
Millville	0	39	--[1]	0	0	0
Milton	0	312	12	5	0	0
Monroe	0	1	--[1]	1	0	0
Monson	0	98	--[1]	10	0	0
Montague	5	96	7	11	0	0
Monterey	0	9	--[1]	2	0	0
Montgomery	0	12	--[1]	1	0	0
Mount Washington	0	2	0	0	0	0
Nahant	0	33	0	0	0	0
Nantucket	102	141	10	6	1	1
Natick	1	503	29	5	0	0
Needham	2	401	18	0	1	0
New Ashford	0	5	0	0	0	0
New Bedford	1559	1311	93	198	6	4
New Braintree	0	6	--[1]	0	0	0
New Marlborough	0	17	0	1	0	0
New Salem	0	12	--[1]	0	0	0
Newbury	0	61	--[1]	1	0	0
Newburyport	900	203	12	9	0	0
Newton	3321	886	73	8	4	3
Norfolk	1	129	9	0	0	0
North Adams	319	141	7	31	0	0
North Andover	0	370	15	1	1	1
North Attleboro	2	413	31	11	1	1
North Brookfield	0	51	--[1]	2	0	0
North Reading	0	202	17	1	1	1
Northampton	904	235	14	12	0	0
Northborough	0	175	10	3	0	0
Northbridge	0	197	12	14	0	0
Northfield	0	26	--[1]	0	0	0
Norton	0	275	23	16	0	0
Norwell	0	120	--[1]	2	0	0
Norwood	631	347	21	10	1	1
Oak Bluffs	108	26	--[1]	1	0	0

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Oakham	0	18	--[1]	0	0	0
Orange	0	81	5	11	0	0
Orleans	0	23	--[1]	0	0	0
Otis	0	10	0	1	0	0
Oxford	1	170	10	7	0	0
Palmer	1	129	7	16	0	0
Paxton	0	33	--[1]	3	1	1
Peabody	1	539	33	20	6	4
Pelham	0	9	0	0	0	0
Pembroke	0	275	14	5	1	0
Pepperell	0	149	5	8	0	0
Peru	0	8	0	0	0	0
Petersham	0	11	--[1]	2	0	0
Phillipston	0	16	--[1]	2	0	0
Pittsfield	777	484	44	58	1	0
Plainfield	0	5	0	0	0	0
Plainville	1	105	--[1]	5	0	0
Plymouth	786	677	40	23	4	3
Plympton	0	33	--[1]	0	0	0
Princeton	0	25	--[1]	1	0	0
Provincetown	0	4	0	0	0	0
Quincy	2	1151	84	39	5	4
Randolph	1	445	36	14	2	2
Raynham	0	124	9	4	1	1
Reading	1	287	19	9	2	1
Rehoboth	1	103	8	3	0	0
Revere	1	628	52	35	0	0
Richmond	0	10	0	0	0	0
Rochester	0	43	--[1]	1	0	0
Rockland	0	230	19	19	2	2
Rockport	0	60	--[1]	0	0	0
Rowe	0	5	0	0	0	0
Rowley	0	69	--[1]	1	0	0
Royalston	0	7	0	1	0	0
Russell	0	14	0	2	0	0
Rutland	1	110	8	3	0	0
Salem	1703	515	28	34	1	0
Salisbury	0	98	7	13	1	1
Sandisfield	0	5	0	0	0	0
Sandwich	1	218	7	4	0	0
Saugus	0	286	25	7	1	1
Savoy	0	6	0	1	0	0
Scituate	1	202	10	2	0	0
Seekonk	1	135	14	7	1	1
Sharon	2	213	15	3	1	1

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Sheffield	1	28	0	1	0	0
Shelburne	0	21	--[1]	2	0	0
Sherborn	1	52	--[1]	0	1	1
Shirley	0	64	--[1]	4	0	0
Shrewsbury	0	462	19	5	0	0
Shutesbury	3	18	0	0	0	0
Somerset	0	138	8	9	1	1
Somerville	4	928	63	47	6	5
South Hadley	0	143	7	6	0	0
Southampton	0	56	--[1]	2	0	0
Southborough	1	154	7	2	0	0
Southbridge	443	242	19	39	0	0
Southwick	1	113	--[1]	8	0	0
Spencer	0	139	10	13	1	0
Springfield	5912	2503	227	477	15	8
Sterling	0	94	7	2	1	1
Stockbridge	0	10	0	1	0	0
Stoneham	0	263	18	2	1	1
Stoughton	1	320	27	12	0	0
Stow	1	88	5	0	0	0
Sturbridge	0	91	6	5	1	1
Sudbury	1	236	9	1	1	0
Sunderland	0	33	0	2	0	0
Sutton	0	123	9	4	1	1
Swampscott	0	175	11	1	1	1
Swansea	0	139	8	6	1	1
Taunton	637	769	64	62	2	1
Templeton	0	88	10	4	0	0
Tewksbury	0	391	24	8	1	0
Tisbury	1	37	--[1]	3	0	0
Tolland	0	4	--[1]	0	0	0
Topsfield	0	69	--[1]	0	0	0
Townsend	1	115	6	4	0	0
Truro	0	14	0	0	0	0
Tyngsborough	0	187	12	8	0	0
Tyringham	0	2	0	0	0	0
Upton	1	112	11	3	1	0
Uxbridge	0	186	13	3	1	1
Wakefield	0	351	20	1	0	0
Wales	0	20	--[1]	1	0	0
Walpole	0	303	18	4	0	0
Waltham	302	684	38	16	3	1
Ware	196	109	9	9	1	1
Wareham	488	225	9	20	0	0
Warren	0	58	--[1]	5	0	0

