



**Maternal and Infant Health Monthly Surveillance Report**  
**Hamilton County**  
**May 2010**

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## Introduction

The series of Maternal and Infant Health Monthly Surveillance Reports is part of a county-wide initiative to improve maternal and infant health and to reduce infant mortality. In order to take effective actions to improve the health and safety of infants in the community, it is essential to identify, describe and monitor the problems and the populations at risk. This report characterizes the current status of infant mortality and select risk factors in Hamilton County.

The data source for this report series has recently been enhanced to improve the monthly surveillance process.

The Ohio Department of Health (ODH) is now providing additional mortality data to Hamilton County Public Health on a monthly basis that will be used improve the timeliness and accuracy of monthly surveillance. These provisional data are numbers only and do not include any additional information from birth or death certificates. The data included in this report were obtained from the ODH on 5/20/2010.

### Infant Mortality Surveillance

- Number of infant deaths by month
- Current monthly infant mortality rate
- Current monthly neonatal mortality rate
- Current monthly preterm birth rate
- Current two year IMR moving average
- Comparison of “Filed” and “Unfiled” data sources

## Infant Mortality Surveillance

Public health surveillance is the ongoing systematic collection, analysis, interpretation and dissemination of data regarding a health-related event for use in public health action to reduce morbidity and mortality and to improve health.<sup>1</sup> The Maternal and Infant Health Surveillance System is designed to better understand infant morbidity and mortality in our community, monitor infant deaths and evaluate whether collective actions to prevent infant death are effective. The surveillance charts contained within this report are tools that are used to monitor infant mortality and select risk factors in our community.

Please read the General Guidelines for Using Surveillance Charts in the Appendix.

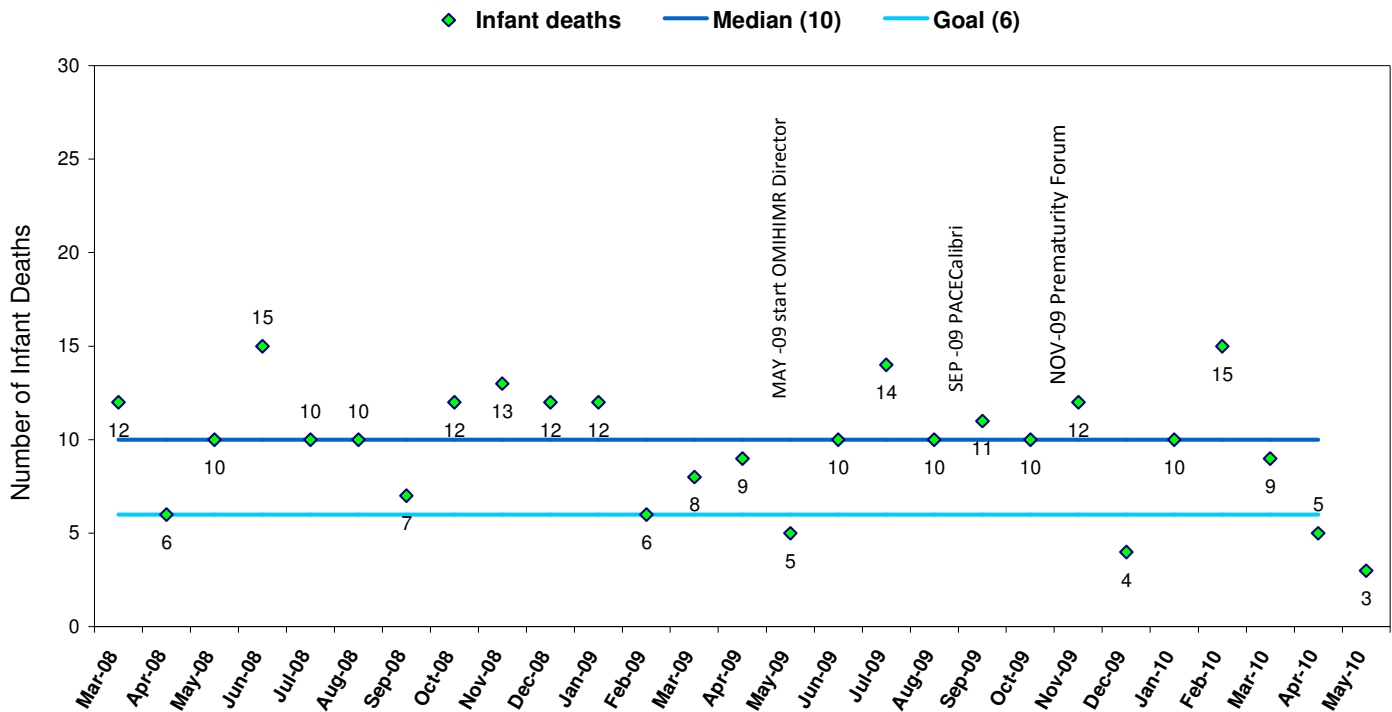
<sup>1</sup> Centers for Disease Control and Prevention. *Updated Guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group*, WMMR, July 27, 2001, Vol.50 No. RR—13

