



# MetroWest Birth Report

Prepared by:  
Lorenz J. Finison, Ph.D.  
Principal, SigmaWorks

August, 2011

**METROWEST**  
**HEALTH**  
**FOUNDATION**

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# METROWEST HEALTH FOUNDATION

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Analysis and opinions expressed are solely those of the author.

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## Executive Summary

The 2002 *MetroWest Health Data Book* contained birth data through 1999; the 2005 *MetroWest Health Data Book and Atlas* contained MetroWest and Massachusetts birth data through 2002 and the 2006 *MetroWest Birth Report* contained birth data through 2004. This 2011 report, which examines 2005-2009 data from the Massachusetts Registry of Vital Records and Statistics, updates the 2006 report and explores in depth:

- the age distribution of women by race, ethnicity, and origin, in order to better understand disparities in birth rates
- the social and health context of birth—including marital status and paternity acknowledgment—and the adequacy, types, and sites of prenatal care afforded to women in MetroWest
- teen births and their context
- birth outcomes, including maternal and infant mortality, pre-term birth, and low birthweight, and differences in birth method (i.e., vaginal or caesarian section)

### Summary of Findings

- Key positives are that for most of the indicators examined, MetroWest fares better than Massachusetts.
- Key opportunities for improvement for MetroWest are rates of teen birth; disparities in teen prenatal care; high rates of Hispanic teen birth, especially of second births before age 20; and low rates of marriage and paternity acknowledgment, especially for Black and Hispanic young mothers, and most specifically for Black teens.

### Recommendations

Each of the major findings of this study can be translated into potential interventions.

- Public schools, community groups, and health care providers could be involved in addressing many of the problems involved in teen pregnancy and birth. Avoidance of second births before age 20 is particularly vital.
- Health care providers could be involved in responding to issues of inadequate care and the apparent lack of, or lower use of, midwifery services that in other parts of Massachusetts serve young Black and Hispanic women who are at risk for inadequate prenatal services.
- Methods could be developed to obtain better town-specific counts of Brazilian teens, especially in Framingham, Marlborough, and Milford. These counts would be valuable in assessing teen birth rates for this group.

## **Summary of Findings from the 2006 MetroWest Birth Report**

Birth-related findings from the *2006 MetroWest Birth Report* and the *MetroWest Databook and Atlas* include the following:

- The teen birth rate for MetroWest in 1998-2004 was lower than for Massachusetts as a whole.
- Both Massachusetts and MetroWest teen birth rates declined between 1989 and 2004.
- In both Massachusetts and MetroWest, in 1998-2004, Hispanic teen birth rates were significantly higher than Black teen birth rates, which in turn were significantly higher than White teen birth rates. White teen birth rates were significantly higher than Asian teen birth rates for MetroWest and slightly but significantly lower in Massachusetts as a whole.
- In Massachusetts and MetroWest in 1998-2004, Hispanic and Black mothers had a lower percentage with “adequate” or “adequate intensive” prenatal care than did White or Asian mothers.

This *2011 MetroWest Birth Report* replicates the above findings with more recent data and extends the analysis of births in MetroWest to include time trends since the *2006 MetroWest Birth Report*.

### **Note on Race and Ethnicity Identification**

To improve readability, the term Black means Black, not Hispanic ; Asian means Asian, not Hispanic; and White means White, not Hispanic, as these terms are defined by Federal OMB regulations, the U.S. Census, and the Massachusetts Department of Public Health.<sup>1</sup>

### **MetroWest Towns and Regions**

MetroWest comprises 25 cities and towns, centered in the Framingham/Natick area. For analytic purposes, three sub-areas have been created: Eastern, NorthWest, and SouthWest. In addition, statistical analysis has revealed two kinds of communities that we have labeled as “more commercial and more residential.” The MetroWest communities are listed in Table 1.

**Table 1: MetroWest Towns, Regions, and Kinds of Communities**

City or Town	Sub-Region	Kind of Community
Dover	Eastern	More Residential
Medfield	Eastern	More Residential
Millis	Eastern	More Residential
Natick	Eastern	More Commercial
Needham	Eastern	More Residential
Norfolk	Eastern	More Residential
Sherborn	Eastern	More Residential
Sudbury	Eastern	More Residential
Wayland	Eastern	More Residential
Wellesley	Eastern	More Residential
Framingham	NorthWest	More Commercial
Hudson	NorthWest	More Commercial
Marlborough	NorthWest	More Commercial
Northborough	NorthWest	More Residential
Southborough	NorthWest	More Residential
Westborough	NorthWest	More Commercial
Ashland	SouthWest	More Commercial
Bellingham	SouthWest	More Residential
Franklin	SouthWest	More Residential
Holliston	SouthWest	More Residential
Hopedale	SouthWest	More Residential
Hopkinton	SouthWest	More Residential
Medway	SouthWest	More Residential
Mendon	SouthWest	More Residential
Milford	SouthWest	More Commercial

Source: *MetroWest Health Data Book and Atlas*, 2005

Details on the methods used in creating the “kind of community” typology are available in the 2002 *MetroWest Health Data Book*.

## **Demographic Profiles of Women and Birth Mothers in MetroWest**

**Race- and Ethnicity-Specific Birth Rates** Race- and ethnicity-specific crude birth rates vary considerably within the MetroWest region, as shown in Table 2. The major comparisons between Massachusetts and MetroWest are pictured in Figure 1.

### *Eastern Region*

The crude birth rate for White women (44.9 per 1,000) is significantly higher than for Black women (31.1 per 1,000), and lower than for Asian women (51.1 per 1,000). Asian women therefore have a significantly higher rate than Black women. No other differences are statistically significant.

#### *SouthWest Region*

The crude rate for Asian women (87.8 per 1,000) is significantly higher than for White (49.2 per 1,000) and Black women (60.6 per 1,000). The rate for Hispanic women (63.3 per 1,000) is higher than for White women. No other differences are statistically significant.

#### *NorthWest Region*

The crude rate for Asian women (78.1 per 1,000) is significantly higher than for White (53.6 per 1,000) and Black (58.8 per 1,000) women. The rate for Hispanic women (65.7 per 1,000) is higher than for White women. No other differences are statistically significant.

#### *Residential/ Commercial Comparison*

For all race/ethnicity groups, the crude birth rates in the more commercial communities (57.4 per 1,000) are consistently higher than for the more residential communities (43.8 per 1,000).

#### *MetroWest Total*

Asian (68.7 per 1,000) and Hispanic (61.5 per 1,000) crude birth rates are higher than those for White (49.2 per 1,000) and Black women (53.1 per 1,000).

#### *Massachusetts*

Hispanic crude birth rates (65.2 per 1,000) are significantly higher than those for Asians (56.5 per 1,000) and Blacks (57.4 per 1,000), who in turn have significantly higher crude rates than those of Whites (43.1 per 1,000).

#### *MetroWest/Massachusetts Comparison*

Crude birth rates for White women and Asian women are significantly higher in MetroWest, and crude rates for Black women are significantly lower when compared to Massachusetts crude rates. Rates for Hispanic women are slightly but significantly higher in Massachusetts than in MetroWest.

**Table 2: Crude Birth Percents and Rates by Race/Ethnicity and Region, 2005-2009**

Region	Race/Ethnicity	Births 2005-2009	Percent of All Births	Rate per 1,000 women 15-49	Margin of Error
Eastern Towns	White	6,926	85.5	44.9	1.0
	Black	91	1.1	31.1	6.3
	Hispanic	227	2.8	42.7	5.4
	Asian/Pacific Islander	784	9.7	51.1	3.5
	All Other	75	0.3	NA	NA
	Total	8,103	14.3	44.9	1.0
SouthWest Towns	White	7,609	86.2	49.2	1.1
	Black	148	1.7	60.6	9.5
	Hispanic	385	4.4	63.3	6.1
	Asian/Pacific Islander	553	6.3	87.8	7.0
	All Other	134	0.5	NA	NA
	Total	8,829	14.3	51.1	1.0
NorthWest Towns	White	8,063	71.2	53.6	1.1
	Black	474	4.2	58.8	5.1
	Hispanic	1,361	12.0	65.7	3.4
	Asian/Pacific Islander	1,224	10.8	78.1	4.2
	All Other	206	0.6	NA	NA
	Total	11,328	14.3	54.6	1.0
Commercial Towns	White	11,452	73.1	56.0	1.0
	Black	570	3.6	58.9	4.7
	Hispanic	1,662	10.6	66.7	3.1
	Asian/Pacific Islander	1,685	10.8	87.7	4.0
	All Other	295	0.6	NA	NA
	Total	15,664	14.3	57.4	0.9
Residential Towns	White	11,146	88.5	43.7	0.8
	Black	143	1.1	38.1	6.1
	Hispanic	311	2.5	43.3	4.7
	Asian/Pacific Islander	876	7.0	48.5	3.1
	All Other	120	0.3	NA	NA
	Total	12,596	14.3	43.8	0.7
MetroWest Towns	White	22,598	80.0	49.2	0.6
	Black	713	2.5	53.1	3.8
	Hispanic	1,973	7.0	61.5	2.6
	Asian/Pacific Islander	2,561	9.1	68.7	2.6
	All Other	415	0.5	NA	NA
	Total	28,260	14.3	50.4	0.6
Massachusetts	White	260,583	67.8	43.1	0.2
	Black	32,588	8.5	57.4	0.6
	Hispanic	53,499	13.9	65.2	0.5
	Asian/Pacific Islander	28,375	7.4	56.5	0.6
	All Other	9,318	0.8	NA	NA
	Total	384,363	14.3	47.2	0.1

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Figure 1: MetroWest and Massachusetts Birth Rates, per 1,000 Women age 15-49, by Race/Ethnicity, 2005-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

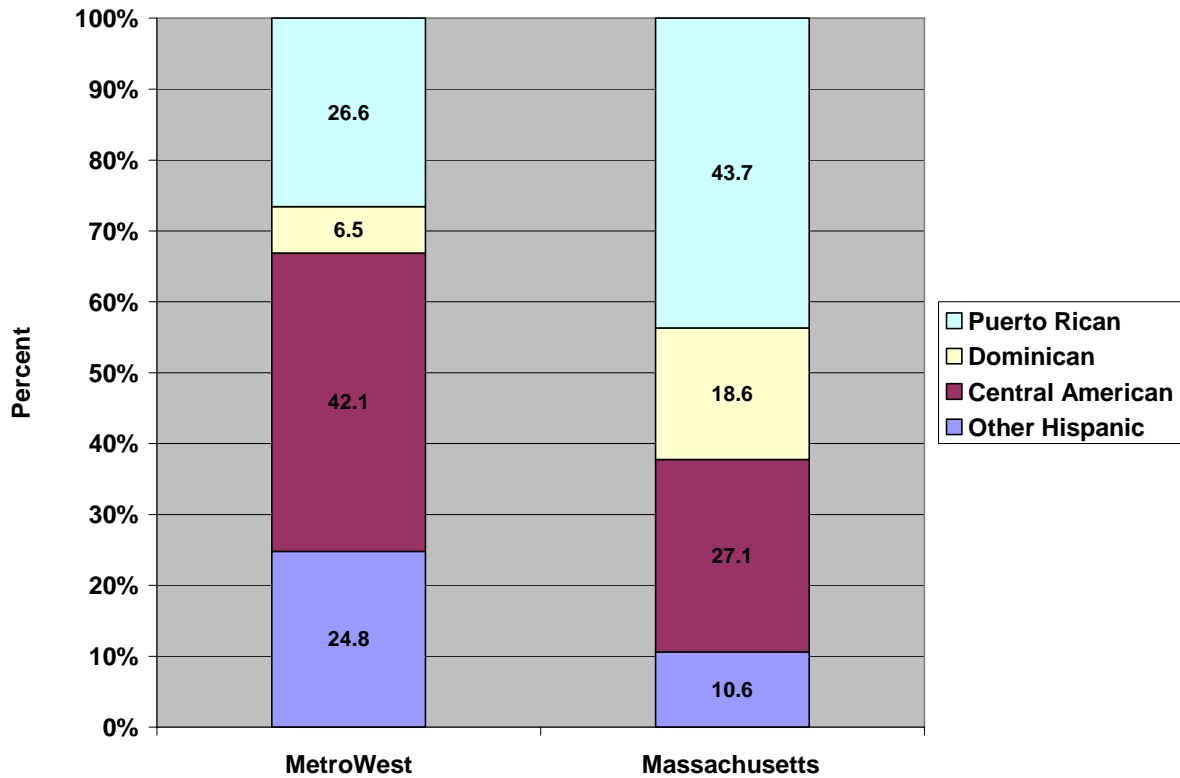
**Data Note:** The denominators used here are estimated from the U.S. Census 2000 and 2010 populations so as to create populations for 2005, 2006, 2007, 2008 and 2009, and a midpoint population estimate.