Table 19A. Birth Characteristics: Occurrence and Resident Births and Infant Deaths, Massachusetts Municipalities: 2000

Community	Occurrence Births	Resident Births	Low Birthweight	Teen Births, < 20 years	Infant Deaths	Neonatal Deaths
Warwick	1	9	0	1	0	0
Washington	0	1	0	0	0	0
Watertown	2	388	27	6	2	1
Wayland	2	180	9	0	1	1
Webster	1	195	13	14	0	0
Wellesley	88	351	21	1	0	0
Wellfleet	0	17	--[1]	2	0	0
Wendell	0	5	--[1]	0	1	1
Wenham	0	31	0	0	0	0
West Boylston	0	59	--[1]	2	0	0
West Bridgewater	0	81	--[1]	6	0	0
West Brookfield	0	30	--[1]	3	0	0
West Newbury	0	47	--[1]	0	0	0
West Springfield	0	291	14	23	0	0
West Stockbridge	0	7	0	1	0	0
West Tisbury	2	32	--[1]	0	0	0
Westborough	3	243	21	10	3	3
Westfield	1	447	29	30	4	3
Westford	0	317	20	2	0	0
Westhampton	0	14	0	0	0	0
Westminster	0	77	--[1]	2	0	0
Weston	1	93	8	0	0	0
Westport	0	126	8	6	1	1
Westwood	0	193	10	1	0	0
Weymouth	3883	757	52	19	4	4
Whately	0	10	--[1]	0	0	0
Whitman	0	195	17	6	1	1
Wilbraham	0	115	7	2	0	0
Williamsburg	0	22	--[1]	0	0	0
Williamstown	0	46	--[1]	0	1	0
Wilmington	0	318	15	2	2	2
Winchendon	1	118	9	12	0	0
Winchester	2478	298	6	1	0	0
Windsor	1	6	--[1]	0	0	0
Winthrop	0	171	15	7	0	0
Woburn	2	485	28	19	4	2
Worcester	6223	2535	220	297	25	18
Worthington	0	11	--[1]	1	0	0
Wrentham	0	148	10	4	0	0
Yarmouth	0	204	15	14	3	3
Unknown	0	0	--	--	--	--

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 Statistics, Research and Evaluation, Massachusetts Department of Public Health.

Table 19B. Birth Characteristics, Occurrence and Resident Births and Infant Deaths by County, Massachusetts: 2000

County Name	Occurrence Births	Resident Births			Deaths	
		Number	Low Birthweight	Teen (< 20 years)	Infant	Neonatal
STATE TOTAL	**82,673**	**81,582**	**5,711**	**5,395**	**377**	**288**
Barnstable	1,634	1,992	119	97	13	10
Berkshire	1,262	1,210	72	123	3	0
Bristol	5,065	6,742	508	564	30	23
Dukes	112	143	6	5	0	0
Essex	8,280	9,553	626	750	54	43
Franklin	512	706	45	56	1	1
Hampden	6,313	5,900	460	802	25	15
Hampshire	1,108	1,274	81	58	5	4
Middlesex	17,164	19,381	1,255	667	81	63
Nantucket	102	141	10	6	1	1
Norfolk	4,624	8,555	538	163	24	22
Plymouth	3,704	6,415	448	392	33	26
Suffolk	23,365	9,560	848	938	57	45
Worcester	9,428	10,010	695	774	50	35

Table 19C. Birth Characteristics, Occurrence and Resident Births and Infant Deaths, Massachusetts Community Health Network Areas (CHNAs): 2000

Community Health Network Area	Occurrence Births	Resident Births			Deaths	
		Number	Low Birthweight	Teen (< 20 years)	Infant	Neonatal
STATE TOTAL	**82,673**	**81,582**	**5,711**	**5,395**	**377**	**288**
Community Health Network of Berkshire County	1,262	1,210	72	123	3	0
Upper Valley Health Web (Franklin County)	512	872	54	80	2	1
Partnership for Health in Hampshire County (Northampton)	1,108	1,252	81	58	5	4
The Community Health Connection (Springfield)	5,914	3,923	295	557	17	9
Community Health Network of Southern Worcester County	445	1,387	101	111	3	1
Community Partners for Health (Milford)	782	2,361	148	68	11	9
Community Health Network of Greater Metro West (Framingham)	2,493	5,517	355	143	22	18
Community Wellness Coalition (Worcester)	6,225	3,944	297	339	28	20
Fitchburg/Gardner Community Health Network	1,980	3,269	212	263	12	9
Greater Lowell Community Health Network	2,836	4,033	260	316	18	15
Greater Lawrence Community Health Network	2,772	2,797	181	325	19	17
Greater Haverhill Community Health Network	1,214	1,842	135	109	6	5
Community Health Network North (Beverly/Gloucester)	2,588	1,319	73	54	2	1
North Shore Community Health Network	1,706	3,595	237	262	27	20
Greater Woburn/Concord/Littleton Community Health Network	3,997	2,641	135	30	12	9
North Suburban Health Alliance (Medford/Malden/Melrose)	2,053	3,409	242	76	10	9
Greater Cambridge/Somerville Community Health Network	2,167	3,220	207	87	15	12
West Suburban Health Network (Newton/Waltham)	3,714	2,967	191	29	10	6
Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	23,366	10,174	885	944	57	45
Blue Hills Community Health Alliance (Greater Quincy)	4,523	4,714	293	112	13	12
Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	399	1,918	159	238	8	6
Greater Brockton Community Health Network	2,429	3,274	280	272	19	16
South Shore Community Partners in Prevention (Plymouth)	787	2,439	145	83	11	7
Greater Attleboro-Taunton Health & Education Response	1,852	3,375	249	183	7	5
Partners for a Healthier Community (Fall River)	1,654	1,590	136	175	15	13
Greater New Bedford Health & Human Services Coalition	2,047	2,264	153	250	11	8
Cape and Islands Community Health Network	1,848	2,276	135	108	14	11

APPENDIX

TECHNICAL NOTES

1. 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 2000 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) 624-5541.

