

**2009 INFANT MORTALITY RATE**  
**FOR THE**  
**DISTRICT OF COLUMBIA**

**Prepared by**

**Data Management and Analysis Division  
Center for Policy, Planning, and Evaluation  
Department of Health**

**Government of the District of Columbia  
Vincent C. Gray, Mayor**

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## 2009 INFANT MORTALITY RATE

### Executive Summary

There has been an overall declining trend in the infant mortality rate over the past ten years from 2000 to 2009. During this ten-year period, the number of infant deaths decreased from 91 in 2000 to 89 in 2009 resulting in an overall decrease in the District's infant mortality rate of 16.8 percent between 2000 and 2009. There were 2 fewer infant deaths in 2009 compared to 2000 and there were 1,342 more live births in 2009 compared to 2000. Table 1 and Figure 1 present a ten-year summary of these statistics.

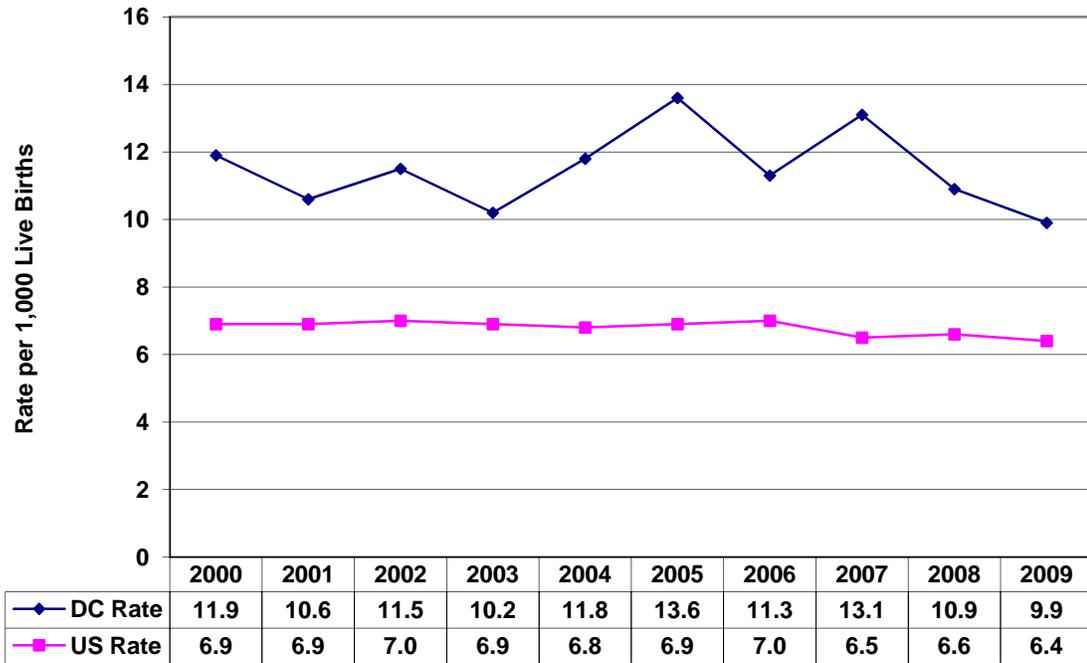
<b>Table 1: Ten-Year Infant Mortality Trends</b>			
<b>District of Columbia Residents, 2000-2009</b>			
<b>Year</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>Infant Mortality Rate*</b>
2000	7,666	91	11.9
2001	7,621	81	10.6
2002	7,494	86	11.5
2003	7,616	78	10.2
2004	7,937	94	11.8
2005	7,940	108	13.6
2006	8,522	96	11.3
2007	8,870	116	13.1
2008	9,134	100	10.9
2009	9,008	89	9.9

\* Per 1,000 live births

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

As there continues to be significant variation in the infant mortality rates for the District of Columbia in recent years after a period of decline in the 2000s, the rate has not continued to have a stable downward trend. Between years 2000 and 2005, a 14.3 percent increase was observed, which gradually declined after 2005, except for 2007. Due to this lack of continued improvements, the District of Columbia Department of Health (DOH) released the Infant Mortality Action Plan in December 2007, which is a comprehensive road map on the efforts to reduce the infant mortality rate in the District. There are three major foci of effort: (1) to increase the capacity of home visitation for pregnant women; (2) to enhance collaboration within DOH and between other agencies; and (3) to increase coordination between the government and community organizations.

**Figure 1. District of Columbia and National Infant Mortality Rate, 2000-2009**



Sources: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health. National Center for Health Statistics (NCHS).

## **2008 to 2009 Comparison Highlights**

- The number of infant deaths decreased from 100 in 2008 to 89 in 2009, a decrease of 11.0 percent.
- The overall infant mortality rate for the District decreased by 9.2 percent from a rate of 10.9 in 2008 per 1,000 live births to 9.9 per 1,000 live births in 2009. The national infant mortality rate slightly decreased from 6.6 in 2008 to 6.4 in 2009.
- The infant mortality rates decreased in Wards 3, 5, 6 and 7 but increased in Wards 1, 2, 4 and 8.
- Death to infants younger than 28 days decreased from a rate of 8.1 per 1,000 live births in 2008 to 6.3 per 1,000 live births in 2009, a decrease of 22.2 percent. (74 neonatal deaths in 2008 and 57 in 2009.)
- The post-neonatal death rate (deaths occurring from 28 days to under 1 year of age) increased by 24.8 percent, from 2.8 per 1,000 live births in 2008 to 3.6 in 2009. (26 post-neonatal deaths in 2008 and 32 in 2009.)
- The infant death rate to non-Hispanic black mothers decreased from 16.6 per 1,000 live births in 2008 to 14.6 per 1,000 live births in 2009 (Table 2), a decrease of 12 percent. (68 infant deaths in 2009 to District residents).
- The infant death rate to non-Hispanic white mothers was 3.5 per 1,000 live births in 2008 and 2.6 for 2009, a decrease of 25.7 percent (Table 2). (6 infant deaths in 2009 to District residents).
- The infant death rate to Hispanic mothers increased by 207.7 percent from 2.6 per 1,000 live births in 2008 (Table 2) to 8.0 per 1,000 live births in 2009. (12 infant deaths in 2009 to District residents).
- The number of infant deaths that resulted from multiple births decreased from 16 in 2008 to 15 in 2009.
- There was one maternal death in 2009; same as the number in 2008.
- The proportion of births to teen mothers (15-19 years of age) decreased by 3.4 percent from 2008 to 2009. (1,031 births to teen mothers in 2009).

## **Statistical Overview**

In 2009, there were 9,008 live births and 89 infant deaths to District of Columbia residents (Table 1). This resulted in an infant mortality rate of 9.9 deaths for every 1,000 live births. In 2008, there were 9,134 live births and 100 infant deaths. The infant mortality rate for 2008 was 10.9 deaths per 1,000 live births. There was a 9.2 percent decrease in the infant mortality rate from 10.9 per 1,000 live births in 2008 to 9.9 per 1,000 live births in 2009. There were 11 fewer infant deaths in 2009 than in 2008. Ward 8 had the highest infant mortality rate at 18.4 deaths per 1,000 live births (Table 10). The 2009 births (9,008) decreased by 1.4 percent over 2008 births (9,134).

Of the 89 infant deaths that occurred in 2009, 57 (or 64 percent) occurred during the neonatal period (under 28 days of life). The neonatal death rate decreased by 22.2 percent from 8.1 per 1,000 live births in 2008 to 6.3 per 1,000 live births in 2009. The neonatal period is important relative to efforts to reduce infant mortality. Many of the causes of infant deaths during this period could have been mitigated or prevented with preconception and prenatal care.

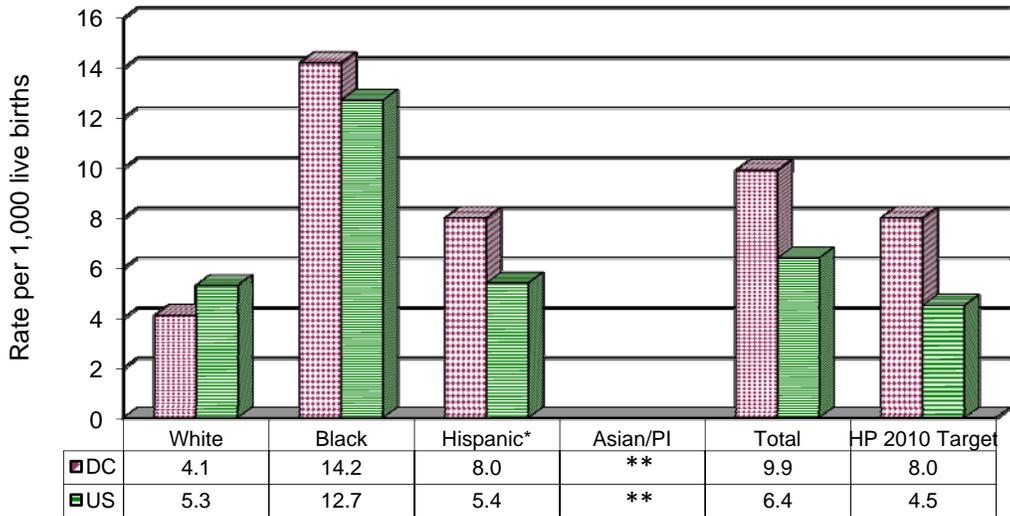
<b>Table 2: Live Births, Infant Deaths and Infant Mortality by Race/Hispanic Origin District of Columbia Residents, 2008 &amp; 2009</b>						
<b>Race/Ethnicity</b>	<b>Live Births</b>		<b>Infant Deaths</b>		<b>Infant Mortality Rate<sup>1</sup></b>	
	<b>2008</b>	<b>2009</b>	<b>2008</b>	<b>2009</b>	<b>2008</b>	<b>2009</b>
Total	9,134	9,008	100	89	10.9	9.9
Black	5,031	4,847	83	69	16.5	14.2
White	2,494	2,655	8	11	3.2	4.1
Asian/Other	1,565	1,202	5	7	3.2	5.8
Total	9,134	9,008	100	89	10.9	9.9
Non-Hispanic Black	4,989	4,670	83	68	16.6	14.6
Non-Hispanic White	2,304	2,325	8	6	3.5	2.6
Hispanic <sup>2</sup>	1,527	1,498	4	12	2.6	8.0

Notes: <sup>1</sup> Per 1,000 live births

<sup>2</sup> Hispanics include persons of all Hispanic origin of any race.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Figure 2: Infant Mortality Rates for the District of Columbia, 2009 and the United States, Preliminary 2009**



\*Hispanics include persons of all Hispanic origin of any race.

\*\*Rates not computed due to small number of infant deaths and, therefore, are likely to be unstable.

Sources: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.  
National Center for Health Statistics: [http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_04.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf)

## **Factors Contributing to Infant Mortality**

Vital statistics over the years have indicated that factors such as low birth weight, lack of adequate prenatal care, and prematurity are associated with infant mortality. Other factors such as race/ethnicity, maternal age, and marital status may also be associated with infant mortality.

### ***Low Birth Weight***

In 2009, the percentage of low birth weight infants (those weighing under 2,500 grams or 5.5 pounds) in the District was 10.3 percent compared to 10.5 percent in 2008 (Tables 3 and 8). This represents a slight decrease of 1.9 percent. About one in fifteen low birth weight infants died before their first birthday.

### ***Very Low Birth Weight***

A decrease was seen among very low birth weight (under 1,500 grams) newborns between 2008 and 2009; **very low birth weight** declined from 2.6 percent to 2.1 percent, while **moderately low birth weight** (1,500–2,499 grams) increased from 7.9 percent to 8.2 percent (data not shown). Birth weight is an important predictor of early death and long-term disability<sup>1,2,3</sup>. The lower the birth weight, the greater the risk of poor birth outcome. In 2009, nearly six out of ten of all very low birth weight infants compared with about 30 percent (or three in ten) of normal weight infants (2,500 and more grams) did not survive their first year of life.

