

Maternal and Infant Health Monthly Surveillance Report

Hamilton County

April 2009

Expanded Quarterly Edition

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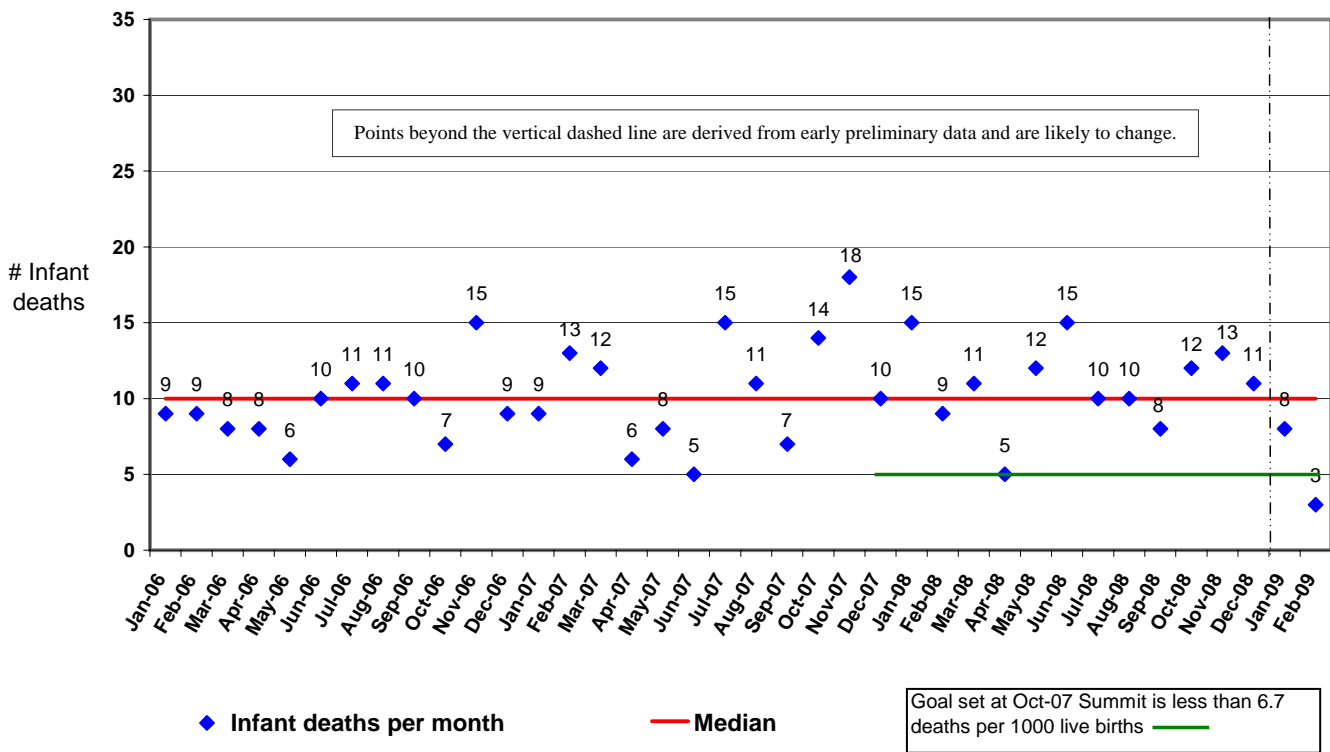
Thank you also to the Child Policy Research Center at Cincinnati Children’s Hospital Medical Center for providing quality improvement input and the control chart template.

Infant Mortality

Number of Infant Deaths

The number of infant deaths in recent months (Figure 1) remains higher than the goal set at the October 2007 Infant Mortality Summit.

Figure 1. Infant Mortality Run Chart, Hamilton County 2006-2009*



* Data for 2007 are final. Data for 2008 and 2009 are preliminary. Preliminary reporting may be incomplete, particularly in recent months.

