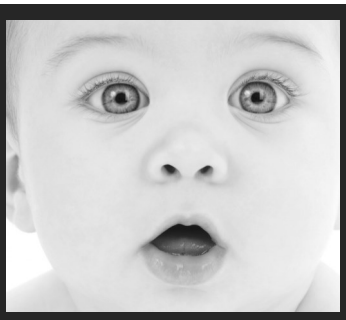

Hamilton County Maternal and Infant Health Monthly Surveillance Report

April 2014

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HAMILTON COUNTY
PUBLIC HEALTH
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Introduction

The series of Maternal and Infant Health Monthly Surveillance Reports are part of a county-wide initiative to improve maternal and infant health and 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 populations at risk. This report characterizes the current status of infant mortality in Hamilton County.

Infant Mortality Surveillance

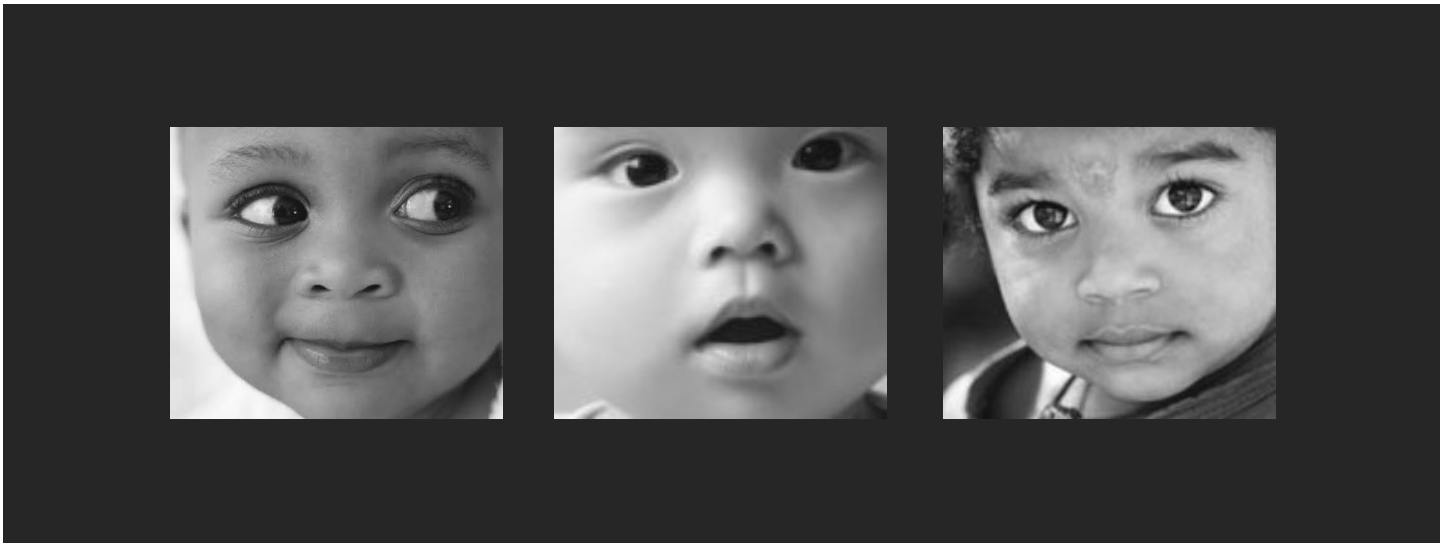
- ⇒ Number of infant deaths by month
- ⇒ Current monthly infant mortality rate
- ⇒ Current monthly neonatal mortality rate
- ⇒ Current monthly preterm, very preterm, and <23 weeks gestation birth rate
- ⇒ Percentage of pregnancies adequately spaced
- ⇒ Maternal smoking rates
- ⇒ Number of sleep-related death
- ⇒ Current two-year infant mortality rate moving average
- ⇒ Comparison of "Filed" and "Unfiled" data

The data sources for this report series have been enhanced to improve the monthly surveillance process. The Ohio Department of Health (ODH) is now providing additional monthly mortality data to Hamilton County Public Health that will be used to 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 mortality data included in this report were obtained from ODH on May 8, 2014 and May 15, 2014; the birth data were updated on the Ohio Public Health Information Warehouse on May 22, 2014.

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 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 deaths are effective. The surveillance charts contained within this report are tools that are used to monitor infant mortality in our community. Please read the General Guidelines for Using Surveillance Charts in **Appendix B**.

[1]Centers for Disease Control and Prevent. *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

Table 1. Number of Infant Deaths and Births, Hamilton County, 2013-2014

Month	Hamilton County Infant Deaths 2013	Hamilton County Infant Deaths 2014	Hamilton County Infant Births 2013	Hamilton County Infant Births 2014
January	7	7	880	887
February	9	1	774	849
March	11	7	872	879
April	5	8	865	820
May	14		931	
June	4		886	
July	4		994	
August	8		957	
September	5		919	
October	11		879	
November	10		869	
December	7		915	
Total	95	23	10,741	3,435

One measure of infant mortality is the number of infant deaths per month. In April 2014, there were 8 infant deaths within Hamilton County. Five of the infant deaths that occurred in April 2014 in Hamilton County, occurred amongst Cincinnati residents. Table 1 displays the provisional number of infant deaths and births for each month in 2013 and 2014. Please see **Appendix A** on Page 9 to learn more about provisional death data limitations.