Further detail is available on the specific backgrounds of birth mothers in MetroWest, as compared with Massachusetts. For example, among Black women, a smaller percentage of mothers in MetroWest identify as Haitian (8.8%) than for Massachusetts as a whole (17.5%). Among Hispanic women in MetroWest fewer identify as Puerto Rican (26.6%) than in Massachusetts (43.7%), and conversely, more identify as “Other South American (21.3% versus 8.4%). Among Asians, more mothers in MetroWest identify as Chinese (28.3% versus 26.2%) or Asian Indian (17.8% versus 15.1%), and fewer as Vietnamese (3.1% versus 13.0%) and slightly fewer as Korean (5.5% versus 6.8%). Among those who identify as “Other, Non-Hispanic,” more identify as Brazilian in MetroWest (45.9%) than in Massachusetts (21.9%). Further detail on specific backgrounds is available in Appendix A, and a summary table of birth statistics is reported in Appendix B.

## Births to Hispanic Mothers

The Birth Registry reports several subgroups of Hispanic-ethnicity mothers, including Puerto Rican, Dominican, Central American, and other Hispanic groups.

**Figure 2: Origin of Hispanic Ethnicity Mothers, 2005-2009**



Source: Mass-CHIP v3.00 r326, Massachusetts Department of Public Health

The ethnicity of the Hispanic mothers giving birth in MetroWest differs from the state as a whole. Puerto Rican and Dominican mothers combined make up almost two-thirds of the Hispanic births in the state; however, in MetroWest, these populations comprise slightly more than one-third of Hispanic births. Almost half (42.1%) of births to Hispanic mothers in MetroWest were to mothers in the Central American (Mexican, Salvadoran, Guatemalan, Honduran, Other Central American) Hispanic category.

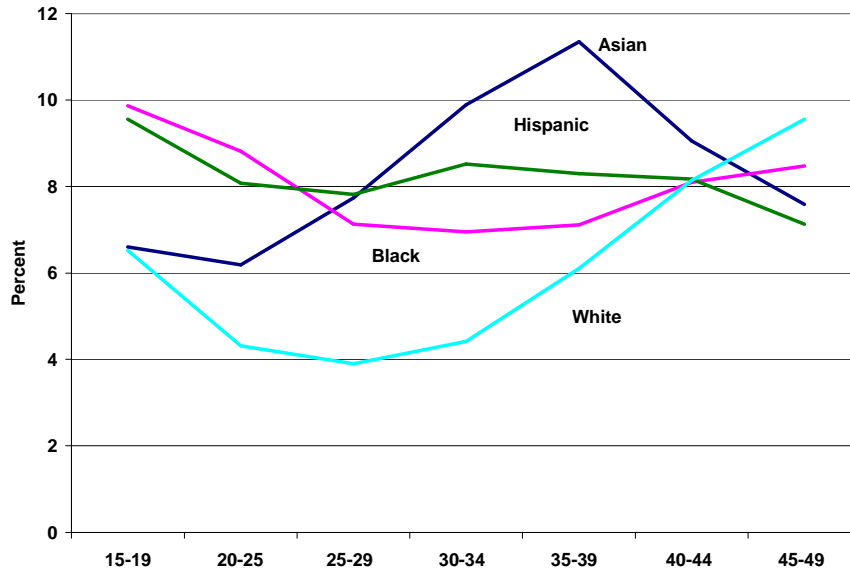
## Female Age Distributions in MetroWest

The interpretation of race and ethnicity differences in birth counts and rates must take into account the differing age distributions of women who are of child-bearing age. For example, Hispanic birth *counts* in the younger age ranges are large relative to those in older age ranges, in contrast to the White population. But this statistic could occur for two different reasons:

(1) Hispanic women tend to give birth at a younger age than White women, or (2) more Hispanic

women are “at risk” for giving birth because Hispanic females have a younger age distribution than White women. Either or both of these factors could be implicated in the birth-count patterns.

**Figure 3: Female Age Distribution, Ages 15-49, MetroWest, 2010**



Source: U.S. Census, 2010.

Data Note: The percentages reported in Figure 3 are calculated on the denominator of all women, regardless of age.

Figure 3 illustrates the large differences in age distributions for MetroWest Hispanic, White, Black, and Asian females of reproductive age. White women are much older than Black; Asian; and Hispanic women. These differences in age distribution require the calculation and presentation of age-specific birth rates, rather than crude rates that might overstate the underlying birth rates with populations with a younger age distribution.

So that the differences in age distribution can be “discounted” in the analysis of birth patterns, we use age-specific birth rates for each group. We have calculated MetroWest and Massachusetts rates for age groups 15-17, 18-19, 20-25, 25-29, 30-34, 35-39, 40-44, and 45-49, based on the Census 2000 and 2010 Census figures and from these figures estimated populations for the mid-point of 2005-2009 time period. These are standard age categories used by the Massachusetts Vital Records and Statistics Registry and the Federal government for reporting birth rates. A very small number of births (6) to MetroWest teens under fifteen occurred in 2005-2009.

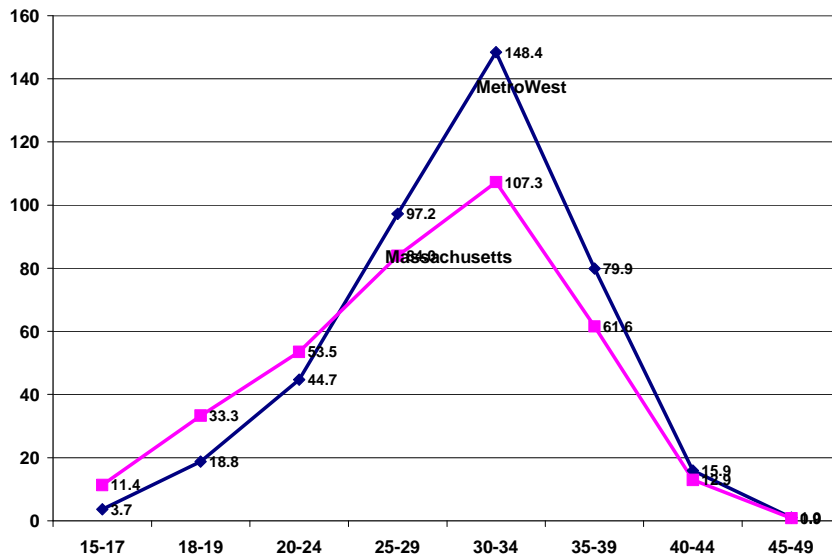
### Age-Specific Birth Rates

MetroWest birth rates, overall, are slightly higher than for Massachusetts as a whole, as illustrated in Figure 4. The annualized 2005-2009 rate per 1,000 women is 50.4 for MetroWest and 47.2 for Massachusetts. The comparable 2000-2004 rates per 1,000 women were 54.8 for MetroWest and 48.4 for Massachusetts. These rates represent a slight decline for Massachusetts and a more substantial decline for MetroWest. The overall rates obscure a dramatic difference in the age

distribution of the mothers. For ages 15-24, MetroWest rates are lower than for Massachusetts as a whole, while for ages 25-49, MetroWest rates are higher. This pattern may reflect a postponement of child-bearing for women of higher education and income levels—characteristics of a larger number of women who reside in MetroWest—in comparison with Massachusetts.

**Data Note:** The age distributions for the female populations of MetroWest and Massachusetts are estimated via a straight line trend from the 2000 and 2010 U.S. Census reports. Thus, the age specific rates calculated here will be slightly different from those calculated in Mass-CHIP, since these latter calculations are without the benefit of the 2010 Census data. The 2000-2004 figures reported here are therefore also slightly different from those published in the 2006 *MetroWest Birth Report*.

**Figure 4: Age-Specific Birth Rates, MetroWest and Massachusetts, 2005-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

### Birthplace of Mother

A mother’s place of birth, taken from Massachusetts birth certificates, may have implications for the interpretation of birth data including—in a later section—the adequacy of prenatal care.

**Table 3: Percentage of Births 2005-2009 by Race/Ethnicity and Birthplace of Mother**

Race/Ethnicity	Birthplace of Mother	Age Range			
		15-19	20-24	25-34	35 and up
White	50 States	79.9	63.4	81.3	86.6
	PR	NA	NA	0.1	NA
	Other	19.7	36.5	18.6	13.4
Black	50 States	81.6	45.8	30.3	32.4
	PR	0.0	NA	NA	0.0
	Other	18.4	53.7	69.2	67.6
Hispanic	50 States	42.3	27.0	21.5	23.6
	PR	13.5	13.4	10.9	8.0
	Other	44.2	59.5	67.6	68.4
Asian	50 States	NA	11.8	11.1	14.5
	PR	0.0	NA	0.0	NA
	Other	NA	88.2	88.9	85.3

NA indicates data not available due to suppression of small counts; NH indicates non-Hispanic; PR indicates Puerto Rico.

**Data Notes:** (1) Table 3 captures only a part of the Brazilian population, since many Brazilians identify as “other race, non-Hispanic.” Other Brazilians identify as “White” and are in Table 3. (2) Some groups may not total 100% due to unknown birthplace being deleted from Table 3, or due to data suppression.

The data in Table 3 illustrate that the population of Asian mothers in MetroWest is by far the most likely to have been born outside of the continental U.S. The influence of changes in the immigration laws, particularly those targeted to refugees and those with special occupational skills, must be considered in examining the race and ethnicity background and economic status of immigrants, especially in the suburban areas.<sup>2</sup>

Black mothers in the older age ranges tend to be born outside the United States whereas younger mothers are likely to have been born in the continental U.S. White mothers in the 20-24 age range are more likely to be born *outside* the U.S. than are White mothers in all other age ranges. This situation may represent recent immigration trends, e.g., an influx of young Brazilian or Russian women in their late teens or early twenties.