The rate of very low birth weight decreased for non-Hispanic black infants from 2008 to 2009 (from 3.8 percent to 3.0 percent); very low birth weight slightly decreased for non-Hispanic white (from 0.9 percent to 0.8 percent); and very low birth weight increased for Hispanic infants from 0.9 percent to 1.7 percent.

### **Low Birth Weight and Race and Hispanic Origin of Mother**

The percentage of low birth weight babies that was born to all black mothers decreased from 13.7 percent in 2008 to 12.9 percent in 2009 (Table 3). Likewise, the percentage of low birth weight babies born to Asian and Pacific Islander mothers decreased from 7.9 percent in 2008 to 5.7 percent in 2009. Conversely, there was an increase in low birth weight babies born to all white mothers, from 6.6 percent in 2008 to 7.4 percent in 2009. Figure 3 shows the distribution of total births by infant birth weight and race and Hispanic origin of mother.

The rate of low birth weight births increased by 28.8 percent among babies born to Hispanic mothers from 5.9 percent in 2008 to 7.6 percent in 2009. Non-Hispanic white low birth weight increased from 6.6 percent in 2008 to 7.0 percent in 2009. Non-Hispanic black decreased slightly from 13.7 percent to 13.0 percent for 2008-2009.

**Table 3: Percent Distribution of Low Birth Weight<sup>1</sup> Babies  
by Race and Hispanic Origin of Mother  
District of Columbia Residents, 2008 and 2009**

<b>Race/Hispanic Origin</b>	<b>2008</b>	<b>2009</b>	<b>Percent Change</b>
Total Births for All Races	9,134	9,008	-1.4
- Number Low Birth Weight	956	929	
- Percentage LBW among all Births	10.5%	10.3%	-1.9
Total Births to Black* Mothers	5,031	4,847	-3.7
- Number Low Birth Weight	689	627	
- Percentage LBW among Births to Black Mothers	13.7%	12.9%	-5.6
Total Births to White* Mothers	2,494	2,655	6.5
- Number Low Birth Weight	165	196	
- Percentage LBW among Births to White Mothers	6.6%	7.4%	11.9
Total Births to Asian and Pacific Islander Mothers	216	314	45.4
- Number Low Birth Weight	17	18	
- Percentage LBW among Births to Asian and Pacific Islander Mothers	7.9%	5.7%	-27.2
Total Births to Hispanic/Latina Mothers	1,527	1,498	-1.9
- Number of Low Birth Weight	90	114	
- Percentage LBW among Births to Hispanic Mothers	5.9%	7.6%	29.1

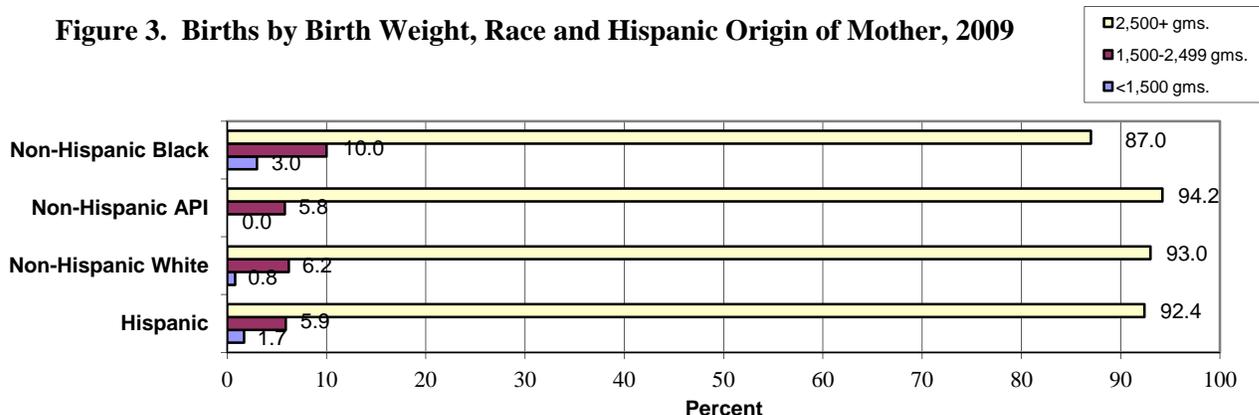
\*Includes mothers of Hispanic origin.

Notes: <sup>1</sup> Low Birth Weight means under 2,500 grams or 5lbs. 8oz.

2. Number does not add up due to exclusion of other races and unknown.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Figure 3. Births by Birth Weight, Race and Hispanic Origin of Mother, 2009**



Note: API means Asian and Pacific Islanders.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Low Birth Weight and Age of Mother

In the District of Columbia the percentage of low birth weight infants born to all mothers under 20 years of age increased from 11.6 percent in 2008 to 12.0 percent in 2009 (Table 4). The percentage of low birth weight babies born to all mothers 20 years of age and older decreased from 10.3 percent in 2008 to 10.1 percent in 2009.

	2008	2009	Percent Change
Total Births for All Ages	9,134	9,008	-1.4
- Number of Low Birth Weight	956	929	
- Percentage of Low Birth Weight	10.5%	10.3%	-1.8
Total Births to Mothers Under 20 Years of Age	1,114	1,057	-5.1
- Number of Low Birth Weight	129	127	
- Percentage of Low Birth Weight among mothers < 20 years old	11.6%	12.0%	3.6
Total Births to Mothers 20 Years of Age and Older	8,001	7,948	-0.7
- Number of Low Birth Weight	824	802	
- Percentage of Low Birth Weight among mothers ≥20 years old	10.3%	10.1%	-2.0
Total Births to Mothers Whose Age is Unknown <sup>2</sup>	19	3	-84.2
- Number of Low Birth Weight	3	0	
- Percentage of Low Birth Weight	15.8%	0%	-100.0

Notes: <sup>1</sup> Low Birth Weight means under 2,500 grams or 5lbs. 8oz.

<sup>2</sup> Mother's age is computed from date of birth to date of delivery. If date of birth is not reported, then mother's age is reported as unknown.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Low Birth Weight and Infant Deaths by Age of Mother

Of the 929 low birth weight births, 60 infants (6.4 percent) died in 2009. A total of 26 infants (29 percent of all 89 infant deaths) died to mothers 25-29 years of age. Twenty of these 26 infants (76.9 percent) were low birth weight. Almost one-half (49.4 percent) of all infant deaths (N=89) occurred to mothers aged 20-29 years. Twenty-nine percent of all infant deaths occurred to mothers aged 30-39 years and 18 percent of all infant deaths were to mothers aged below 20 years (Table 5).

Low Birth Weight and Infant Deaths by Race of Mother

Of the 89 infant deaths, 60 (67.4 percent) were low birth weight infants (49 died during the neonatal period and 11 in the post-neonatal period). Eight of the 11 (72.7 percent) infant deaths to white mothers were born weighing under 2,500 grams. Forty-five of the 69 (65.2 percent) infant deaths to black mothers were low birth weight babies. The one infant death to an Asian mother was a low birth weight baby. Of the 60 low birth weight infants, 52 (86.7 percent) were very low birth weight and eight were moderately low birth weight (13.3 percent).

<b>Table 5: Percent Distribution of Low Birth Weight Infant Deaths by Age of Mother and Time of Death District of Columbia Residents, 2009</b>							
Age of Mother	Infant Deaths	Percent Deaths*	LBW Deaths	%LBW Deaths**	Time of Infant Death		
					Total LBW	Neonatal	Post-neonatal
Total	89	100.0	60	67.4	60	49	11
< 20 years	16	18.0	13	81.3	13	8	5
20-24 years	18	20.2	12	66.7	12	10	2
25-29 years	26	29.2	20	76.9	20	17	3
30-34 years	14	15.7	7	50.0	7	7	0
35-39 years	12	13.5	7	58.3	7	7	0
≥ 40 years	3	3.4	1	33.3	1	0	1
Unknown age	0	0	0	0	0	0	0

\*Percentage based on all infant deaths (N=89).

\*\*Percentage based on total deaths in each age group.

Note: LBW means low birth weight (under 2,500 grams or 5lbs. 8 oz.).

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

## ***Prematurity***

Prematurity leads to low birth weight and infant mortality. Table 6 shows the percentages of all premature births (less than 37 weeks gestation) for 2008-2009. Premature births in the District decreased from 12.1 percent in 2008 to 10.9 percent in 2009. Preterm births have decreased across all racial groups in 2009 except for Hispanics, which increased by 9.1 percent. Approximately 13.2 percent of non-Hispanic black mothers delivered preterm babies compared to 7.8 percent non-Hispanic white mothers and 8.9 percent Hispanic/Latina mothers.

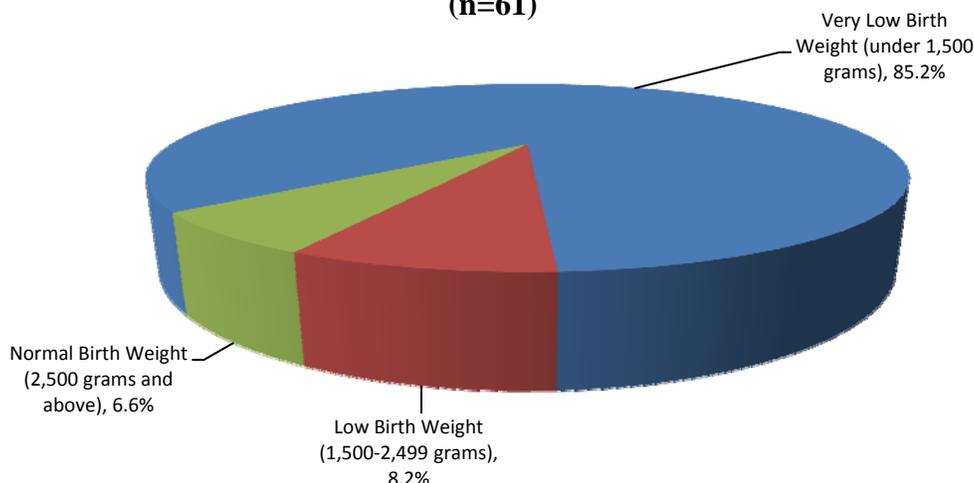
More than 66 percent of all preterm births occurred between 34-36 weeks gestation. Sixty-one of the 89 (68.5 percent) infants who died in 2009 were preterm. Of these preterm infant deaths, 52 (85.2 percent) were below 32 weeks gestation (very pre-term) and weighed under 1,500 grams (Figure 4). Almost 87 percent of preterm infants died to mothers ages 15-34.

<b>Table 6. Percent Distribution of Premature Babies by Race and Hispanic Origin of Mother District of Columbia Residents, 2008 and 2009</b>			
<b>Race/Hispanic Origin</b>	<b>2008</b>	<b>2009</b>	<b>Percent Change</b>
Total Births for all Races	9,134	9,008	
-Number of Premature Babies	1,107	983	
-Percent Premature Babies	12.1%	10.9%	-9.8
Total Births to Black* Mothers	5,031	4,847	
-Number of Premature Babies to Black Mothers	745	635	
-Percent Premature Babies to Black Mothers	14.8%	13.1%	-11.5
Total Births to White* Mothers	2,494	2,655	
-Number of Premature Babies to White Mothers	236	220	
-Percent Premature Babies to White Mothers	9.5%	8.3%	-12.8
Total Births to Asian and Pacific Islander (API) Mothers	216	314	
-Number of Premature Babies to API Mothers	19	22	
-Percent Premature Babies to API Mothers	8.8%	7.0%	-20.4
Total Births to Hispanic Mothers	1,527	1,498	
-Number of Premature Babies to Hispanic Mothers	126	134	
-Percent Premature Babies to Hispanic Mothers	8.2%	8.9%	9.1

\* Includes mothers of Hispanic origin.

