



Maternal and Infant Health Monthly Surveillance Report
Hamilton County
August 2010

Andrea Allen, MPH, Epidemiologist
Debbie Gordon, BBA, Data Systems Specialist
Ted Folger, MS, Director of Epidemiology and Assessment



250 William Howard Taft Road, 2nd Floor
Cincinnati, OH 45219 • 513.946.7800
hamiltoncountyhealth.org

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 (**Appendix A**). The data included in this report were obtained from the ODH on September 14, 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

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.¹ 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 B**.

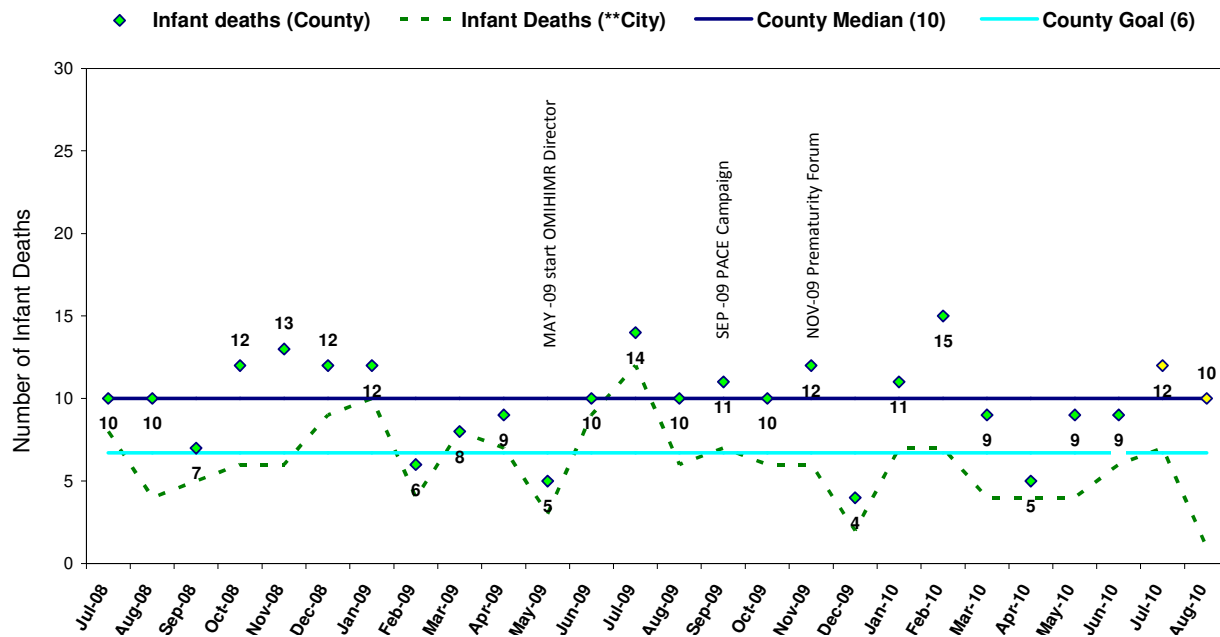
¹Centers for Disease Control and Prevention. *Updated Guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group*, MMWR, July 27, 2001, Vol.50 No. RR—13

Number of Infant Deaths

There were 10 infant deaths recorded in Hamilton County during August as of September 14, 2010. The two-year median remained 10 deaths per month in Hamilton County.

One measure of infant mortality is the number of deaths per month. Figure 1 below show the count of infant deaths in Hamilton County and Cincinnati by month over the past two years. Updates to the July data increased the number of deaths reported from eleven to twelve (Figure 1). Infant mortality (n=10 provisional deaths) reported for August was at the two-year median of 10 deaths (Figure 1). Updates to the city of Cincinnati data increased the number of deaths for June and July. Provisional data for 2010 indicate that 49% of infant deaths have occurred to residents of Cincinnati (Figure 1). Please see **Appendix A** on page 7 to learn more about the provisional death data.

Figure 1. Number of Infant Deaths, Hamilton County July 2008 - Aug 2010*



NOTE: The county median is calculated using data from July 2008 – June 2010.

* Data for 2009-2010 are provisional; ODH reconciles (i.e., finalizes) data by fall of the subsequent year. Yellow points are more likely to change in future reports.

** Data for the City of Cincinnati should be interpreted with caution after 2008. Records in 2009-2010 have not been geo-coded and city assignment is based on provisional methods; data are subject to change.