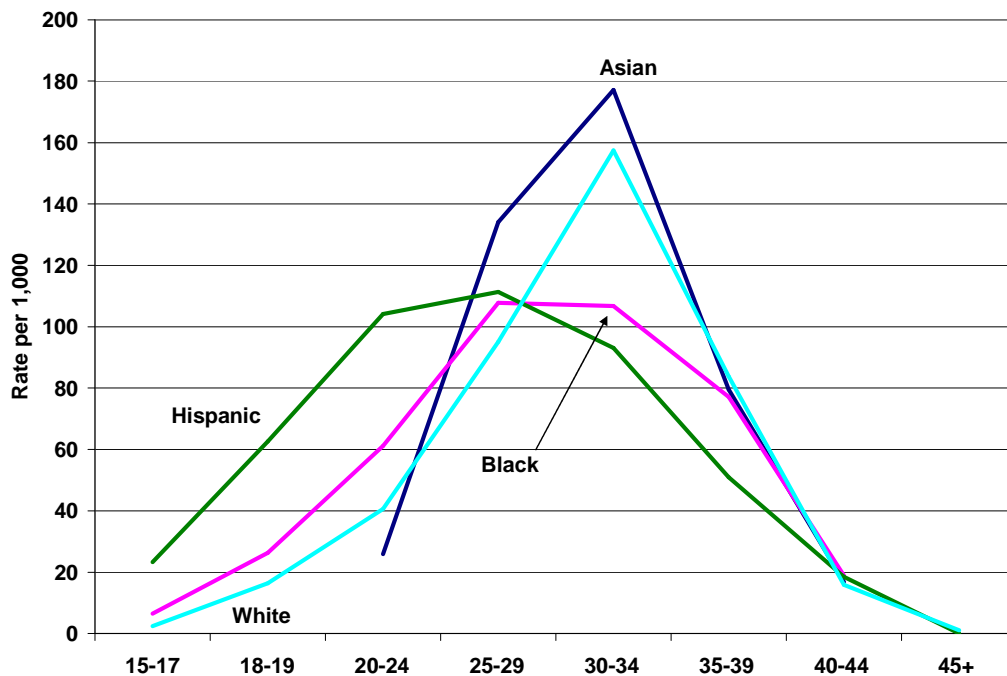
Hispanic mothers in the older age ranges are less likely (27.0%, 21.5% and 23.6%, respectively) to have been born within the continental U.S., in contrast to Hispanic teen mothers, who are more likely (42.3%) to have been born within the continental U.S.

### Age-Specific Birth Rates by Race and Ethnicity

There are highly significant differences in age distribution that contribute to the crude rate patterns in Table 2 principally, MetroWest Asian and Hispanic women of child-bearing age are considerably younger than White women of child-bearing age, as we saw in Figure 3.

Figure 5 clarifies the differences in birth rates by race and ethnicity group. The White, Black, and Asian groups have relatively low birth rates until age 25-29. Black motherhood plateaus in the age range 25-34. Asian and White women peak in the age group 30-34. Hispanic women show a very different pattern, with the highest group birth rates for age ranges 15-17, 18-19 and 20-24. The Hispanic rates peak at 25-29 and then decline. These differences in age distribution have implications for programming around pregnancy and birth. One could argue that the Black, Asian, and White rates in MetroWest show a *postponement of birth*, possibly for educational or economic reasons, or alternatively, that the Hispanic rates show *early birth*, perhaps due to other cultural or life circumstances. This phenomenon is of special concern in the youngest age groups, 15-17 and 18-19: many of these young women have not attained an educational level that could help them become economically self-sufficient.

**Figure 5: MetroWest Birth Rates, by Age and Race/Ethnicity**



**Data Note:** Asian birth counts for ages 18-19 and 45-49 are extremely small and are suppressed by the Massachusetts Department of Public Health. Asian births for the age group 15-17 are zero. Black births in the age group 45-49 are very small and are suppressed.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

### Births to Brazilian Mothers

While population data is inadequate to determine true birth rates for Brazilian women, it is possible to determine counts of births to Brazilian women and the percentage of these births to teen mothers.

Table 4 indicates a substantial increase in the number of Brazilian births in MetroWest (2,784 in the period 2005-2009 versus 1,798 in 2000-2004). Of those 2,784, 5.8 percent were births to teenagers. Most Brazilian births were accounted for by two communities—Framingham and Marlborough—and a smaller number in Milford.

**Table 4: Births to Brazilian and “Other Portuguese” Mothers in 2000-2004 and 2005-2009**

Region	Births to All Ages, 2000-2004	Births to All Ages, 2005-2009	Births to Teens 15-19, 2000-2004	Births to Teens 15-19, 2005-2009
MetroWest	1,798	2,784	101	97
Massachusetts	7,729	11,913	467	424
Framingham	884	1,293	54	54
Marlborough	371	599	20	18
Milford	168	382	13	14

Note: “Other Portuguese” refers to other elements of the Portuguese diaspora, very small in number, not to mothers from Portugal. Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

## Teen Births

### Social consequences of teen birth

The discussion in the 2005 *MetroWest Health Data Book and Atlas* of the problems associated with teen birth is unchanged.

Teenage childbearing is a serious problem that affects the outcomes of the children and the mothers. Infants of adolescent mothers are more likely to face adverse health outcomes, including low birthweight, pre-term birth, and infant mortality. In addition to the effects on health, teenage childbearing has profound social and economic consequences.

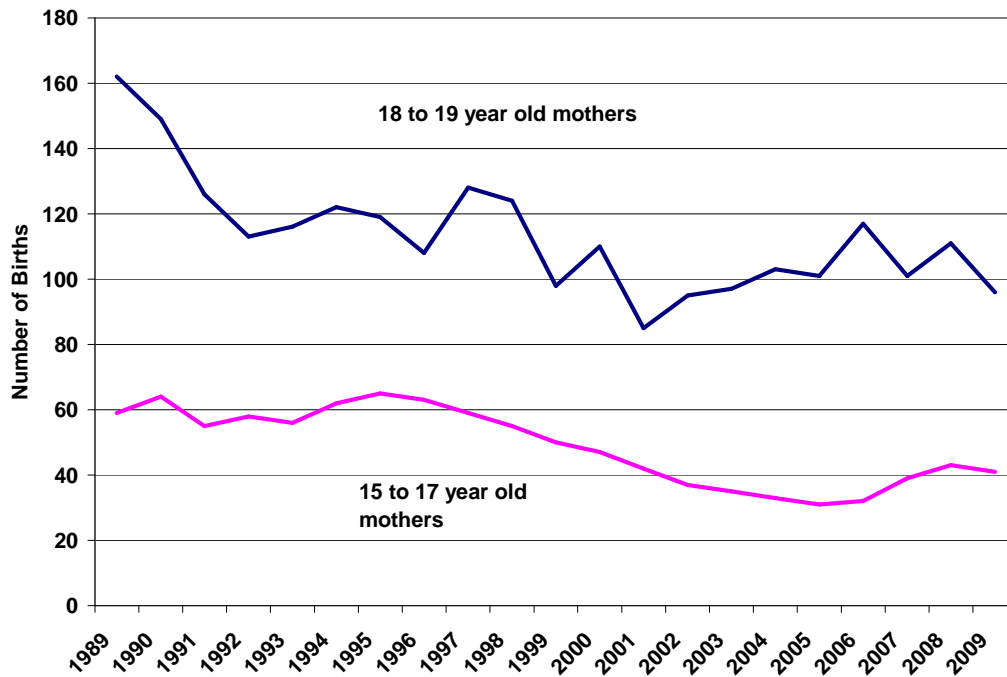
These effects are especially serious for women under age 18 who give birth, because most of them are unmarried and have not completed high school. Eight to 12 years after birth, a child born to an unmarried teenage high-school dropout is 10 times more likely to be living in poverty than a child born to a mother with none of these three characteristics. Children born to single mothers are also much more likely to drop out of high school, have a child in their teens, and be neither employed nor in school in their late teens.

Teenage childbearing is associated with a number of other health risk behaviors, such as drinking and drug use.<sup>3</sup>

## Trends and Comparisons

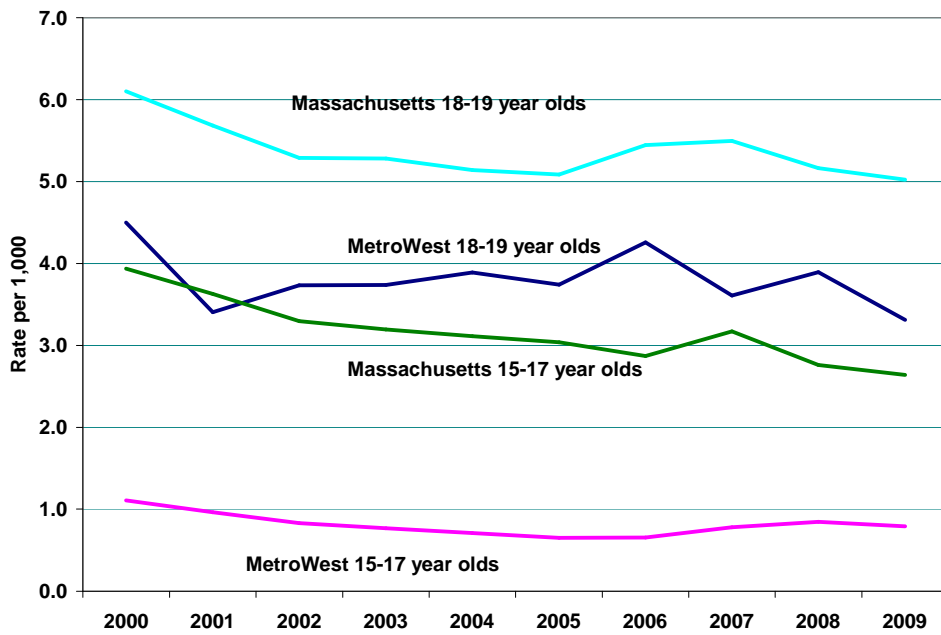
Teen (age 15-19) birth rates have declined significantly since 1990 at the national, state, and local levels. MetroWest teen birth counts show some variation from year to year, with a slight up-turn in recent years despite a longer downward trend. This finding is duplicated in the birth-rate data as shown in Figure 7. Overall, there were 712 births to MetroWest resident teens (15-19) in the period 2005-2009, for an average annual count of 142. In contrast, for 2000-2004 there were 684 teen births for an average annual count of 137. Most of the increase is due to Hispanic teen births. These increased from 157 to 208, from the earlier to the later time period, while White births decreased from 476 to 453 in the same time period. Thus, the slight upward trend is not due to changes in fertility but is due to the changes in the relative numbers of White and Hispanic teens “at risk” in the MetroWest population and due to Hispanic teens having a higher fertility rate.

**Figure 6: Number of Teen Births 15-17, 18-19, MetroWest 1989-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Figure 7: Teen (15-19) Birth Rates, Massachusetts and MetroWest, 2000-2009**

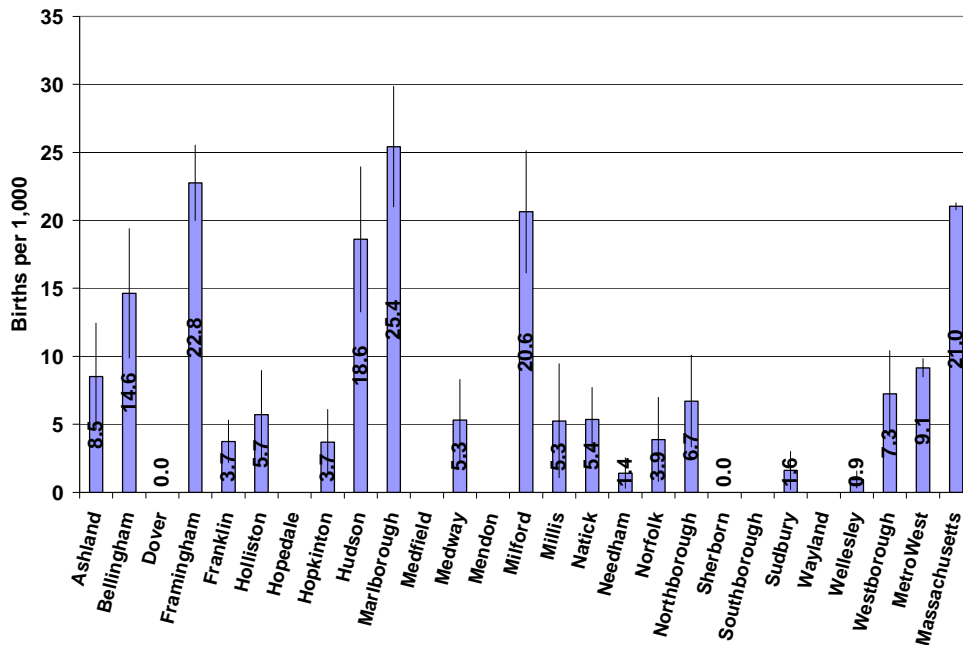


Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

The teen birth rate in the MetroWest area was significantly lower than the rate for Massachusetts—a very positive finding, as the state rate is also relatively low compared to that of the nation. However, the slight rise for MetroWest 15-17 year olds contrasts with the state rate which has continued to slowly decline.