Infant Deaths, Hamilton County

2014 Year-to-Date

Infant Deaths, Cincinnati

2014 Year-to-Date

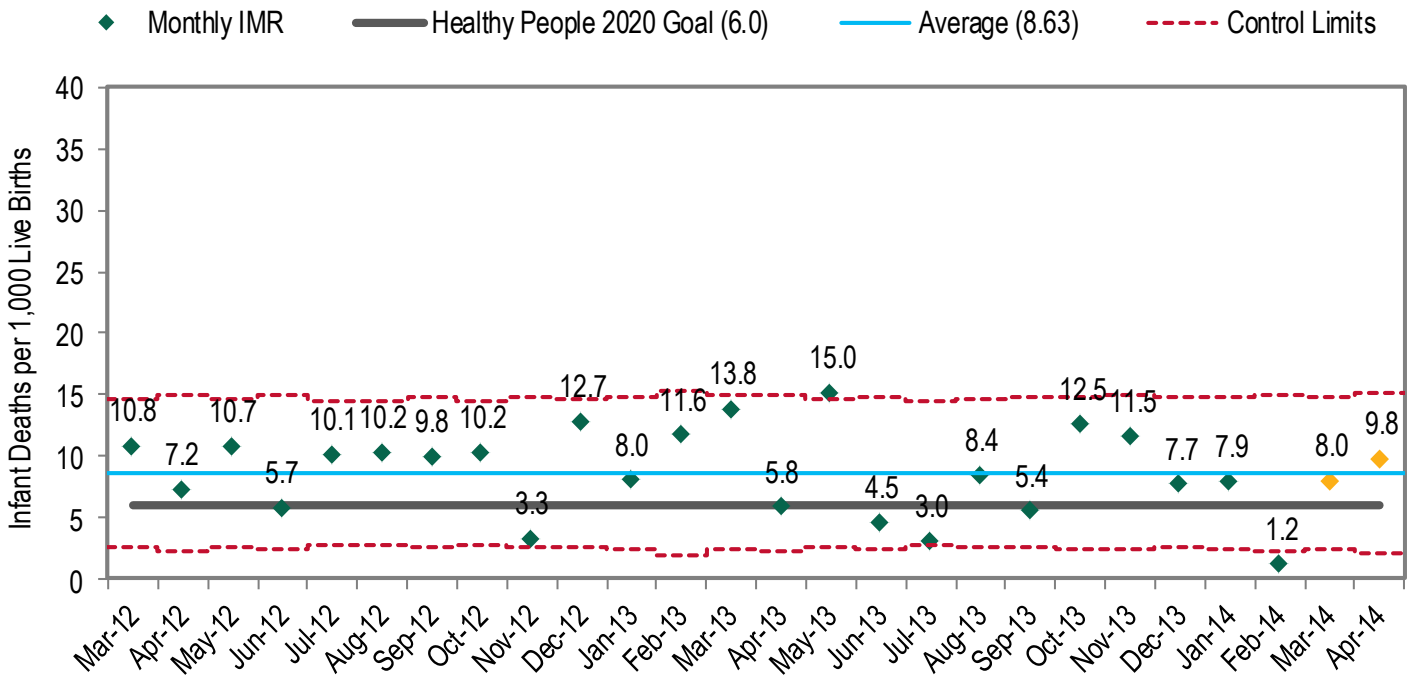
Infant Mortality Rates

The IMR for April 2014 was 9.8. This provisional rate was higher than the Healthy People 2020 goal (6.0).

Another method used to monitor infant mortality is the 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 babies born, the Infant Mortality Rate (IMR) is calculated. The monthly IMR is the number of infants (children less than one year of age) who died, divided by the number of live births during the month per 1,000 live births. The Neonatal Infant Mortality Rate (NIMR) is a specific IMR for neonates (infants younger than 28 days) who died per 1,000 live births.