Note: Premature births mean births under 37 weeks of gestation.

**Figure 4. Preterm Infant Deaths by Birth Weight, 2009  
(n=61)**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

### ***Entry into prenatal care***

Early, high-quality prenatal care (PNC) is one of the cornerstones of a safe motherhood program, which begins before conception, continues with appropriate PNC and protection from pregnancy complications, and maximizes healthy outcomes for infants and mothers<sup>4</sup>. Women who receive late (third trimester of pregnancy<sup>5</sup>) or no PNC do not receive timely preventive care or education and are at risk for having undetected complications of pregnancy that can result in severe maternal morbidity and sometimes death<sup>6,7</sup>.

It is important to note that births for which prenatal care began was unknown were subtracted from the total number of births before percentages were computed. Thus, based on this computation, 76 percent of District resident mothers who gave birth in 2009 began prenatal care in the first trimester of pregnancy (Table 9). More than 90 percent of white mothers who gave birth in 2009 had timely entry into prenatal care compared to 81.3 percent among Asian mothers and 68.5 percent of black mothers (data not shown).

About 5.1 percent of mothers began care late or had no prenatal care at all. More than two-thirds of these were black women.

### ***Marital Status***

The proportion of births to unmarried women decreased in 2009 to 55.5 percent compared with 57.8 percent in 2008, a 4.0 percent decrease. Of the 4,995 (55.5 percent) births to unmarried women in 2009, 19.9 percent of these births were to teenagers (15-19 years). Eighty-seven percent of births to women aged 20-24 years and 61.9 percent of births to women aged 25-29 years were to unmarried women.

In 2009, 91.0 percent of infant deaths were to unmarried women, compared to 81.0 percent in 2008

for an increase of 12.3 percent. Between 2006 and 2009, the majority of infant deaths were to unmarried women (Table 7).

Year	Total Number of Births	Births to Unmarried Women		Births to Married Women		Total Infant Deaths	Infant Deaths to Unmarried Women		Infant Deaths to Married Women	
		Number of births	Percent	Number of Births	Percent		Number of Infant Deaths	Percent	Number of Infant Deaths	Percent
2009	9,008	4,995	55.5	3,950	43.8	89	81	91.0	7	7.9
2008	9,134	5,278	57.8	3,846	42.2	100	81	81.0	17	17.0
2007	8,870	5,190	58.5	3,679	41.5	116	87	75.0	25	21.6
2006	8,522	4,908	57.6	3,613	42.4	96	77	80.2	18	18.8

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

### **Geographical Distribution**

The District's infant mortality rate is comparable to cities of similar size and population mix. Among the following four cities, the District's rate was the lowest in 2009 and 2006; the District tied with Richmond for lowest rate in 2008; and third lowest in 2005 and 2007 (Table 8).

City	2005	2006	2007	2008	2009
Baltimore City, Maryland <sup>1</sup>	11.3	12.4	11.3	12.1	13.5
Detroit City, Michigan <sup>2</sup>	15.9	13.4	14.9	14.9	14.8
District of Columbia <sup>3</sup>	13.6	11.3	13.1	10.9	9.9
Richmond, Virginia <sup>4</sup>	13.2	13.5	12.4	10.9	12.2

Sources: <sup>1</sup> Vital Statistics Administration, Department of Health and Mental Hygiene, Maryland.

<sup>2</sup> Vital Records & Health Data Development Section, Michigan Department of Community Health.

<sup>3</sup> Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

<sup>4</sup> Virginia Department of Health, VA State Center for Health Statistics.

The presence of geographical subdivisions such as wards and census tracts in the District provides a basis for breaking down District-wide data into small area statistics for comparison and analyses. In the absence of individual-level socioeconomic data, these ward statistics form a useful basis for evaluating health status indicators against demographic and environmental ward characteristics. Table 9 shows selected maternal and child health indicators and infant deaths by geographic areas or wards in the District of Columbia. In 2009, there was a decrease in the number of infants born in five wards (1, 3, 4, 7 and 8) of the city (Table 10). The infant mortality breakdown by ward for 2009 shows a decline in the infant mortality rate for four wards (3, 5, 6, and 7). The infant mortality rate increased in Wards 1, 2, 4, and 8. Among the wards with increased infant mortality rates for 2009, Ward 8 had the highest rate (18.4 per 1,000 live births), but Ward 2 had the largest percentage increase (100.0 percent) from a rate of 2.9 per 1,000 live births in 2008 to 5.8 in 2009. Due to the small number of infant deaths in Ward 2, caution should be exercised when interpreting the percentage increase in the infant mortality rate, which is highly variable and does not meet standards of reliability or precision. Ward 6 had the largest meaningful decrease from a rate of 8.0 in 2008 to 1.9 in 2009; this rate was even lower than Ward 3, which typically has the lowest infant mortality rate in the city. However, caution should be used when interpreting the rate and percentage change because of the very small numbers (Tables 10, 11, and 12). Infant mortality rates by ward from 2005 and 2009 are presented in Table 13. The geographic distribution of 2009 ward-level data for selected measures such as infant mortality, birth rates, low birth weight, preterm births, entry into prenatal care, and teen births in the District of Columbia are depicted in Maps 1, 2, 3, 4, 5, and 6, respectively.

**Table 9. Indicators of Maternal and Child Health, and Infant Mortality by Ward  
District of Columbia Residents, 2009**

Indicators	DC	Ward 1	Ward 2	Ward 3	Ward 4	Ward 5	Ward 6	Ward 7	Ward 8
2009 Estimated Population <sup>1</sup>	599,657	75,935	79,641	76,887	75,513	74,053	76,335	70,824	70,469
Live Births Rate/1,000 pop <sup>1</sup>	9,008 15.0	1,227 16.2	693 8.7	765 9.9	1,441 19.1	1,099 14.8	1,067 14.0	1,162 16.4	1,521 21.6
Live Births									
Black	4,847	343	132	25	614	797	419	1,082	1,413
White	2,655	405	412	644	339	151	586	32	80
Hispanic <sup>2</sup>	1,498	502	111	54	550	142	47	55	33
Births to Unmarried Women (Percent)	4,995 55.5	635 51.8	173 25.0	42 5.5	798 55.4	711 64.7	383 35.9	975 83.9	1,259 82.8
% Births to Unmarried Women									
Black	79.0	71.4	62.9	12.0	60.3	74.8	80.9	86.2	87.8
White	10.6	17.8	7.8	3.7	23.0	16.6	5.5	31.2	11.2
Hispanic <sup>2</sup>	66.9	72.5	51.4	27.8	73.4	64.8	27.7	70.9	45.4
Births to Mothers age <20 yrs. (Percent)	1,057 11.7	102 8.3	27 3.9	3 0.4	118 8.2	159 14.5	73 6.8	267 23.0	302 19.9
Births to Mothers 15-19 yrs. (Percent)	1,031 11.4	100 8.1	25 3.6	3 0.4	117 8.1	156 14.2	73 6.8	260 22.4	291 19.1
Birth Rate/1,000 Women 15-19 yrs. <sup>3</sup>	47.6	37.2	6.6	1.2	59.3	52.5	60.5	85.6	85.2
Low Birth Weight Live Births <sup>4</sup> (Percent)	929 10.3	105 8.6	63 9.1	49 6.4	116 8.0	116 10.6	91 8.5	170 14.6	216 14.2
% Low Birth Weight Births <sup>4</sup>									
Black (Percent)	627 (12.9)	33 (9.6)	15 (11.4)	6 (24.0)	57 (9.3)	103 (12.9)	45 (10.7)	161 (14.9)	205 (14.5)
White (Percent)	196 (7.4)	34 (8.4)	37 (9.0)	35 (5.4)	27 (8.0)	6 (4.0)	45 (7.7)	4 (12.5)	8 (10.0)
Hispanic <sup>2</sup> (Percent)	114 (7.6)	41 (8.2)	13 (11.7)	8 (14.8)	36 (6.5)	7 (4.9)	2 (4.3)	5 (9.1)	2 (6.1)
Low Birth Weight <sup>4</sup> to Mothers <20 yrs. (Percent)	127 12.0	7 6.9	5 18.5	0 0	14 11.9	18 11.3	3 4.1	40 15.0	39 12.9
% Preterm Births (<37 weeks gestation)	10.9	9.0	9.0	8.0	9.0	11.6	9.5	14.1	14.9
% Births With Prenatal Care Beginning First Trimester <sup>5,6</sup>	76.1	73.3	81.3	90.1	72.6	73.2	83.6	70.3	71.4
% Births With Late or No Prenatal Care <sup>5,6</sup>	5.1	7.5	3.8	2.1	6.3	6.5	3.4	6.0	4.3
Infant Deaths (under 1 yr.) Rate (per 1,000 live births) <sup>7</sup>	89 9.9	10 8.1	4 5.8	2 2.6	15 10.4	13 11.8	2 1.9	15 12.9	28 18.4

Notes: <sup>1</sup> Rates based on 2009 estimated population. Annual Estimates of the Resident Population by Sex and Age for the District of Columbia, July 1, 2009 (Release Date: June 2010). U.S. Census Bureau, Population Division. Ward estimates were derived from ward-population proportions from the District of Columbia Census 2010 Demographic and Housing Profiles by Ward, U.S. Census Bureau, Census 2010 Data prepared by the DC Office of Planning State Data Center.

<sup>2</sup> Hispanics include persons of all Hispanic origin of any race.

<sup>3</sup> Rates by ward for women aged 15-19 years were calculated using ward-population proportions for this demographic from the District of Columbia Census 2010 Demographic and Housing Profiles by Ward, U.S. Census Bureau, Census 2010 Data prepared by the DC Office of Planning State Data Center.

<sup>4</sup> Low birth weight (under 2,500 grams or 5 lbs. 8 oz.).

<sup>5</sup> Prenatal care beginning in the first trimester of pregnancy is defined as the date of the first prenatal care visit occurring during the first three months of pregnancy (or during the first 13 weeks after the first day of the last menstrual period). Late prenatal care is defined as the date of the first prenatal care visit occurring during the third trimester (or the last three months of pregnancy).

<sup>6</sup> Births for which unknown "prenatal care began" were subtracted from the total number of births before percentages were computed.

<sup>7</sup> Due to the small number of infant deaths, infant mortality rates are highly variable and should be interpreted cautiously.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Ward	Births		Infant Deaths		Infant Mortality Rate <sup>1</sup>		
	2008	2009	2008	2009	2008	2009	Percent Change <sup>2</sup>
1	1,306	1,227	8	10	6.1	8.1	32.8
2	682	693	2	4	2.9	5.8	100.0
3	786	765	4	2	5.1	2.6	-49.0
4	1,467	1,441	15	15	10.2	10.4	2.0
5	1,085	1,099	14	13	12.9	11.8	-8.5
6	998	1,067	8	2	8.0	1.9	-76.3
7	1,222	1,162	21	15	17.2	12.9	-25.0
8	1,583	1,521	28	28	17.7	18.4	4.0
Unknown	5	33	0	0	0.0	0.0	-
Total	9,134	9,008	100	89	10.9	9.9	-9.2

<sup>1</sup>Infant deaths per 1,000 live births.

<sup>2</sup>Changes in value over time (e.g., rates) [(New - Old) / Old = Decimal x 100 = Percent change].

Notes: 1. Due to the small number of infant deaths, the above infant mortality rates are highly variable and should be interpreted cautiously.