# Number of Infant Deaths

There were 5 infant deaths recorded in Hamilton County during April and 3 deaths in May as of May 20, 2010.

One measure of infant mortality is the number of deaths per month. Figure 1 shows the count of infant deaths in Hamilton County by month over the past two years. Provisional data indicate that there were 10 deaths in January. Updates to the February data increased the number of deaths reported to 15 (Figure 1). Infant mortality reported for March increased from 2 to 9 deaths since the last monthly report. To date there are 5 deaths recorded for April and 3 deaths in May. Please see Table 1 on page 7 to learn more about the “provisional data.”

**Figure 1. Number of Infant Deaths, Hamilton County 3/2008-5/2010\***



NOTE: The median is calculated using data from March 2008 – May 2010.

\* Data for 2009-2010 are provisional

Data Source: Ohio Department of Health Vital Statistics

# Infant Mortality Rates

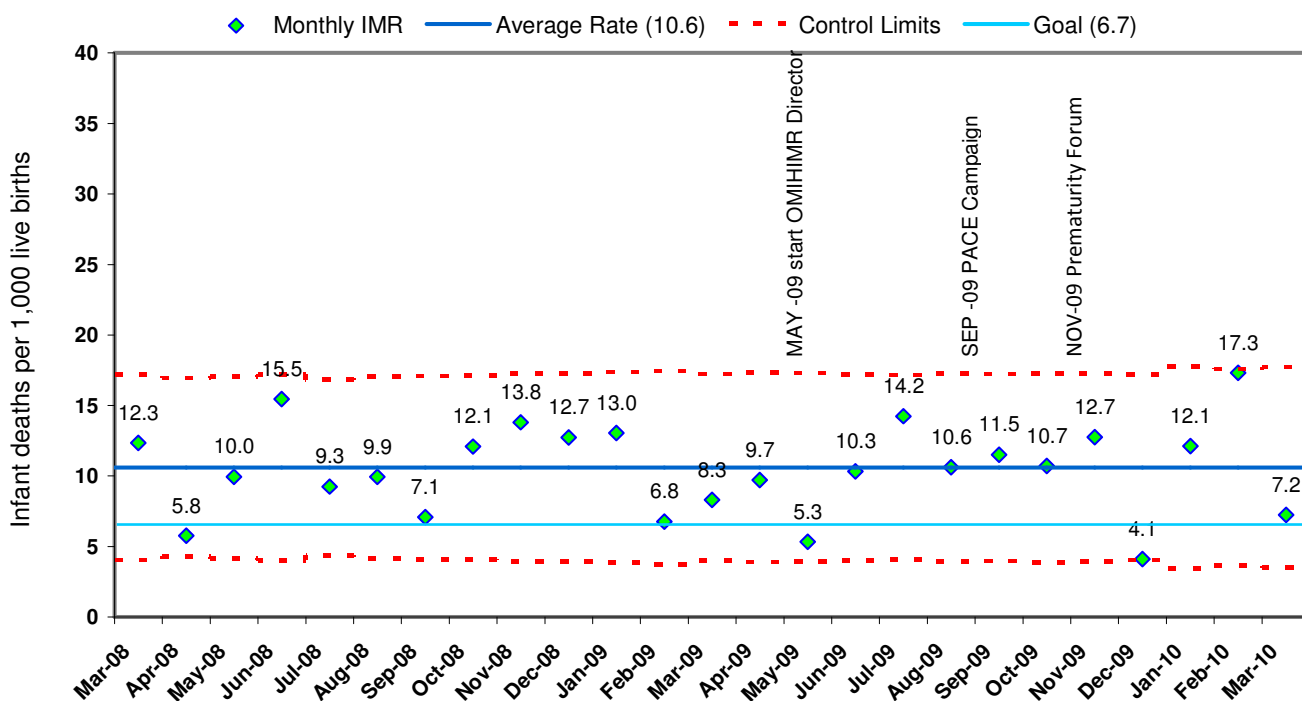
Another method used to monitor infant mortality is examination of the number of infant deaths in relation to the total number of births. An increase in the number of infant deaths may not be surprising if there is also an increase in the overall number of babies born. To evaluate infant deaths with regard to the number of births, the Infant Mortality Rate (IMR) is calculated. The IMR is the number of infants less than one year who died per 1,000 live births. The Neonatal Mortality Rate (NIMR) is a specific IMR for neonates (infants younger than 28 days) who died per 1,000 live births.