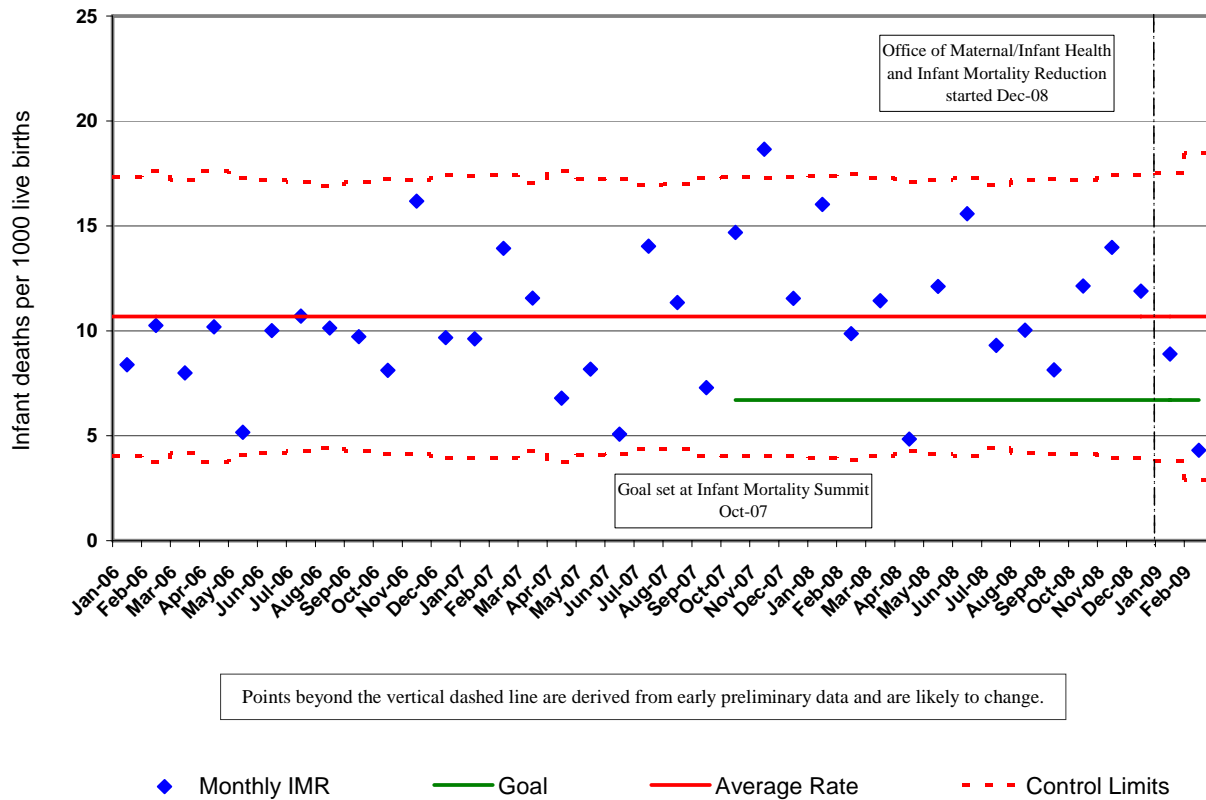
NOTE: Because Hamilton County tends to have approximately 1,000 live births each month, the number of infant deaths can be directly compared to the goal of 6.7 deaths per 1,000 live births set at the October 2007 Infant Mortality Summit.

Infant Mortality Rates

Using the control chart method, which includes data from 2006 to 2009, an apparent seasonal pattern is noted with monthly infant mortality rates. Rates have peaked in November each year, most notably in 2007 when the rate exceeded the control limit (Figure 2). Conversely, the lowest rates have occurred in the spring months – May 2006, June 2007 and April 2008. This observation was not detected in previous reporting without the control chart method. Further analysis of infant deaths in these months may improve the understanding of risk factors for infant mortality in Hamilton County.

Neonatal mortality alone makes up a substantial part of overall infant mortality, and neonatal mortality by itself exceeds the overall infant mortality goal in Hamilton County. Figure 3 shows that the mean neonatal mortality rate, 7.64 per 1,000 live births, remained above the goal of 6.7 infant deaths per 1,000 live births.

