



Hamilton County Maternal and Infant Health Monthly Surveillance Report



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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.

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 March 10, 2014; the birth data were updated on the Ohio Public Health Information Warehouse on January 30, 2014.

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

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 health¹. 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**.

¹Centers 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.

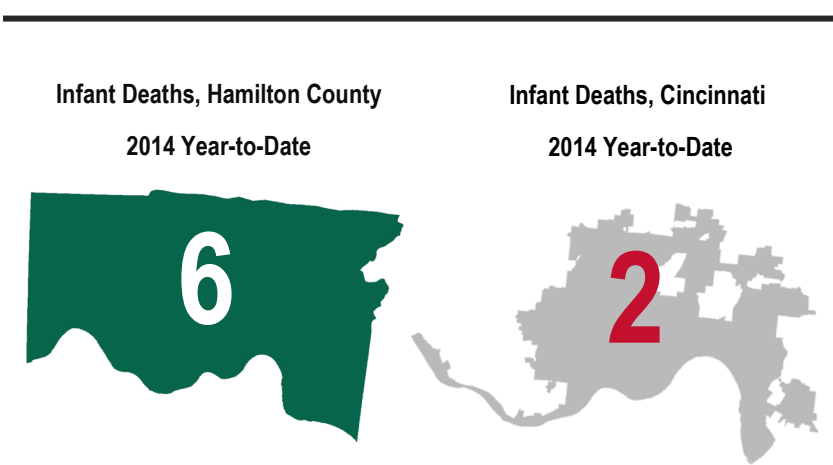


Number of Infant Deaths

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

Month	Hamilton County		Hamilton County	
	Infant Deaths 2012	Infant Deaths 2014	Infant Births 2013	Infant Births 2014
January	7	6	880	886
February	9		774	
March	11		872	
April	5		865	
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	6	10,741	886

One measure of infant mortality is the number of infant deaths per month. Two of the infant deaths that occurred in January 2014 in Hamilton County, occurred amongst Cincinnati residents. In January 2014, there were 6 infant deaths within Hamilton County. Table 1 displays the provisional number of infant deaths and births for each month in 2013 and 2014. Please see **Appendix A** on Page 6 to learn more about provisional death data limitations.