2. Ward distribution based on 2002 ward boundaries. Previous to 2007, 1992 ward boundaries were used. However, there was no change in the distribution of infant deaths among the ward when using the 1992 boundaries.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Ward	Births	Infant Deaths	IMR*	LBW	Teen Births	LBW to Teens
1	1,227	10	8.1	105	102	7
2	693	4	5.8	63	27	5
3	765	2	2.6	49	3	0
4	1,441	15	10.4	116	118	14
5	1,099	13	11.8	116	159	18
6	1,067	2	1.9	91	73	3
7	1,162	15	12.9	170	267	40
8	1,521	28	18.4	216	302	39
Unknown	33	0	-	3	6	1
Total	9,008	89	9.9	929	1,057	127

\*Infant deaths per 1,000 live births.

Notes: 1. Due to the small number of infant deaths, the above infant mortality rates are highly variable and should be interpreted cautiously.

2. Ward distribution based on 2002 ward boundaries. Previous to 2007, 1992 ward boundaries were used. However, there was no change in the distribution of infant deaths among the ward when using the 1992 boundaries.

3. Teen birth in this table is defined as mother's younger than 20 years of age.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

<b>Ward</b>	<b>Births</b>	<b>Infant Deaths</b>	<b>IMR*</b>	<b>LBW</b>	<b>Teen Births</b>	<b>LBW to Teens</b>
1	1,306	8	6.1	100	128	11
2	682	2	2.9	57	39	4
3	786	4	5.1	57	6	0
4	1,467	15	10.2	128	143	8
5	1,085	14	12.9	118	178	24
6	998	8	8	102	79	9
7	1,222	21	17.2	168	226	40
8	1,583	28	17.7	225	315	33
Unknown	5	0	-	1	0	0
<b>Total</b>	<b>9,134</b>	<b>100</b>	<b>10.9</b>	<b>956</b>	<b>1,114</b>	<b>129</b>

\* Infant deaths per 1,000 live births.

Notes: 1. Teen birth means birth to a mother under the age of 20 years.

2. LBW means low birth weight (under 2,500 grams or 5 lbs. 8 oz.).

3. Due to the small number of infant deaths, the above infant mortality rates are highly variable and should be interpreted cautiously.

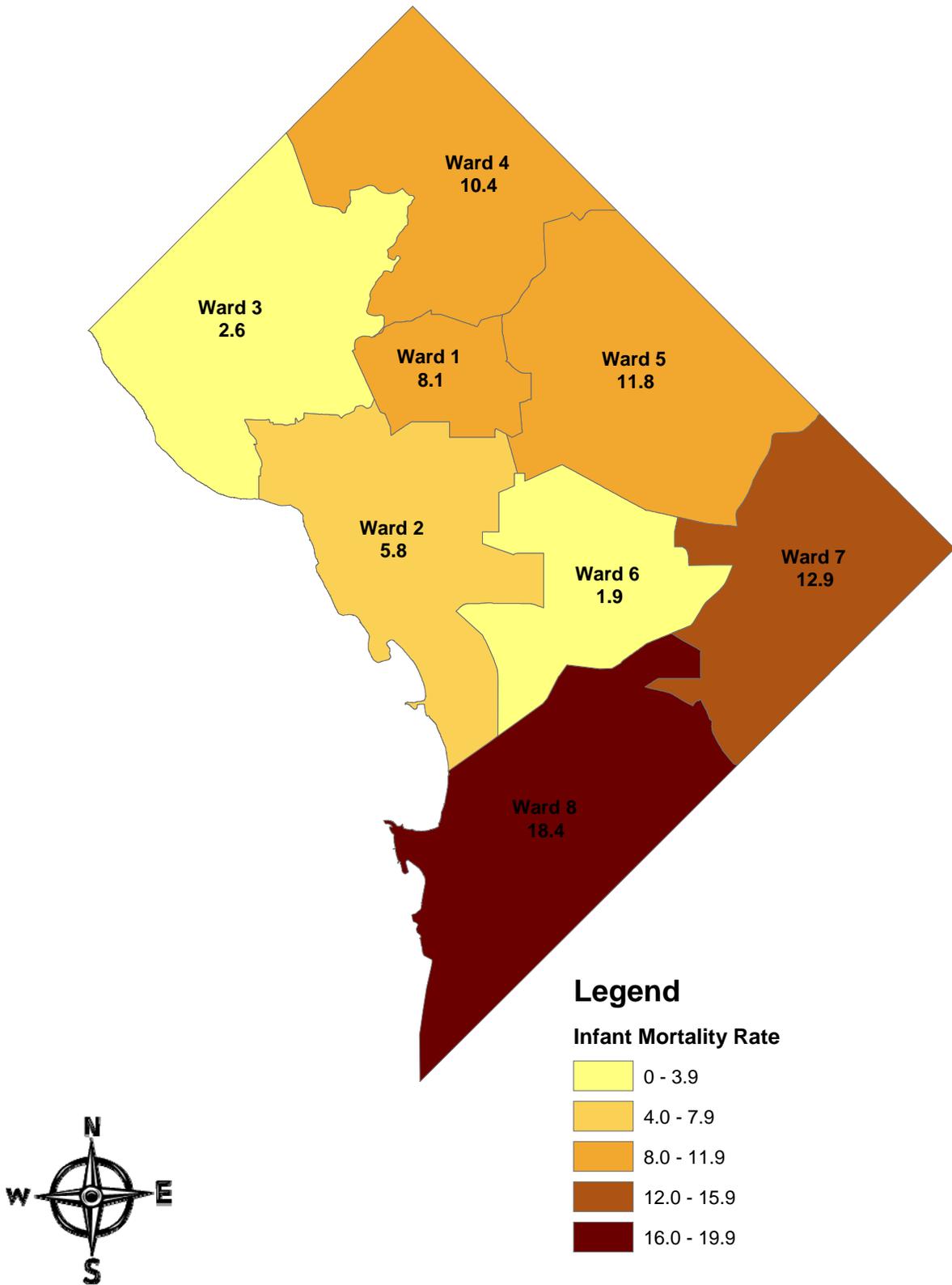
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

<b>Ward</b>	<b>2005</b>	<b>2006</b>	<b>2007</b>	<b>2008</b>	<b>2009</b>
<b>1</b>	11.6	5.5	5.6	6.1	8.1
<b>2</b>	6.3	13.0	12.6	2.9	5.8
<b>3</b>	5.3	2.2	1.3	5.1	2.6
<b>4</b>	14.2	6.1	17.1	10.2	10.4
<b>5</b>	17.9	20.0	16.3	12.9	11.8
<b>6</b>	13.7	9.1	6.4	8.0	1.9
<b>7</b>	15.9	12.8	19.0	17.2	12.9
<b>8</b>	21.7	21.6	18.8	17.7	18.4
<b>Total</b>	<b>13.6</b>	<b>11.3</b>	<b>13.1</b>	<b>10.9</b>	<b>9.9</b>

Note: Due to the small number of infant deaths, the above infant mortality rates are highly variable and should be interpreted cautiously.

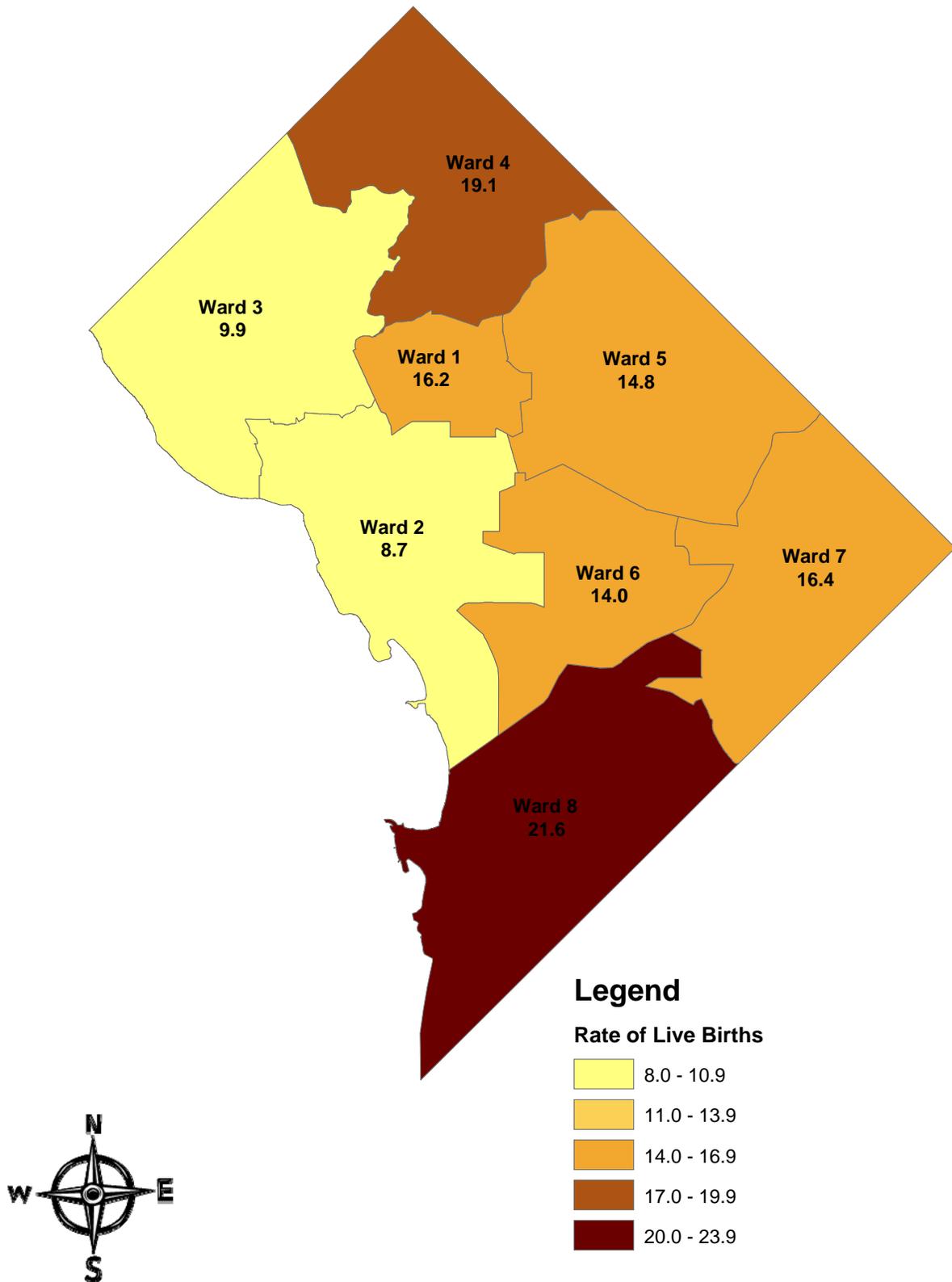
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Map 1. Rates of Infant Mortality by Ward, District of Columbia, 2009**



