

Maternal and Infant Health Monthly Surveillance Report
Hamilton County
August 2009
Expanded Quarterly Edition

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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 reduce infant mortality. In order to make effective actions that improve the health and safety of infants in the community, it is essential to identify, describe and monitor the problem and the populations at risk. This report characterizes the current status of infant mortality and select risk factors in Hamilton County.

Monthly surveillance

- Number of infant deaths by month
- Current monthly infant mortality rate
- Current monthly neonatal mortality rate
- Current monthly preterm birth rate

Quarterly surveillance

- PPOR phase 1
- Risk factor surveillance

What is 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 mortality in our community, monitor infant deaths that occur and evaluate whether collective actions to prevent infant death are effective. The “surveillance chart” is a very useful tool because it is set up to be interpreted quickly. Please read the General Guidelines for Using Surveillance Charts in the Appendix.

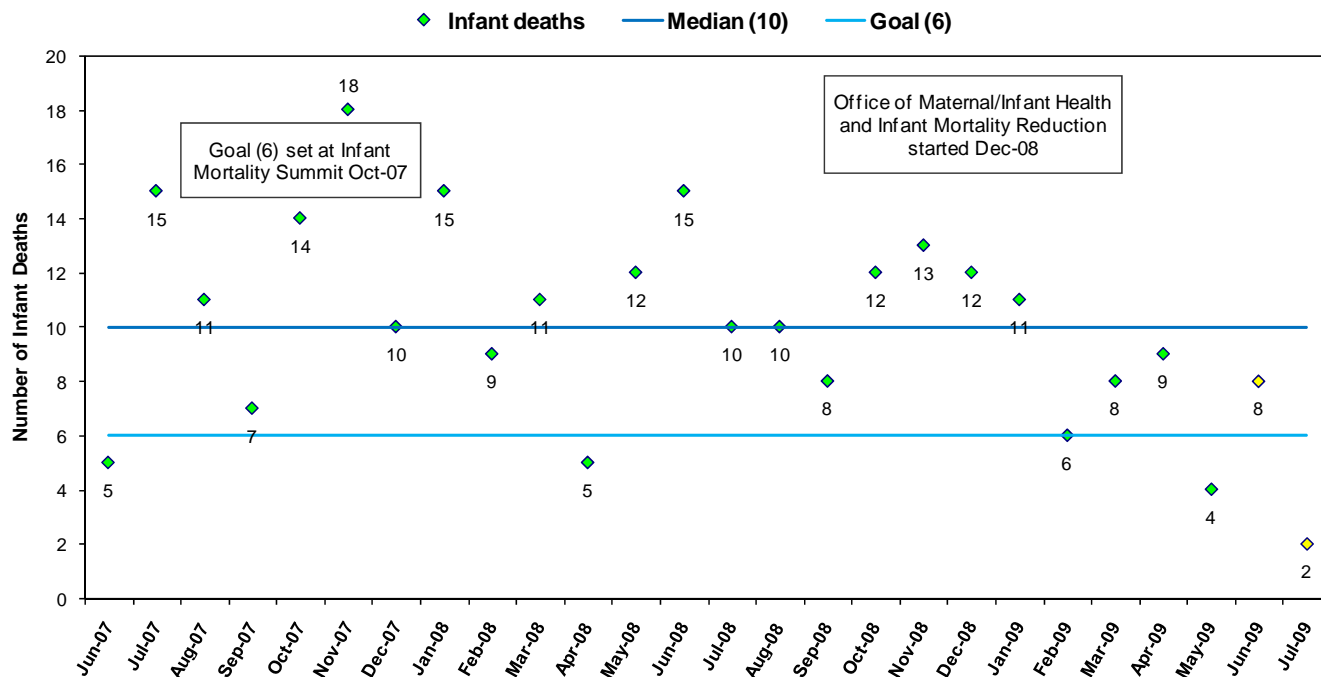
Number of Infant Deaths

There were 4 infant deaths in May.