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 monthly IMR is the number of infants less than one year who died divided by the number of live births during the month 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 June IMR (10.4) was similar to the two-year average of 10.6 deaths per 1,000 live births. The provisional data currently indicate an elevated IMR for the month of August; this may change with subsequent updates.

The IMR in June (10.4) was similar to the two-year average of 10.3 deaths per 1,000 live births (Figure 2). The IMRs for July and August are currently estimated at 13.2 and 16.6, respectively (Figure 2). The July IMR remains elevated after updates to the July data on September 14, 2010. The elevated IMR in August is likely an artifact of incomplete birth statistics as of the last data analysis on September 14, 2010; see subsequent reports for improved statistical validity (**Appendix A**). The IMRs were calculated based on 907 births recorded in July and only 602 births recorded in August.

The NIMR remained above the mean (7.5 neonatal deaths per 1,000 live births) in May-August (Figure 3); however, these rates are provisional and subject to change. Eight of the 10 deaths in August were classified as neonatal deaths. Neonatal deaths have comprised 75% of the infant deaths recorded in 2010.

Figure 2. Infant Mortality Rate Surveillance Chart, Hamilton County July 2008- Aug 2010*

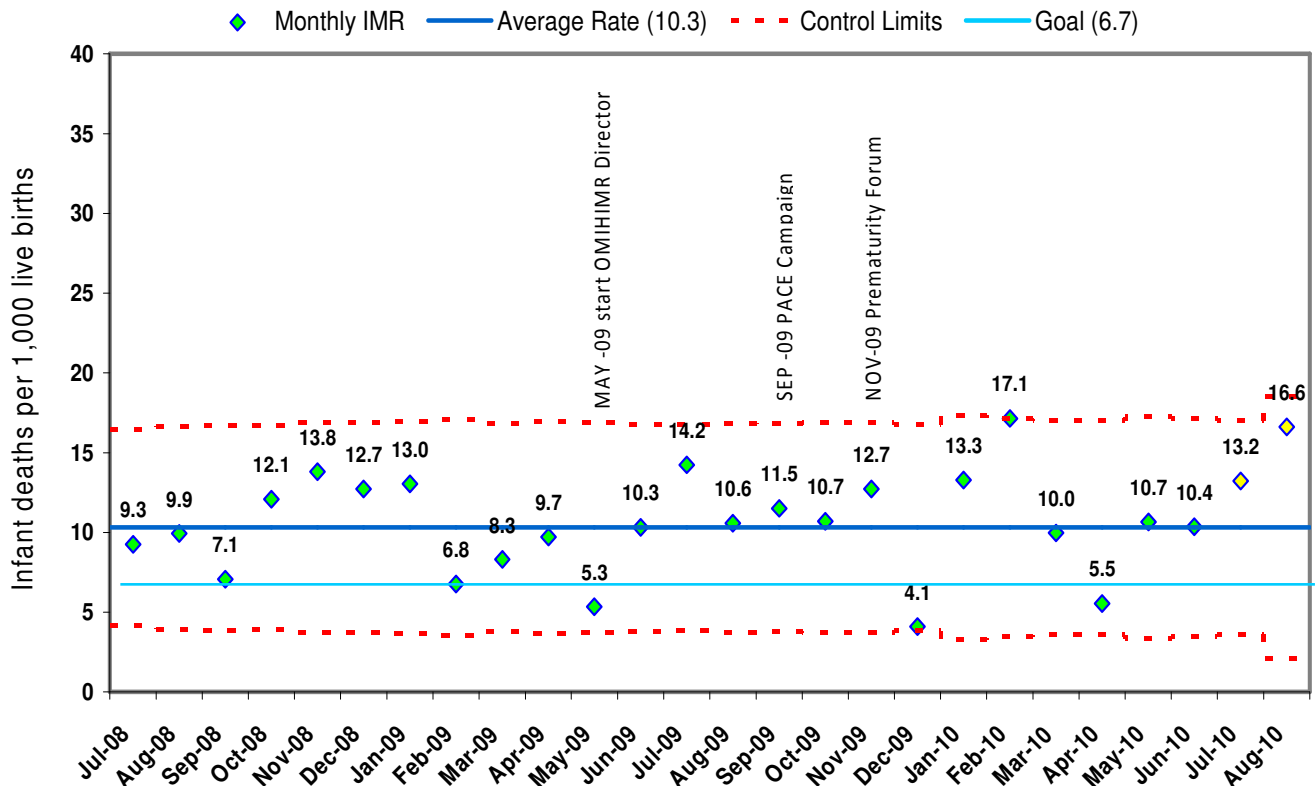
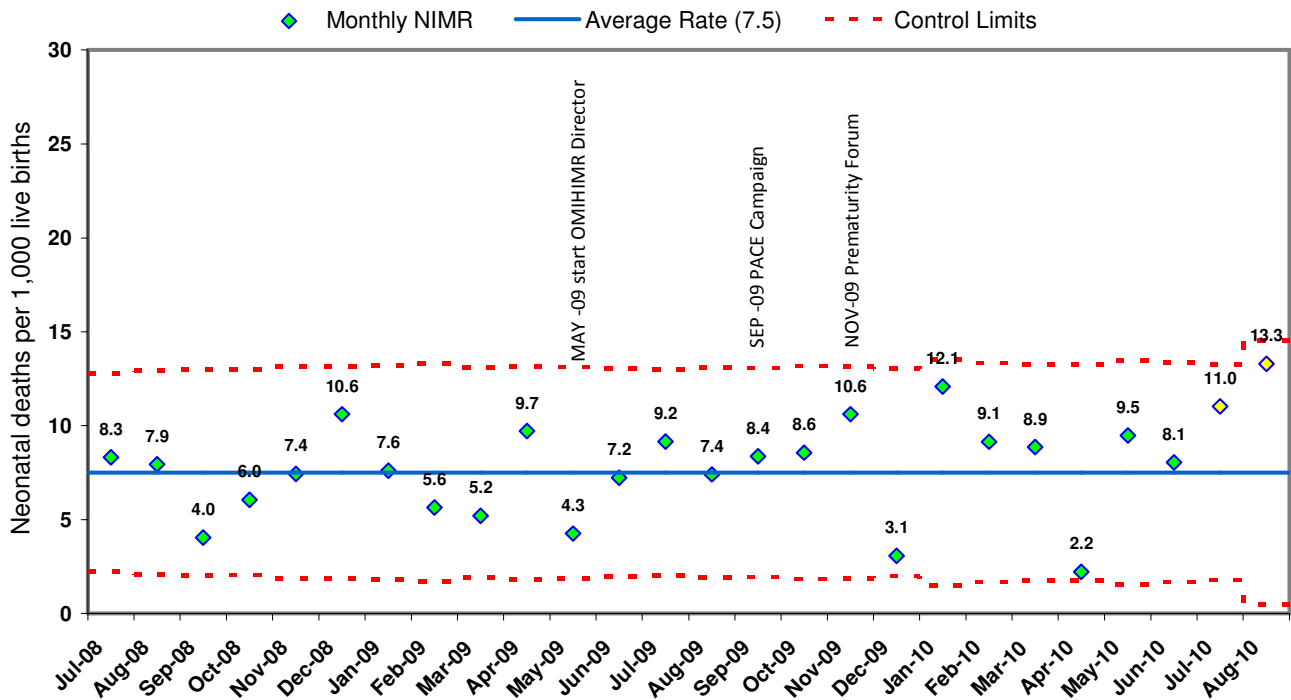