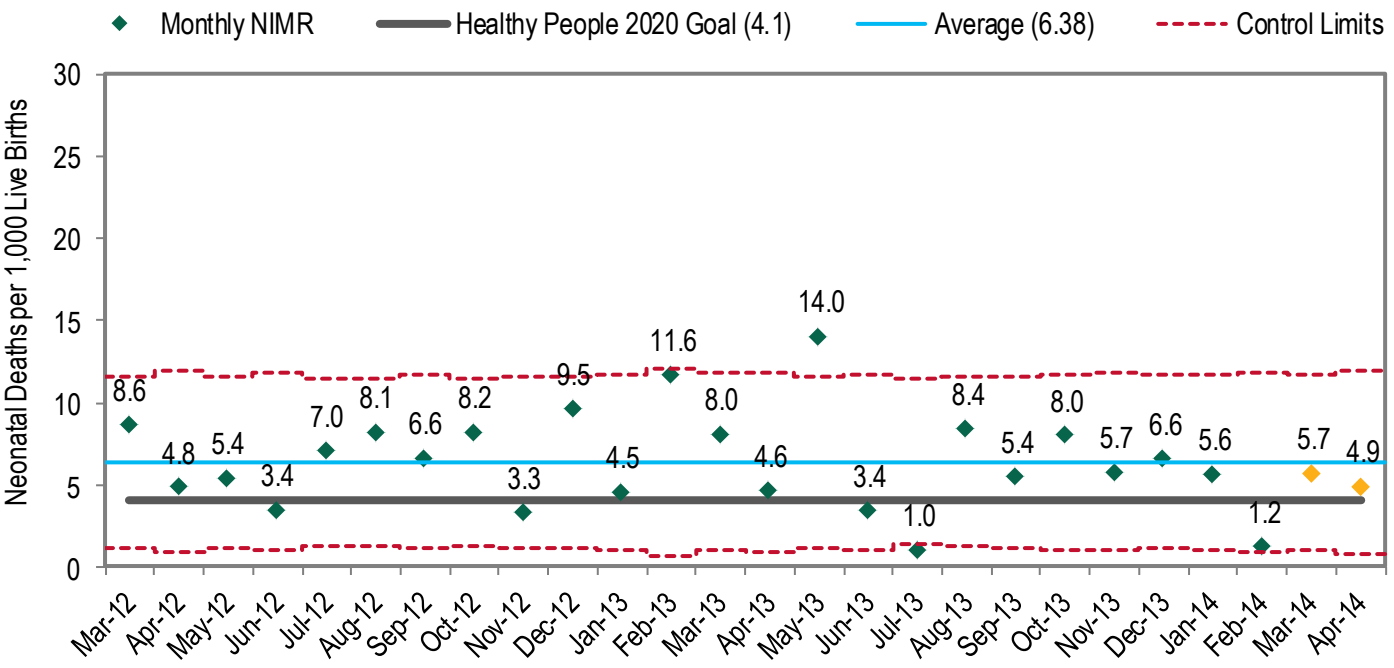
The IMR for April 2014 was 9.8 infant deaths per 1,000 live births (Figure 1). April was above the average IMR (8.63) as shown in Figure 1. Subsequent reports will provide improved statistical validity of these estimates (**Appendix A**). The April 2014 NIMR was below the upper statistical thresholds and is displayed in Figure 2. The April NIMR (4.9) is above the Healthy People 2020 goal of 4.1 neonatal deaths per 1,000 live births and below the Hamilton County 24-month average of 6.38 neonatal deaths per 1,000 live births. Neonatal deaths accounted for 73.7 percent of the January 2013-April 2014 infant deaths as of data collected on May 8, 2014 and May 15, 2014. As can be seen from the comparison of Hamilton County rates and national infant health goals, Hamilton County is experiencing problems within the community regarding maternal and infant health.

Figure 1. Infant Mortality Rate Surveillance Chart, Hamilton County, Mar 2012—Apr 2014*



NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
* Data for 2013-2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Figure 2. Neonatal Mortality Rate Surveillance Chart, Hamilton County, Mar 2012—Apr 2014*



NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
* Data for 2013-2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Preterm, Very Preterm, and <23 Weeks Gestation Birth Rates