One way to monitor infant mortality is to count the number of infant deaths that have occurred. Figure 1 shows the count of infant deaths by month over the past two years. In May 2009 the number of infant deaths (4) was below the goal of 6. As previously noted in the May Surveillance report seasonal trend analysis, Hamilton County tends to have fewer infant deaths in the spring months - April, May and June.

¹ 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

Figure 1. Number of Infant Deaths, Hamilton County 2007-2009*



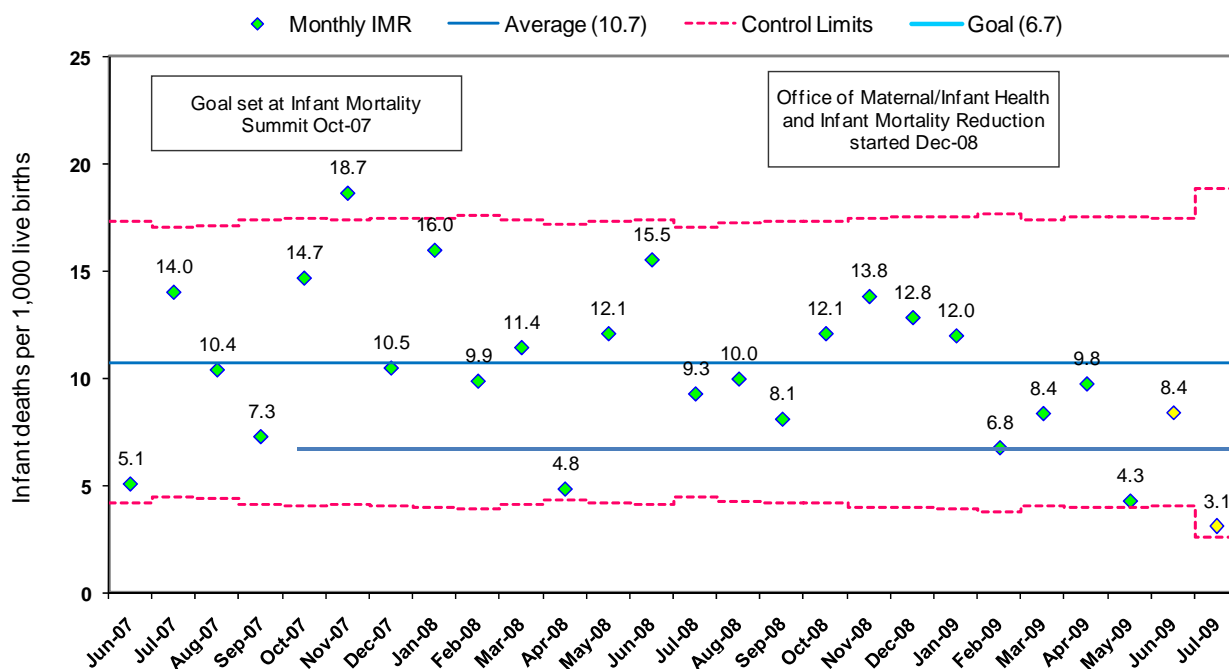
NOTE: The median is from June 2007 –May 2009 data
 NOTE: Yellow points are derived from preliminary data and are likely to change.
 *Data for 2008 and 2009 are preliminary
 Data Source: Ohio Department of Health

Infant Mortality Rates

Another way to monitor infant mortality is to look at the number of infant deaths with the number of births that occur. 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, we use the Infant Mortality Rate (IMR), or the number of infants less than 1 year who died per 1,000 live births. The Neonatal Mortality Rate (NIMR) is a specific IMR for neonates, or infants less than 28 days who died per 1,000 live births. In May 2009 the IMR falls very close to a control limit (see General Guidelines for Using Surveillance Charts in the Appendix). Three of the four infants who died in May were neonates.