**The February IMR (17.3) appears to be at the highest level in more than two years, 1.6 times higher than expected.**

Based on the most recent provisional data available, the IMR in January rose to 12.1 from the 8.5 previously reported (Figure 2). The January IMR reported here is based on 825 live births. The February IMR of 17.3 was the highest rate recorded during the past 24 months and nearly exceeded the statistical threshold upper bound; the IMR is based on 867 live births (Figure 2). The IMR for March is currently estimated at 10.9, based on the 9 infant deaths and 829 births currently recorded by ODH. The current IMR for April is 13.2 and is based on 378 births. No birth data are available yet for May so an IMR was not calculated for the 3 reported deaths.

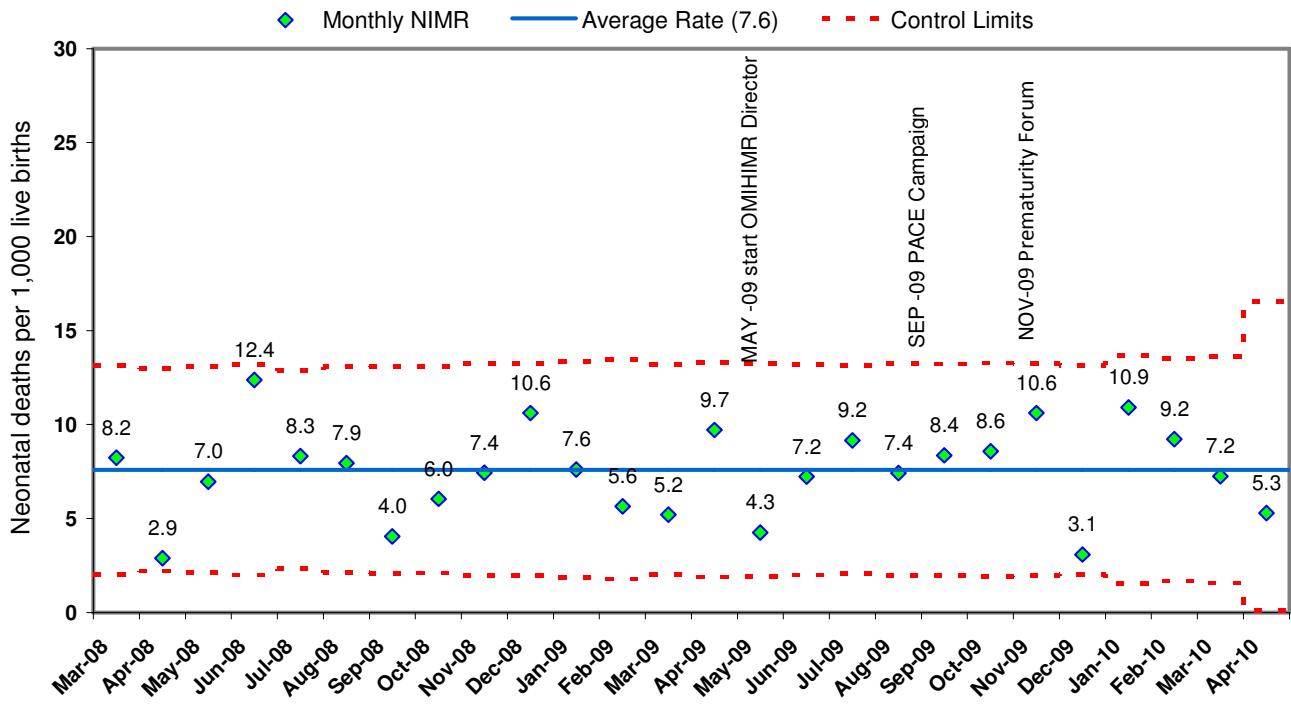
The NIMR remained above the mean (10.6 neonatal deaths per 1,000 live births) in January and February 2010 (Figure 3). The provisional April rate is currently estimated as 5.3 deaths per 1000 live births.