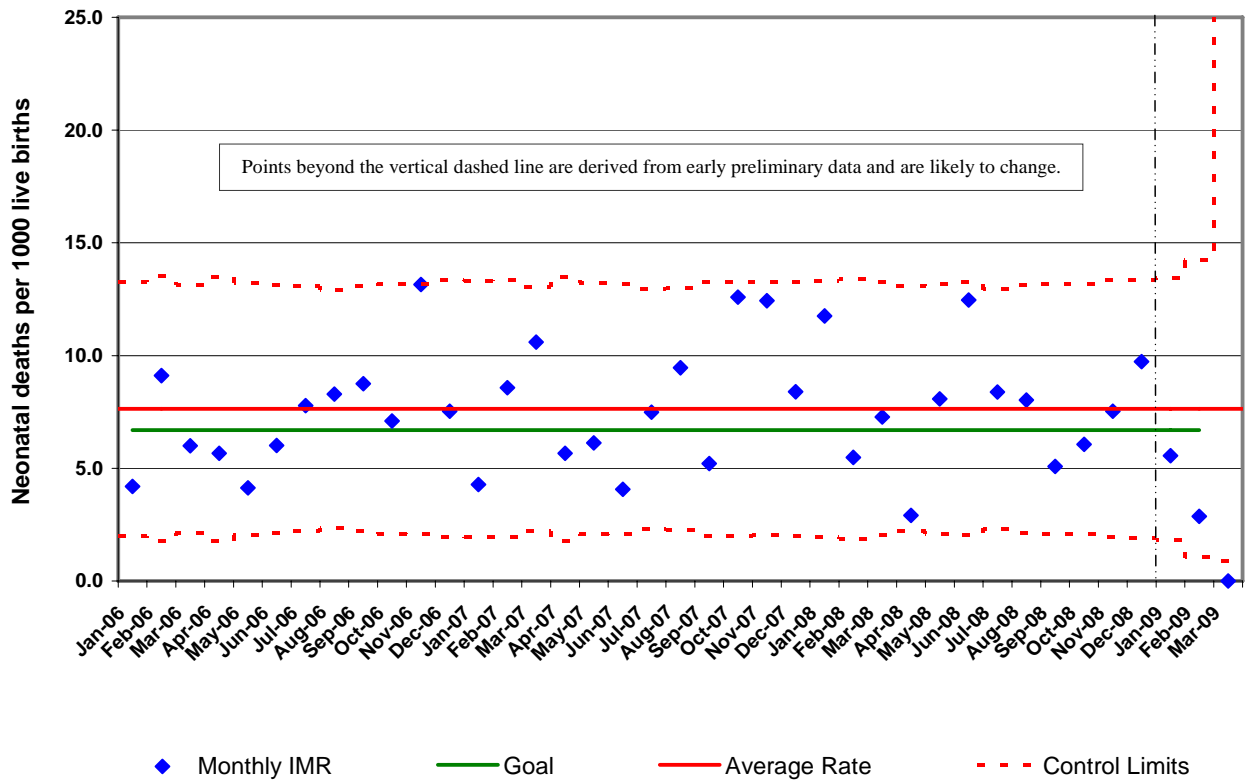
Figure 2. Infant Mortality Rate Control Chart, Hamilton County 2006-2009*



* Data for 2007 are final. Data for 2008 and 2009 are preliminary. Preliminary reporting may be incomplete, particularly in recent months.

NOTE: The Infant Mortality Rate is calculated as the number of infant deaths (0-1 year old) per 1,000 live births.

Figure 3. Neonatal Mortality Rate Control Chart, Hamilton County 2006-2009*



*Data for 2007 are final. Data for 2008 and 2009 are preliminary. Preliminary reporting may be incomplete, particularly in recent months.
 NOTE: The Neonatal Mortality Rate is calculated as the number of neonatal deaths (0-28 days old) per 1,000 live births.