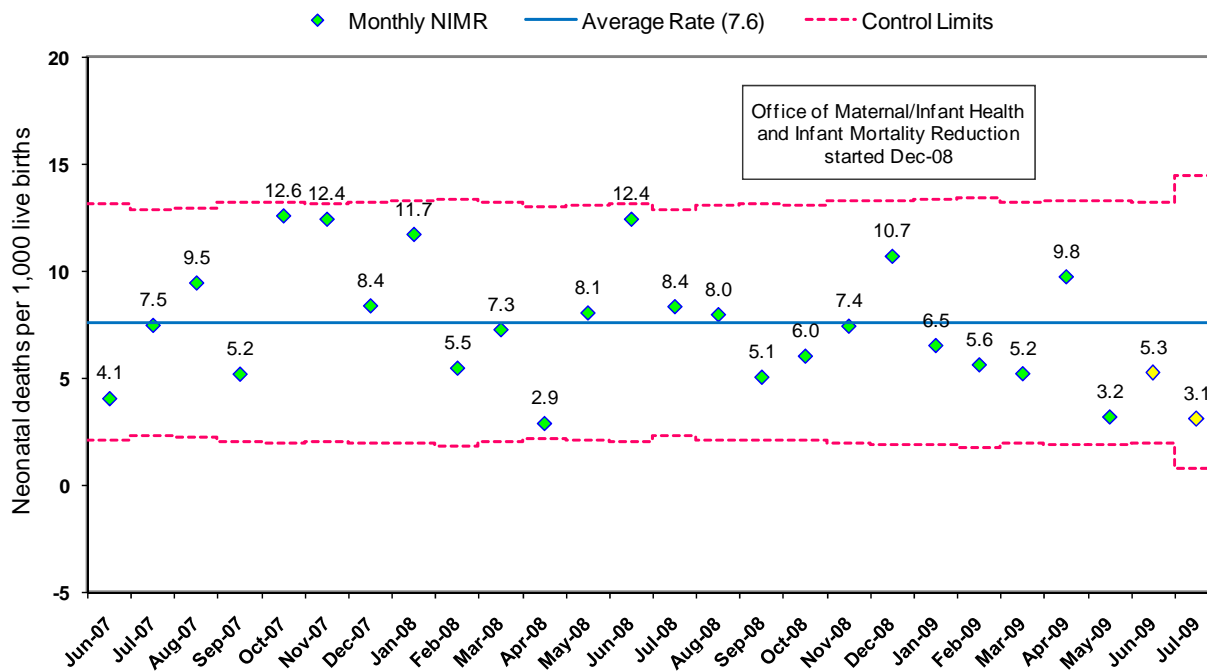
No significant changes occurred in the IMR or NIMR.

Figure 2. Infant Mortality Rate Surveillance Chart, Hamilton County 2007-2009*



NOTE: The IMR average rate is from June 2007 – May 2009 data.
 NOTE: Yellow points are derived from preliminary data and are likely to change.
 *Data for 2008 and 2009 are preliminary
 Data Source: Ohio Department of Health