2. 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 upon 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 updates of birth and death certificate files. 1998 birth rates were recalculated using 1998 population estimates released by the Massachusetts Institute for Social and Economic Research (MISER) in September 2000. See Section 3 for details.

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.

3. 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 Hispanics were included with whites and it was not possible to accurately calculate Hispanic-specific rates of natality and mortality.

4. POPULATION ESTIMATES:

The Massachusetts Department of Public Health (DPH) Population 2000 file is a preliminary file of 2000 population estimates for Massachusetts. It is based upon the U.S. Census 2000 SF1 file (released June, 2001) for Massachusetts, which contains data on population and housing for the 351 towns, 14 counties, and the state overall.

The DPH file was derived from the Census 2000 file by allocating persons who indicated "some other race" or multiple races to the conventional DPH race categories: "White", "Black or African American", "Asian" and "Native American." In Census 2000, unlike previous censuses, respondents were able to classify themselves by Hispanic ethnicity and by single or multi-race categories, including "some other race." In order make the DPH Population 2000 file consistent with previous years' population files, the DPH Population 2000 file maintains the prior race and Hispanic categories. The DPH Population 2000 file used in this report is preliminary. A final file will be released later this year.

1999 rates in this publication are based on the DPH 1999 Population file, which is a linear interpolation between the preliminary draft Population 2000 file and the 1998 MISER population estimates. All 1999 population-based rates in this year's report have been recalculated using the DPH 1999 Population file.

The Massachusetts Institute for Social and Economic Research (MISER), is the source of population estimates used in this report to calculate population-based rates (for example, teen birth rates and fertility rates) through 1998. For example, all 1999 birth rates in last year's publication (*Massachusetts Births 1999*) were calculated using 1998 MISER population estimates as denominators (the latest available population estimates at the time of publication). These rates have been recalculated in *Massachusetts Births 2000* using the DPH 1999 Population estimates as denominators.

5. DEFINITION AND IDENTIFICATION OF PREGNANCY-ASSOCIATED AND MATERNAL DEATHS.

There are various ways to categorize a woman who dies during pregnancy, childbirth, or in the postpartum period. Two components are included in every definition of maternal death: the timing of death in relation to the pregnancy and birth, and the causes of death. Two definitions are used in this report: maternal death and pregnancy-associated death. The traditional definition of maternal death can be found in the World Health Organization's *International Classification of Diseases* (ICD). WHO defines maternal deaths as women who died during pregnancy or within 42 days of delivery from causes related to pregnancy, childbirth or its management. Deaths from accidental or incidental causes are excluded. The National Center for Health Statistics uses the WHO definition to conduct surveillance on maternal death in the US.

Maternal deaths are restricted to women whose underlying causes of death were coded with ICD-9 codes 630-676 (from 1990-1998), or with ICD-10 codes O00-O99 (1999 forward).

The definition of a pregnancy-associated death was developed in 1986 by the Maternal Mortality Study Group, which is jointly chaired by American College of Obstetrics and Gynecology (ACOG) and the Centers for Disease Control and Prevention (CDC). Pregnancy-associated deaths differ from maternal deaths in two fundamental ways: all deaths are included irrespective of cause, and deaths that occurred between 42 and 364 days after delivery also are included.

6. UPCOMING CHANGE TO MEASURE OF ADEQUACY OF PRENATAL CARE

Beginning with next year's publication (*Massachusetts Births 2001*), adequacy of prenatal care will be measured differently. The Adequacy of Prenatal Care Utilization (APNCU) Index will replace the Kessner Index, which has been used to date 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.

Table 1 of this report provides a preview of data on adequacy of prenatal care based on the APNCU Index, as well as a comparison with the Kessner Index for 1997-2000 data. Beginning with *Massachusetts Births 2001*, all data on adequacy of prenatal care, including historical trend data, will be calculated based on the APNCU Index.

Below is a summary of the categories of the APNCU Index.

Category	**Month Prenatal Care Began**	**% of Expected Prenatal Care Visits**
Adequate Plus	1, 2, 3, or 4	110% or more
Adequate	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	

7. MISSING WINCHESTER HOSPITAL DATA FOR 2000 BIRTHS

Winchester Hospital failed to collect and report a subset of data on approximately half of the births (approx. 1,180) occurring at Winchester Hospital in 2000. This subset of data included the following information: infant birthweight, infant gestational age, parity, method of delivery, number of prenatal care visits, adequacy of prenatal care, source of prenatal care payment, and breastfeeding.

The omission of this data from the Massachusetts birth file resulted in higher percentages of missing data for these indicators than usual (see chart below).