Figure 3. Neonatal Mortality Rate Surveillance Chart, Hamilton County July 2008 Aug 2010*



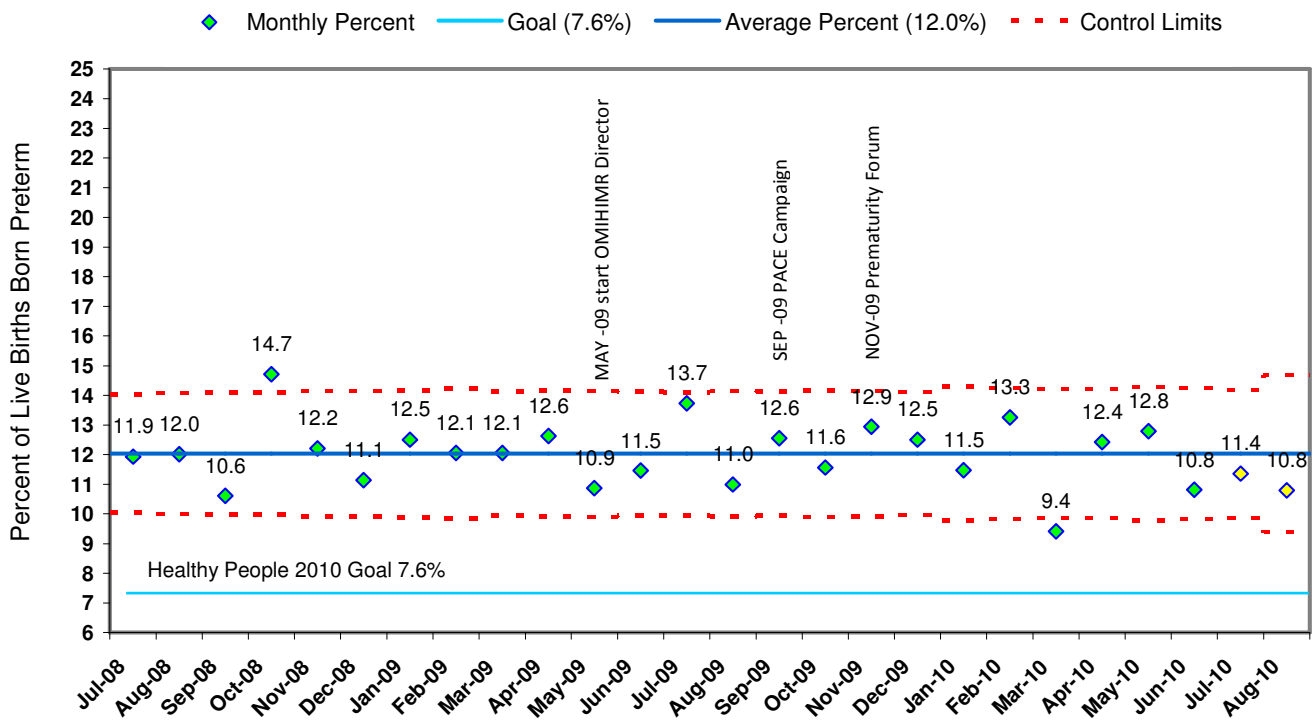
NOTE: The mean is calculated using two years of data from July 2008–June 2010. Yellow points are more likely to change in future reports.
 * Data for 2009-2010 are provisional
 Data Source: Ohio Department of Health Vital Statistics

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 percentage of preterm births in May 2010 (12.8%) was higher than the two-year average of 12.0%. Updates to the July data increased the rate of preterm births from 9.6% to 11.4%; however this rate remains below the two year average. The data for the past 3 months display rates that are lower than the two year average of 12.0% (Figure 4).

The percentage of preterm births in May 2010 (12.8 %) was higher than the two-year average of 12.0%. Rates for June, July, and, August were lower than May and two year average.

Figure 4. Preterm Birth Rate Surveillance Chart, Hamilton County July 2008- Aug 2010*