**Figure 2. Infant Mortality Rate Surveillance Chart, Hamilton County 3/2008-3/2010\***



NOTE: The mean is calculated using two years of data from March 2008 – February 2010.  
 \* Data for 2009-2010 are provisional  
 Data Source: Ohio Department of Health Vital Statistics

**Figure 3. Neonatal Mortality Rate Surveillance Chart, Hamilton County 3/2008-4/2010\***



NOTE: The mean is calculated using two years of data from March 2008 – March 2010.

\* Data for 2009-2010 are preliminary

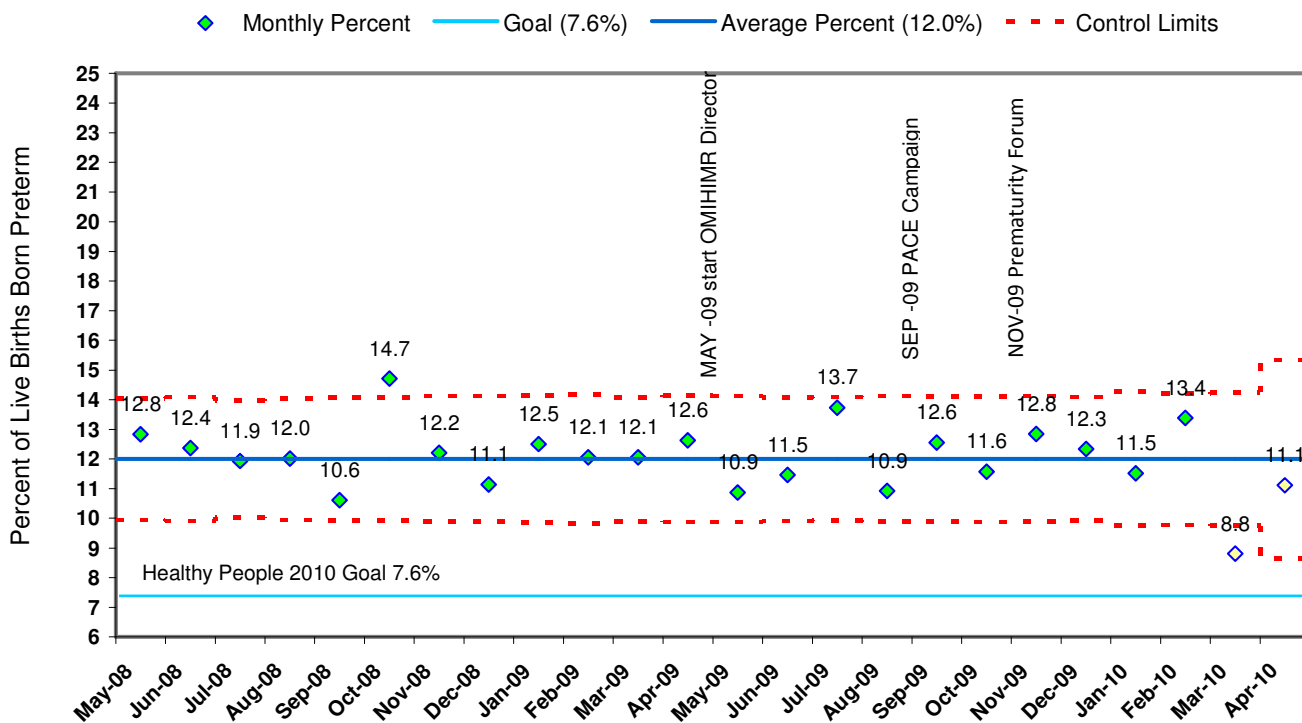
Data Source: Ohio Department of Health Vital Statistics