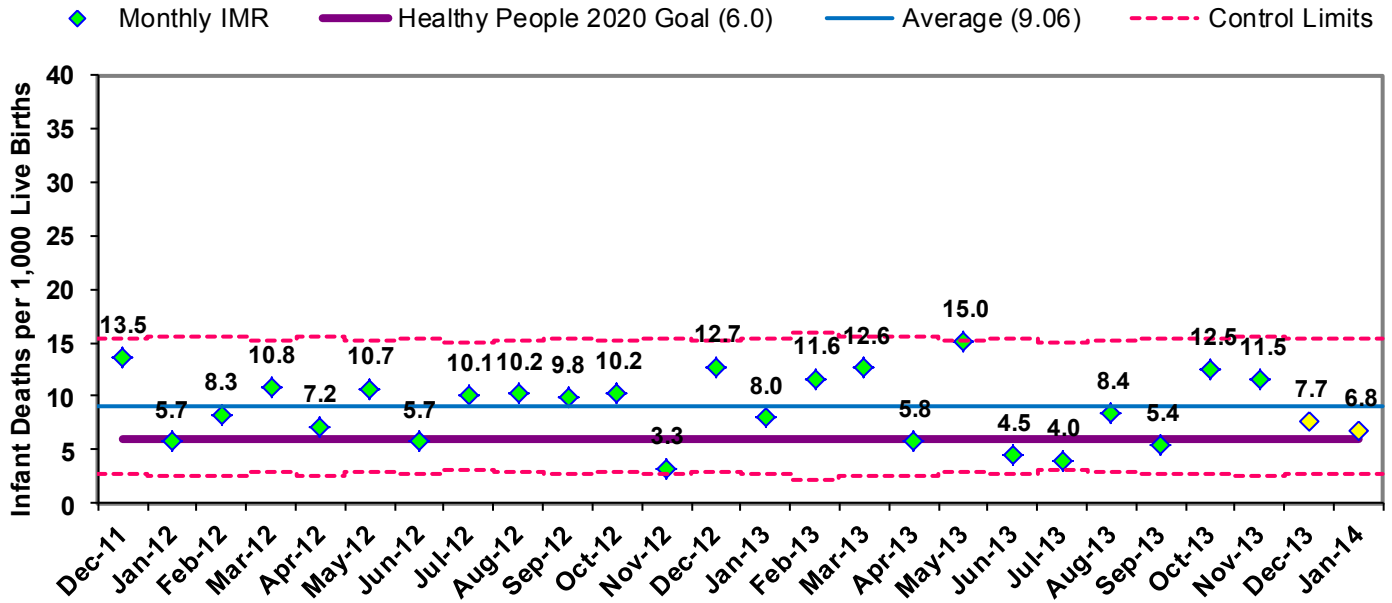
Infant Mortality Rates

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 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 January 2014 was 6.8. This provisional rate was greater than the Healthy People 2020 goal (6.0).

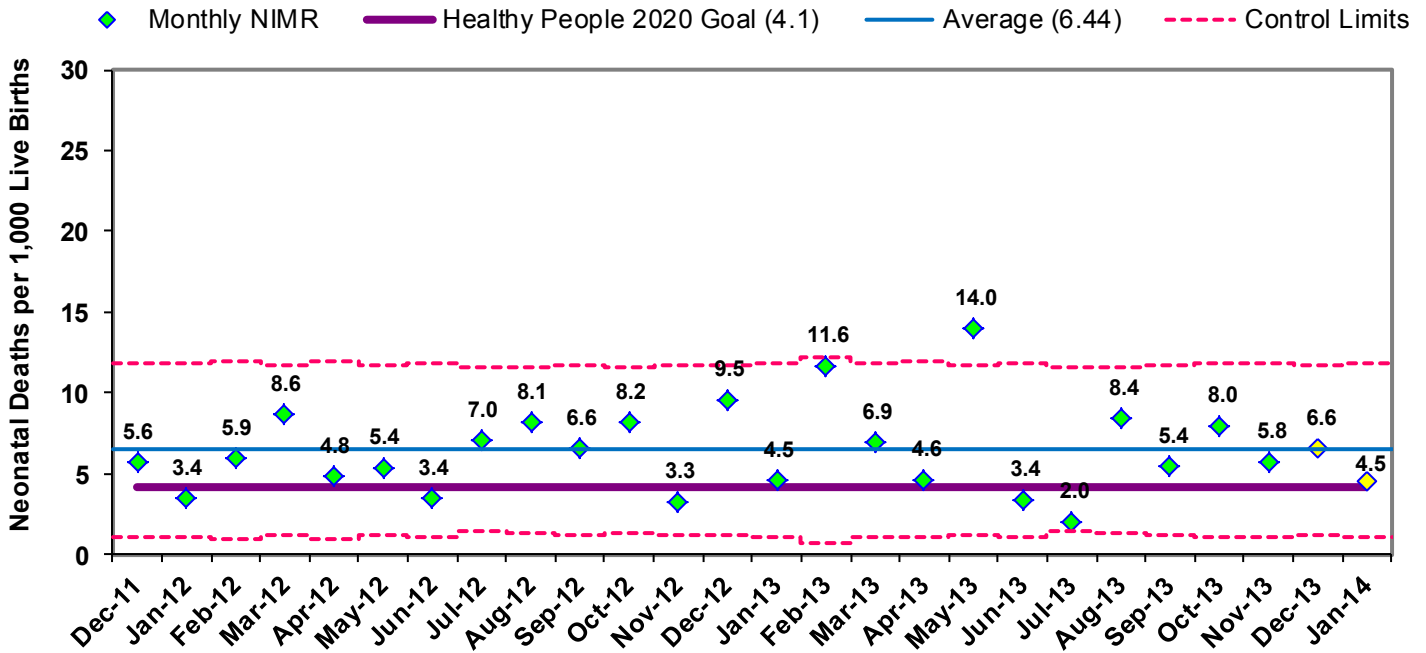
The IMR for January 2014 was 6.8 infant deaths per 1,000 live births (Figure 4). January was below the average IMR (9.06) as shown in Figure 1. Subsequent reports will provide improved statistical validity of these estimates (**Appendix A**). The January 2014 NIMR was below the upper statistical thresholds and is displayed in Figure 2. The January NIMR (4.5) 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 6.44 neonatal deaths per 1,000 live births. Neonatal deaths accounted for 75.2 percent of the January 2013—January 2014 infant deaths as of data collected on March 10, 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, Dec 2011—Jan 2014*