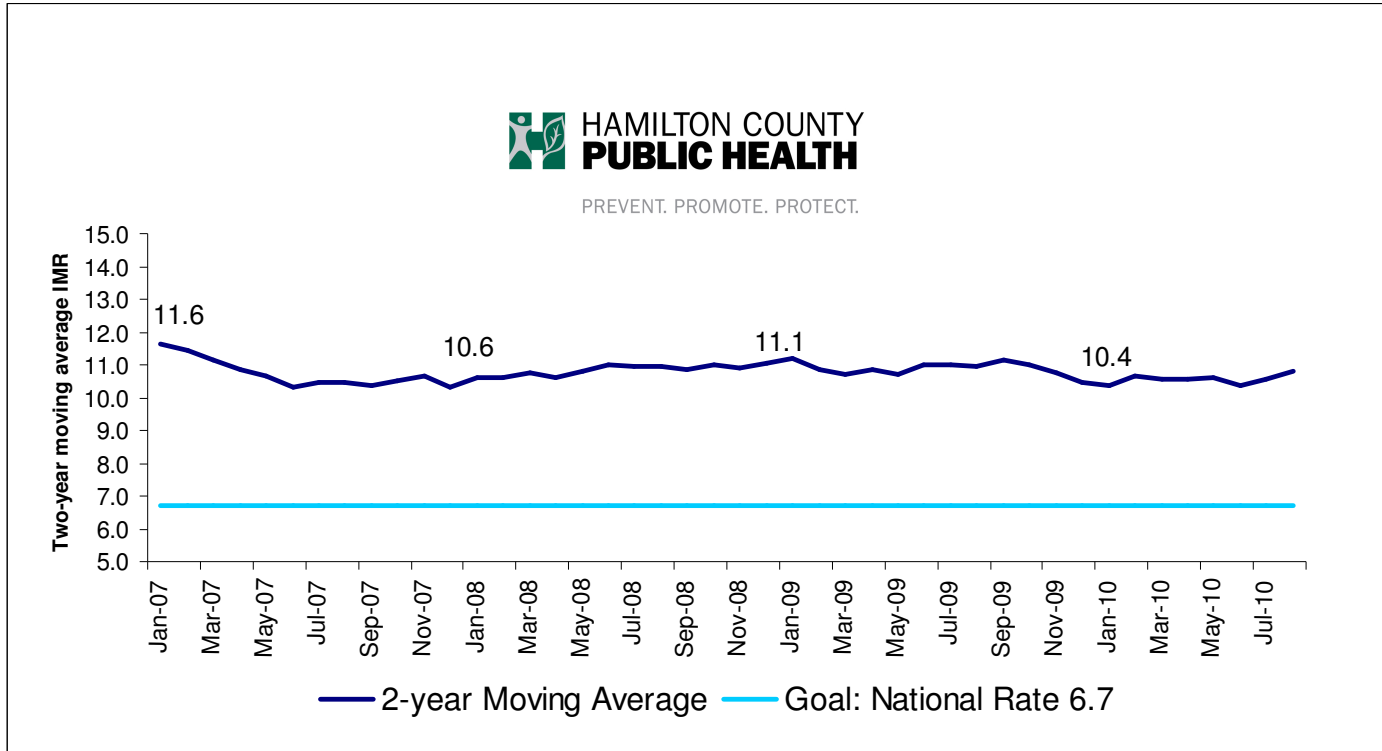


NOTE: The mean is calculated using two years of data from July 2008 – June 2010. Yellow points are more likely to change in future reports.
 *Data for 2009-2010 are provisional
 Data Source: Ohio Department of Health Vital Statistics

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 August 2010 (10.8) (Figure 5). Although an upward trend was observed in 2008, this trend was flanked by significant downward trends in 2007 and 2009 (Figure 5). The data for 2010 indicate that the two-year moving average has ranged from 10.4 - 10.8 (Figure 5). 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 January 2007- August 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

Appendix A- Data Limitations

There are multiple datasets that can be used to support surveillance activities associated with infant mortality. Two primary data sources are used to supply the data for monthly Maternal and Infant Health Surveillance Report (http://www.hamiltoncountyhealth.org/en/resource_library/reports.html). Both of these data sources are considered provisional until the Ohio Department of Health completes data reconciliation processes each year. Provisional Data Source A (PDS-A) contains records that correspond to filed certificates and are linkable (i.e., birth to death records), whereas Provisional Data Source B (PDS-B) contains records that correspond to both filed and unfiled/pending certificates and are not linkable. The former (PDS-A) is used for more in-depth analysis of risk factors, but suffers from incompleteness due to missing unfiled/pending certificates. The latter (PDS-B) is used to collect death data more expeditiously, but provides only count data, precluding more in-depth analysis of prenatal and perinatal risk factors. Data from both PDS-A and PDS-B become more accurate as the length of time increases from event to report. Annually, the ODH releases a reconciled dataset that contains final cause of death information and geographic information.

PDS-B is used in this report to provide the count statistics in each section except infant deaths within the city of Cincinnati (Figure 1) and preterm births (Figure 4). Table 1 displays the discrepancy between the two infant mortality data sources available from the Ohio Department of Health (ODH). There were 12(15%) infant deaths in 2010 that were not yet filed at the time of this report (Table 1). By May 20, 2010, all 2009 death certificates had been filed at the state level and both data sources corresponded. Prior to that time, the number of infant deaths reported was higher in PDS-B than in PDS-A. Please note that delayed certificates directly impact data quality and therefore, the integrity of findings shared in this report.

Table 1. Infant Mortality Data Source Assessment, Hamilton County 2009 - 2010

Data Source	2009	2010
	No. Infants < 1 yr.	No. Infants < 1 yr.
PDS-A	111	69
PDS-B	111	81
Discrepancy	0	12

Appendix B

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.



Thank you to John Paulson and Inez Williams, Ohio Department of Health Center for Public Health Statistics and Informatics, and Merrily Wholf, Ohio Bureau of Child and Family Health Services, for providing data for this report. We also appreciate the contributions of the Child Policy Research Center at Cincinnati Children's Hospital Medical Center for ongoing quality improvement support and the HCIMSS Data Work Group for input and guidance.