## Preterm Birth Rates

The preterm birth rate is the percentage of infants born before 37 weeks gestation. Prematurity is a significant risk factor for infant mortality. The January preterm birth rate (11.5%) was lower than the two-year average rate of 12.0% (Figure 4). The provisional preterm birth rate in February (13.4%) was the highest since July 2009. This increase may be associated with the concurrent increase observed in the IMR (Figures 2 & 4). The preterm birth rate dropped precipitously in March to 8.8%; however, these figures remain subject to change. The April preterm rate is estimated at 11.1% based on current provisional data.

The percentage of preterm births in February 2010 (13.4%) was higher than the average rate of 12.0%.

**Figure 4. Preterm Birth Rate Surveillance Chart, Hamilton County 5/2008-4/2010\***



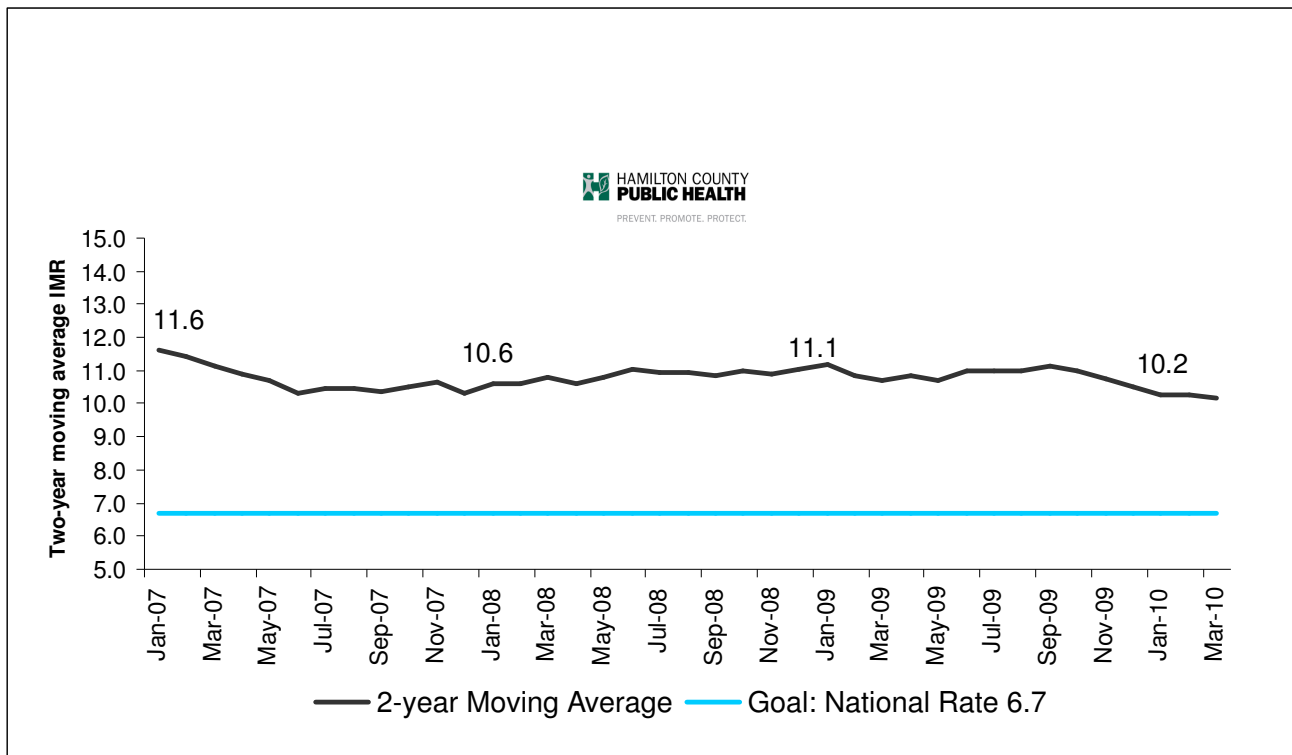
Yellow data points are likely to change.