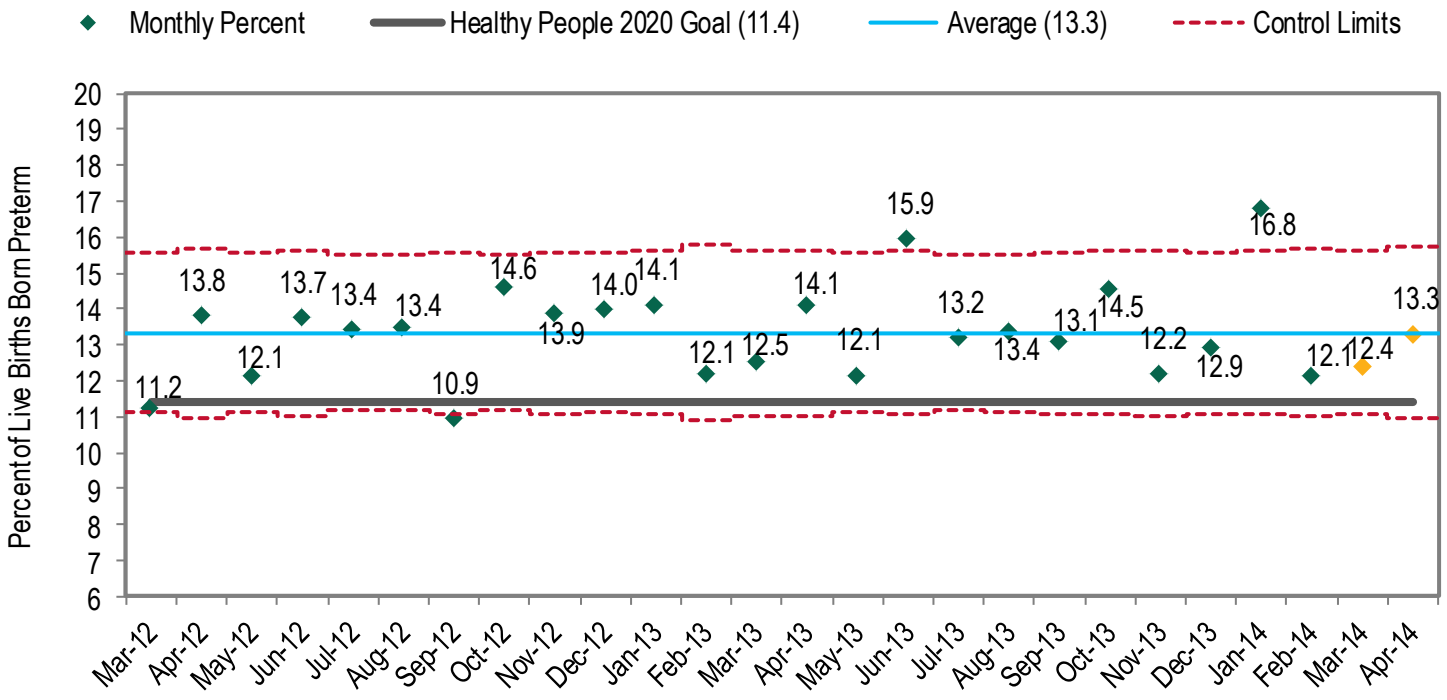
The preterm birth rate is the percentage of infants born before 37 weeks gestation. The very preterm birth rate is the percentage of infants born before 32 weeks gestation. Preterm birth is a significant risk factor of infant mortality and many other adverse health outcomes. The average preterm birth rate in Hamilton County (13.3 percent) is above the Healthy People 2020 goal of 11.4 percent. The provisional preterm birth percentage for April 2014 is 13.3 percent; this rate is above the Healthy People 2020 goal of 11.4 percent for all live births. The average very preterm birth percentage in Hamilton County (2.86 percent) is above the Healthy People 2020 goal of 1.8 percent. The provisional very preterm birth percentage for April 2014 is 3.3 percent; this rate is above the Healthy People 2020 goal of 1.8 percent for all live births. The provisional <23 weeks gestation birth percentage for April 2014 is 0.1 percent in Hamilton County is below the average <23 weeks gestation birth rate in Hamilton County (0.40 percent). The <23 weeks gestation birth rate is also important to track as approximately 1/3 of infant deaths within Hamilton County each year are from babies who are born earlier than 23 weeks gestation. These babies are born so early that their chance of survival after being born is very small. By preventing preterm births in Hamilton County, infant morbidity and mortality can be reduced, ultimately preserving the community's financial resources and providing children with a healthy start to life.

The preterm birth rate for April 2014 (13.3 percent) was equal to the Hamilton County average (13.3 percent) and above the Healthy People 2020 goal for preterm births (11.4 percent).

The very preterm birth rate for April 2014 (3.3 percent) was above the Hamilton County average (2.86 percent) and above the Healthy People 2020 goal for very preterm births (1.8 percent)

These data are provisional and may change in future reports

Figure 3. Preterm Birth Rate Surveillance Chart, Hamilton County, Mar 2012—Apr 2014*



NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
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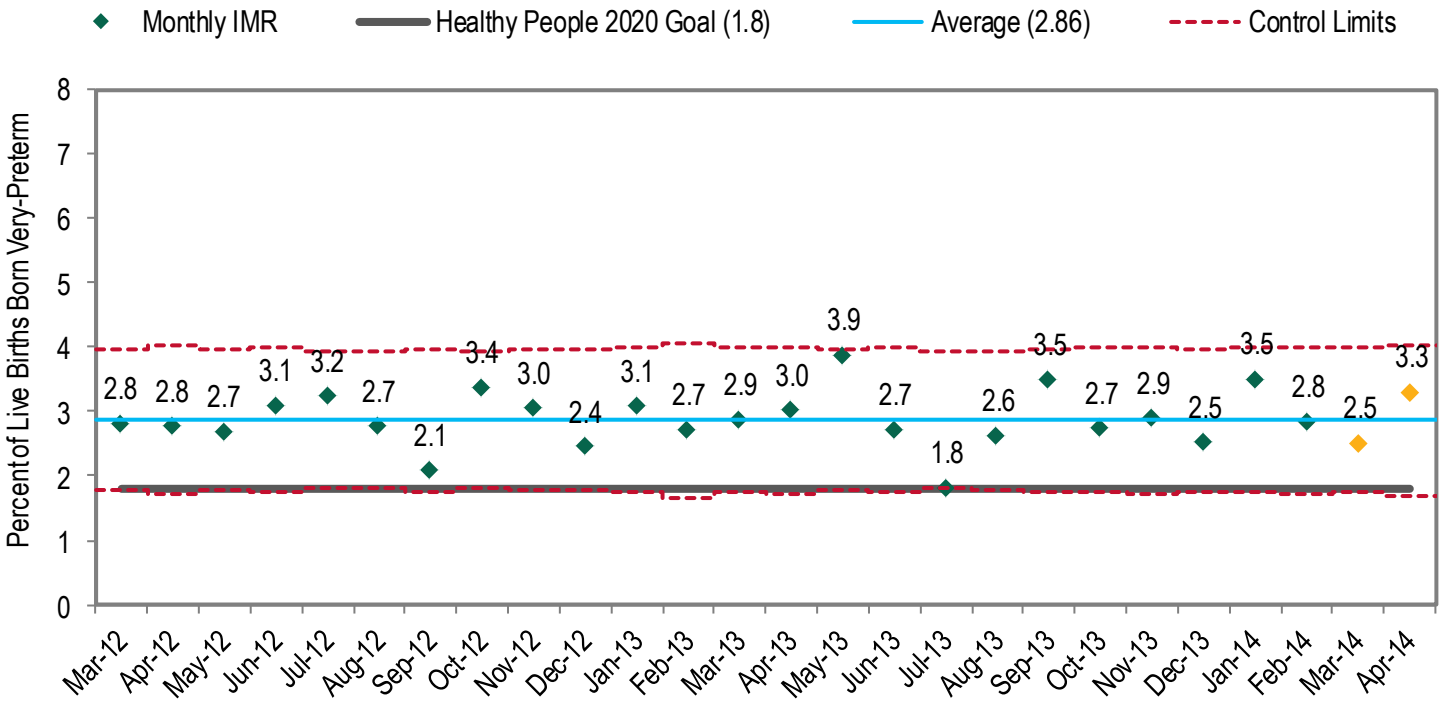
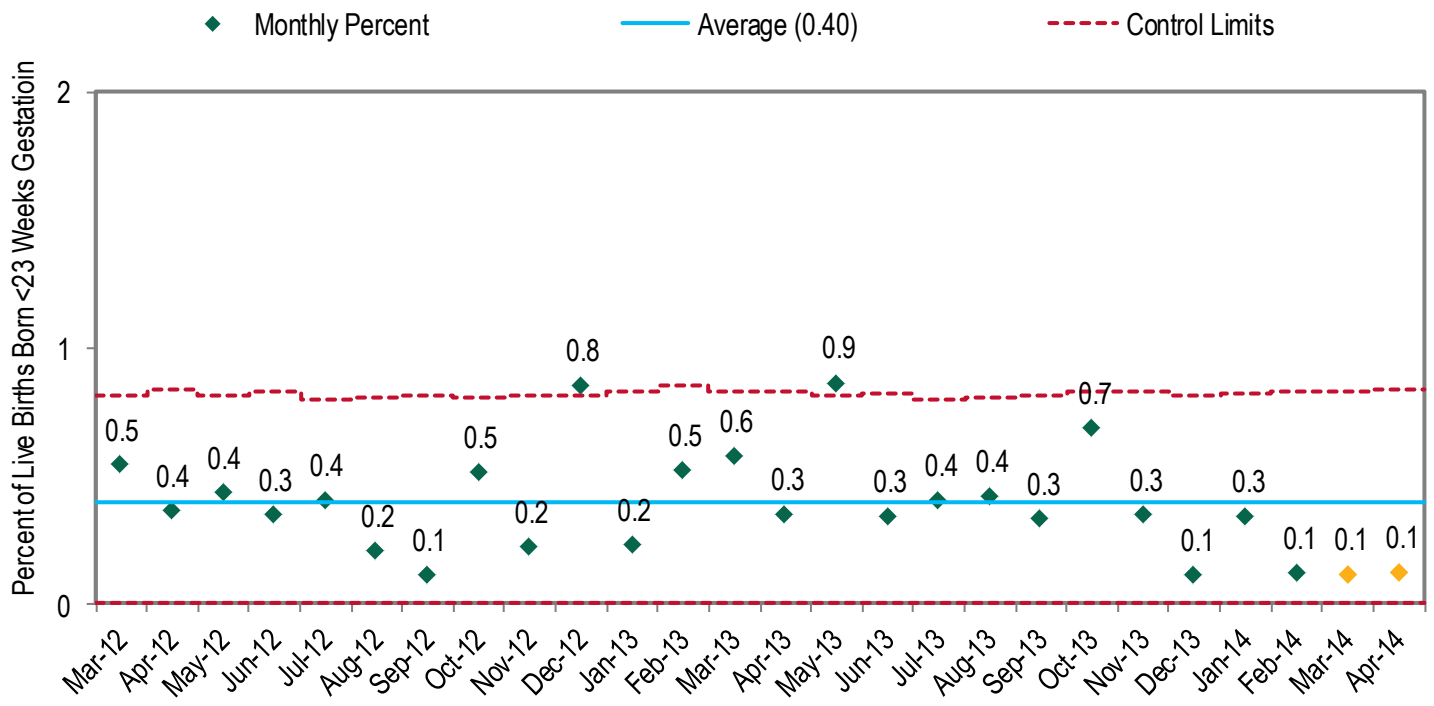
Data Source: ODH Vital Statistics

Figure 4. Very Preterm Birth Rate Surveillance Chart, Hamilton County, Mar 2012—Apr 2014*



NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
* Data for 2013—2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Figure 5. <23 Weeks Gestation Birth Rate Surveillance Chart, Hamilton County, Mar 2012—Apr 2014*