Percent of Records with Missing Data, Massachusetts Birth Data (Occurrence Births)

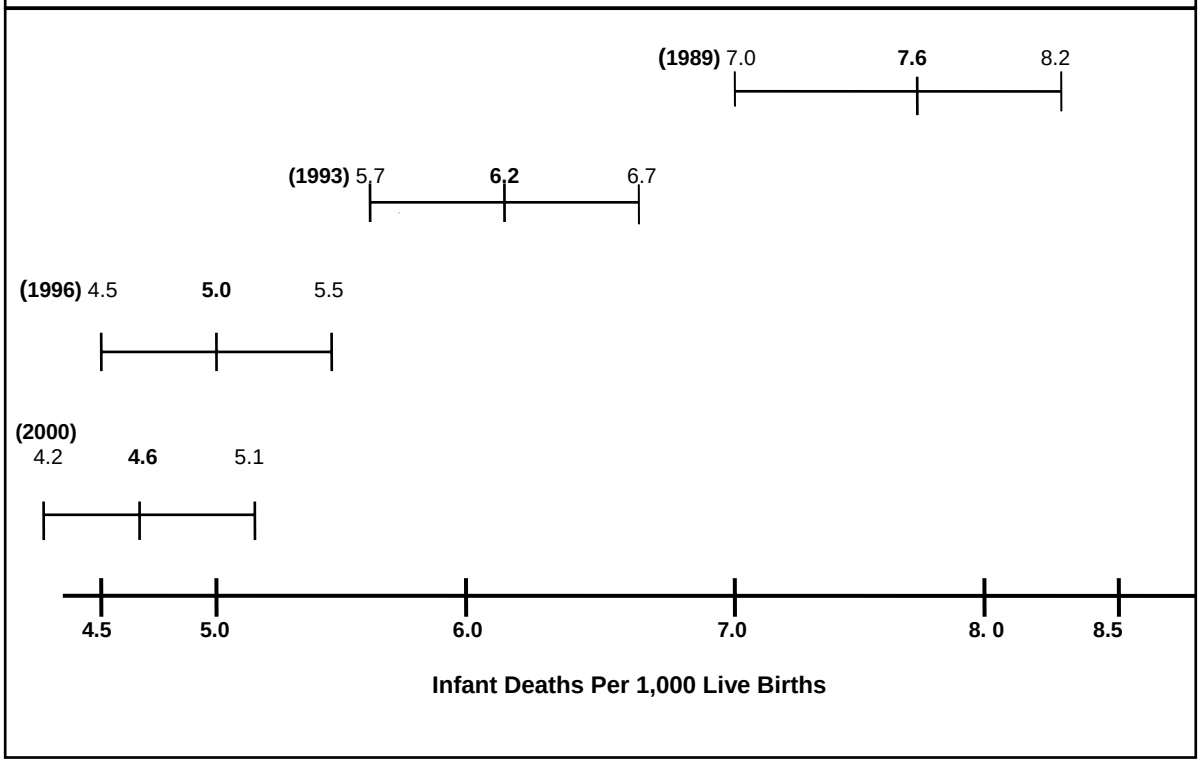
Massachusetts Birth Data	1999	2000 (excluding Winchester Hospital)	2000 (all births, including Winchester Hospital)
Birthweight	0.3%	0.2%	1.7%
Gestational Age	0.7%	1.0%	2.4%
Adequacy of Prenatal Care	0.7%	1.1%	2.5%
Breastfeeding	0.5%	0.8%	2.2%

CONFIDENCE INTERVALS AND INFANT MORTALITY RATES

Beginning in 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

Year	IMR (per 1,000 births)	95% Confidence Interval
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 the annual IMRs for 1993, 1996, and 2000.

95% Confidence Intervals for Infant Mortality Rates, by Race and Hispanic Ethnicity, Massachusetts: 1990-2000

	Total[1]		Non-Hispanic White		Non-Hispanic Black		Hispanic		Asian	
Year	n	**Rate**[2] (C.I).	n	**Rate**[2](C.I).	n	**Rate**[2](C.I).	n	**Rate**[2](C.I).	n	**Rate**[2](C.I).
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)

[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 2000, the non-Hispanic black infant mortality rate was 12.8 deaths per 1,000 live births (95% CI: 9.9,15.7), which was 3.4 times greater than the non-Hispanic white infant mortality rate of 3.8 (95% CI: 3.4, 4.3). The difference in these two rates was statistically significant. The rate of infant mortality for non-Hispanic blacks was also significantly elevated compared to both Hispanic and Asians in 2000.

DEFINITION OF RATES

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. (Also see Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

Birth Rate

Births per 1,000 population. (Also see Age-specific Birth Rate, Crude Birth Rate, Fertility Rate, and Teen Birth Rate)

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

Cesarean Section Rates

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

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

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

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

NOTE: the rates presented in Table 16 are for occurrence births but can be calculated for resident births as well. VBAC: Vaginal birth after Cesarean section.

Crude Birth Rate

The number of births in a year divided by the population, multiplied by 1,000.

Fertility 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

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

General Fertility Ratio
Same as Fertility Rate.

Infant Mortality Rate (IMR)
The death rate among infants less than one year old, per 1,000 live births.

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

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.

$$\text{Maternal Mortality Ratio (MMR)} = \frac{\text{Number of maternal deaths}}{\text{Number of live births born in Massachusetts in the same year}} \times 1{,}000$$

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

$$\text{Perinatal Mortality Rate} = \frac{\text{Number of fetal and infant deaths in the perinatal period (from 28 weeks gestational age through 6 days old)}}{\text{Number of fetal deaths plus live births in the same year}} \times 1{,}000$$

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.