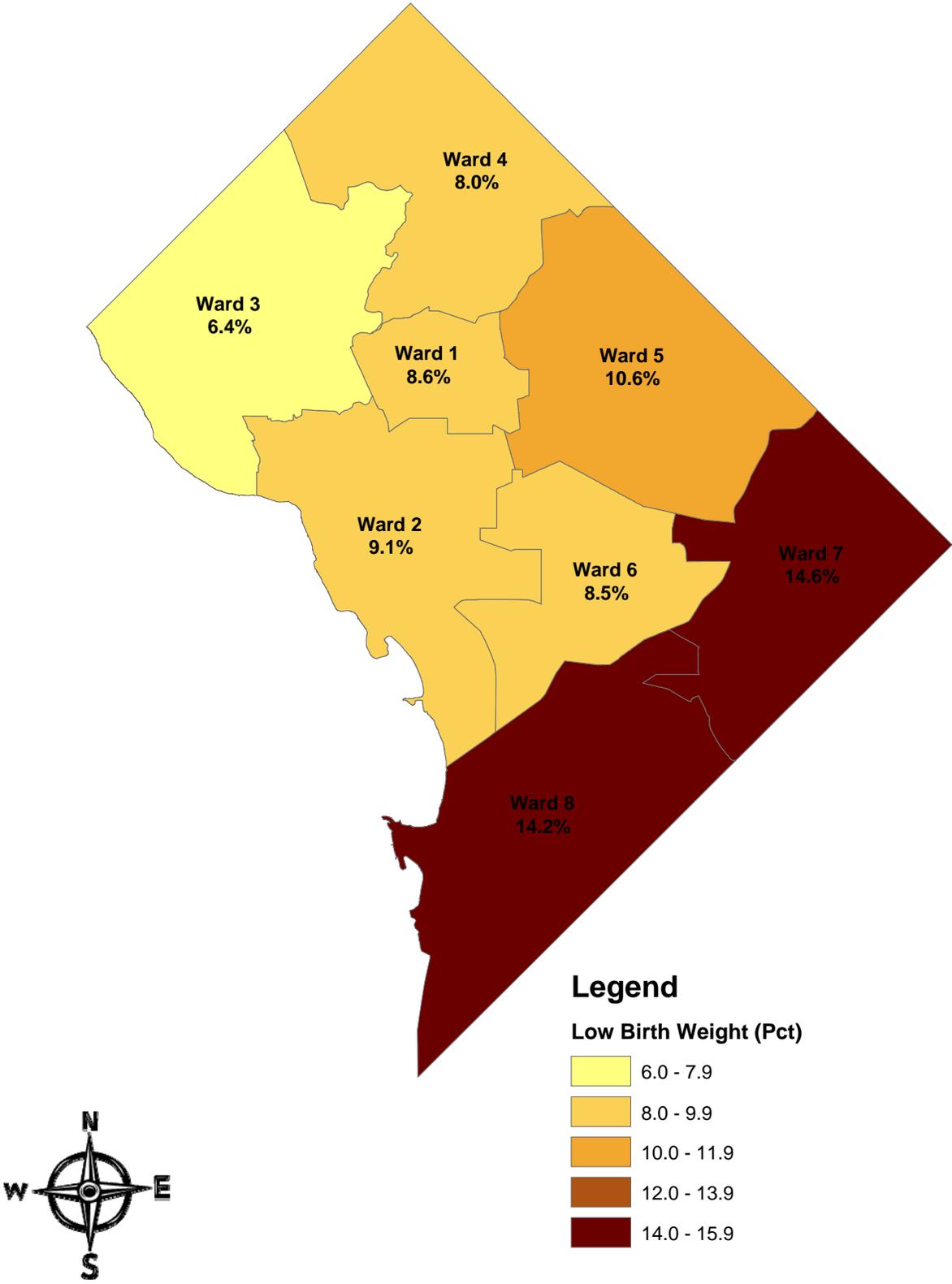
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Map 2. Rates of Live Births to DC Residents by Ward, District of Columbia, 2009**



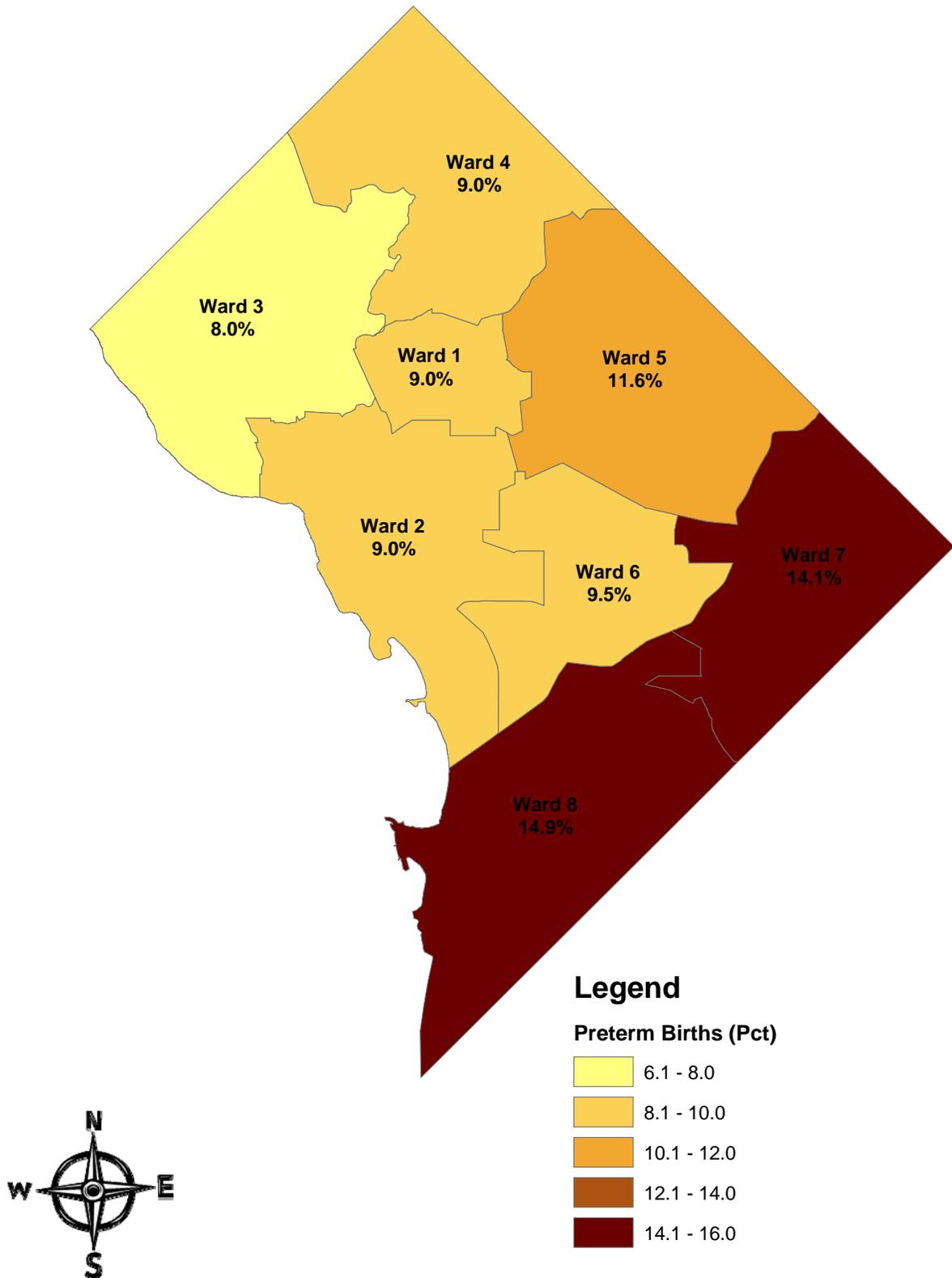
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Map 3. Percentage of Low Birth Weight Live Births by Ward, District of Columbia, 2009



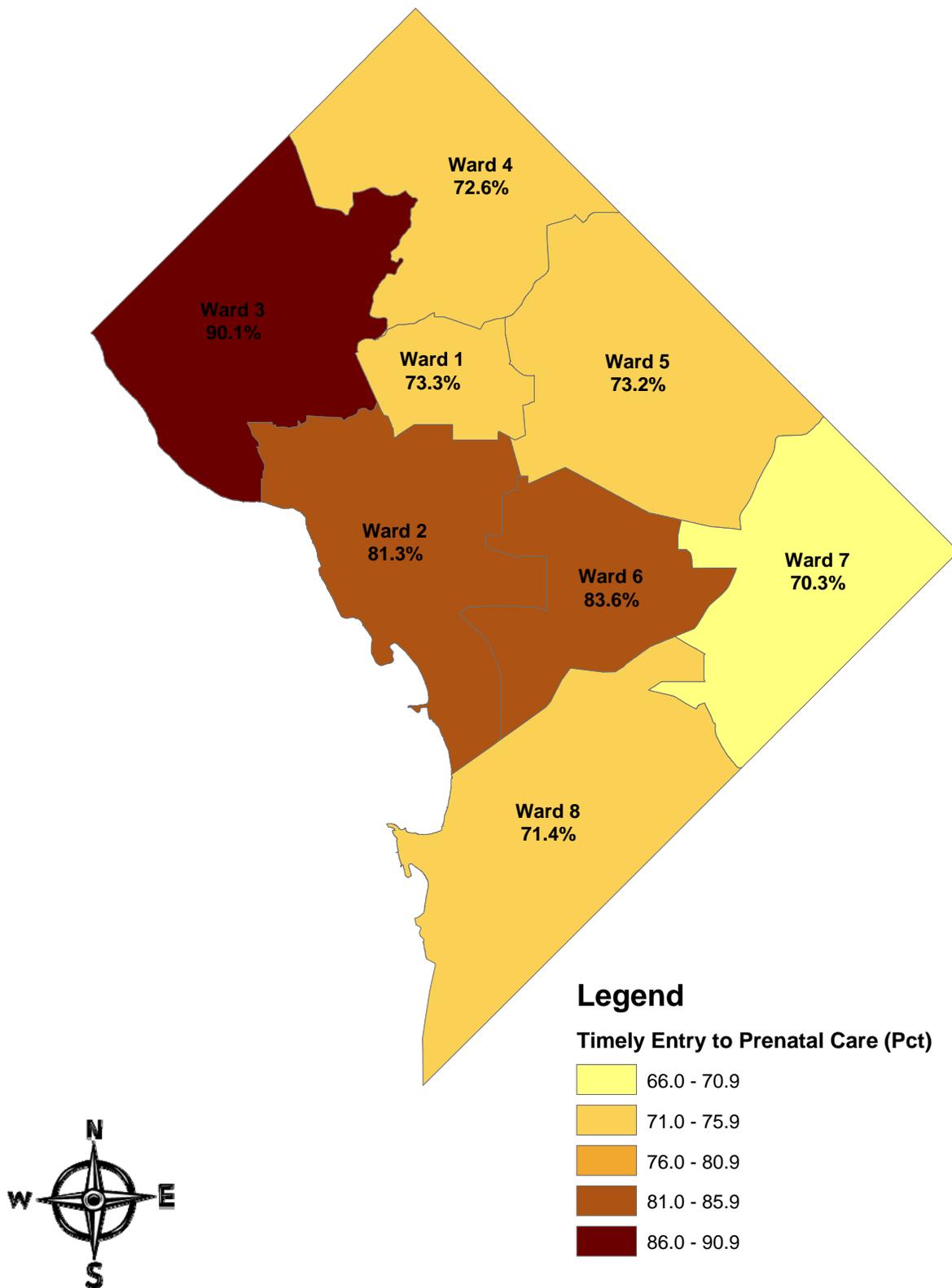
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Map 4. Percentage of Preterm Births by Ward, District of Columbia, 2009**