Figure 3. Neonatal Mortality Rate Surveillance Chart, Hamilton County 2007-2009*



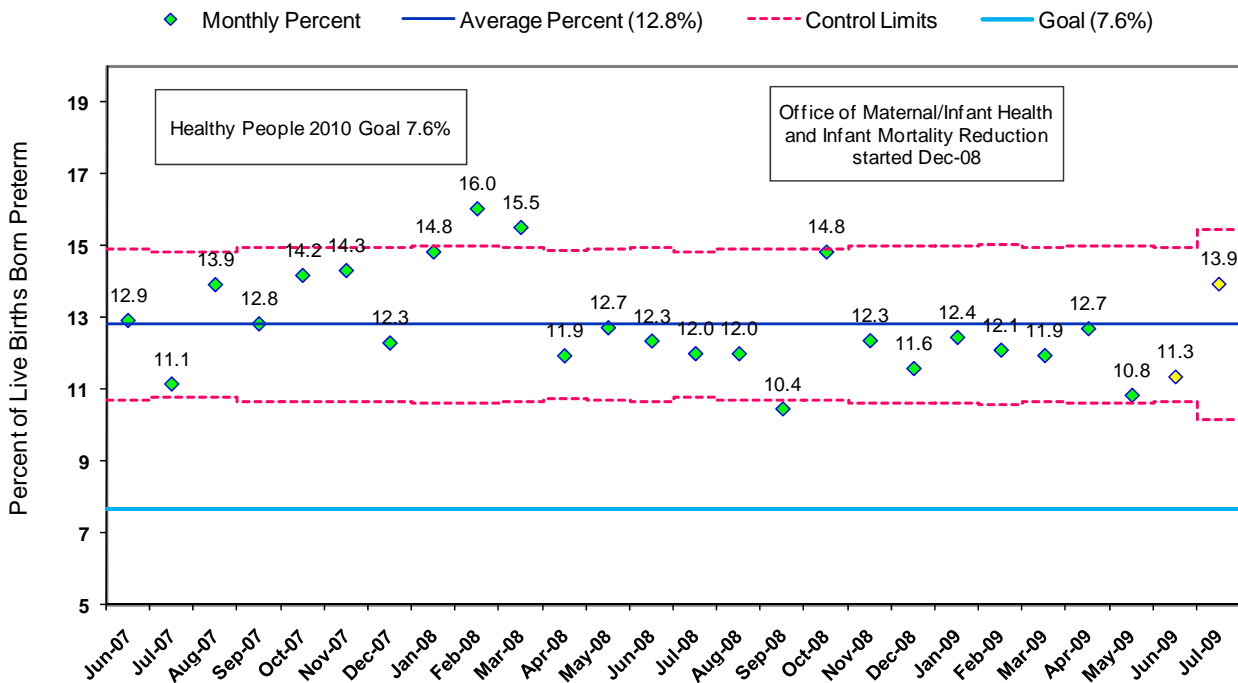
NOTE: The NIMR average rate is derived from June 2007 – May 2009 data.
 NOTE: Yellow points are derived from preliminary data and are likely to change.
 *Data for 2008 and 2009 are preliminary
 Data Source: Ohio Department of Health

Preterm Birth Rates

The overall significant decline in preterm birth rate continued.

The overall significant decline in the preterm birth rate over 2008 in Hamilton County was first noted in the February surveillance report. Preterm birth rate is the percentage of infants born before 37 weeks gestation. In May the percentage (10.8%) was below the two-year average (12.8%), and the two year average dropped to 12.8% from 13.5% (previously reported in the July surveillance report). As more data becomes available for June and July, the seemingly higher percentages of preterm births in these months may be substantiated.

Figure 4. Preterm Birth Rate Surveillance Chart, Hamilton County 2007-2009*



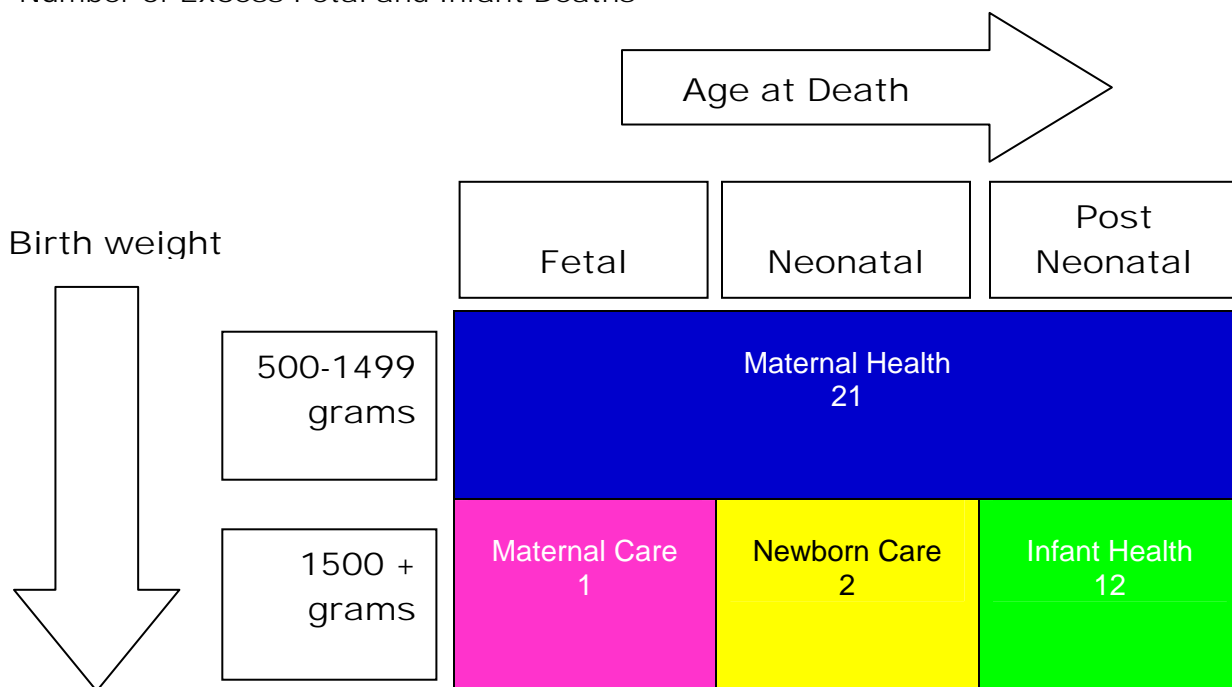
NOTE: The average percent of preterm births is from June 2007 – May 2009 data.
 NOTE: Yellow points are derived from preliminary data and are likely to change.
 *Data for 2008 and 2009 are preliminary
 Data Source: Ohio Department of Health