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

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

The total rate of change is calculated as follows:

$$\frac{Pn-Po}{Po} \times 100$$

where

Pn = rate during later time period
Po = rate during earlier time period

Population Estimates for Massachusetts Communities, 2000

TOWN NAME	COUNTY	CHNA	POPULATION
Abington	Plymouth	22	14,605
Acton	Middlesex	15	20,331
Acushnet	Bristol	26	10,161
Adams	Berkshire	1	8,809
Agawam	Hampden	4	28,144
Alford	Berkshire	1	399
Amesbury	Essex	12	16,450
Amherst	Hampshire	3	34,874
Andover	Essex	11	31,247
Aquinnah (Gay Head)	Dukes	27	344
Arlington	Middlesex	17	42,389
Ashburnham	Worcester	9	5,546
Ashby	Middlesex	9	2,845
Ashfield	Franklin	2	1,800
Ashland	Middlesex	7	14,674
Athol	Worcester	2	11,299
Attleboro	Bristol	24	42,068
Auburn	Worcester	8	15,901
Avon	Norfolk	22	4,443
Ayer	Middlesex	9	7,287
Barnstable	Barnstable	27	47,821
Barre	Worcester	9	5,113
Becket	Berkshire	1	1,755
Bedford	Middlesex	15	12,595
Belchertown	Hampshire	3	12,968
Bellingham	Norfolk	6	15,314
Belmont	Middlesex	17	24,194
Berkley	Bristol	24	5,749
Berlin	Worcester	9	2,380
Bernardston	Franklin	2	2,155
Beverly	Essex	13	39,862
Billerica	Middlesex	10	38,981
Blackstone	Worcester	6	8,804
Blandford	Hampden	4	1,214
Bolton	Worcester	9	4,148
Boston	Suffolk	19	589,141
Bourne	Barnstable	27	18,721
Boxborough	Middlesex	15	4,868
Boxford	Essex	12	7,921
Boylston	Worcester	8	4,008
Braintree	Norfolk	20	33,828
Brewster	Barnstable	27	10,094
Bridgewater	Plymouth	22	25,185
Brimfield	Hampden	5	3,339
Brockton	Plymouth	22	94,304
Brookfield	Worcester	5	3,051
Brookline	Norfolk	19	57,107
Buckland	Franklin	2	1,991
Burlington	Middlesex	15	22,876
Cambridge	Middlesex	17	101,355
Canton	Norfolk	20	20,775
Carlisle	Middlesex	15	4,717
Carver	Plymouth	23	11,163
Charlemont	Franklin	2	1,358
Charlton	Worcester	5	11,263
Chatham	Barnstable	27	6,625
Chelmsford	Middlesex	10	33,858
Chelsea	Suffolk	19	35,080
Cheshire	Berkshire	1	3,401
Chester	Hampden	21	1,308
Chesterfield	Hampshire	3	1,201
Chicopee	Hampden	21	54,653
Chilmark	Dukes	27	843
Clarksburg	Berkshire	1	1,686
Clinton	Worcester	9	13,435
Cohasset	Norfolk	20	7,261
Colrain	Franklin	2	1,813
Concord	Middlesex	15	16,993
Conway	Franklin	2	1,809
Cummington	Hampshire	3	978
Dalton	Berkshire	1	6,892
Danvers	Essex	14	25,212
Dartmouth	Bristol	26	30,666
Dedham	Norfolk	18	23,464
Deerfield	Franklin	2	4,750
Dennis	Barnstable	27	15,973
Dighton	Bristol	24	6,175
Douglas	Worcester	6	7,045
Dover	Norfolk	18	5,558
Dracut	Middlesex	10	28,562
Dudley	Worcester	5	10,036
Dunstable	Middlesex	10	2,829
Duxbury	Plymouth	23	14,248
East Bridgewater	Plymouth	22	12,974
East Brookfield	Worcester	5	2,097
East Longmeadow	Hampden	4	14,100
Eastham	Barnstable	27	5,453
Easthampton	Hampshire	3	15,994
Easton	Bristol	22	22,299
Edgartown	Dukes	27	3,779
Egremont	Berkshire	1	1,345
Erving	Franklin	2	1,467
Essex	Essex	13	3,267
Everett	Middlesex	16	38,037
Fairhaven	Bristol	26	16,159
Fall River	Bristol	25	91,938
Falmouth	Barnstable	27	32,660
Fitchburg	Worcester	9	39,102
Florida	Berkshire	1	676
Foxborough	Norfolk	7	16,246
Framingham	Middlesex	7	66,910
Franklin	Norfolk	6	29,560
Freetown	Bristol	26	8,472
Gardner	Worcester	9	20,770
Georgetown	Essex	12	7,377
Gill	Franklin	2	1,363
Gloucester	Essex	13	30,273
Goshen	Hampshire	3	921
Gosnold	Dukes	27	86
Grafton	Worcester	8	14,894
Granby	Hampshire	3	6,132
Granville	Hampden	4	1,521
Great Barrington	Berkshire	1	7,527
Greenfield	Franklin	2	18,168
Groton	Middlesex	9	9,547
Groveland	Essex	12	6,038
Hadley	Hampshire	3	4,793
Halifax	Plymouth	23	7,500
Hamilton	Essex	13	8,315
Hampden	Hampden	4	5,171
Hancock	Berkshire	1	721
Hanover	Plymouth	23	13,164
Hanson	Plymouth	23	9,495
Hardwick	Worcester	9	2,622
Harvard	Worcester	9	5,981
Harwich	Barnstable	27	12,386
Hatfield	Hampshire	3	3,249
Haverhill	Essex	12	58,969
Hawley	Franklin	2	336
Heath	Franklin	2	805
Hingham	Plymouth	20	19,882
Hinsdale	Berkshire	1	1,872
Holbrook	Norfolk	22	10,785
Holden	Worcester	8	15,621

