
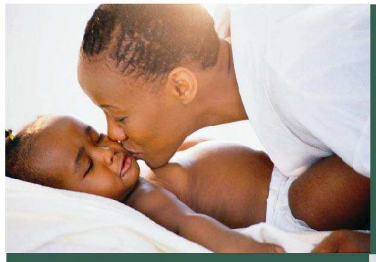


Maternal and Infant Health Monthly Surveillance Report

Hamilton County

March 2011

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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 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.

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**

The data source for this report series has been enhanced to improve the monthy 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 ODH on April 11, 2011.

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**.

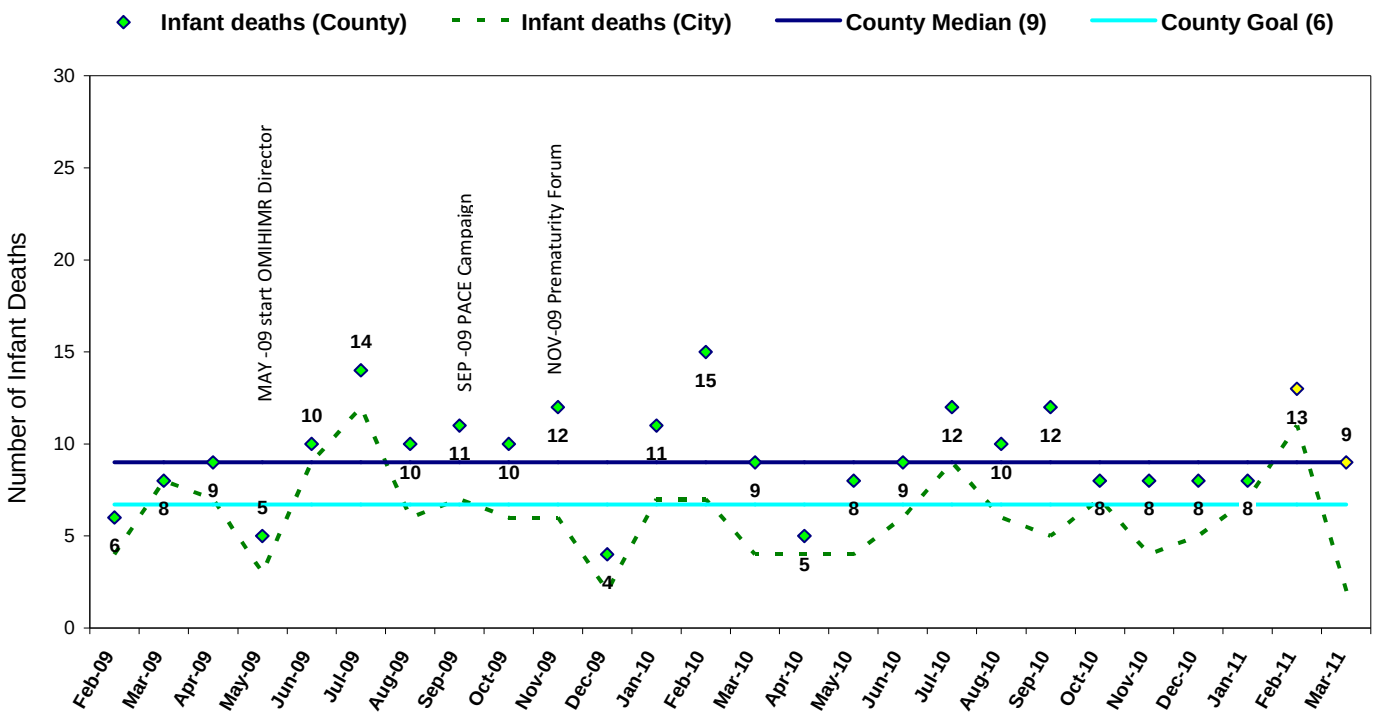
[1] Centers for Disease Control and Prevention. *Updated Guidelines for Evaluating Public Health Surveillance Systems: Recommendations from the Guidelines Working Group*, MMWR, July 27, 2001, Vol.50 No. RR—13

Number of Infant Deaths

There were 9 infant deaths recorded in Hamilton County during March as of April 11, 2011.