Perinatal Periods of Risk Phase 1

Perinatal Periods of Risk (PPOR) is a framework for understanding infant mortality that has been used worldwide by the World Health Organization and Centers for Disease Control and Prevention (CDC). It was introduced into the United States around 1997 through a joint initiative of the CDC, March of Dimes, CityMatch-University of Nebraska Medical Center, and the Health Resources and Services Administration Maternal and Child Health Bureau.² Using the PPOR framework, fetal and infant deaths are divided into four areas based on birth weight and age of infant at death. These areas represent action focus for the community.

In Phase 1 of PPOR analysis, excess mortality is used to show areas where more fetal and infant deaths occurred in a community compared to another group with more ideal infant health outcomes. This Phase 1 analysis was performed for the 2007 birth cohort in Hamilton County. The comparison group was a subgroup of the 2007 birth cohort for Ohio consisting of low-risk women based on standard maternal characteristics routinely used in PPOR. The women included in the comparison group were White, Non-Hispanic, 20 years or older, non-smokers, who completed more than high school education. The infant mortality rate among the comparison group was 4.7 per 1,000 live births, which is lower than the goal for Hamilton County of 6.7 per 1,000. Figure 5 shows the excess deaths that occurred in Hamilton County when compared to this group.

Figure 5. PPOR Phase 1 Analysis for the Hamilton County 2007 Birth Cohort, Number of Excess Fetal and Infant Deaths