Population Estimates for Massachusetts Communities, 2000, continued

TOWN NAME	COUNTY	CHNA	POPULATION
Holland	Hampden	5	2,407
Holliston	Middlesex	7	13,801
Holyoke	Hampden	21	39,838
Hopedale	Worcester	6	5,907
Hopkinton	Middlesex	7	13,346
Hubbardston	Worcester	9	3,909
Hudson	Middlesex	7	18,113
Hull	Plymouth	20	11,050
Huntington	Hampshire	21	2,174
Ipswich	Essex	13	12,987
Kingston	Plymouth	23	11,780
Lakeville	Plymouth	24	9,821
Lancaster	Worcester	9	7,380
Lanesborough	Berkshire	1	2,990
Lawrence	Essex	11	72,043
Lee	Berkshire	1	5,985
Leicester	Worcester	8	10,471
Lenox	Berkshire	1	5,077
Leominster	Worcester	9	41,303
Leverett	Franklin	2	1,663
Lexington	Middlesex	15	30,355
Leyden	Franklin	2	772
Lincoln	Middlesex	15	8,056
Littleton	Middlesex	15	8,184
Longmeadow	Hampden	4	15,633
Lowell	Middlesex	10	105,167
Ludlow	Hampden	21	21,209
Lunenburg	Worcester	9	9,401
Lynn	Essex	14	89,050
Lynnfield	Essex	14	11,542
Malden	Middlesex	16	56,340
Manchester	Essex	13	5,228
Mansfield	Bristol	24	22,414
Marblehead	Essex	14	20,377
Marion	Plymouth	26	5,123
Marlborough	Middlesex	7	36,255
Marshfield	Plymouth	23	24,324
Mashpee	Barnstable	27	12,946
Mattapoisett	Plymouth	26	6,268
Maynard	Middlesex	7	10,433
Medfield	Norfolk	7	12,273
Medford	Middlesex	16	55,765
Medway	Norfolk	6	12,448
Melrose	Middlesex	16	27,134
Mendon	Worcester	6	5,286
Merrimac	Essex	12	6,138
Methuen	Essex	11	43,789
Middleborough	Plymouth	24	19,941
Middlefield	Hampshire	3	542
Middleton	Essex	11	7,744
Milford	Worcester	6	26,799
Millbury	Worcester	8	12,784
Millis	Norfolk	7	7,902
Millville	Worcester	6	2,724
Milton	Norfolk	20	26,062
Monroe	Franklin	2	93
Monson	Hampden	4	8,359
Montague	Franklin	2	8,489
Monterey	Berkshire	1	934
Montgomery	Hampden	4	654
Mt. Washington	Berkshire	1	130
Nahant	Essex	14	3,632
Nantucket	Nantucket	27	9,520
Natick	Middlesex	7	32,170
Needham	Norfolk	18	28,911
New Ashford	Berkshire	1	247
New Bedford	Bristol	26	93,768
New Braintree	Worcester	9	927
New Marlborough	Berkshire	1	1,494
New Salem	Franklin	2	929
Newbury	Essex	12	6,717
Newburyport	Essex	12	17,189
Newton	Middlesex	18	83,829
Norfolk	Norfolk	7	10,460
North Adams	Berkshire	1	14,681
North Andover	Essex	11	27,202
North Attleboro	Bristol	24	27,143
North Brookfield	Worcester	5	4,683
North Reading	Middlesex	16	13,837
Northampton	Hampshire	3	28,978
Northborough	Worcester	7	14,013
Northbridge	Worcester	6	13,182
Northfield	Franklin	2	2,951
Norton	Bristol	24	18,036
Norwell	Plymouth	20	9,765
Norwood	Norfolk	20	28,587
Oak Bluffs	Dukes	27	3,713
Oakham	Worcester	9	1,673
Orange	Franklin	2	7,518
Orleans	Barnstable	27	6,341
Otis	Berkshire	1	1,365
Oxford	Worcester	5	13,352
Palmer	Hampden	4	12,497
Paxton	Worcester	8	4,386
Peabody	Essex	14	48,129
Pelham	Hampshire	3	1,403
Pembroke	Plymouth	23	16,927
Pepperell	Middlesex	9	11,142
Peru	Berkshire	1	821
Petersham	Worcester	2	1,180
Phillipston	Worcester	2	1,621
Pittsfield	Berkshire	1	45,793
Plainfield	Hampshire	3	589
Plainville	Norfolk	7	7,683
Plymouth	Plymouth	23	51,701
Plympton	Plymouth	23	2,637
Princeton	Worcester	9	3,353
Provincetown	Barnstable	27	3,431
Quincy	Norfolk	20	88,025
Randolph	Norfolk	20	30,963
Raynham	Bristol	24	11,739
Reading	Middlesex	16	23,708
Rehoboth	Bristol	24	10,172
Revere	Suffolk	19	47,283
Richmond	Berkshire	1	1,604
Rochester	Plymouth	26	4,581
Rockland	Plymouth	23	17,670
Rockport	Essex	13	7,767
Rowe	Franklin	2	351
Rowley	Essex	12	5,500
Royalston	Worcester	2	1,254
Russell	Hampden	4	1,657
Rutland	Worcester	9	6,353
Salem	Essex	14	40,407
Salisbury	Essex	12	7,827
Sandisfield	Berkshire	1	824
Sandwich	Barnstable	27	20,136
Saugus	Essex	14	26,078
Savoy	Berkshire	1	705
Scituate	Plymouth	20	17,863
Seekonk	Bristol	24	13,425
Sharon	Norfolk	20	17,408
Sheffield	Berkshire	1	3,335
Shelburne	Franklin	2	2,058
Sherborn	Middlesex	7	4,200
Shirley	Middlesex	9	6,373