One measure of infant mortality is the number of deaths per month. Figure 1 below shows the count of infant deaths in Hamilton County and Cincinnati by month over the past two years. Infant mortality (n=9 provisional deaths) reported for March was at the two-year median of nine deaths (Figure 1). Provisional data for 2011 indicate that 67%, of infant deaths have occurred to residents of Cincinnati (Figure 1). Please see **Appendix A** on page 6 to learn more about the provisional death data.

Figure 1. Number of Infant Deaths, Hamilton County Feb 2009 – March 2011*



NOTE: The county median is calculated using data from February 2009 – January 2011.

* Data for 2009-2011 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 2009-2011 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 IMRs for February and March are estimated at 15.7 and 9.7, respectively. The February rate was above the two-year average of 9.9 deaths per 1,000 live births.

The IMRs for February and March are currently estimated at 15.7 and 9.7, respectively (Figure 2). The February IMR was above the two-year average (9.9). The IMRs were calculated based on 827 births recorded in February and an estimated 926 births for March. See subsequent reports for improved statistical validity of these estimates (**Appendix A**).

The February and March NIMRs were estimated as 10.8 and 6.5, respectively (Figure 3). These rates are provisional and subject to change. Six of the nine deaths in March were classified as neonatal deaths. Neonatal deaths have comprised 70% of the infant deaths recorded in 2011.

Figure 2. Infant Mortality Rate Surveillance Chart, Hamilton County Feb 2009-March 2011*