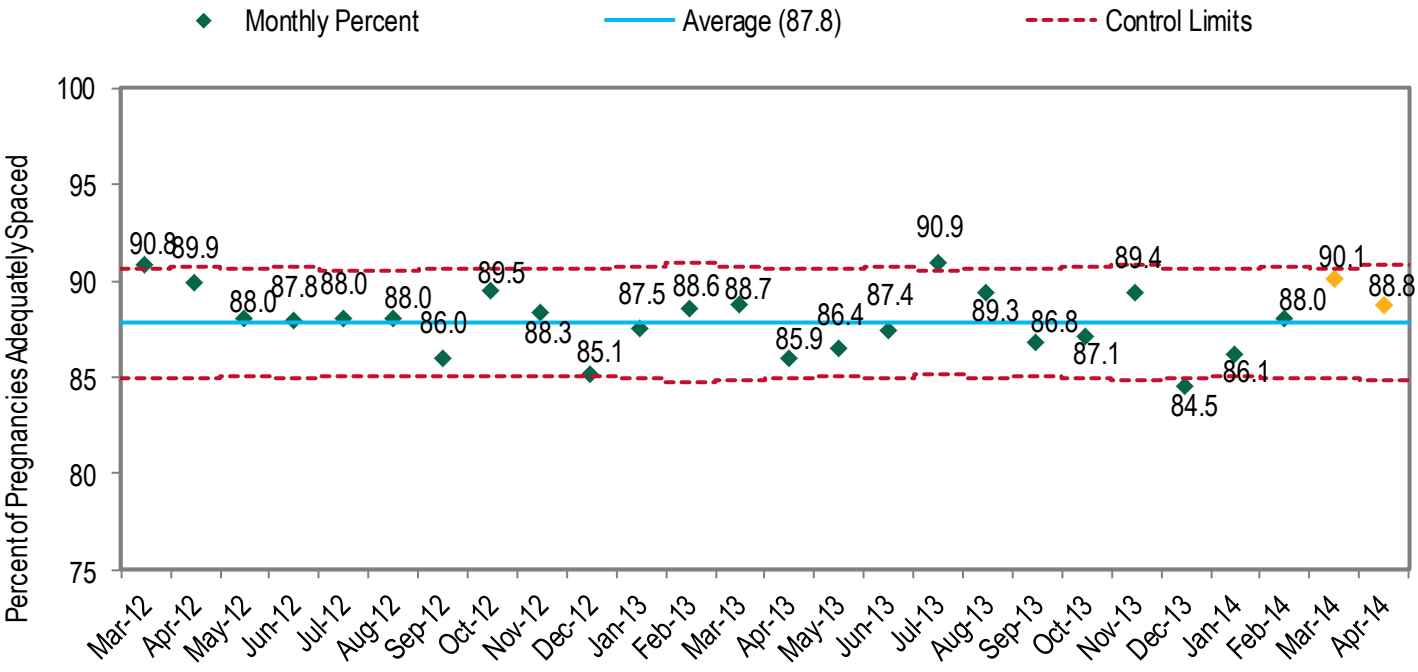


NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
* Data for 2013—2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Adequately Spaced Pregnancies

It has been shown that waiting 18 months between giving birth to one baby and conceiving the next gives a woman the best chance to have a healthy, full-term baby. When mom's body has enough time to heal, her next pregnancy is healthier. Not waiting 18 months or more is strongly associated with premature birth, a factor in two thirds of Hamilton County's 2012 infant deaths. Figure 6 below shows the percentage of pregnancies that are adequately spaced (18+ months from delivery to conception). By informing mothers about properly spacing pregnancies, the risk of adverse health complications and premature death of the infant could be reduced.

Figure 6. Percentage of Pregnancies Adequately Spaced, Hamilton County, Mar 2012— Apr 2014*