Population Estimates for Massachusetts Communities, 2000, continued

TOWN NAME	COUNTY	CHNA	POPULATION
Shrewsbury	Worcester	8	31,640
Shutesbury	Franklin	2	1,810
Somerset	Bristol	25	18,234
Somerville	Middlesex	17	77,478
South Hadley	Hampshire	3	17,196
Southampton	Hampshire	3	5,387
Southborough	Worcester	7	8,781
Southbridge	Worcester	5	17,214
Southwick	Hampden	4	8,835
Spencer	Worcester	5	11,691
Springfield	Hampden	4	152,082
Sterling	Worcester	9	7,257
Stockbridge	Berkshire	1	2,276
Stoneham	Middlesex	16	22,219
Stoughton	Norfolk	22	27,149
Stow	Middlesex	7	5,902
Sturbridge	Worcester	5	7,837
Sudbury	Middlesex	7	16,841
Sunderland	Franklin	2	3,777
Sutton	Worcester	6	8,250
Swampscott	Essex	14	14,412
Swansea	Bristol	25	15,901
Taunton	Bristol	24	55,976
Templeton	Worcester	9	6,799
Tewksbury	Middlesex	10	28,851
Tisbury	Dukes	27	3,755
Tolland	Hampden	4	426
Topsfield	Essex	13	6,141
Townsend	Middlesex	9	9,198
Truro	Barnstable	27	2,087
Tyngsborough	Middlesex	10	11,081
Tyringham	Berkshire	1	350
Upton	Worcester	6	5,642
Uxbridge	Worcester	6	11,156
Wakefield	Middlesex	16	24,804
Wales	Hampden	5	1,737
Walpole	Norfolk	7	22,824
Waltham	Middlesex	18	59,226
Ware	Hampshire	3	9,707
Wareham	Plymouth	26	20,335
Warren	Worcester	5	4,776
Warwick	Franklin	2	750
Washington	Berkshire	1	544
Watertown	Middlesex	17	32,986
Wayland	Middlesex	7	13,100
Webster	Worcester	5	16,415
Wellesley	Norfolk	18	26,613
Wellfleet	Barnstable	27	2,749
Wendell	Franklin	2	986
Wenham	Essex	13	4,440
West Boylston	Worcester	8	7,481
West Bridgewater	Plymouth	22	6,634
West Brookfield	Worcester	5	3,804
West Newbury	Essex	12	4,149
West Springfield	Hampden	4	27,899
West Stockbridge	Berkshire	1	1,416
West Tisbury	Dukes	27	2,467
Westborough	Worcester	7	17,997
Westfield	Hampden	21	40,072
Westford	Middlesex	10	20,754
Westhampton	Hampshire	3	1,468
Westminster	Worcester	9	6,907
Weston	Middlesex	18	11,469
Westport	Bristol	25	14,183
Westwood	Norfolk	18	14,117
Weymouth	Norfolk	20	53,988
Whately	Franklin	2	1,573
Whitman	Plymouth	22	13,882
Wilbraham	Hampden	4	13,473
Williamsburg	Hampshire	3	2,427
Williamstown	Berkshire	1	8,424
Wilmington	Middlesex	15	21,363
Winchendon	Worcester	9	9,611
Winchester	Middlesex	15	20,810
Windsor	Berkshire	1	875
Winthrop	Suffolk	19	18,303
Woburn	Middlesex	15	37,258
Worcester	Worcester	8	172,648
Worthington	Hampshire	3	1,270
Wrentham	Norfolk	7	10,554
Yarmouth	Barnstable	27	24,807

1. MDPH 2000 Preliminary Population Estimates (released January, 2002).

Population Estimates for Massachusetts Community Health Network Areas (CHNA) and Counties, 2000[1]