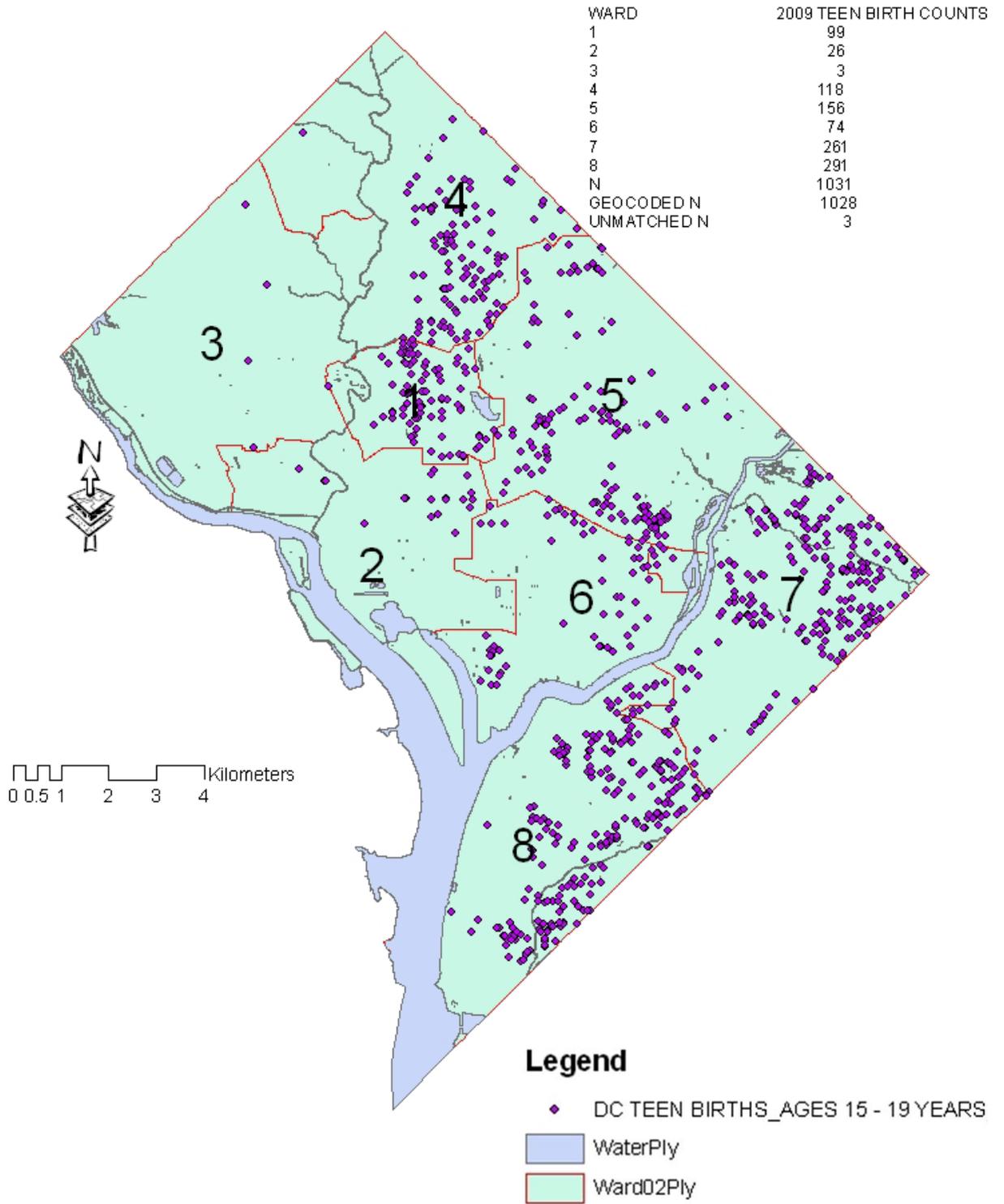
Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Map 5. Percentage of Births with Prenatal Care Beginning First Trimester by Ward, District of Columbia, 2009**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

**Map 6. Teen Births by Ward, District of Columbia, 2009**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

## Causes of Death

The leading cause of infant mortality, **Congenital malformations, deformations and chromosomal abnormalities classified** accounted for 19.1 percent of all infant deaths (Table 14). **Disorders related to short gestation and low birth weight, not elsewhere classified (low birth weight)** was the second ranked leading cause of infant death, which accounted for 13.5 percent of all infant deaths in 2009. **Newborn affected by maternal complications of pregnancy** was the third leading cause of death, which accounted for 12.4 percent of all infant mortality. **Newborn affected by complications of placenta, cord, and membranes** was the fourth leading cause of death, which accounted for 9 percent of all infant deaths. **Sudden infant death syndrome (SIDS)** was the fifth leading cause of death, which accounted for 4.5 percent each of all infant mortality. **These five leading causes of infant death in 2009 accounted for more than one-half (58.4 percent) of all infant deaths in the District of Columbia.** The first four leading causes of death were the same in 2009 as in 2008; however, the first and third ranks switched positions from the previous year. **Sudden infant death syndrome (SIDS)** became the fifth leading cause in 2009, two ranks higher 2008.

**Table 14: Leading Causes of Infant Death  
District of Columbia Residents, 2009**

Rank <sup>1</sup>	Cause of Death (Based on Tenth Revision, International Classification of Diseases, Second Edition, 2004)	Number	Percent*	Rate**
...	All causes	89	100.0	988.0
1	<b>Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)</b>	17	19.1	188.7
	... <b>Other congenital malformations of nervous system (Q01-Q02,Q04,Q06-Q07)</b>	2	2.2	22.2
	... <b>Congenital malformations of heart (Q20-Q24)</b>	3	3.4	33.3
	... <b>Congenital malformations of digestive system (Q35-Q45)</b>	1	1.1	11.1
	... <b>Congenital malformations of genitourinary system (Q50-Q64)</b>	4	4.5	44.4
	... <b>Other congenital malformations and deformations (Q10-Q18,Q86-Q89)</b>	2	2.2	22.2
	... <b>Edward's syndrome (Q91.0-Q91.3)</b>	3	3.4	33.3
	... <b>Patau's syndrome (Q91.4-Q91.7)</b>	1	1.1	11.1
	... <b>Other chromosomal abnormalities, not elsewhere classified (Q92-Q99)</b>	1	1.1	11.1
2	<b>Disorders related to short gestation and low birth weight, not elsewhere classified (P07)</b>	12	13.5	133.2
	... <b>Extremely low birth or extreme immaturity (P07.0, P07.2)</b>	9	10.1	99.9
	... <b>Other low birth weight or preterm (P07.1, P07.3)</b>	3	3.4	33.3
3	<b>Newborn affected by maternal complications of pregnancy (P01)</b>	11	12.4	122.1
	... <b>Newborn affected by incompetent cervix (P01.0)</b>	3	3.4	33.3
	... <b>Newborn affected by premature rupture of membranes (P01.1)</b>	6	6.7	66.6
	... <b>Newborn affected by multiple pregnancy (P01.5)</b>	1	1.1	11.1

**Table 14: Leading Causes of Infant Death  
District of Columbia Residents, 2009**

Rank <sup>1</sup>	Cause of Death (Based on Tenth Revision, International Classification of Diseases, Second Edition, 2004)	Number	Percent*	Rate**
	... Newborn affected by other maternal complications of pregnancy (P01.2–P01.4,P01.6–P01.9)	1	1.1	11.1
4	Newborn affected by complications of placenta, cord, and membranes (P02)	8	9.0	88.8
	... Newborn affected by chorioamnionitis (P02.7)	6	6.7	66.6
	... Newborn complications involving placenta (P02.0-P02.3)	2	2.2	22.2
5	Sudden infant death syndrome (SIDS) (R95)	4	4.5	44.4
...	All other causes	37	41.6	410.7

\*Percent based on total number of infant deaths.

\*\*Rate per 100,000 live births.

...Category not applicable.

<sup>1</sup> Rank based on number of infant deaths.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

In 2009, the leading cause of death nationally was **Congenital malformations, deformations and chromosomal abnormalities**, same as in the District of Columbia. **Disorders related to short gestation and low birth weight, not elsewhere classified (low birth weight)** was the second leading cause for the U.S. (Table 15) and also the second for the District of Columbia.

**Table 15. Infant Deaths and Infant Mortality Rates for the 10 Leading Causes of Infant Death: United States, Preliminary, 2009.**

Rank <sup>1</sup>	Cause of death (based on the <i>International Classification of Diseases, Tenth Revision, Second Edition, 2004</i> )	Number	Rate <sup>2</sup>
...	All causes	26,526	642.1
1	Congenital malformations, deformations and chromosomal abnormalities (Q00–Q99)	5,358	129.7
2	Disorders related to short gestation and low birth weight, not elsewhere classified (P07)	4,463	108.0
3	Sudden infant death syndrome (R95)	2,168	52.5
4	Newborn affected by maternal complications of pregnancy (P01)	1,586	38.4
5	Accidents (unintentional injuries) (V01–X59)	1,158	28.0
6	Newborn affected by complications of placenta, cord and membranes (P02)	1,022	24.7
7	Bacterial sepsis of newborn (P36)	682	16.5
8	Respiratory distress of newborn (P22)	587	14.2
9	Diseases of the circulatory system (I00-I99)	565	13.7
10	Neonatal hemorrhage (P50–P52,P54)	537	13.0
...	All other causes (residual)	8,400	203.3

...Category not applicable.

<sup>1</sup> Rank based on number of infant deaths.

<sup>2</sup> Rates are per 100,000 live births.

Notes: 1. Data are based on a continuous file of records received from the states. Figures are based on weighted data rounded to the nearest individual, so categories may not add to totals or subtotals.

2. For certain causes of death such as unintentional injuries, sudden infant death syndrome, and congenital malformations, deformations and chromosomal abnormalities, preliminary and final data may differ significantly because of the truncated nature of the preliminary file. Data are subject to sampling and/or random variation.

Source: National Vital Statistics Reports, Vol. 59, No. 4, March 16, 2011. Deaths: Preliminary data for 2009. Available from:

[http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_04.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf)

## Neonatal Mortality

The leading cause of neonatal death in 2009 was **Congenital malformations, deformations and chromosomal abnormalities**, which accounted for 22.8 percent of all neonatal deaths. **Disorders related to short gestation and low birth weight, not elsewhere classified (low birth weight)**, was the second leading cause (21.1 percent), and **Newborn affected by maternal complications of pregnancy** (19.3 percent) was the third leading cause of neonatal death (Table 16).

Rank <sup>1</sup>	Cause of Death (Based on Tenth Revision, International Classification of Diseases, Second Edition, 2004)	Number	Percent*	Rate**
...	All causes	57	100.0	632.8
1	<b>Congenital malformations, deformations and chromosomal abnormalities (Q00-Q99)</b>	13	22.8	144.3
2	<b>Disorders related to short gestation and low birth weight, not elsewhere classified (P07)</b>	12	21.1	133.2
3	<b>Newborn affected by maternal complications of pregnancy (P01)</b>	11	19.3	122.1
4	<b>Newborn affected by complications of placenta, cord, and membranes (P02)</b>	8	14.0	88.8
...	All other causes or total	13	22.8	144.3

\*Percent based on total number of neonatal deaths.

\*\*Rate per 100,000 live births.

...Category not applicable.

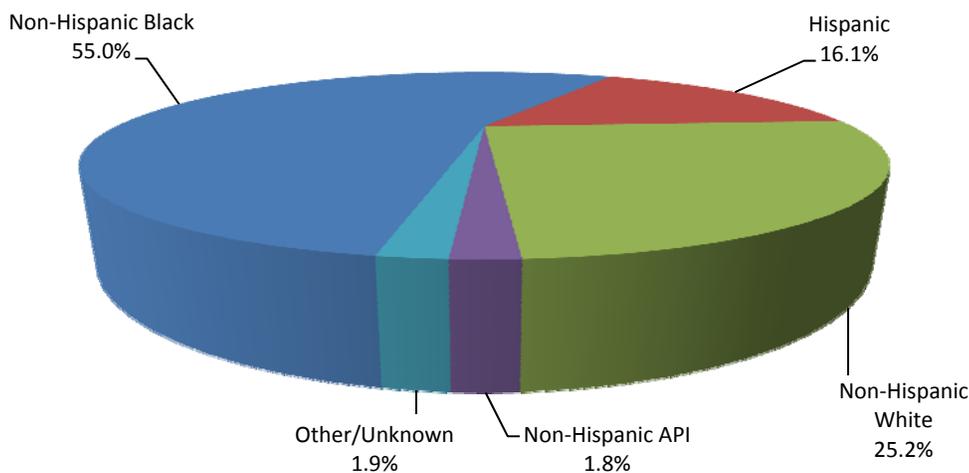
<sup>1</sup>Rank based on number of infant deaths.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

## **Five-Year Birth and Infant Death Trend**

Figure 5 shows the total number of births, 43,474 for the five-year period of 2005 to 2009. Fifty-five percent were to non-Hispanic black mothers, 25.2 percent were to non-Hispanic white mothers and 16.1 percent were to Hispanic mothers.