Data for individual MetroWest towns is reported in Figure 8, although the teen birth rates for several towns have been suppressed by the Vital Registry due to low counts. Marlborough, Framingham, Milford and Hudson are significantly above the MetroWest average.

Figure 8: MetroWest Teen (15-19) Births by Town, 2005-2009

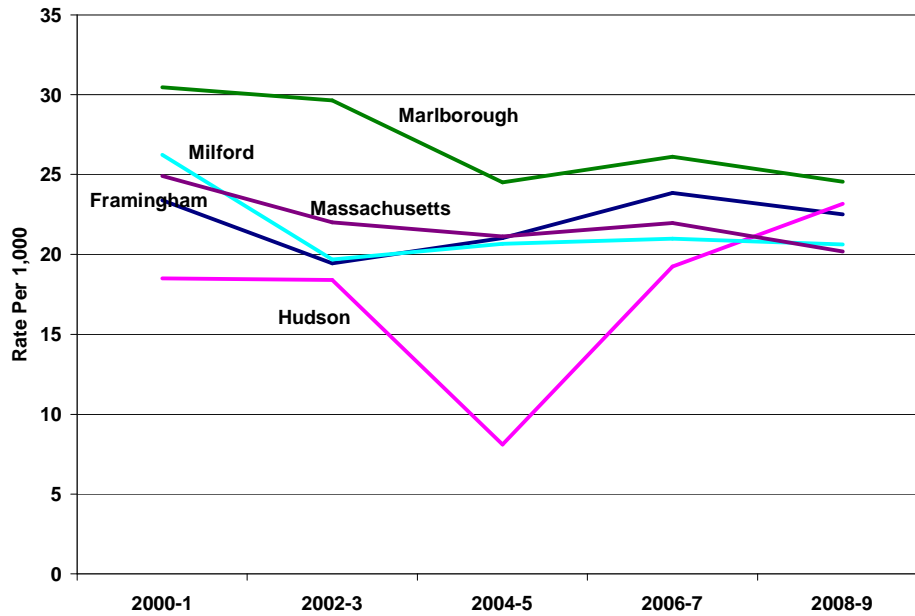


Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Data Note:** Teen birth counts for Hopedale, Medfield, Mendon, Southborough and Wayland were suppressed due to low counts. Dover and Sherborn had zero teen births in the period 2005-2009.

The four communities in MetroWest that are significantly higher than the MetroWest average—Framingham, Marlborough, Milford and Hudson—show different patterns over time, with Marlborough consistently above the Massachusetts average. The other towns show a variable pattern, clustered around the Massachusetts average, unlike other communities in MetroWest which are lower than the Massachusetts average. Of note, Massachusetts shows a slight but consistent decline over the decade.

**Figure 9: Teen (15-19) Birth Rates, Two-Year Averages, 2000-2009, Framingham, Marlborough, Milford, Hudson and Massachusetts**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Data Note:** Two-year averages are used to smooth out the excessive variation from year to year.

### Teen Birth Key Issues

Before planning interventions for teens, it is necessary to know details about race and ethnicity, parity, marriage, paternity acknowledgment, prenatal care, and other factors addressed in subsequent sections. Specifically, the following questions are pertinent:

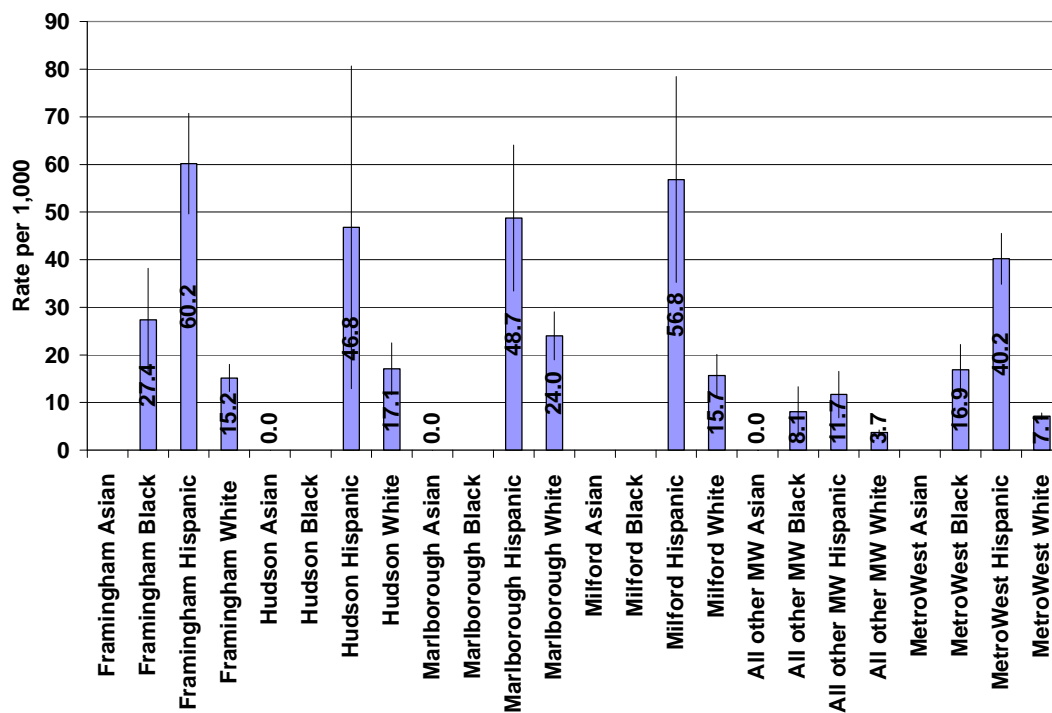
- To what extent does the label “Hispanic” represent too broad a brush that might hide important differences in birth rates for young women? For example, differing social networks and norms between Puerto Rican and non-Puerto Rican Hispanic populations might necessitate programs tailored to specific groups.
- To what extent do the birth rates for young women represent repeat births—that is, two births in rapid succession with a short interbirth interval?
- To what extent do the birth rates for young women represent unmarried births, or births for which paternity is not acknowledged, which put young women at risk for a lifetime of poverty and the potential risk of intergenerational poverty?

- To what extent does the birth process for young women take place in a context of inadequate prenatal care?
- Who are the service providers providing prenatal care for young women?

### Teen Birth in Framingham, Marlborough, Hudson and Milford

In Framingham, Marlborough, Hudson and Milford, teen birth rates are significantly above the MetroWest average. A close look at these births, as shown in Figure 10, reveals that the principal factor driving the higher overall teen rates in Framingham, Marlborough and Milford is the higher rate of births for Hispanic teens than for White teens in these communities, coupled with a significant Hispanic teen population “at risk.” The other factor driving the overall teen rates in Framingham, Hudson, Marlborough and Milford is that White rates are *also* elevated significantly in these towns. As Figure 10 indicates, the *White* rates are significantly lower in MetroWest, once Framingham, Marlborough, Hudson Milford are taken out of the data. The rates also decrease for MetroWest Hispanic births. One must conclude that something about the “context” of these communities drives higher teen birth rates, particularly Hispanic but also White teen birth rates, and that “something” might be amenable to intervention.

**Figure 10: Teen Birth Rates in Framingham, Marlborough, Hudson and Milford, by Race and Ethnicity, 2005-2009**



**Data Note:** Data for Black teens in Hudson, Marlborough and Milford and for Asian teens Framingham and Milford were suppressed due to small counts. Asian teens in Hudson and Marlborough had true zero counts.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

Programmatically, it would be helpful to understand the specific origins of the Hispanic teen mothers. Unfortunately, town- and age-specific population data for the Puerto Rican Hispanic teen population does not exist to further analyze the Puerto Rican versus non-Puerto Rican population birth *rates* in the four key communities. Percentages of births only are available. In the five-year period 2005-2009, of 117 Hispanic births in Framingham, 56 (47.9%) were to teens of Puerto Rican origin; of 25 Hispanic births in Milford, 9 (36.0%) were to teens of Puerto Rican origin; of 53 Hispanic teen births in Hudson, 18 (34.0%) were to Puerto Rican mothers, and of 37 Hispanic births in Marlborough, 7 (18.9%) were to teens of Puerto Rican origin. The source of these differences in birth counts is unknown; it could be the underlying teen population sizes, or differential birth rates.

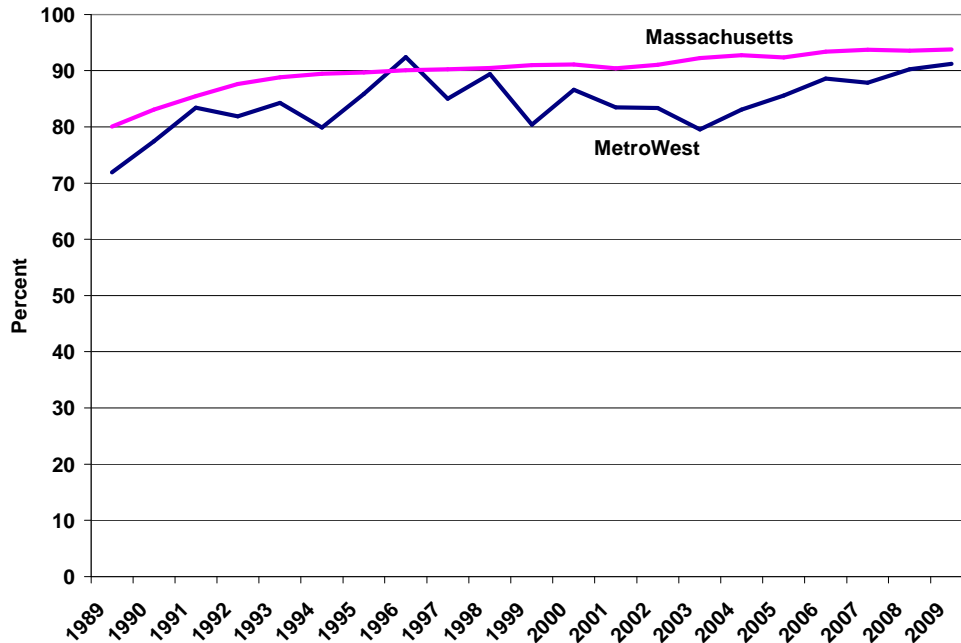
### **Teen Birth Parity**

A factor exacerbating the problem of teen birth is that of parity (number of births, e.g., parity 1 is the first birth to a mother, parity 2 is the second birth to the same mother). A significant number of teens, particularly those who are Hispanic, give birth a second time before age 20. Of births to Hispanic 18- to 19-year-olds, 20.1% are a second birth. Thus, a very significant portion of the higher birth rate for Hispanic teens is a consequence of second births, but this problem has lessened since 2000-2004 when the percentage of second or higher parity births was 31.4%. In contrast, for White teens 18- to 19-years old, 8.3% in 2005-2009 were second births as compared with 13.6% in 2000-2004. Asian and Black teen parity counts were too low in number to provide reliable estimates.

### **Teen Birth and Marriage**

Teen birth has negative consequences, particularly in the absence of marriage or other supportive partnership. The topic of birth and marriage is discussed broadly in the next section. Figure 11 illustrates that lack of marriage is an increasing problem for teen mothers in Massachusetts: unmarried teens constitute more than 90% of all teen births in each year in the past fifteen years, and is a significant problem in MetroWest at more than 80% for most years since 1991.

**Figure 11: Percentage of Teen (15-19) Births to Unmarried Mothers, 1989-2009, MetroWest and Massachusetts**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

The topic of teen marriage and birth is part of a broader discussion of the social and health care context of birth.