NOTE: The mean is calculated using two years of data from May 2008 – April 2010.  
 \*Data for 2009-2010 are provisional  
 Data Source: Ohio Department of Health Vital Statistics

## Two Year Moving Average

Reviewing monthly rates is one approach used to determine whether there has been a change over time. However, monthly rates have a tendency to fluctuate and may disguise emerging trends. An alternative measure is the un-weighted, monthly moving average, which can provide a more stable picture of evolving trends. In Figure 5, the infant mortality rate for each month is the twenty-four month average of months immediately prior to and including the current month. The two-year moving average decreased from January 2007 (11.6) to January 2010 (10.2). Although an upward trend was observed in 2008, this trend was flanked by significant downward trends in 2007 and 2009 (Figure 5). Figure 5 shows a decrease of almost one infant death per 1000 live births since January 2009. Please note that the moving average is subject to change based on new data, which may ultimately affect current trends. Multiple approaches are required to measure the impact of program efforts on infant mortality.

**Figure 5. Two Year Moving Average Infant Mortality Rate by Month  
Hamilton County 1/2007-3/2010\***



NOTE: The infant mortality rate for each month is the average of twenty-four months immediately prior to and including that month.

NOTE: Data for 2009-2010 are provisional

Data Source: Ohio Department of Health Vital Statistics

## Data Limitations

Table 1 displays the discrepancy between the two infant mortality data sets available from the State of Ohio. The number of infants for whom data which cannot be linked (birth certificate to death certificate) is listed in the “Not Filed” row, indicating that one or both of the two certificates has not yet been filed with the state.

The number of infants for whom the two data sources can be linked are listed in the “Filed” row in Table 1. The “Filed” data is valuable for public health efforts because much information from the birth certificate can be linked to that provided by the death certificate, so that the cause of death can be correlated with prenatal and perinatal risk factors. However, even within the “filed” data set, demographic, medical and/or risk factor information may not be complete or may not link properly

“Unfiled” data provides the numbers of births and deaths in a more timely manner but does not allow risk factor analysis. “Unfiled” data are used in this report for all sections except preterm birth. Preterm birth information was obtained from the “filed” dataset.

By May 20, 2010, all 2009 death certificates had been filed at the state level and the two data sources agreed on the same basic set of numbers. Prior to that time, the number of infant deaths reported was higher in the “unfiled” data set. Please note that almost 20% of the 2010 infant death certificates remained unfiled as of 5/20/2010.

**Table 1. “Filed” vs. “Unfiled” Pediatric Mortality Data  
Hamilton County 2009 - 2010**

<b>State Provisional Data – Pediatric Mortality</b>				
	<b>2009</b>		<b>2010</b>	
	<b>N=154</b>		<b>N=55</b>	
	<b>No. Children &lt; 18</b>	<b>No. Infants &lt; 1 yr.</b>	<b>No. Children &lt; 18</b>	<b>No. Infants &lt; 1 yr.</b>
<b>Certificates filed</b>	<b>43</b>	<b>111</b>	<b>12</b>	<b>34</b>
<b>Certificates not filed</b>	<b>0</b>	<b>0</b>	<b>1</b>	<b>8</b>



## Appendix

### General Guidelines for Using Surveillance Charts

The Hamilton County Infant Mortality Surveillance System, part of the Office of Maternal and Infant Health and Infant Mortality Reduction, uses **surveillance charts** to monitor infant mortality rates and preterm birth rates. These charts provide a method for monitoring the status of infant health over time and provide timely feedback on the effectiveness of local efforts to reduce infant deaths and preterm births.

Several tools are included in the surveillance charts that help facilitate interpretation: (1) a baseline - the center line [solid] which is the average number of deaths or births per month over the preceding two years, (2) a goal line which shows the goal that has been established by the community and (3) upper and lower control limits [dashed] that allow users to detect unusual events. Annotations indicate when certain interventions began or special changes occurred.

Here are some types of unexpected events that could be detected within surveillance charts:

- \* A single point outside of the control limit
- \* A run of eight or more consecutive points below or above the center line
- \* Six consecutive decreasing or increasing points
- \* Two out of three consecutive points near a control limit

**This report was prepared for the Office of Maternal and Infant Health and Infant Mortality Reduction, now known as the Women and Infant Vitality Network.**



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