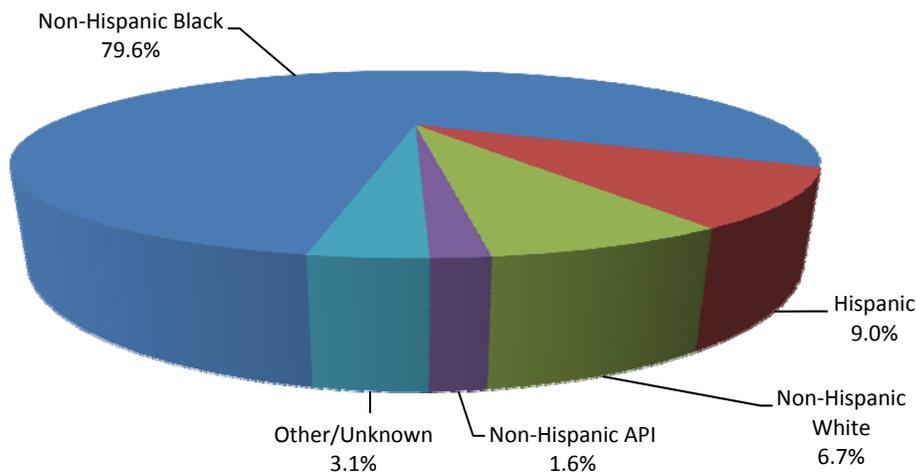
**Figure 5. Births by Race and Hispanic Origin of Mother, 2005-2009 (N=43,474)**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

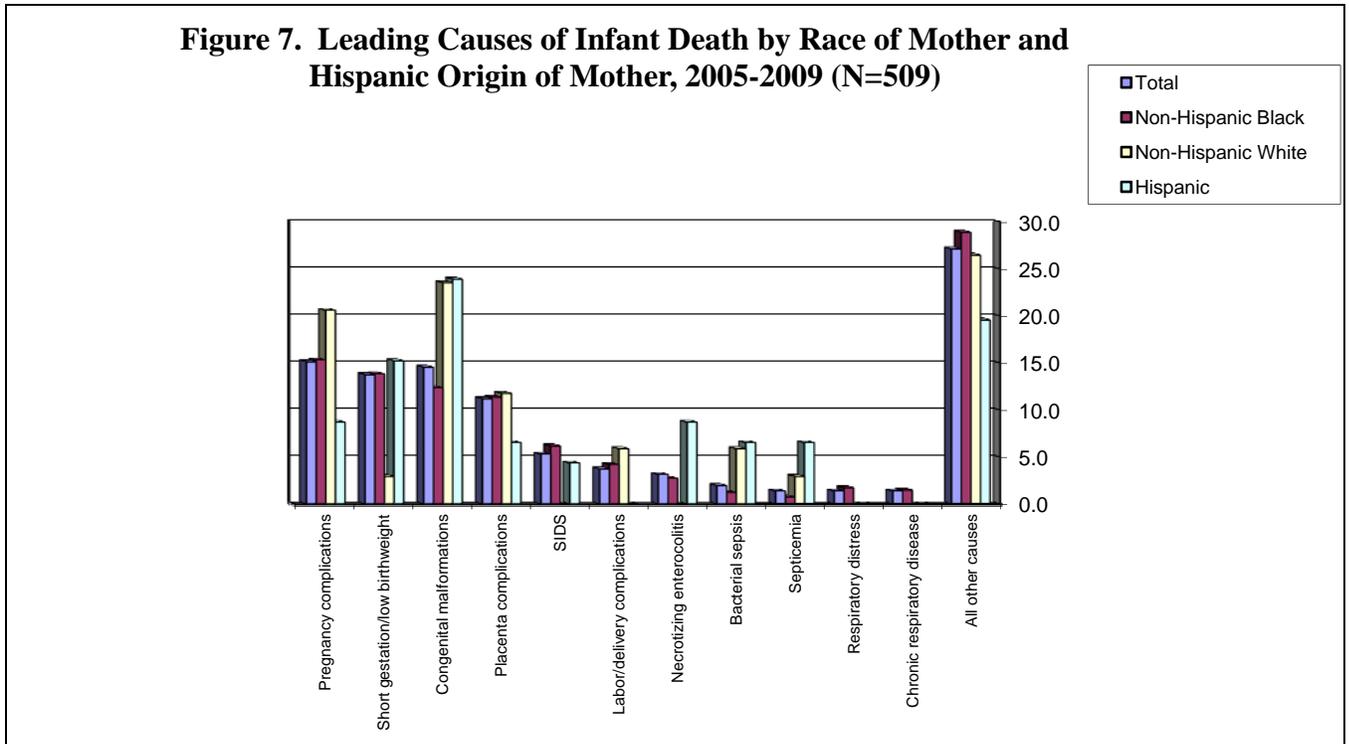
Of the total number of births (43,474), 509 infants died from 2005 to 2009. Figure 6 shows the average percentage of infant deaths by race/ethnicity from 2005 to 2009. On average between 2005 to 2009, infants to non-Hispanic black mothers, disproportionately died (79.6 percent) compared to their total number of births (55.0 percent).

**Figure 6. Infant Deaths by Race and Hispanic Origin of Mother, 2005-2009 (N=509)**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Figure 7 shows the leading causes of infant death over this five-year period (2005-2009). The leading cause of infant mortality was **Newborn affected by maternal complications of pregnancy**, which accounted for 15.1 percent, followed by **Congenital malformations, deformations and chromosomal abnormalities** (14.5 percent). The third leading cause was **Short gestation and low birth weight** (13.8 percent).

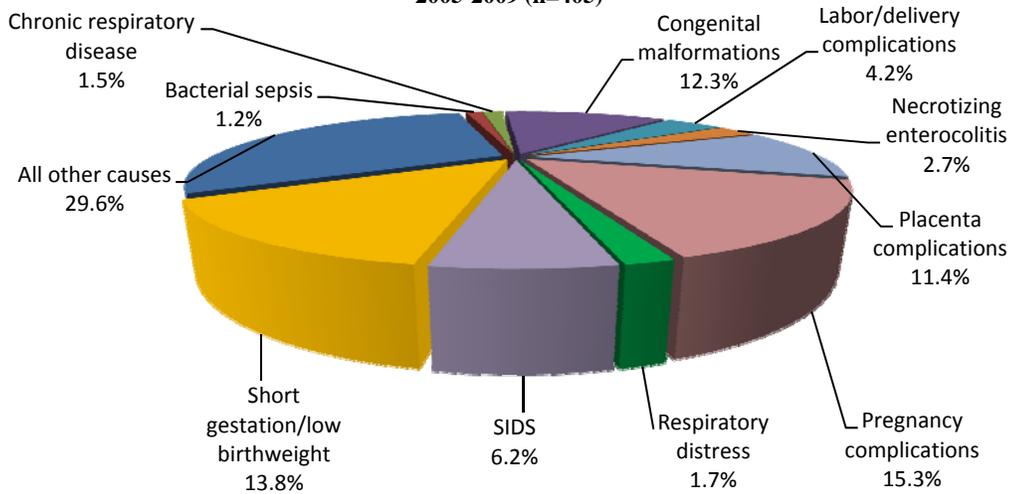


Note: Data by Asian/Pacific Islander were excluded due to small numbers.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

The leading cause of infant death to non-Hispanic black mothers, on average from 2005-2009, was **Newborn affected by maternal complications of pregnancy**, which accounted for 15.3 percent. **Disorders related to short gestation and low birth weight, not elsewhere classified** (13.8 percent) was the second leading cause of infant death to non-Hispanic black mothers, followed by **Congenital malformations, deformations and chromosomal abnormalities** (12.3 percent), which was the third leading cause (Figure 8).

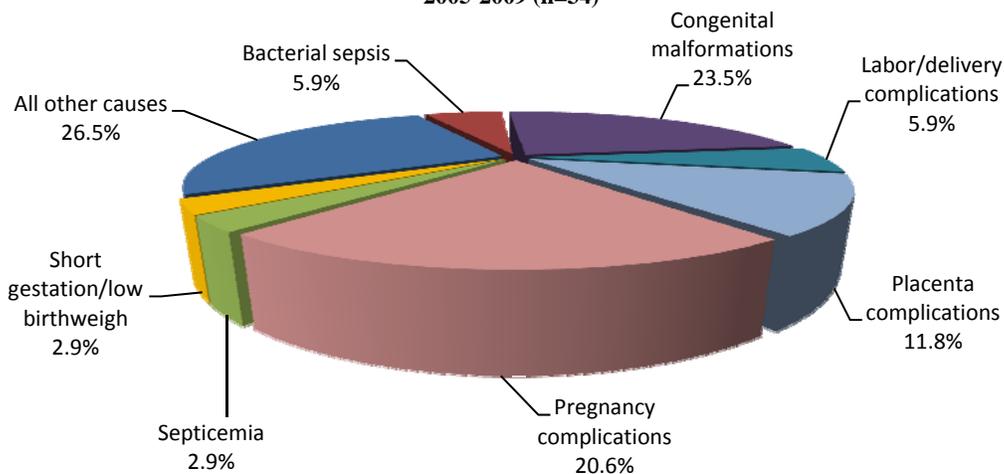
**Figure 8. Leading Causes of Infant Death to Non-Hispanic Black Mothers, 2005-2009 (n=405)**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

For infant deaths to non-Hispanic white mothers, **Congenital malformations, deformations and chromosomal abnormalities** was the leading cause of infant death (23.5 percent), followed by **Newborn affected by maternal complications of pregnancy** (20.6 percent). **Newborn affected by complications of placenta, cord and membranes** was the third leading cause of infant death (11.8 percent) (Figure 9).

**Figure 9. Leading Causes of Infant Death to Non-Hispanic White Mothers, 2005-2009 (n=34)**

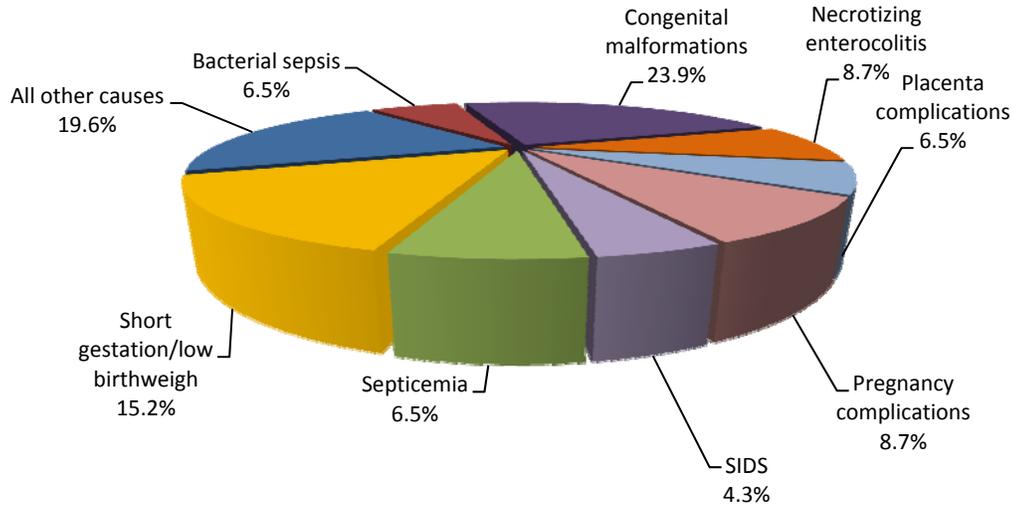


Note: Percentage does not add to 100 due to rounding.

Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

Figure 10 shows that the leading cause of infant death to Hispanic mothers was **Congenital malformations, deformations and chromosomal abnormalities (23.9 percent)**. **Disorders related to short gestation and low birth weight, not elsewhere classified (15.2 percent)** was the second leading cause. **Newborn affected by maternal complications of pregnancy and Necrotizing enterocolitis tied at third place (8.7 percent)**.

**Figure 10. Leading Causes of Infant Death to Hispanic Mothers, 2005-2009 (n=46)**



Source: Data Management and Analysis Division, Center for Policy, Planning and Evaluation, DC Department of Health.

In 2007, the District of Columbia Department of Health (DOH) released the Infant Mortality Action Plan, which is a comprehensive road map on the efforts to reduce the infant mortality rate in the District. There are three major foci of effort: (1) to increase the capacity of home visitation for pregnant women; (2) to enhance collaboration within DOH and between other agencies; and (3) to increase coordination between the government and community organizations. The Community Health Administration (CHA) has implemented activities that actively monitor and measure progress. New activities since the 2008 infant mortality report are discussed below.

### **Current Reproductive Health Outcomes Oriented Programs**

As there continues to be significant variation in the infant mortality rates for the District of Columbia in recent years after a period of decline in the 1990s, the rate has not continued to have a stable downward trend, however, rates decreased from 10.9 in 2008 to 9.9 in 2009. The District of Columbia Department of Health (DOH) Community Health Administration (CHA) continues its efforts to identify strategies and initiatives that increase District resident awareness of infant mortality; perinatal disparities; the importance of interconceptional health and planning; and resources available to improve birth outcomes. The CHA's Perinatal and Infant Health Bureau (PIHB) has led and continues to lead these initiatives. The PIHB's DC Healthy Start (DCHS) program provides services to identify and reduce behavioral and medical risk factors among pregnant and parenting women, and to improve access to healthcare and the overall health of mothers and children. Services include: outreach and recruitment of participants, home visitation, assessment and screening, referral and linkages to medical and other services, social support, and health education. In October 2011, PIHB improved its DCHS program by having all its case management staff complete the *Parents as Teachers* training to become certified Parents as Teachers (PAT) Educators. This new activity was incorporated into the home visitation services provided by the DCHS program. This nationally recognized evidence-based curriculum improves a child's school readiness; empowers parents to monitor their infant's development; improves understanding of the important role parents play in stimulating their child's growth and development; and teaches parents how to advocate for their child's education, health and well-being.

The PIHB continues to promote the "*I am a Healthy DC MOM*", and "*I am a Healthy DC Baby*" public information campaign. In June 2011, PIHB released "*I am a Healthy DC Dad*" public information campaign to target issues surrounding fathers in the District and how they can help improve their child's birth outcome. The three subthemes are: *I will commit to being a father*; *I will keep my baby safe*; and *I will stay fit and health*. Materials related to all these campaigns emphasize what parents can do to have a healthy baby and where to call to obtain more information and support.

The DOH's Safe Cribs program promotes and educates parents and caregivers on providing a healthy sleeping environment for infants in the District of Columbia. It aims to reduce the infant mortality rate and reduce the likelihood of Sudden Infant Death Syndrome (SIDS), suffocation and roll-overs caused by co-sleeping. The Safe Cribs program has 19 partner agencies/stakeholders throughout the District. These partners are community based organizations that provide case management services to their clients. The program works with these agencies to distribute cribs and pack-n-plays to their clients. Four of these partners provide SIDS education sessions within their agencies in Wards 1 – 4; however, plans are being made to educate all clients who receive the cribs/pack-in-plays to ensure that they receive the full two hours of education needed prevent SIDS. The program distributed 993 cribs and pack-n-plays to the residents of the District of

Columbia in FY11. Of the 993 items distributed, 66 were standard cribs and 927 were pack-n-plays that were provided to needy families would otherwise bed-share with their infants.

In 2011, DOH stepped up its Fetal Alcohol Syndrome Disorder (FASD) prevention efforts to educate pregnant women and women of childbearing age on the dangers of drinking alcohol while pregnant. The FASD State Plan was updated and submitted to US Department of Health and Human Services Substance Abuse Mental Health Services Administration (SAMHSA) FASD Center for Excellence on October 30, 2011. The FASD State Coordinator offered training to community based organizations and other programs whose mission include maternal child health. The coordinator also collaborated with the DC Healthy Start Program's health educators to offer a number of training and educational sessions including working with the New Heights Program (a school based teen parent program), the Safe Cribs Program and the First Time Motherhood Program to inform prospective parents about the dangers of drinking during pregnancy.

In 2009, DOH implemented the Electronic Birth Registry System. This system allows for the real-time analysis of trends related to perinatal outcomes and, with the appropriate consent from new mothers, allows determinations to be made relative to eligibility for Healthy Start and other programs to assist mothers and infants at risk.

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## **Technical Notes**

### **Data Sources and Method**

Data shown in this report for 2009 are based on data from the District of Columbia (DC) resident linked birth/infant death data set, which are part of the DC Vital Registration System and DC resident infant deaths and births that occurred in other states through the inter-state exchange agreement. Data for DC were collected and reported using the 1989 revision and 2003 revision of the U.S. standard birth certificate and the 2003 revision of the U.S. standard death certificate.

The linked birth/infant death data set is the primary data source for analyzing infant mortality trends and patterns in DC. In the linked birth/infant death data set, information from resident birth certificate is linked to information from resident death certificate for each infant less than 1 year of age. The purpose of the linkage is to use the many additional variables available from the birth certificate to conduct more detailed analyses of infant mortality patterns. The linked birth/infant death data set is particularly useful for computing accurate infant mortality rates by race and ethnicity because the race and ethnicity of the mother from the birth certificate is used in both the numerator and denominator of the infant mortality rate. The race and ethnicity from the birth certificate is generally provided by the mother at the time of delivery, and is considered to be more accurate than race and ethnicity from the death certificate that is provided by an informant, or in the absence of an informant, by observation. Linked birth/infant death data sets are available from the Data Management and Analysis Division (DMAD), Center for Policy, Planning, and Evaluation (CPPE), DC Department of Health.

The report also uses data from the National Center for Health Statistics (NCHS) 2009 preliminary mortality report for the United States, National Vital Statistics Reports, Vol. 59, No. 4, March 16, 2011. Deaths: Preliminary data for 2009. Available from: [http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59\\_04.pdf](http://www.cdc.gov/nchs/data/nvsr/nvsr59/nvsr59_04.pdf)

### **Cause-of-death classification**

The mortality statistics presented in this report were compiled in accordance with World Health Organization (WHO) regulations, which specify that member nations classify and code causes of death in accordance with the current revision of the International Classification of Diseases (ICD). The ICD provides the basic guidelines used in virtually all countries to code and classify causes of death. Effective with deaths occurring in 1999, the United States began using the Tenth Revision of this classification (ICD-10).

In this report, tabulations of cause-of-death statistics are based solely on the underlying cause of death. The underlying cause is defined by WHO as “the disease or injury which initiated the train of events leading directly to death, or the circumstances of the accident of violence which produced the fatal injury.” The underlying cause is selected from the conditions entered by the physician in the cause-of-death section of the death certificate. When more than one cause or condition is entered by the physician, the underlying cause is determined by the sequence of conditions on the certificate, provisions of the ICD, and associated selection rules and modifications. Generally, more medical information is reported on death certificates than is directly reflected in the underlying cause of death. This is captured in NCHS multiple cause-of-death statistics.

## **Tabulation lists and cause-of-death ranking**

For this report, the tabulation List of 130 Selected Causes of Death used for deaths for all infant less than 1 year of age. This list is also used to rank leading causes of death.

## **Race and Hispanic origin**

The 1989 revision of the U.S. Standard Certificate of Birth allows the reporting of race and Hispanic origin separately on the birth certificates. Race of the mother is reported in nine categories on the birth certificates: white, black, American Indian, Chinese, Japanese, Hawaiian, Filipino, “other” Asian or Pacific Islander, and “other” race. Hispanic origin of decedent is reported as the country of origin. The 2003 revision of the U.S. Standard Certificate of Birth and Death allow the reporting of more than one race (multiple races). This change was implemented to reflect the increasing diversity of the population of the United States and to be consistent with the decennial census. The race and ethnicity items on the revised certificate are compliant with the 1997 “Revision of the Race and Ethnic Standards for Federal Statistics and Administrative Reporting.” These were issued by the Office of Management and Budget (OMB) and have replaced the previous standards that were issued in 1997.

## **Population bases for computing rates**

Populations used for computing 2009 birth and death rates shown in this report represent the population residing in DC, enumerated as of April 1 for census 2000 year and estimated as of July 1 for 2009 (Release Date: June 2010). Birth and death rates shown in this report for 2009 by ward were calculated using ward estimates derived from ward-population proportions from the District of Columbia Census 2010 Demographic and Housing Profiles by Ward, U.S. Census Bureau, Census 2010 Data prepared by the DC Office of Planning State Data Center.

## **Computing rates**

Rates in this report are on an annual basis per 1,000 live births and per 100,000 population residing in the District of Columbia.

## **Availability of mortality data**

Infant Mortality data are available in publications, unpublished tables, and electronic products as described on the Department of Health, Center for Policy, Planning, and Evaluation website at the following address: <http://doh.dc.gov/doh/cwp/view,a,1374,q,602045.asp>. Detailed analyses not provided in this report are available upon request.

## Definition of terms

Birth weight	The weight of the fetus or infant at the time of delivery.
Gestational period	Number of weeks elapsed between the first day of the last menstrual period and date of delivery or date of pregnancy termination. The term gestational period is interchangeable with weeks of gestation, gestational age, and duration of pregnancy. This report uses the physician's estimate of gestational age.
Infant death	Death of an infant before his or her first birthday.
Live birth	Every product of conception that gives a sign of life after birth, regardless of the length of the pregnancy, is considered a live birth. This concept is included in the definition set forth by the World Health Organization in 1950 and revised in 1988 by a working group formed by the American Academy of Pediatrics and the American College of Obstetricians and Gynecologists. A live birth is the complete expulsion or extraction from its mother of a result of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached.
Low birth weight	Newborn weighing under 2,500 grams or 5 lbs., 8 oz.
Neonatal death	Death of a child younger than 28 days of age.
Occurrence data	Vital statistics compiled on the basis of where the vital event actually occurred.
Plurality	The number of siblings born as the result of a single pregnancy (e.g., twins, triplets).
Post-neonatal death	Death of a child 28 days of age or older but younger than one year of age.
Premature birth	A live birth weighing 2,500 grams (5-1/2 pounds) or less. If birth weight is not stated, length of gestation (under 37 weeks) is used.
Preterm birth	Birth before 37 completed weeks of gestation.
Residence data	Vital statistics compiled on the basis of the usual place of residence of the mother regardless of where the birth occurred.
Very low birth weight	Newborn weighing under 1,500 grams or 3lbs. 5oz.

## **Rates and Ratios**

The impact of chance variation must be considered in evaluating categories with small frequencies. For example, a small change in the number of births by racial/ethnic groups in a county or ward—as is the case in the District—can disproportionately affect the fertility rate for that county. Rates for cities and counties, therefore, require special consideration. Regional and state rates, with larger frequencies, provide more stable rates.

Birth Rate (Crude) = (Number of live births / Population) X 1,000

Fertility Rate = (Number of live births to women aged 15-44/ Number of women aged 15-44) X 1,000

Infant mortality rate = (Number of infant deaths/Number of live births) X 1,000

Neonatal mortality rate = (Number of neonatal deaths/Number of live births) X 1,000

Post-neonatal mortality rate = (Number of post-neonatal deaths/Number of live births) X 1,000