## The Social and Health Care Context of Birth

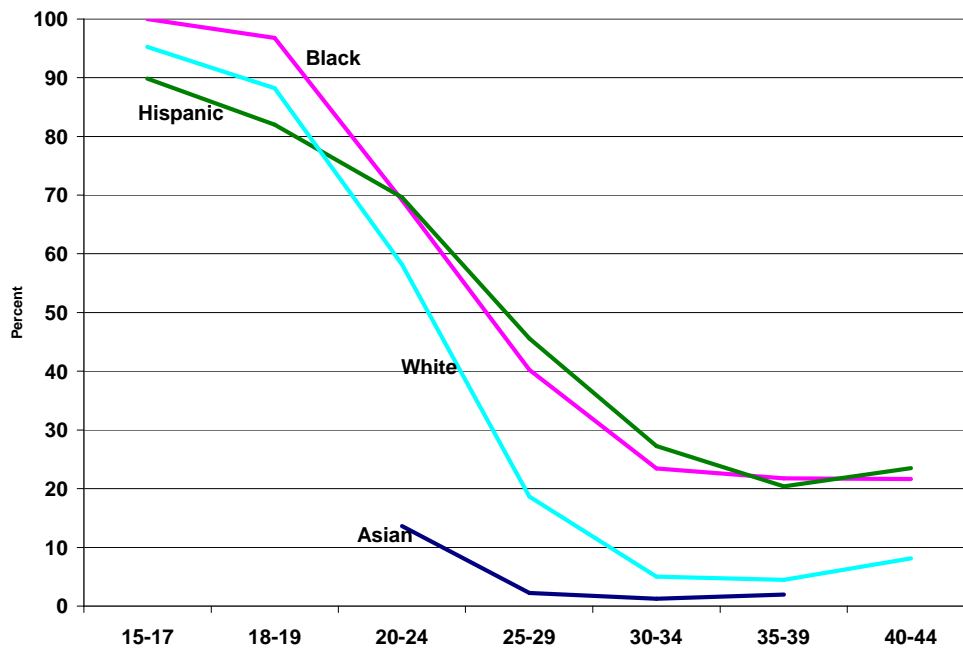
### Marriage and Birth

Birth and marriage are becoming increasingly disconnected in MetroWest and in Massachusetts. The younger cohorts of mothers are most sensitive to these changes. Examining the 15-29 year old mothers shows that for MetroWest mothers, 27.5% were unmarried in 2000-2004, and that figure increased to 36.6% in 2005-2009, a large change in a small period of time. In Massachusetts as a whole, a similar change has taken place, at a higher level: the comparable rates are 47.7% in 2000-2004 and 54.4% in 2005-2009.

Research has indicated that pregnancy and birth in the teen years, without a high school diploma and without marriage, vastly increases the probability of a lifetime of poverty—sometimes reaching into successive generations. On the whole, the percentage of births to unmarried teens has been lower in MetroWest than in Massachusetts, though both rates are still above 80%. Therefore, it is of critical interest to determine the patterns of marriage associated with childbirth. The data indicate that the “broad brush” approach to race and ethnicity differences does not tell the whole story. For each

race and ethnicity group, the percentage of unmarried mothers plummets with age, yet race and ethnicity differences remain at each age level. The rate of unmarried Asian mothers drops to 10% and under after age 25. The rate of unmarried White mothers drops to a similar point, but only after age 30. By age 30, the rate of unmarried Black and Hispanic mothers drops to approximately 30%, and then remains relatively constant between 20% and 30% through the 40-44 year old cohort. Thus, the key groups to be concerned about are Black and Hispanic teens, but especially Hispanic teens, due to the high level of unmarried Hispanic teens giving birth, and the relatively high level of Hispanic teens that are giving birth for the second time (see section on parity). Thus, further study about the dynamics of pregnancy and birth and possible interventions for Hispanic teens, particularly among those who have already given birth once, would be indicated.

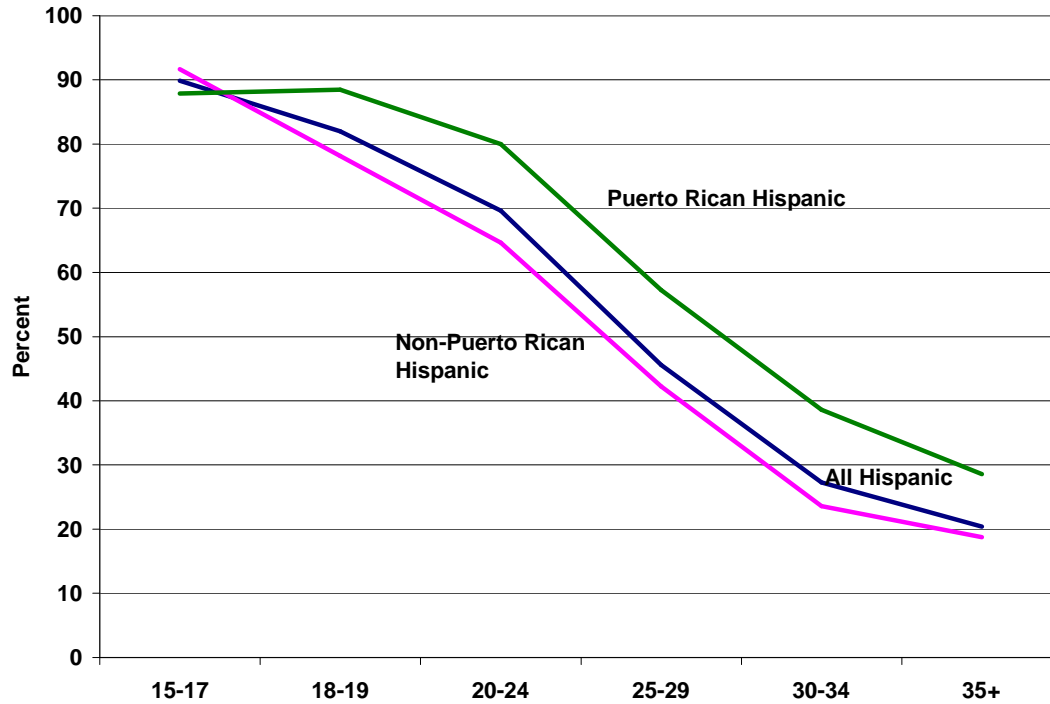
**Figure 12: Percent of Births to Unmarried Mothers, by Age and Race/Ethnicity, MetroWest 2005-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Data Notes:** The pattern in Figure 12 could reflect generational differences, or different patterns of unmarried and married women migrating to or from MetroWest, or some combination of both factors. Current data do not permit analysis to separate out these factors. Rates for Asian women younger than 20 and 45 and over, are suppressed in the data reports, due to small counts.

**Figure 13: MetroWest Puerto Rican and non-Puerto Rican Percent of Births to Unmarried Mothers, 2005-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

Figure 13 shows that the “broad brush” approach to analysis does not work well for Hispanic births, since there are significant differences between unmarried Puerto Rican mothers and unmarried non-Puerto Rican Hispanic mothers. Overall, in MetroWest, 61.3% of births to Puerto Rican Hispanic mothers are to unmarried women, while only 42.2% of births to non-Puerto Rican Hispanic mothers are to unmarried women. The comparable Massachusetts figures are 76.4% for Puerto Rican mothers and 57.7% for non-Puerto Rican Hispanic mothers. At each age level, a larger percentage of births to Puerto Rican mothers are to unmarried women than is true for non-Puerto Rican Hispanic mothers. These differences are minimal in the oldest group available for age-specific comparison, 35- to 39-year-olds. Finally, a significant time trend has occurred since the 2000-2004 baby cohort. Among Hispanic mothers, the percentage unmarried has risen from 36.3% to 47.3% in just five years! This increase has appeared in both Puerto Rican mothers (50.8% to 61.3%) and non Puerto Rican Hispanic mothers (30.5% to 42.2%). Overall, the proportion of Puerto Rican mothers has fallen: in 2000-2004, 40.1% of Hispanic mothers in MetroWest were Puerto Rican, in 2005-2009, this percentage had fallen to 34.4%.

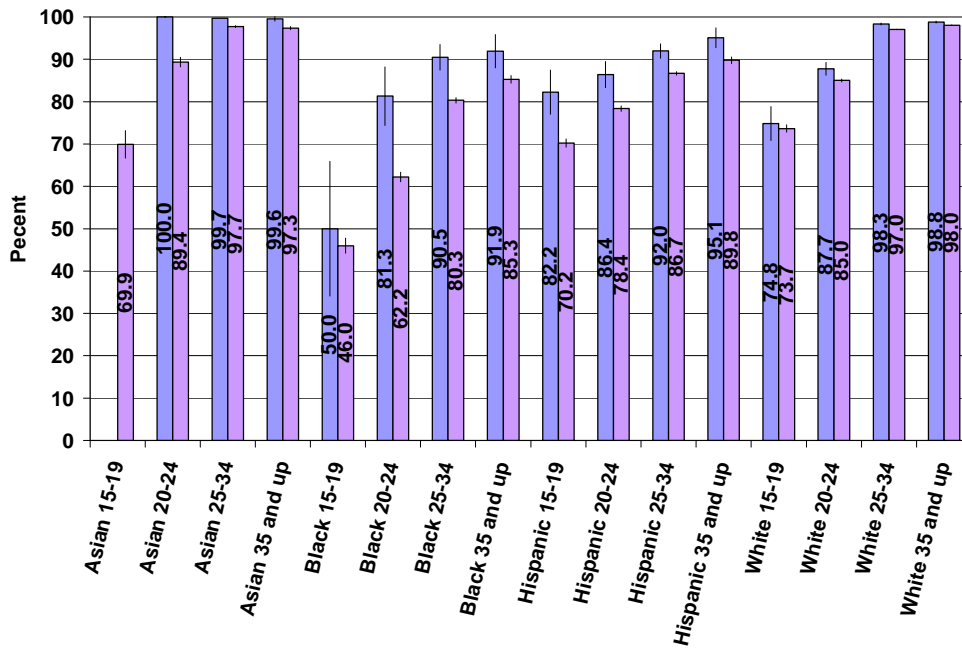
### **Paternity Acknowledgment**

Related to marriage is the problem of paternity acknowledgment. Recognizing that it often takes more than one adult to “raise” a child, paternity acknowledgment is an important aspect of fertility. Without such acknowledgment, a family’s financial resources may be strained, and a lifetime of

poverty more likely. In addition, paternity acknowledgment may be of psychological importance for child development.<sup>4</sup>

Significant disparities in paternity acknowledgment by age and race are presented in Figure 14.

**Figure 14: Percent of Births With Paternity Acknowledgment, by Age, Race, and Ethnicity, 2005-2009**



**Data Note:** The first bar in each pair is MetroWest; the second bar is Massachusetts. MetroWest Asian teens had too few births to provide an estimate and to avoid a violation of privacy rights, and the data for this group was suppressed by the Massachusetts Department of Public Health

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

Paternity acknowledgment may be a “leading indicator” of relationship stability, since increases in paternity acknowledgment come earlier in age than marriage. The results for paternity acknowledgment show several distinct patterns: First, there is increasing acknowledgment up to the age range 25-34. Second, the paternity acknowledgment rate is slightly higher in MetroWest than it is in Massachusetts as a whole. Third, there are systematic race and ethnicity differences: Asian women are most likely to list paternity, followed by White, Hispanic, and Black women. It is of special concern that Black teen paternity acknowledgment is so low (about 50%), for both Massachusetts and MetroWest. This low rate suggests both problems in family formation for the future of these teens and the possibility of their having been sexually victimized, as has been indicated by Joycelyn Elders, former Surgeon General of the United States.<sup>5</sup> The overall rate of paternity acknowledgment is 96.6% in MetroWest and 91.1% in Massachusetts. This compares with 97.6% and 92.6%, in 2000-2004, and represents a very small but statistically significant drop in paternity acknowledgement.