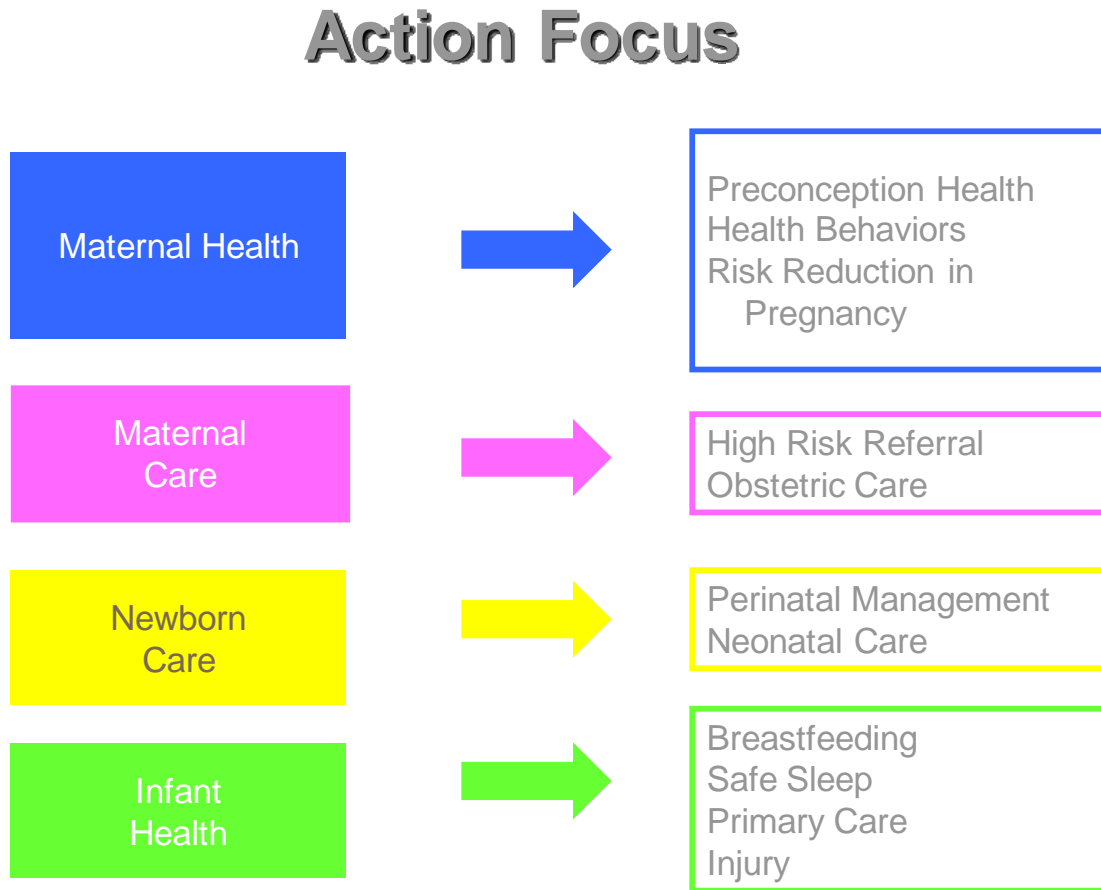


Note: Feto-infant mortality in PPOR analysis excludes infants <500 grams and <24 weeks. Otherwise, inconsistencies in reporting practices make it difficult to compare between groups.

²www.Citymatch.org

Figure 6 shows example target areas for actions related to the specific action focus groups. Further analysis of specific risk factors related to infant mortality in Hamilton County will help to better identify which targets of action will be most effective at reducing infant mortality.

Figure 6. PPOR Action Focus Groups with Example Target Areas for Action



Adapted from *Perinatal Periods of Risk Approach: the US Urban Experience* located on the website www.Citymatch.org

Risk Factor Surveillance

Risk factor measurements that were not in the April Surveillance report, but are included here are: obesity, prenatal care, multiple births, and congenital anomalies. The measurement on fertility treatment was not included because the number of unknown or missing data was approximately twenty percent. The most recent preliminary data for Hamilton County are found in the last column, and the first two columns provide related data for comparison.

This report does not include measurements for the following important related factors:

- Alcohol use
- Drug use
- Exposure to violence/physical abuse
- Mental health
- Responsible sexual behavior
- Access to primary care
- Adequate prenatal care
- Interconception interval

In each group the risk for pre-pregnancy chronic diseases, such as diabetes and hypertension, for women who gave birth in Hamilton County from January to June was fairly similar to women who gave birth in Ohio during the same timeframe (Table 1). About one percent more mothers in Hamilton County who gave birth in the first half of 2009 were underweight (6.6%), compared to Ohio (5.7%). The percentage of mothers with Chlamydia infection who gave birth in Hamilton County was higher in the first half of 2009 (4.3%) compared to that in all of 2008 (2.9%) and throughout the state (2.1%). The percentage of mothers who received no prenatal care in Hamilton County (10.3%) was almost six times higher than in Ohio (1.8%) (Table 2). The number of mothers in Hamilton County who had a previous other pregnancy outcome, including spontaneous and induced abortion (31%) was more than three percentage points higher than in Ohio (27.4%). More mothers in Hamilton County who gave birth during the first part of 2009 had a prior preterm birth (5%) than in 2008 (3.9%). It appears the group of women who gave birth in Hamilton County during the first part of 2009 were at slightly higher risk overall for preterm birth.