NOTE: The mean is calculated using two years of data from Dec 2011—Nov 2013. 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, Dec 2011—Jan 2014*



NOTE: The mean is calculated using two years of data from Dec 2011—Nov 2013. Yellow points are more likely to change in future reports.
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 Data Source: ODH Vital Statistics

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

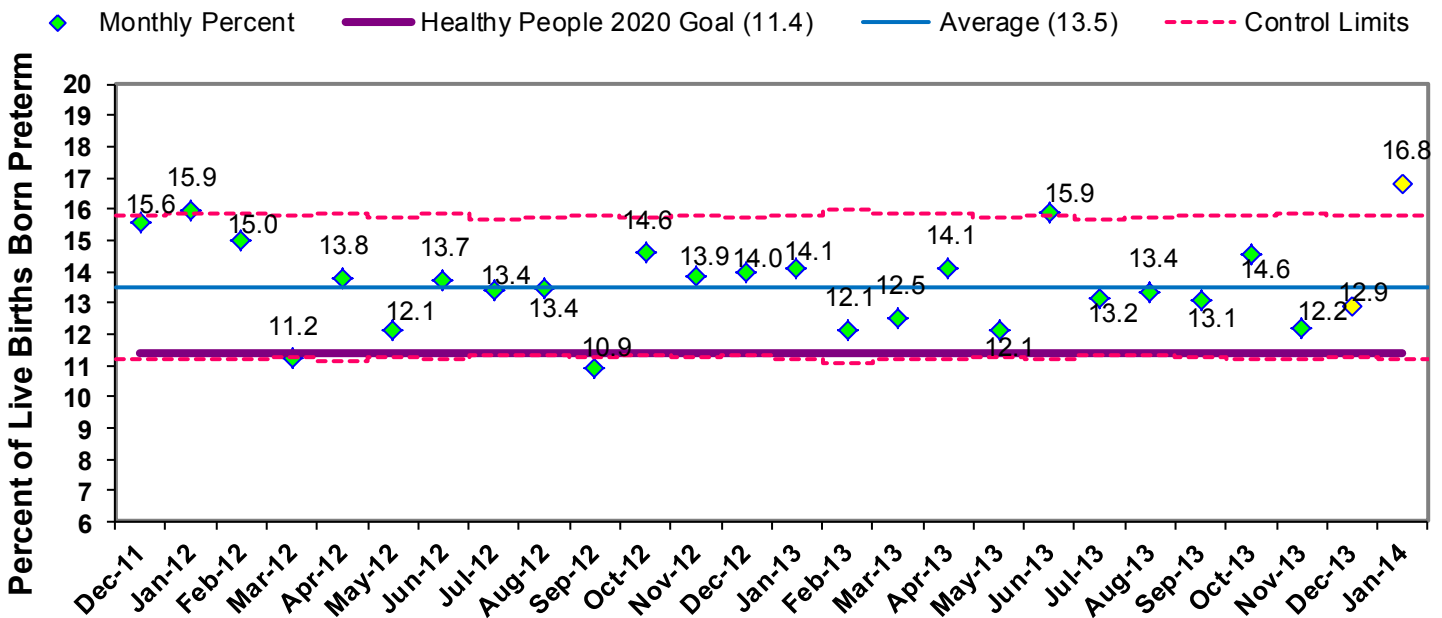
The preterm birth rate is the percentage of infants born before 37 weeks gestation. The very preterm birth rate is the percentage of infants born before 32 weeks gestation. Preterm birth is a significant risk factor of infant mortality and many other adverse health outcomes. The average preterm birth rate in Hamilton County (13.5 percent) is above the Healthy People 2020 goal of 11.4 percent. The provisional preterm birth percentage for January 2014 is 16.8 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 (2.94 percent) is above the Healthy People 2020 goal of 1.8 percent. The provisional very preterm birth percentage for January 2014 is 3.5 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 January 2014 is 0.3 percent in Hamilton County is below the average <23 weeks gestation birth rate in Hamilton County (0.45 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 January 2014 (16.8 percent) was above the Hamilton County average (13.5 percent) and above the Healthy People 2020 goal for preterm births (11.4 percent).