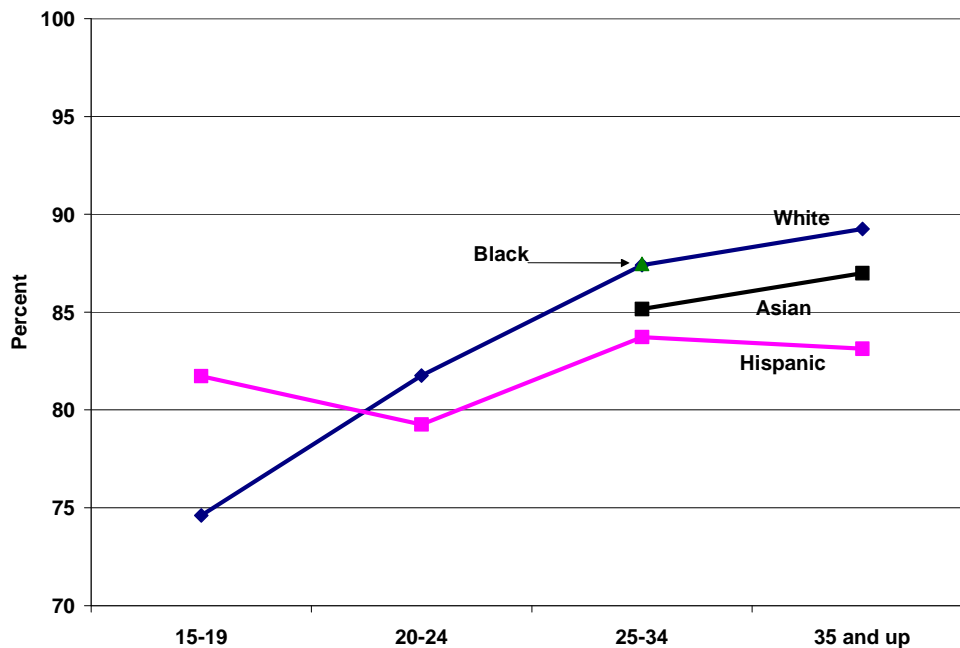
## Smoking During Pregnancy

Smoking during pregnancy has many negative effects necessitating specific warnings for pregnant women on cigarette packs. Smoking during pregnancy is relatively rare for MetroWest mothers (3.0%), while for Massachusetts mothers the rate is 7.2%. These rates both show a small but significant drop from 2000-2004, where the rates were 3.9% and 8.4%, respectively.

## Prenatal Care Adequacy

A key indicator, with implications for intervention, is that of prenatal care. The “Kotelchuk Index” was developed to measure the adequacy of prenatal care, and is described in more detail in the 2005 *MetroWest Data Book and Atlas*. The two highest levels of care are called “adequate” and “adequate intensive” (in some reports called “adequate plus”). The percentage of mothers in MetroWest with at least adequate prenatal care has been consistently higher than the percentage in the state as a whole. In 2005-2009, 86.6% of MetroWest mothers received at least adequate care, compared to 81.8% statewide. These percentages represent a small but significant drop from the 2000-2004 figures which were, respectively, 90.2% and 83.4%. These figures also vary by ethnicity, however, as can be seen in Figure 15, which also shows the change in adequacy of prenatal care with age.

**Figure 15: Percentage of Women with Adequate or “Adequate Intensive” Prenatal Care, by Race/Ethnicity, 2005-2009**



Note: All data points based on fewer than 200 births during the five year period are excluded from the chart due to unreliable rate estimation.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

For age groups 25 and up, White mothers had significantly more adequate or adequate plus care than Hispanic mothers. No other race and ethnicity comparisons were statistically significant. For White mothers, there is a highly significant age trend. Older mothers were much more likely to have adequate or adequate plus prenatal care than younger mothers.

Note that the possible inadequacy of prenatal care among residents of MetroWest does not imply inadequacy of care for women giving birth *in* MetroWest birthing hospitals. The interpretation of such differences is somewhat problematic, since the calculation of the rates takes into account when prenatal care was started, and the degree to which it is sustained. Thus, newcomers to the MetroWest area may have received less than adequate care from outside the area, or even outside the country. Data on the initiation of prenatal care is presented in the next section.

### **Prenatal Care in the First Trimester**

The Kotelchuk Index includes as one of its components the extent to which prenatal care was initiated in the first trimester of pregnancy. Such care was provided in 88.6% of cases in MetroWest as compared with 81.2% in Massachusetts, for the 2005-2009 period. These percentages also represent a slight drop from the 2000-2004 figures of 90.9% and 83.1%, respectively.

### **Prenatal Care Providers**

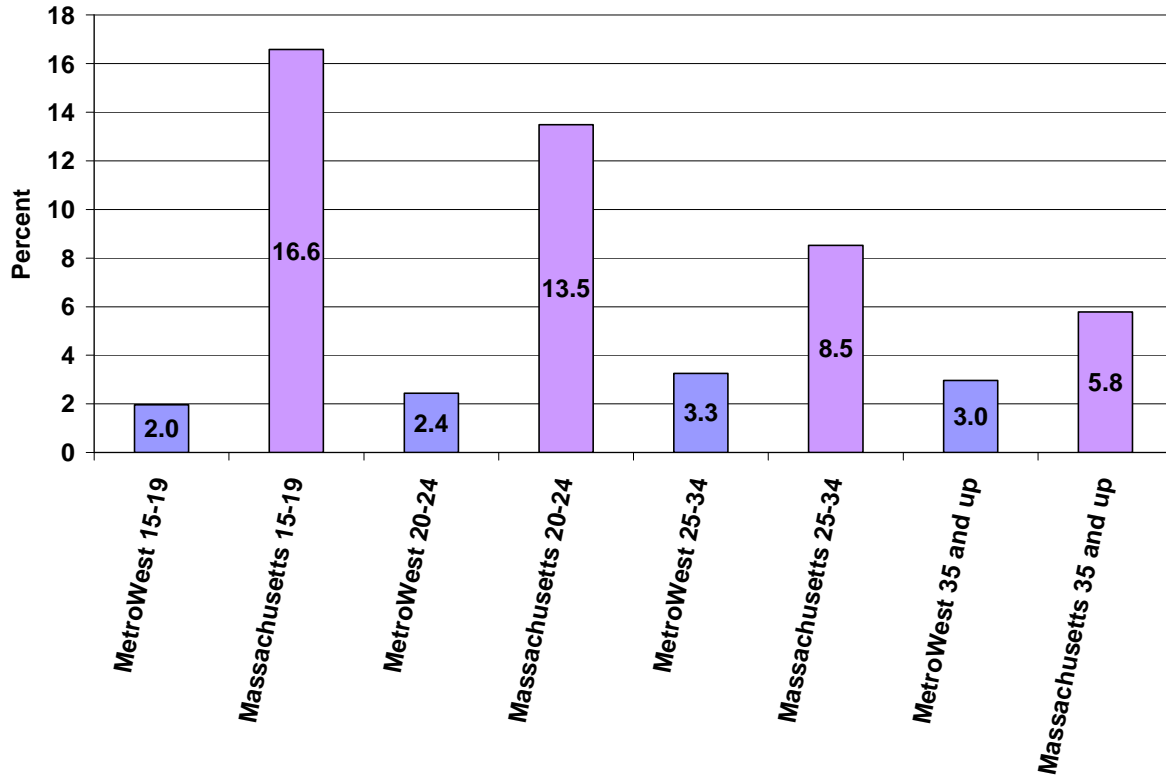
The Vital Statistics Registry reports data on the providers of prenatal care. Results in Table 5 indicate insignificantly small race/ethnicity differences in the percentages receiving care from an MD/DO.

**Table 5: Percent Receiving Prenatal Care from an MD/DO, 2005-2009**

<b>Race/Ethnicity</b>	<b>15-19</b>	<b>20-24</b>	<b>25-34</b>	<b>35+</b>	<b>All Ages</b>
White	95.6	96.6	94.9	95.1	95.1
Black	97.4	94.3	97.0	93.5	95.7
Hispanic	98.6	96.4	96.8	96.0	96.8
Asian	NA	96.4	96.9	96.2	96.6
All Other	88.9	78.1	85.4	85.4	84.3
All	96.4	95.9	95.1	95.1	95.2

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Figure 16: Percentage of Mothers Using Certified Nurse Midwife for Prenatal Care, MetroWest and Massachusetts, 2005-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

Certified nurse midwives (CNM) play a significant role in the provision of prenatal care in Massachusetts; where 9.2% of mothers report that they received their prenatal care from a CNM from 2005-2009. However, only 3.1% of mothers in MetroWest relied on a midwife for their prenatal care. The age-specific differences are seen even more clearly in Figure 16. The greatest differences are among younger mothers, about 16.6% of whom rely on a CNM in Massachusetts compared to 2.0% in MetroWest.

### **Prenatal Care Sites**

The heavier MetroWest reliance on physicians noted above may also be reflected in a greater likelihood of receiving prenatal care in a private office. Mothers in MetroWest (86.2%) were far more likely than mothers statewide (68.3%) to receive their prenatal care in a private office. This difference is consistent across all age and race/ethnicity groups, but particularly pronounced among younger, non-White mothers. For example, among teen mothers statewide, only 39.3% of Black, 37.0% of Hispanic, and 39.9% of Asian mothers received their prenatal care in a private office, while in MetroWest the comparable figures for teens were 68.4% (Black) and 87.0% (Hispanic). Data for MetroWest Asian teen mothers was unavailable due to the small number of births.

**Table 6: Percent Receiving Prenatal Care in a Private Office, MetroWest, by Age, 2005-2009**

Race/Ethnicity	Age 15-19	Age 20-24	Age 25-34	Age 35+	All Ages
White	81.7	86.1	88.1	85.2	86.8
Black	68.4	78.1	86.1	76.2	81.2
Hispanic	87.0	82.7	84.1	83.4	84.0
Asian	NA	89.1	89.9	86.1	89.8
All Other*	NA	53.1	57.0	52.1	54.9
All	81.9	84.3	87.6	84.7	86.2

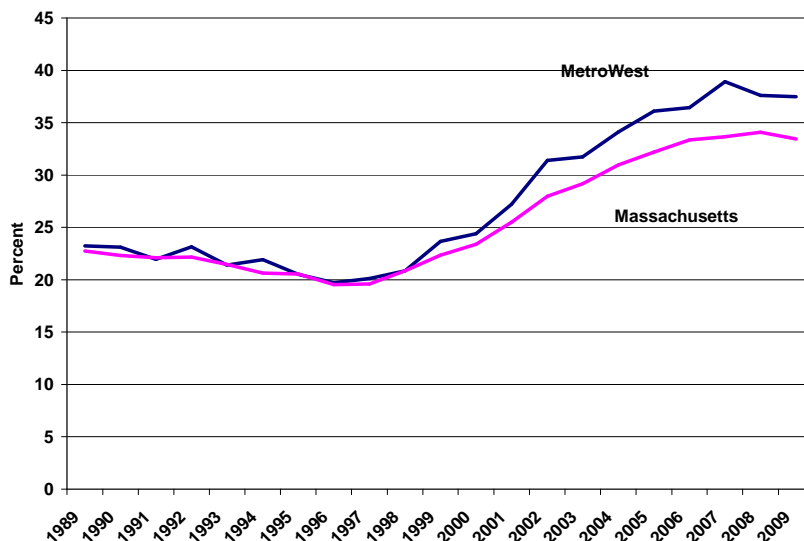
Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

\*All other includes unknown. If source of prenatal care is also unknown, then percentages will be low.