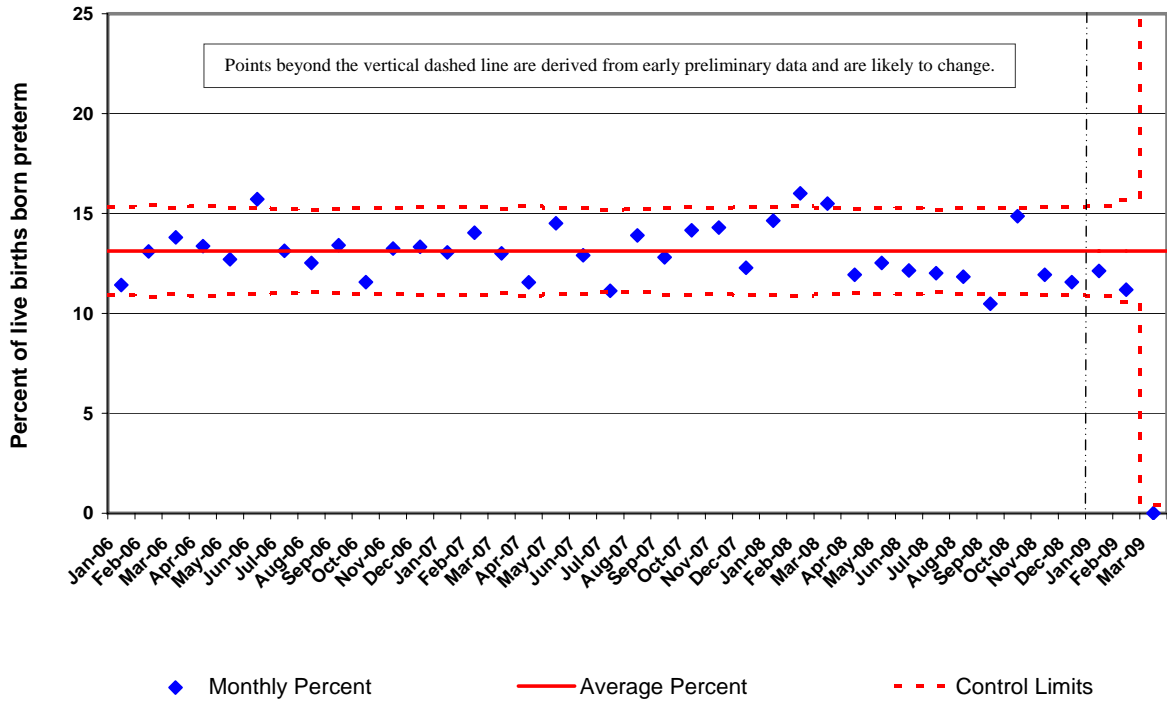
Preterm Births

A significant decline in the rate of preterm births in 2008 was noted in previous surveillance reports (February & March). This trend appears to continue as indicated with eight of the nine most recent months under the mean rate of 13.1 (Figure 4).

September was the month with the lowest rate of preterm births for 2008; it was lower than the control limit (Figure 4). Interestingly, this low rate was followed by a notably higher rate of preterm births in October 2008. Further evaluation would be required to determine the factors that may have contributed to the reduced rate in September 2008.

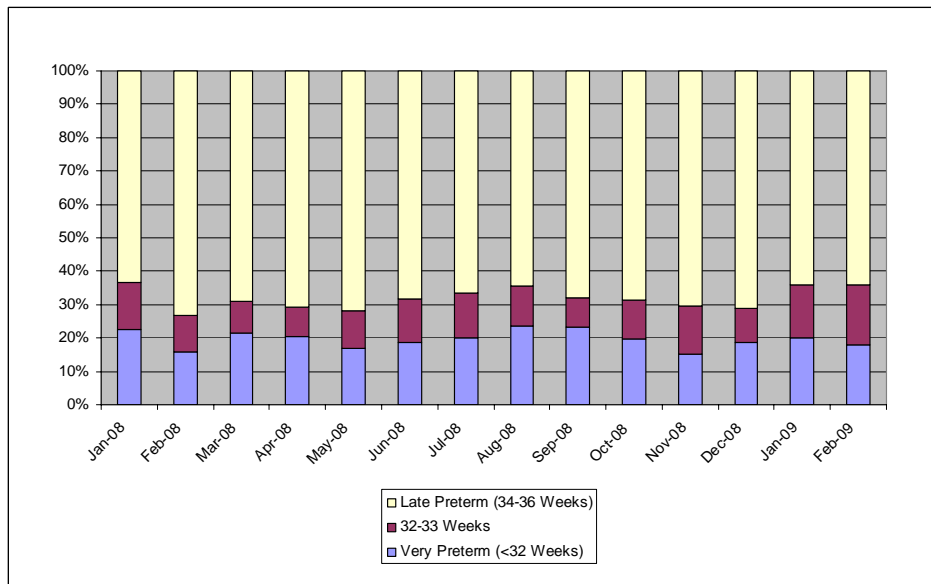
Figure 5 shows that the percent of preterm births that were very preterm (<32 weeks) remained at approximately 20% with the most recent reporting in 2009. The percent late preterm (34-36 weeks) remained over 60%. Table 1 provides a further breakdown of births by gestational age.