The very preterm birth rate for January 2014 (3.4 percent) was above the Hamilton County average (2.94 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, Dec 2011—Jan 2014*



NOTE: The mean is calculated using two years of data from Dec 2011—Nov 2013. 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, Dec 2011—Jan 2014*

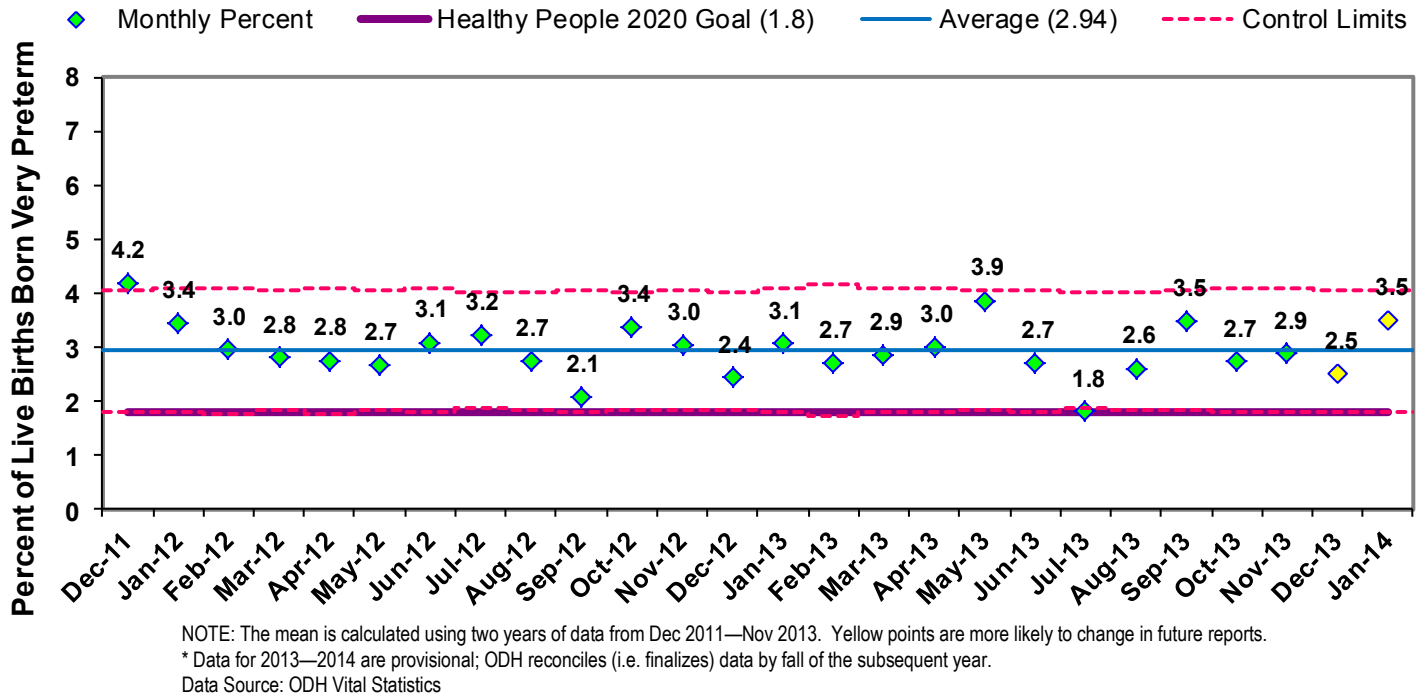
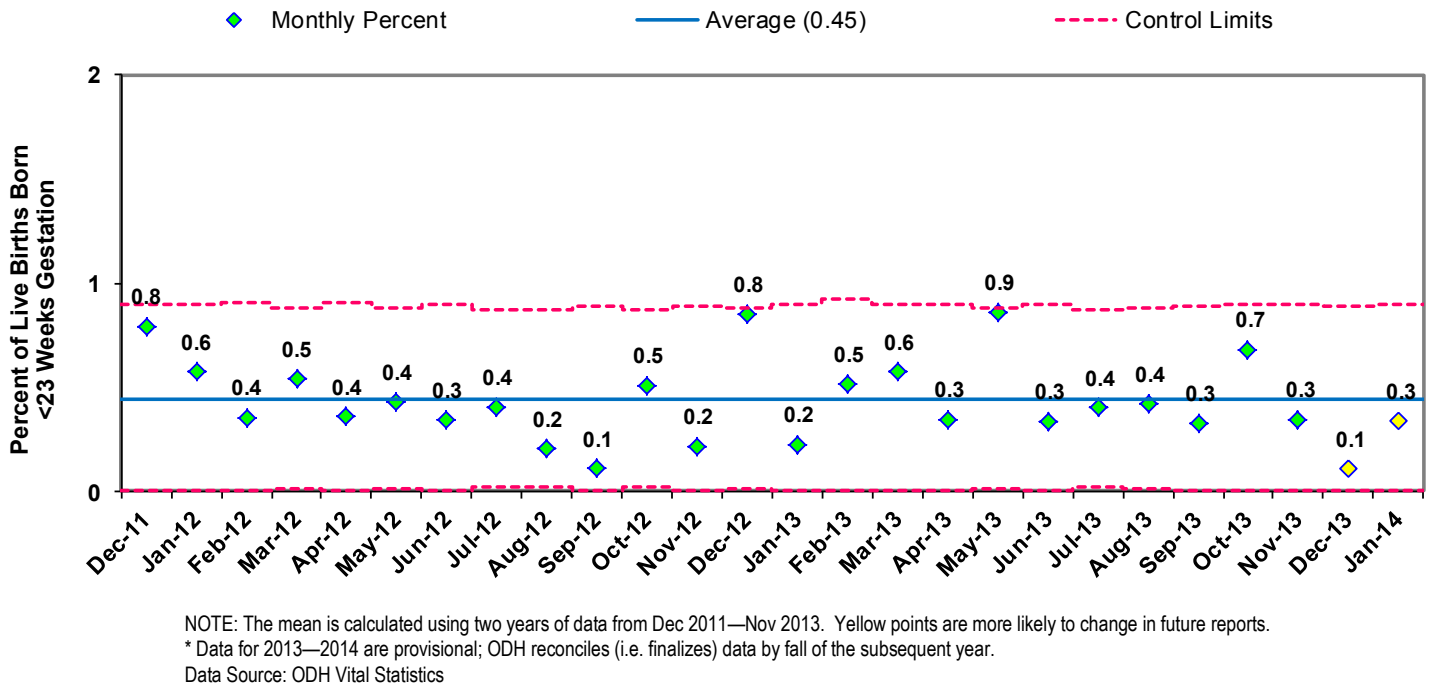