### Caesarean Delivery

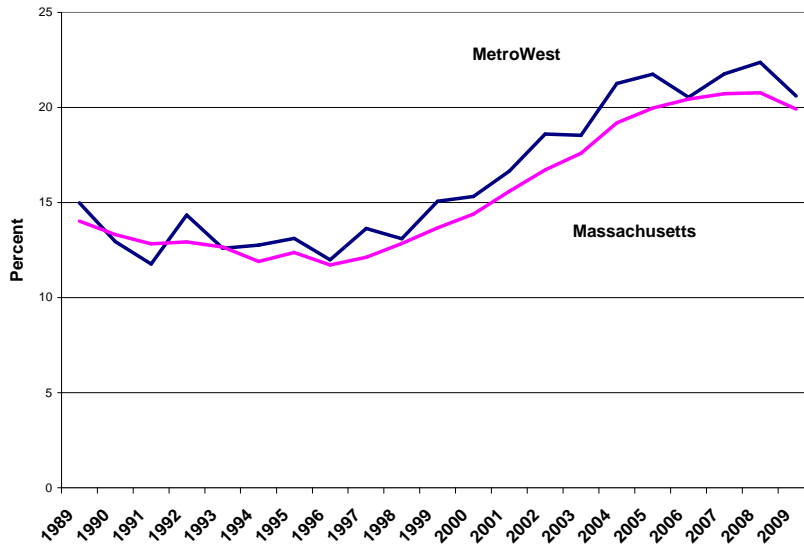
The rising rate of caesarean deliveries has garnered a great deal of attention, including a National Institutes of Health-sponsored conference on the topic.<sup>6</sup> The rising rate is partly the result of an increase in primary (first-time) caesareans. Repeat caesareans have also rapidly increased. Key issues are the frequency of caesarean delivery where it may not be needed; and the recent shift back to repeat caesareans for virtually all mothers with a prior caesarean. Figure 17 presents the trends over time in caesarean births in Massachusetts and MetroWest. The rates are largely comparable until 1998 when the MetroWest rate begins to climb at a faster rate than the statewide rate. It has been argued by the American College of Obstetrics and Gynecology that comparisons of overall rates are problematic and that such analyses should be limited to mothers characterized as “low risk”—with full-term (37+ weeks) singleton births to babies presenting in a vertex (head-down) position.<sup>7</sup> Our data allow us to apply two of these criteria. Figure 18 displays the historical trend in percentage of primary caesareans to mothers with full-term singleton births, and the pattern remains largely the same. We examined the rates by age. Percentages of caesareans for mothers from MetroWest were higher for older mothers than for younger mothers, as shown in Table 7.

**Figure 17: Caesarean Percentage of All Births, 1989-2009**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Figure 18: Primary Caesarean Percentages for Lower-Risk\* Mothers, 1989-2009**



\* Full-term (37+ weeks) singleton births. Does not include unknown delivery method, repeat Caesarian section or vaginal births following a Caesarian section birth.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

**Table 7: Primary Caesarean Percentages by Age, 2005-2009\***

	Age <30	Age 30-34	Age 35+
MetroWest	32.3	36.6	43.0
Massachusetts	27.1	35.5	43.1

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

\*Includes all Caesarian section births, both Primary and repeat.

**Table 8: Caesarean Delivery Counts and Percentages, 2005-2009\***

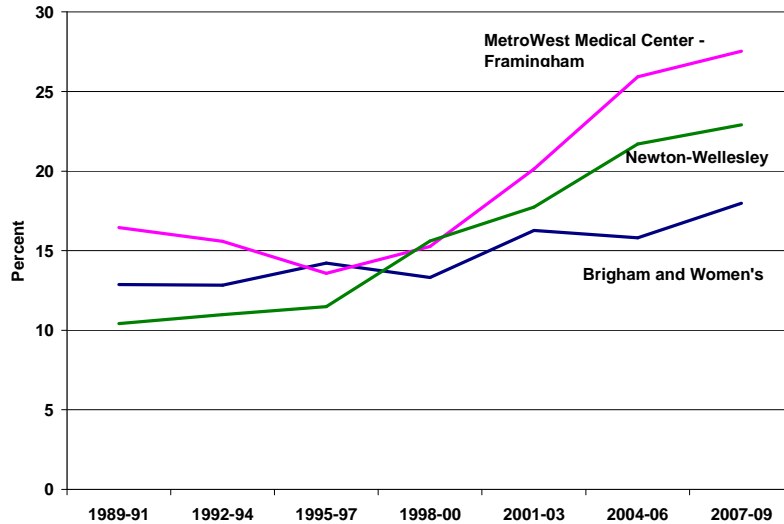
Delivery Method	Average Annual Number	MetroWest Percent	Massachusetts Percent
All caesarean deliveries	2,108	37.3	33.4
Primary caesarean deliveries	1,221	21.6	20.4
Repeat caesarean deliveries	887	15.7	13.0
Vaginal birth after Caesarean (VBAC) deliveries	50	0.9	1.2

Sources: MetroWest and State: MassCHIP v3.00 r326, Massachusetts Department of Public Health

Table 8 indicates that MetroWest’s primary caesarean rate for 2005-2009 was slightly higher than Massachusetts’ rate and the VBAC (Vaginal birth after caesarean) rate was slightly lower.

The VBAC rate has dropped since the period 2000 to 2004 for both MetroWest and Massachusetts, from 1.7% to 0.9% for MetroWest and from 1.9% to 1.2% for Massachusetts.

**Figure 19: Primary Caesarean Percentages (Three-Year Averages) for Lower-Risk\* Mothers, by Hospital, 1989-2009**



\* Full-term (37+ weeks) singleton births. Does not include unknown delivery method, repeat Caesarian section or vaginal births following a Caesarian section birth (VBAC).

Source: MassCHIP v3.00 r326., Massachusetts Department of Public Health

Since hospital factors often play a larger role than town of residence in determining caesarean rates, Figure 19 presents the trends in primary caesarean rates for the three birthing hospitals most often used by mothers in the MetroWest area: MetroWest Medical Center (1,466 annual deliveries to MetroWest residents, 2007-2009), Newton-Wellesley Hospital (1,314 annual deliveries, 2007-2009), and Brigham and Women’s Hospital (516 deliveries, 2007-2009). Because of the extreme variation in rates across single years, three-year averages are used. Analysis is limited to full-term births of singleton infants. An interesting pattern emerges: MetroWest Medical Center generally has the highest primary caesarean rate. Newton-Wellesley begins with the lowest rate, but a consistent rise beginning in the mid-1990s results in a primary caesarian rate over 20% for the most recent period. Brigham and Women’s hospital starts out in the middle of the group, but with a slower rate increase in recent years, the result is the lowest current rate among the three hospitals.

## Birth Outcomes

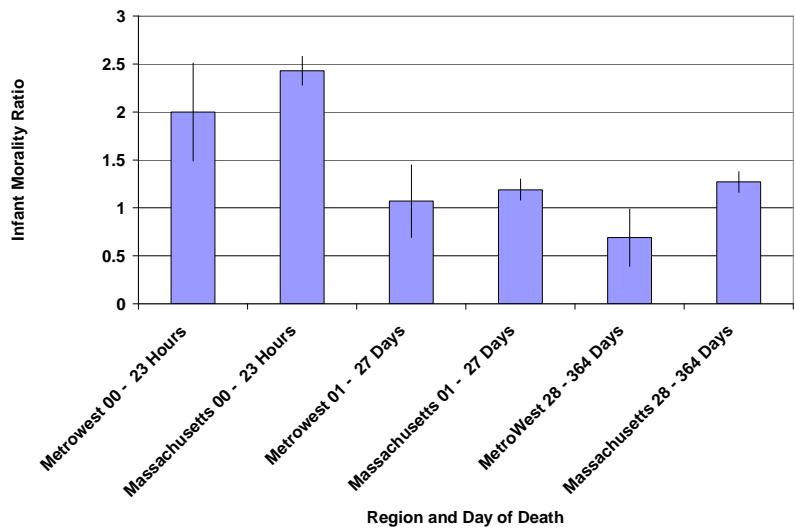
Birth outcomes have several indicators, including neonatal, perinatal, and infant deaths; maternal deaths; pre-term births; and low and very low birthweight. Each of these topics is reviewed in the following sections.

### Infant Mortality

Infant deaths are those deaths that occur in the first year of life. Within this group are neonatal deaths, occurring in the first 28 days of life. An additional classification of deaths includes those that occur within one day of birth. Finally, perinatal deaths are deaths that occur in cases of at least 20 weeks gestation or up to 28 days after birth. This category was created to recognize that many

neonatal deaths occur to pre-term babies. For the outcomes requiring linkage of the birth and death files, data for 2004-2008 are the most recent years available.

**Figure 20: Infant Mortality Ratios for MetroWest and Massachusetts, 2004-2008**



Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

The results for all causes of death shown in Figure 20 demonstrate that for newborns, the mortality ratios (deaths per 1,000/births) for MetroWest and Massachusetts are not significantly different. Nor are the mortality ratios significantly different for neonatal death. MetroWest has a lower rate than Massachusetts of post-neonatal infant death—i.e., in the period between 28 and 364 days. The difference for the post neo-natal period is similar to that observed for 1999-2003 and reported in the previous *2006 MetroWest Birth Report*. The rates for neonatal and post-neonatal death are low—in the range of 1 per 1,000 births.

### Sudden Infant Death Syndrome

Five MetroWest cases of infant deaths due to Sudden Infant Death Syndrome (SIDS) were identified for the period 2004-2008. For the same period, 135 such deaths were reported in Massachusetts.

### Maternal Mortality

Maternal mortality is a rare event in the U.S., and especially in Massachusetts and MetroWest, as shown in Table 9. Only one case of maternal mortality occurred in MetroWest in the five-year period 2004-2008.

**Table 9: Maternal Mortality Summary, 2004-2008**

Type of Mortality	Five Year Total MetroWest Towns	Five Year Total Massachusetts
Maternal Mortality	1	25

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

### Pre-Term, Low-Birthweight, and Very Low-Birthweight Births

The Birth Registry provides data on pre-term births, defined as births occurring before the 37<sup>th</sup> week of gestation. These data indicate that, for the period 2005-2009, 8.7% of births in MetroWest were pre-term, as compared with 8.9% in Massachusetts. These rates represent slight increases in pre-term births for both MetroWest (8.2% for 1999-2003) and Massachusetts (8.5% for 1999-2003).

The rates of low and very low birthweight babies were slightly better in MetroWest (7.1% low + very low birthweight and 1.1% very low birthweight for 2005-2009) than in Massachusetts (7.8% low + very low birthweight and 1.4% very low birthweight for 2005-2009). In MetroWest there has been a slight increase in the percentage of low + very low birthweight babies since 2004 (when they were 6.7% of all births). The rate differences between MetroWest and Massachusetts may in large part reflect the race and ethnicity composition of the female populations at risk, since Black mothers are much more likely to have low-birthweight and very low-birthweight babies, and they are relatively under-represented in MetroWest than in Massachusetts. Nationally, Black babies are almost twice as likely to be of low or very low birthweight (in 2004, 13.7% Black compared to 7.2% White) and more than twice as likely to have extremely low birthweight babies (3.1% as compared to 1.2%). These statistics may reflect a difference in the proportions that are pre-term: nationally in 2004, 17.9% of Black babies were pre-term and 4.0% were very pre-term (less than 32 completed weeks of gestation), while for White infants, 11.5% were pre-term, and only 1.6% were *very* pre-term. The numbers of Black babies in MetroWest is too small for such fine-tuned analyses. Analyzing the data for White babies, the comparable figures are 1.0% and 1.1% very low birthweight babies for MetroWest and Massachusetts, respectively, and 7.0% and 7.1% for low + very low birthweight babies, respectively, so the rates were strikingly comparable.

### Abnormalities and Congenital Anomalies

The Birth Registry provides data on abnormal conditions of newborns, and on specific congenital anomalies. The data in Table 10 indicate the numbers and percentages in MetroWest, and the percentages in Massachusetts. These results indicate that MetroWest newborns are as likely as those in Massachusetts to be diagnosed with “any abnormal condition,” but significantly more likely to be diagnosed with congenital anomalies.