CHNA	POPULATION	COUNTY	POPULATION
1. Community Health Network of Berkshire County	134,953	Barnstable	222,230
2. Upper Valley Health Web (Franklin County)	86,889	Berkshire	134,953
3. Partnership for Health in Hampshire County (Northampton)	150,077	Bristol	534,678
4. The Community Health Connection (Springfield)	291,665	Dukes	14,987
5. Community Health Network of Southern Worcester County	113,702	Essex	723,419
6. Community Partners for Health (Milford)	152,117	Franklin	71,535
7. Community Health Network of Greater Metro West (Framingham)	374,478	Hampden	456,228
8 .Community Wellness Coalition (Worcester)	289,834	Hampshire	152,251
9. Fitchburg/Gardner Community Health Network	250,362	Middlesex	1,465,396
10. Greater Lowell Community Health Network	270,083	Nantucket	9,520
11. Greater Lawrence Community Health Network	182,025	Norfolk	650,308
12. Greater Haverhill Community Health Network	144,275	Plymouth	472,822
13. Community Health Network North (Beverly/Gloucester)	118,280	Suffolk	689,807
14. North Shore Community Health Network	278,839	Worcester	750,963
15. Greater Woburn/Concord/Littleton Community Health Network	208,406		
16. North Suburban Health Alliance (Medford/Malden/Melrose)	261,844	**STATE**	**6,349,097**
17. Greater Cambridge/Somerville Community Health Network	278,402		
18. West Suburban Health Network (Newton/Waltham)	253,187		
19. Alliance for Community Health (Boston/Chelsea/Revere/Winthrop)	746,914		
20. Blue Hills Community Health Alliance (Greater Quincy)	365,457		
21. Four (For) Communities (Holyoke, Chicopee, Ludlow, Westfield)	159,254		
22. Greater Brockton Community Health Network	232,260		
23. South Shore Community Partners in Prevention (Plymouth)	180,609		
24. Greater Attleboro-Taunton Health & Education Response	242,659		
25. Partners for a Healthier Community (Fall River)	140,256		
26. Greater New Bedford Health & Human Services Coalition	195,533		
27. Cape and Islands Community Health Network	246,737		

1. MDPH 2000 Preliminary Population Estimates (released January, 2002).

GLOSSARY

Adequacy of Prenatal Care

The Index of Adequacy of Prenatal Care (also known as the Kessner Index) has five 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 general classification scheme for full-term infants is as follows:

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

This classification is adjusted for gestational age to allow for proper classification of premature births.

[Note: Beginning with next year's publication, *Massachusetts Births 2001*, adequacy of prenatal care will be measured with a different index (the Adequacy of Prenatal Care Utilization Index, developed by Milton Kotelchuck). 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. (The city of Boston constitutes its own Community Health Network area). In the current publication, we have presented some data by CHNA. To determine which cities and towns make up a particular CHNA, the table on pages 90-92 provides the appropriate CHNA code for each city and town.

The data published in this volume reflect the new definitions of CHNAs instituted in January 1997 and the new 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.

Ethnicity

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

Fetal Death

A stillbirth delivered, extracted or expulsed, at 20 weeks gestation or more and / or weighs 350 grams or more.

Gravidity

The number of pregnancies experienced by a woman.

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.

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.

Perinatal Death
Death to a fetus of 28 weeks gestation or older or an 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.

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

Preliminary U.S. Birth Statistics
Data based on a substantial proportion of vital records for U.S. births occurring in 2000, as reported in *Births: Preliminary Data for 2000* National Vital Statistics Report, Volume 49, No. 5.

Race
See the section 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, except the data in Table 15, 16, 17, and 18 are resident data. 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 Canada 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) -- See Birthweight Categories.

Massachusetts Birth Certificate: 2000

USE ONLY STATE APPROVED RIBBONS AND MASS. STANDARD INK
AS REQUIRED BY GEN. LAWS, CHAP. 66, SECT. 4

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: 768283
1A. CERTIFICATE NUMBER (DPH USE ONLY)
2. FACILITY NUMBER
22A. SOCIAL SECURITY CARD
INITIALS
22B. RESIDENT COPY
INITIALS
1. OCCURRENCE

CHILD

3. PLACE OF BIRTH
3C. CITY/TOWN
3B. COUNTY
3A. FACILITY NAME-IF NOT IN FACILITY, NUMBER AND STREET
3D. REGISTERED NUMBER
NAME 4A. FIRST 4B. MIDDLE 4C. LAST
5. SEX 6A. PLURALITY 6B. BIRTH ORDER 7. TIME 8. DATE OF BIRTH (Month, Day, Year)

SAMPLE

CERTIFIER

9A. NAME 9B. TITLE
9C. CERTIFIER TYPE 9D. LICENSE NUMBER
9E. NUMBER AND STREET 9F. CITY/TOWN 9G. STATE 9H. ZIP CODE

MOTHER

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

FATHER

NAME 14A. FIRST 14B. MIDDLE 14C. LAST
BIRTHPLACE 15A. CITY/TOWN 15B. STATE/COUNTRY 16. DATE OF BIRTH (Month, Day, Year)

INFORMANT

17A. I (WE) CERTIFY THAT THE PERSONAL INFORMATION APPEARING ABOVE IS TRUE AND CORRECT. 17B. RELATIONSHIP TO CHILD
17C. DATE SIGNED (Month, Day, Year) 17D. MAILING ADDRESS (If different from item # 13 above) NUMBER AND STREET CITY STATE ZIP CODE

CLERK

18. DATE OF RECORD (Month, Day, Year) 19. SUPPLEMENT FILED (Month, Day, Year) 20. CLERK/REGISTRAR
21. DPH USE ONLY

R-101 • 100M • 10-98

Massachusetts Births 2000 Evaluation Form

TO OUR READERS:
In an attempt to better serve our users, we are enclosing this evaluation form. Please take the time to complete this questionnaire and return it to the address at the bottom of the page. Thank you.

What tables and charts do you find most useful?
What tables and charts do you find least useful?
Are there other tables and charts that you would like added to this publication? If yes, please describe them in detail.
Do you have other comments or suggestions?
Name (optional): **Address:** **(For those who received the publication by mail)** Is the mailing label address correct? If not, please correct the address. Thank you.

Please return your comments to:
Christine Judge
Division of Research and Epidemiology
Bureau of Health Statistics, Research and Evaluation
Massachusetts Department of Public Health
250 Washington Street Boston, MA 02108

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Division of Research and Epidemiology
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