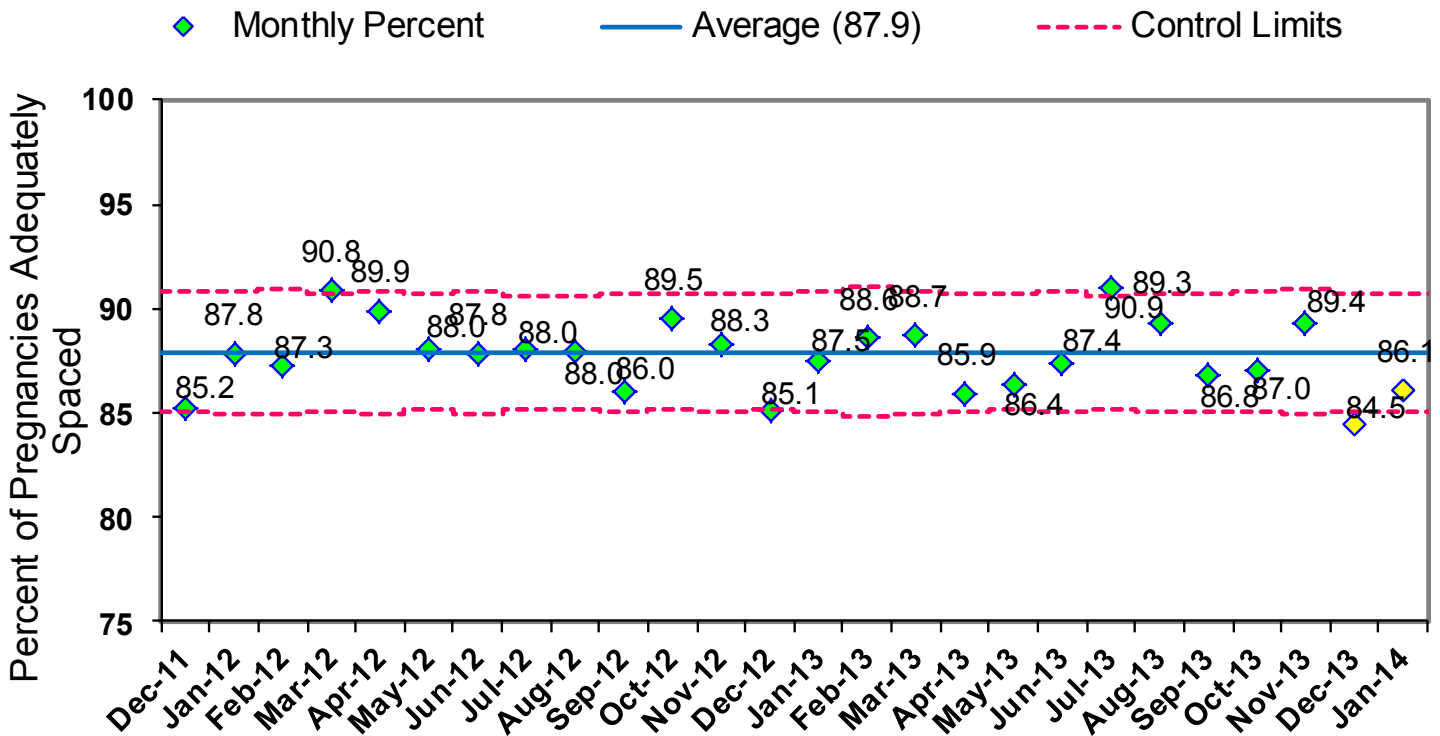
Figure 5. <23 Weeks Gestation Birth Rate Surveillance Chart, Hamilton County, Dec 2011—Jan 2014*