Table 1. Factors Related to Maternal Health

Maternal Health			
	Ohio January-June 2009	Hamilton County 2008	Hamilton County January-June 2009
Measure	Total Births= 72,163	Total Births=11,731	Total births=5568
Obesity All Ages (BMI)			
<18.5 Underweight	5.7%	(799) 6.8%	(369) 6.6%
18.5-24.9 Normal	46.8%	(5,466) 46.6%	(2,597) 46.6%
25-29.9 Overweight	22.7%	(2,581) 22%	(1,251) 22.5%
30+ Obese	24.9%	(2,885) 24.6%	(1,351) 24.3%
Hypertension			
Prepregnancy	1.7%	(164) 1.4%	(113) 2.1%
Gestational	4.3%	(376) 3.2%	(256) 4.6%
Eclampsia	0.6%	(115) 1%	(38) 0.7%
Diabetes			
Prepregnancy	0.8%	(89) 0.8%	(43) 0.8%
Gestational	5.1%	(571) 4.9%	(301) 5.4%
Smoking			
During the 3 Months Before Pregnancy	24.9%	(2820) 24%	(1,237) 22.2%
In the Last 3 Months of Pregnancy	15.8%	(1529) 13%	(732) 13.1%
Infections			
Chlamydia	2.1%	(338) 2.9%	(237) 4.3%
Gonorrhea	0.4%	(148) 1.3%	(78) 1.4%
Syphilis	0.04%	(9) 0.08%	(3) 0.05%
HSV	2.19%	(351) 3%	(197) 3.5%
Teen Births			
18-19 years	7.5%	(922) 7.9%	(380) 6.8%
15-17 years	3.1%	(433) 3.7%	(185) 3.3%
14 and under	0.1%	(24) 0.2%	(6) 0.1%
Did not complete high school	17%	(2362) 20%	(1,110) 20%
Not married	43%	(6054) 52%	(2,932) 53%

*Data for 2008 and 2009 are preliminary
Data Source: Ohio Department of Health

Table 2. Factors Related to Maternal Care and Newborn Care

Maternal Care			
Newborn Care			
	Ohio January-June 2009	Hamilton County 2008	Hamilton County January- June 2009
Measure	Total Births=	Total Births=	Total births=5568
No Prenatal Care	1.8%	(909) 7.8%	(574) 10.3%
Chorioamnionitis	1.1%	(147) 1.3%	(66) 1.2%
Premature Rupture of Membranes	2.7%	(229) 2%	(111) 2%
One or more Previous Other Pregnancy Outcome	27.4%	(3554) 30.3%	(1,731) 31%
Previous Preterm Birth	3.5%	(456) 3.9%	(277) 5%
Infertility Treatment		**	**
Multiples			
Twins	3.4%	(479) 4.1%	(225) 4%
Triplets+	0.2%	(6) 0.1%	(6) 0.1%

*Data for 2008 and 2009 are preliminary

** Over % of these data are missing or unknown; there is insufficient data quality for reporting

Data Source: Ohio Department of Health

Table 3. Factors Related to Infant Health

Infant Health			
	Ohio January-June 2009	Hamilton County 2008	Hamilton County January-June 2009
Measure	Total Births=	Total Births=	Total births=5568
Admission to NICU	6.4%	(792) 6.8%	(385) 6.9%
Not Breastfed	34.1%	(3929) 33.5%	(1,949) 35%
Congenital Anomalies **	0.4%	(38) 0.3%	(21) 0.4%

*Data for 2008 and 2009 are preliminary

** Congenital anomalies reported are limited to those identified and documented at birth and to the following anomalies recordable on the Ohio birth record : Anencephaly, Meningomyelocele/Spina Bifida, Cyanotic Congenital Heart Disease, Congenital Diaphragmatic Hernia, Omphalocele, Gastroschisis, Limb Reduction Defect, Cleft Lip with or without Cleft Palate, Cleft Palate alone, Hypospadias, Down Syndrome, or suspected chromosomal disorder

Data Source: Ohio Department of Health

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 at the Ohio Department of Health for providing data for this report, the Child Policy Research Center at Cincinnati Children's Hospital Medical Center for ongoing quality improvement support and the HCIMSS Data Work Group for guidance and input.

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