Figure 4. Preterm Birth Rate Control Chart, Hamilton County 2006-2009*



*Data for 2007 are final. Data for 2008 and 2009 are preliminary. Preliminary reporting may be incomplete, particularly in recent months.
 NOTE: The Preterm Birth Rate is calculated as the percent of live births that are born before 37 weeks.

Figure 5. Percent of Preterm Births by Gestational Age, Hamilton County 2008-2009*



* Data for 2007 are final. Data for 2008 and 2009 are preliminary. Preliminary reporting may be incomplete, particularly in recent months.

Table 1. Gestational Age Table

Week	Number of Births by Week Gestational Age, Hamilton County 2008-2009* by Month														
	2008												2009		
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR
16	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
18	0	0	0	0	0	1	1	1	1	0	0	0	0	0	0
19	3	0	0	1	1	1	0	0	0	0	0	0	1	0	0
20	1	0	0	1	0	3	0	0	0	1	0	0	0	0	0
21	1	0	0	0	1	1	0	0	0	1	0	0	0	1	0
22	0	0	1	0	0	0	0	0	0	2	0	2	0	0	0
23	3	1	1	0	2	0	1	2	0	0	0	2	1	1	0
24	2	5	2	0	3	0	1	0	1	1	2	2	6	0	0
25	1	3	3	3	0	0	2	0	1	1	1	2	0	0	0
26	2	0	4	1	2	2	0	5	0	2	2	1	1	0	0
27	2	2	7	2	4	1	6	6	5	2	2	1	0	2	0
28	3	4	2	6	2	0	3	1	3	4	3	3	2	3	0
29	4	1	1	1	0	2	2	3	3	3	0	4	3	5	0
30	5	3	5	3	2	2	2	5	3	3	7	1	3	1	0
31	4	4	6	7	4	9	6	5	7	9	0	2	5	1	0
32	7	4	4	4	7	7	11	6	3	7	10	6	8	5	0
33	12	12	10	7	7	8	6	8	6	10	6	5	9	9	0
34	13	14	10	22	8	15	16	12	11	17	16	11	9	14	0
35	24	31	29	15	24	25	17	19	23	34	19	26	27	15	0
36	50	62	64	50	57	40	53	45	36	50	43	39	34	21	0
37	80	94	85	92	91	85	109	116	71	88	84	92	78	72	0
38	188	169	207	216	195	186	210	192	194	175	193	203	163	133	2
39	310	272	292	347	311	318	328	315	324	319	297	291	303	218	0
40	176	186	176	192	205	209	227	199	214	190	183	162	178	154	0
41	41	44	50	60	62	45	66	54	73	67	54	66	66	41	0
42	2	0	1	1	1	2	3	1	1	1	2	2	2	1	0
43	1	0	0	0	0	1	0	0	1	0	0	0	0	0	0
44	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
45	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
47	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
Missing Value	0	1	2	0	0	0	2	1	2	2	5	2	0	0	0
Total	936	912	962	1031	990	963	1074	997	983	989	930	925	899	697	2

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Expanded Quarterly Reporting

Risk Factors & Protective Factors for Infant Mortality

An overview of factors related to infant mortality and birth outcomes was conducted using preliminary vital statistics data for 2008. The Perinatal Periods of Risk (PPOR) model was developed through a joint initiative of the Maternal and Child Health Bureau, March of Dimes, Centers for Disease Control, and CityMatch.¹ It offers a simple and standard way for communities to look at infant mortality, dividing infant mortality into categories that can be prioritized for community action. The PPOR model was used as a framework to organize factors into meaningful categories (Figure 6)¹.