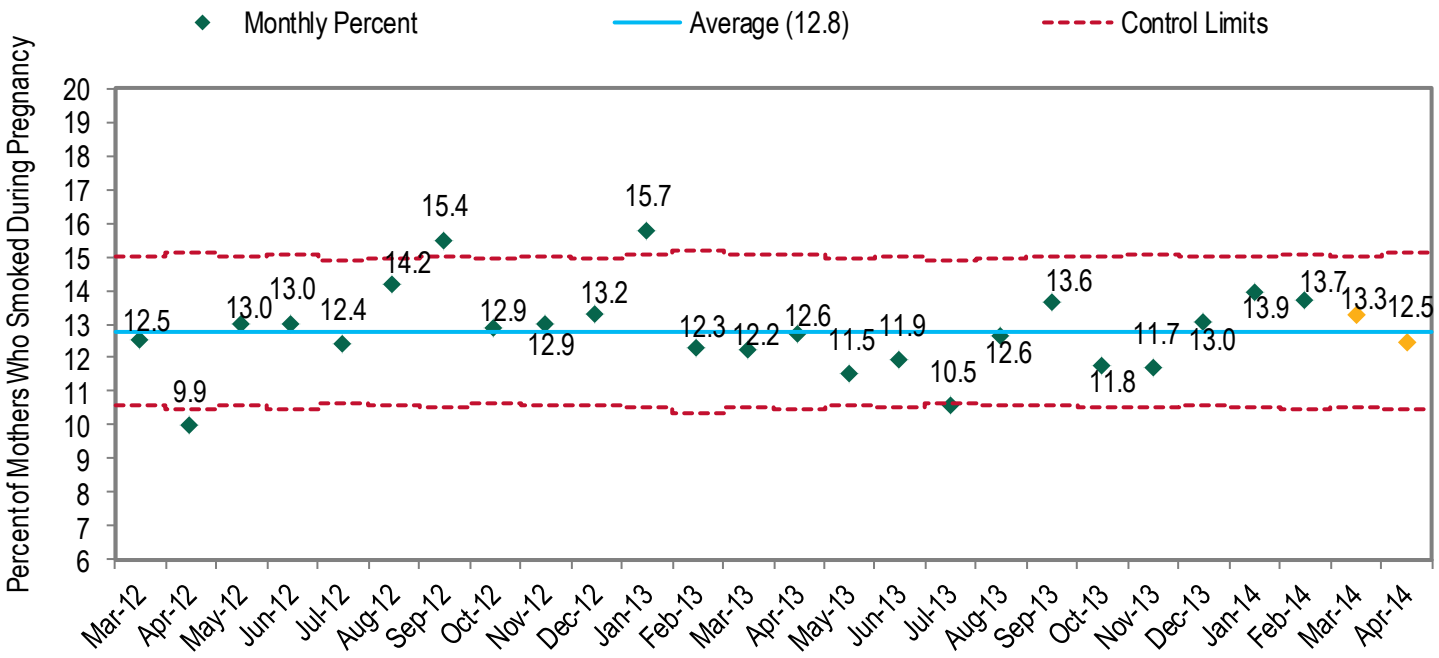


NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
* Data for 2013-2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Maternal Smoking Rate

Tobacco use, and other forms of substance abuse during pregnancy, can be extremely harmful to a developing baby. Recent data show us that local women who smoked during pregnancy were 44% more likely to have an infant death. The provisional rate for April 2014 was 12.5 percent (Figure 7). This rate was below the average rate of women who smoked during pregnancy for Hamilton County (12.8 percent) as shown in Figure 7.

Figure 7. Maternal Smoking Rates, Hamilton County , Mar 2012—Apr 2014*



NOTE: The mean is calculated using two years of data from Mar 2012—Feb 2014. Yellow points are more likely to change in future reports.
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Data Source: ODH Vital Statistics

Sleep-Related Death

A sleep-related death is the death of an infant due to unsafe sleeping environments. A safe sleeping environment is one in which the infant is sleeping alone, on their back and in a crib. Unsafe sleeping environments can consist of co-sleeping (a parent or adult sharing a bed with an infant), an infant sleeping on a couch or in a crib filled with blankets or pillows, or an infant being put to sleep on his/her stomach. There has been one sleep-related death in Hamilton County in 2014 so far. However, as further iterations of the report are published, the number of sleep-related deaths may change as records become finalized and complete.