**Table 10: Abnormal Conditions of Newborn, 2005-2009**

Condition	MetroWest Annual Average Count	MetroWest Percent	Massachusetts
Any Abnormal Condition of Newborn	999	17.7	16.8
Congenital Anomaly	382	8.1*	6.4*

\*Due to some coding problems in the data before 2007, only 2007-2009 data are included in the analysis of congenital anomalies.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

## Summary of Findings

### Demographic Profiles of Women and Birth Mothers in MetroWest

- Crude birth rates are higher for MetroWest White and Asian women than they are in Massachusetts. Crude birth rates are lower for MetroWest Black women than they are in Massachusetts.
- The age distribution of women in child-bearing years varies greatly among race and ethnicity groups. Such a phenomenon necessitates examination of *age-specific* birth rates. A simple message about race and ethnicity birth-rate disparity does not account for the data.
- Among all demographic groups, Hispanic women in MetroWest have both a younger age distribution *and* higher age-specific birth rates in the younger age groups. Thus, given present trends, we can expect a large rise in the Hispanic population in MetroWest—even without new immigration.

### Teen Births

- Teens have a lower rate of “adequate” or “adequate intensive” prenatal care than older mothers.
- Teen birth is typically associated with being unmarried in MetroWest, although the unmarried rates are lower than in Massachusetts.
- Teen birth is associated with lower rates of paternity acknowledgment than for older women. The rate of paternity acknowledgment is lowest for Black teens, in both MetroWest and Massachusetts. This situation is a cause of special concern.
- Hispanic teens have a relatively high rate of *second* births before age 20, in comparison to other groups in MetroWest.
- For teen births, large differences exist among MetroWest towns and regions. The NorthWest Region, Framingham, Hudson, Marlborough, and Milford all have rates significantly elevated above the MetroWest average. Marlborough’s rate of teen birth is also above the Massachusetts average. The high rates in these towns are due to both Hispanic births and to White births.

### The Social and Health Context of Birth

- Mothers in the MetroWest area are less likely to use a nurse-midwife for prenatal care and are more likely to visit a doctor in a private office than mothers in Massachusetts generally.

- There are large differences in rates of unmarried motherhood by age, race, and ethnicity. For each race and ethnicity group, the rate of unmarried motherhood is very high in the teens and then steeply declines in the succeeding age groups.
- Hispanic women have a lower rate of adequate or adequate intensive prenatal care than White non-Hispanic women.
- Smoking during pregnancy is low in MetroWest, as compared with Massachusetts.

### **Birth Outcomes**

- For newborns, the mortality ratios for MetroWest and Massachusetts are not different. Nor are the ratios different for neonatal death.
- MetroWest has a lower rate than Massachusetts of post-neonatal infant death—i.e., in the period between 28 and 364 days.
- The rates of low-birthweight and very low-birthweight babies were slightly better in MetroWest than in Massachusetts. This is due to differences in the race/ethnicity composition of the MetroWest and Massachusetts female child-bearing populations.
- MetroWest babies are about as likely as those in Massachusetts to suffer from abnormal conditions as judged at birth and from congenital anomalies.
- Caesarean rates for mothers in the MetroWest area are higher than the state average, even when analyzing only low risk births, i.e., full term single births.
- The caesarean rate for MetroWest mothers under 30 is higher than the state average, while the rate for mothers 30+ is similar to the state average.

### **Trends – Similarities and differences between the 2005-2009 and 2000-2004 series**

- Crude birth rates in MetroWest have declined.
- There has been a significant increase in Brazilian births.
- The percentage of Puerto Rican Hispanic mothers has declined relative to all Hispanic mothers.
- Teen birth rates have remained relatively constant. An increase in Hispanic teen births has been balanced by a decrease in White non-Hispanic births.
- Four towns continue to lead MetroWest in high teen birth rates: Framingham, Marlborough, Hudson and Milford. These towns are currently at or near the Massachusetts teen birth rates.

- Second births to teens have slightly declined.
- There has been a very large increase in births to unmarried young (15-29 year old) mothers. This has also happened in Massachusetts as a whole.
- The percentages of caesarean and primary caesarean deliveries have increased.
- Vaginal births after C-section (VBAC) has slightly declined

## Recommendations

Several of the recommendations in the 2005 *MetroWest Health Data Book and Atlas* and the 2006 MetroWest Birth Report are validated in this 2011 update. From the more extensive and in-depth analysis in this report, we recommend:

- Continue focus on the teen-birth problem in Framingham, Marlborough, Hudson and Milford, and more specifically on second births before age 20 and among Hispanic teens.
- Organize teen birth interventions, in partnership with school and community organizations, ideally at MetroWest Medical Center, because more than half (52.7%) of the 712 (142 average annual) MetroWest resident teen births in 2005-2009 took place at this hospital.
- Focus on the problem of birth outside of marriage in the younger age groups (i.e., 15-24), as well as the causes and consequences. In addition, focus on the lack of paternity acknowledgment, especially among teens and most specifically among Black teens in MetroWest.
- Focus on the low levels of prenatal care delivered by certified nurse midwives, and investigate the consequences in terms of adequacy of prenatal care, especially for teens and Hispanic and Black mothers, who are shown to have higher levels of less-than-adequate care.
- Given that no teen-specific Brazilian population data are available from the U.S. Census, investigate ways to obtain data on the Brazilian teen population in such communities as Framingham and Marlborough in order to produce more accurate Brazilian teen birth rates. Such an investigation might involve initiatives with the public schools.
- Further investigate the increasingly high rates of primary caesarian section procedures for low-risk MetroWest mothers and the low rate of VBAC (vaginal birth after caesarian birth) in MetroWest.

## Appendix A: Race/Ethnicity and Specific Background

Percent Distribution of Births by Race/Ethnicity and Specific Background, 2005-2009

Race/Hispanic Ethnicity	Ethnicity Background	MetroWest	Massachusetts
White	American	52.1	59.8
	European	31.8	27.5
	Brazilian	10.7	3.6
Black	African American	29.6	42.9
	African	24.8	17.9
	Brazilian	27.3	1.2
	Haitian	8.8	17.5
	West Indian / Caribbean	6.5	7.6
Hispanic	Puerto Rican	26.6	43.7
	"Other South American"	21.3	8.4
	Guatemalan	19.0	7.7
	Mexican	11.6	4.9
	Salvadorian	8.5	10.8
	Dominican	6.5	18.6
Asian/Pacific Islander	Other or Unknown Asian	39.2	20.8
	Chinese	28.3	26.2
	Asian Indian	17.8	15.1
	Korean	5.5	6.8
	Vietnamese	3.1	13.0
Other	Brazilian	45.9	21.9
	Middle Eastern	7.7	5.7
	European	7.2	5.1

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health  
 NH indicates non-Hispanic.

## Appendix B: Summary of Birth Statistics

### Summary of Birth Statistics for MetroWest and Massachusetts 2005-2009

	MetroWest Counts > Age 14*	MetroWest Rate/1,000	Massachusetts Rate/1,000
Crude Birth Rate	28,254	50.4	47.2
15-19	712	9.1	21.0
15-17	186	3.7	11.4
18-19	526	18.8	33.3
20-24	2,512	44.7	53.5
25-29	5,541	97.2	84.0
30-34	10,545	148.4	107.3
35-39	7,212	79.9	61.6
40-44	1,624	15.9	12.9
45+	108	1.0	0.9
White	22,596	51.7	44.8
Black	713	50.2	54.1
Hispanic	2,561	55.5	59.1
Asian/Pacific Islander	1,969	60.8	51.4
All other	415	NA	NA
<b>Births to Unmarried Mothers</b>	<b>Counts (all ages)</b>	<b>Percent</b>	<b>Percent</b>
All	4,382	15.5	32.7
White	3,001	13.3	24.1
Black	278	39.0	58.4
Hispanic	933	47.3	66.0
Asian/Pacific Islander	62	2.4	15.2
<b>Unmarried Mothers By Age</b>			
15-19	632	88.8	93.4
15-17	174	93.6	97.7
18-19	458	87.1	91.5
<b>Other Categories</b>			
Paternity Acknowledgment	27,308	96.6	91.1
Parity: % First	12,079	42.7	44.8
Smoking During Pregnancy	853	3.0	7.2
Began Prenatal Care in First Trimester	25,026	88.6	81.2
Medicaid Payor for Prenatal Care	3,089	10.9	25.0
Caesarean Delivery Rate	10,539	37.3	33.4
Primary Caesarean Rate	6,106	21.6	20.4
Vaginal Birth After Caesarean (VBAC)	251	0.9	1.2
Pre-term Birth (<37 completed weeks)	2,469	8.7	8.9
Low Birthweight	2,011	7.1	7.8
Very Low Birthweight	318	1.13	1.36
Any Abnormal Condition of Newborn	4,995	17.7	16.9
Congenital Anomaly	1,912	6.8	6.1

\*Excludes 6 births to mothers under age 15.

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health; U.S. Data see endnote 5.

## Appendix C: MetroWest Births by Hospital

Count of Births by Hospital for MetroWest Residents, 2005-2009

Hospital	Average Annual Births, by Hospital, 2005-2009	Total Births Residence: Percent by Hospital
MetroWest Medical Center - Framingham	1,523	27.0
Newton Wellesley Hospital	1,311	23.2
Brigham & Women's	573	10.2
Milford-Whitinsville Hospital	526	9.3
U.Mass. Health - Memorial Hospital/Umass. Medical Center (Birth Hospital)	443	7.8
Beth Israel Deaconess	442	7.8
Caritas St. Elizabeth's Hospital	129	2.3
Massachusetts General Hospital	124	2.2
Saint Vincent Hospital	104	1.8
Emerson Hospital	91	1.6
Mount Auburn Hospital	73	1.3
Out-Of-State	61	1.1
Caritas Norwood Hospital	59	1.1
Sturdy Memorial Hospital	51	0.9
New England Medical Center (Tufts)	41	0.7
At Home	22	0.4

Source: MassCHIP v3.00 r326, Massachusetts Department of Public Health

## End Notes

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<sup>1</sup>White, Black and Asian includes only persons who identify as a single race, that is, persons who do not claim multiracial identities. The U.S. Census tables used as denominators include the category of White alone, not Hispanic women, but the Census does not provide tables for Black alone, not Hispanic, women and Asian alone, not Hispanic women. Therefore, there are some women who are omitted from the relevant denominators for the calculation of rates. As a result, the rates may be slightly overestimated for Black and Asian mothers for certain tables and figures, including Table 2, Figure 1, Figure 5, Figure 9, Figure 10 and Appendix B. The degree of overestimation is generally considered to be very slight.

<sup>2</sup>In the case of Asian mothers, this pattern follows the distinctive Asian patterns of immigration into the U.S. Writing specifically about the Chinese population, Peter Kwong has pointed to these differential patterns of immigration. Kwong uses the concept of “Ethnoburbs” to describe the new concentrations of Asians in affluent suburban areas, and the large differences between suburban and urban Asian populations. See: Kwong P, Miscevic D. *Chinese America: The Untold Story of America’s Oldest New Community*. New York, NY: The New Press, 2005.

<sup>3</sup>See MetroWest Health Foundation. *MetroWest Health Data Book*. April 2002.

<sup>4</sup>The issues are obviously complex, particularly in light of the recent Massachusetts Supreme Court decision legalizing gay and lesbian marriage.

<sup>5</sup>Elders MJ, Albert AE. Adolescent pregnancy and sexual abuse. *Journal of the American Medical Association*. 1998;280:648-649.

<sup>6</sup>National Institutes of Health State-of-the-Science Conference Statement Caesarean Delivery on Maternal Request March 27-29, 2006. *Obstet Gynecol* 2006; 107:1386-1397.

<sup>7</sup>ACOG Task Force on Caesarean Delivery. Evaluation of Caesarean Delivery. Washington, DC: ACOG (American College of Obstetrics and Gynecology), 2000.