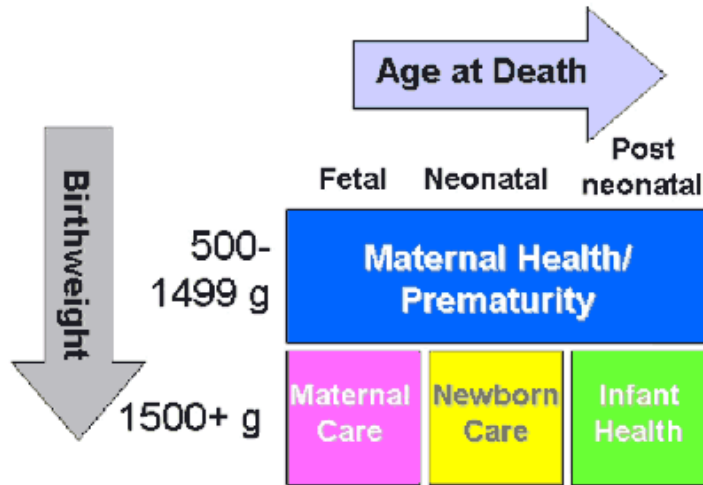
Maternal health factors of mothers of infants who died in Hamilton County included higher percentages of hypertension and diabetes (Table 2). Higher percentages of these mothers were teens 15-17 and 18-19 years old; these mothers also had lower percentages of protective factors, including completion of high school and being married.

Factors related to maternal and infant care included higher percentages of infertility treatment, one or more previous other pregnancy outcome, prior preterm births, premature rupture of membranes and chorioamnionitis (Table 3). More research is needed to better understand the role that infection plays in preterm births in Hamilton County. As predicted, a higher percentage of infants who died were admitted to the NICU.

Measurements for the following important factors were not available for this report:

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

Figure 6. PPOR Categories



¹PPOR Approach (http://www.citymatch.org/ppor_index.php)

Table 2. Factors Related to Maternal Health

Maternal Health/Prematurity			
	Mothers who gave birth 2008		Mothers of infants who died 2008
Measure	Ohio	Hamilton County	Hamilton County
Hypertension			
Prepregnancy	1.7%	1.4%	3.41%
Gestational	3.9%	3.2%	7.95%
Eclampsia	0.5%	1%	3.41%
Diabetes			
Prepregnancy	0.8%	0.8%	2.27%
Gestational	4.9%	4.9%	2.27%
Smoking			
During the 3 Months Before Pregnancy	25.6%	24%	28%
In the Last 3 Months of Pregnancy	16.3%	13%	11%
Infections			
Chlamydia	1.9%	2.9%	4.6%
Gonorrhea	0.4%	1.3%	4.6%
Syphilis	0.04%	0.08%	0%
HSV	2%	3%	1.14%
Teen Births			
18-19 years	7.7%	7.9%	12.5%
15-17 years	3.2%	3.7%	5.7%
14 and under	0.1%	0.2%	0%
Completed high school	83%	80%	72%
Married	57%	48%	19%

*Preliminary Data

NOTE: Data on mothers of infants who died is based on linked birth records with a 67% linkage rate.

Table 3. Factors Related to Maternal Care & Newborn Care

Maternal Care & Newborn Care			
	Mothers who gave birth 2008		Mothers of infants who died 2008
Measure	Ohio	Hamilton County	Hamilton County
Infertility Treatment	0.9%	0.5%	1.1%
One or more Previous Other Pregnancy Outcome	28%	30%	36%
Previous Preterm Birth	3.3%	3.8%	12.5%
Prenatal Rupture of Membranes	2.8%	1.9%	6.8%
Chorioamnionitis	1%	1.3%	9.1%
Admission to NICU	6.3%	6.7%	35.2%

*Preliminary Data

NOTE: Data on mothers of infants who died is based on linked birth records with a 67% linkage rate.

Table 4. Factors Related to Infant Health

Infant Health			
	Mothers who gave birth Fall 2008		Mothers of infants who died 2008
Measure	Ohio	Hamilton County	Hamilton County
Ever Breastfed	61%	56%	15.91%

*Preliminary Data

NOTE: Data on mothers of infants who died is based on linked birth records with a 67% linkage rate.

Specific factors reported may change with subsequent reports. Please contact authors for questions or comments regarding this report:

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