Sleep-Related Deaths in Hamilton County, 2014 Year-to-Date

= 1 sleep-related death

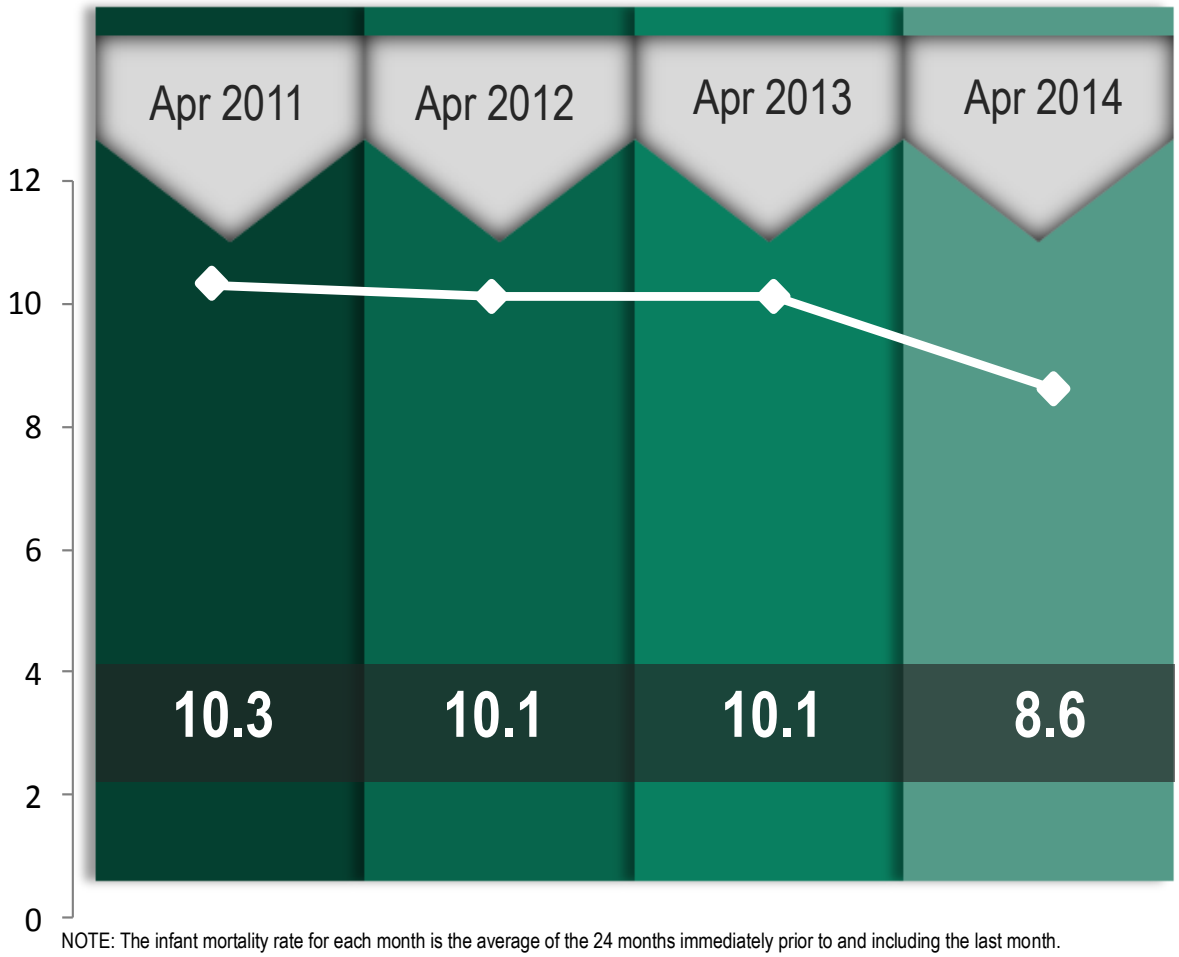
The ABC's of Safe Sleep

Baby sleeps safest alone, on their back, in a crib.

Two-Year Moving Average

Reviewing monthly rates is one approach used to determine whether there has been a change over time in infant mortality. However, monthly rates have a tendency to fluctuate and may disguise emerging trends. An alternative measure in the un-weighted, monthly moving average, which can provide a more stable picture of evolving patterns. In Figure 8, the infant mortality rate for each month is the 24-month average of months immediately prior to and including the current month. The two-year moving average has decreased from Apr 2011 (10.3) to Apr 2014 (8.6) as shown in Figure 8. Please note that the two-year 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 efforts to reduce infant mortality.

Figure 8. Two-Year Moving Average Infant Mortality Rate by Month, Hamilton County, Apr 2011—Apr 2014*



NOTE: The infant mortality rate for each month is the average of the 24 months immediately prior to and including the last month.
* Data for 2013-2014 are provisional; ODH reconciles (i.e. finalizes) data by fall of the subsequent year.
Data Source: ODH Vital Statistics

Cradle Cincinnati's Corner

Did you know? Over half of pregnancies in the United States are unintended - either mistimed or unwanted[1]. Over the past 20 years, this issue has become increasingly concentrated among poor and low-income women. Pregnancy spacing, including mindful family planning, is Cradle Cincinnati's third focus area.

Health professionals recommend that women space their pregnancies for at least 18 months apart. This allows a mother's body to recover from pregnancy and childbirth. Short spacing is associated with an increased risk fo low birth weight, small size for gestational age, and preterm birth[1].

Organizations - both locally and statewide - are stepping up to tackle this issue. The Ohio Hospital Association, as part of it's multi-strategy approach for infant mortality, will roll out initiatives for safe spacing, including education and access to long acting reversible contraception (LARC). Additionally the Cincinnati Health Department, under the scope of The Body Shop, has helped over 4,000 Cincinnatians receive contraception and reproductive health services.

How can you help? Encourage women to create a reproductive plan with their partner and to talk to their doctor about birth control. Or refer women to besider.org, an online birth control network that educates women on the "ins" and "outs" of birth control.

For more information, visit us at cradlecincinnati.org
Or follow us on Twitter at @CradleCincy

[1] Finer LB and Zolan MR, *Shifts in Intended and Unintended Pregnancies in the United States, 2001-2008,* American Journal of Public Health, 2004, 104(S1): S44-S48
[2] Mayo Clinic

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 from monthly Maternal and Infant Health Surveillance Reports (http://www.hamiltoncountyhealth.org/en/resource_library/reports.html). Both of these data sources are considered provisional until the ODH 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. PDS-A is used for more in-depth analysis of risk factors, but suffers from incompleteness due to missing unfiled/pending certificates. 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, 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 3-5). Table 2 displays the discrepancy between the two infant mortality data sources from ODH. Please note that delayed certificates directly impact data quality, and therefore the integrity of findings shared in this report.

Table 2. Infant Mortality Data Source Assessment, Hamilton County, 2013-2014

Data Source	2013 No. Infants < 1 yr.	2014 No. Infants < 1 yr.
PDS-A	92	23
PDS-B	95	23
Discrepancy	3	0

Appendix B

General Guidelines for Using Surveillance Charts

The Hamilton County Infant Mortality Surveillance System (HCIMSS) uses surveillance charts to monitor infant mortality rates and preterm birth rates. These charts provide a method for monitoring the status of infant health other 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: ❶ a baseline—the center line which is the average number of deaths per month over the preceding two years, ❷ a goal line which shows the goal that has been established by the community and ❸ upper and lower control limits [dashed] that allow users to detect unusual evens. 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 by Hamilton County Public Health, Department of Community Health Services, Division of Epidemiology and Assessment in collaboration with Cradle Cincinnati.

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