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, Dec 2011— Jan 2014*

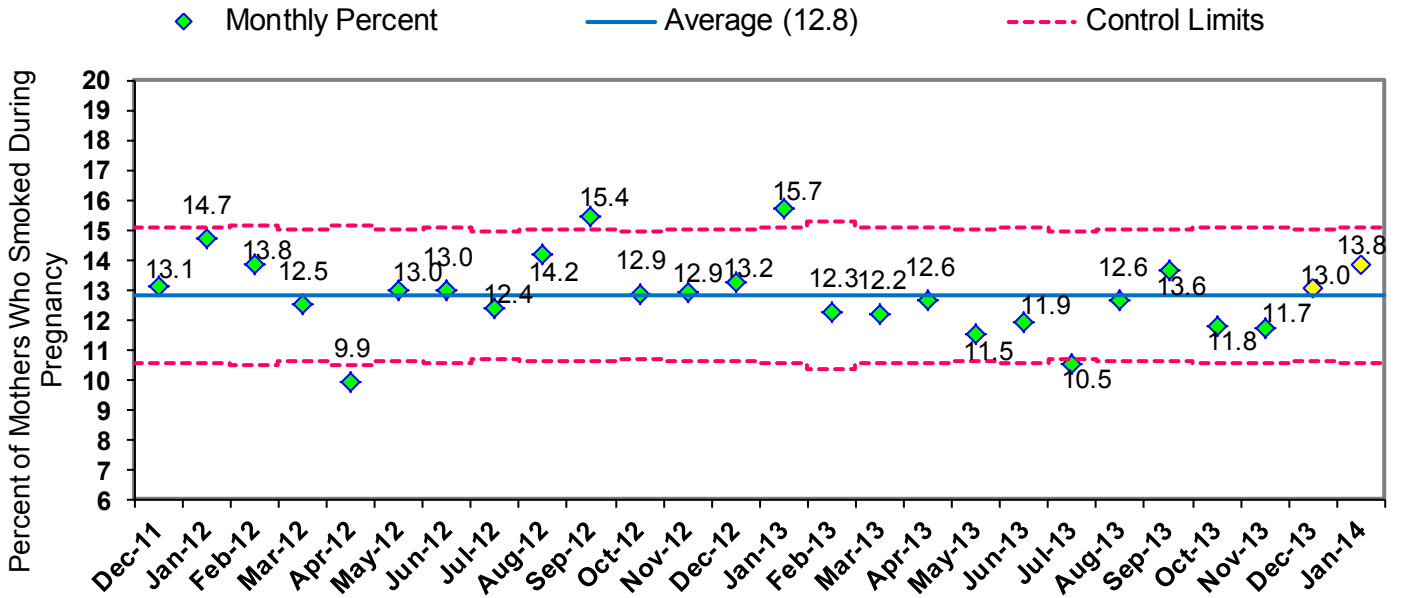


NOTE: The mean is calculated using two years of data from Dec 2011—Nov 2013. Yellow points are more likely to change in future reports.
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 Data Source: ODH Vital Statistics

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 January 2014 was 13.8 percent (Figure 7). This rate was above 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 , Dec 2011—Jan 2014*



NOTE: The mean is calculated using two years of data from Dec 2011—Nov 2013. 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

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. The number of sleep-related deaths in Hamilton County is not yet available. As further iterations of the report are published, the number of sleep-related deaths will become available and published.



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 is 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 Jan 2011 (10.0) to Jan 2014 (8.9) 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, Jan 2011—Jan 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



In 2013, Hamilton County lost 95 babies. While this is an improvement over the past years, we continue to have one of the worst infant mortality rates in the entire country—8.9 deaths for every 1,000 live births. We exceed the national rate of 6.1 and the Healthy People 2020 target rate of 6.0. The good news is that partners across our community—local leaders, maternity hospitals, the city and county health departments, and other organizations—are working towards and invested in reducing infant deaths. Many factors play a role in infant mortality; Cradle Cincinnati is dedicated to addressing three of the biggest offenders: birth spacing, maternal smoking, and unsafe sleep practices.

If you ride the Metro, you'll soon see one of our latest initiatives: "Safe Sleep" bus banners. By disseminating public education campaigns, we hope to reduce sleeping-related deaths. Education is only one way to better our county; we also need the help of other organizations, community groups, and neighbors.

Let's rally together to reduce unnecessary deaths and make Hamilton County one of the healthiest communities in the county for both moms and babies.

For more information, visit us at cradlecincinnati.org

Or follow us on Twitter at [@CradleCincy](https://twitter.com/CradleCincy)

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 even to report. Annual, 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.

Data Source	2013	2014
	No. Infants < 1 yr.	No. Infants < 1 yr.
PDS-A	92	Not Yet Available
PDS-B	95	6
Discrepancy	3	Not Yet Available

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 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 by Hamilton County Public Health, Department of Community Health Services, Division of Epidemiology and Assessment in collaboration with Cradle Cincinnati.



PREVENT. PROMOTE. PROTECT.



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