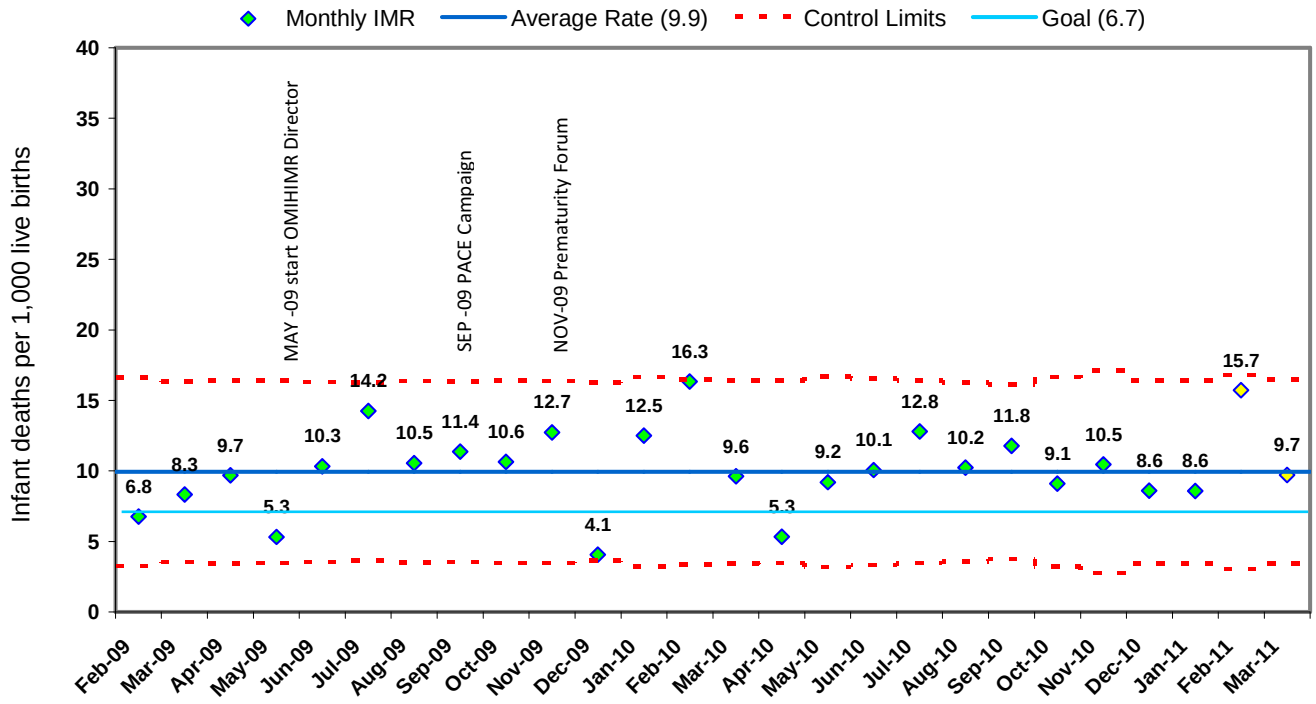
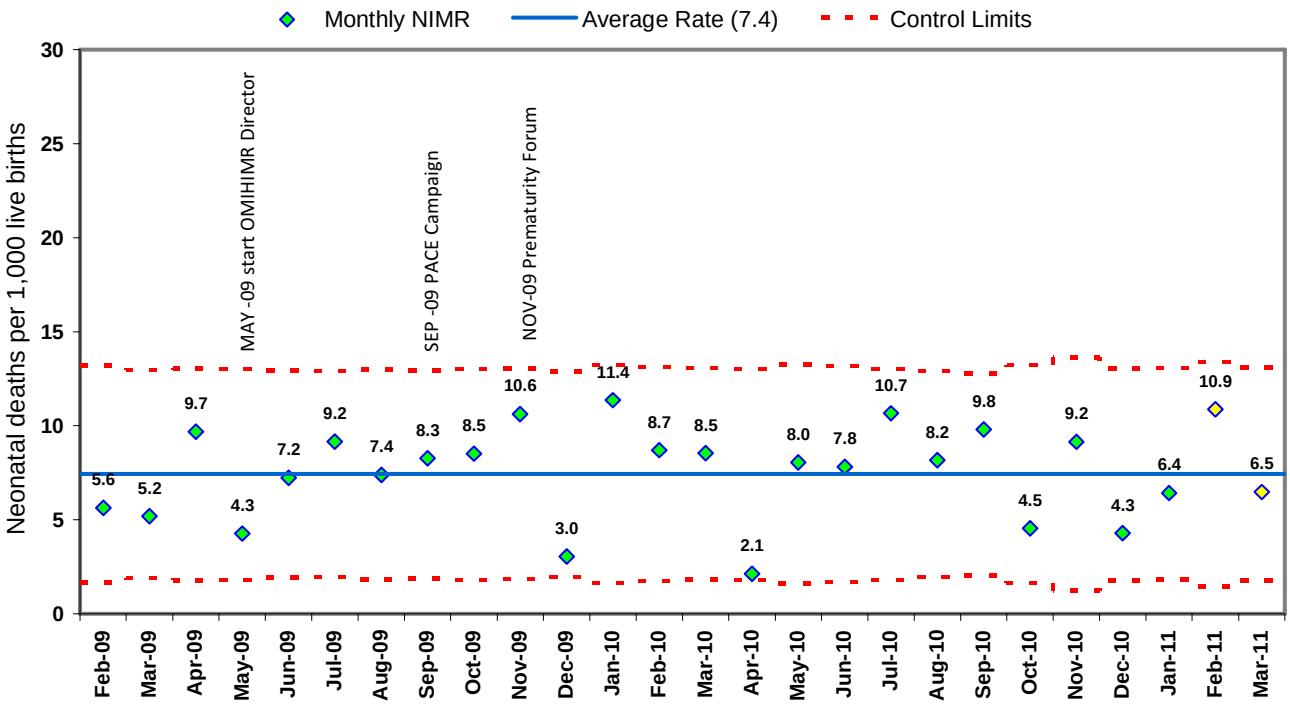


Figure 3. Neonatal Mortality Rate Surveillance Chart, Hamilton County Feb 2009-March 2011*



NOTE: The mean is calculated using two years of data from Feb 2009–Jan 2011. Yellow points are more likely to change in future reports.
The current month's mortality rates are calculated with an estimated denominator. The denominator is an average of the number of births form the preceding 24 months.

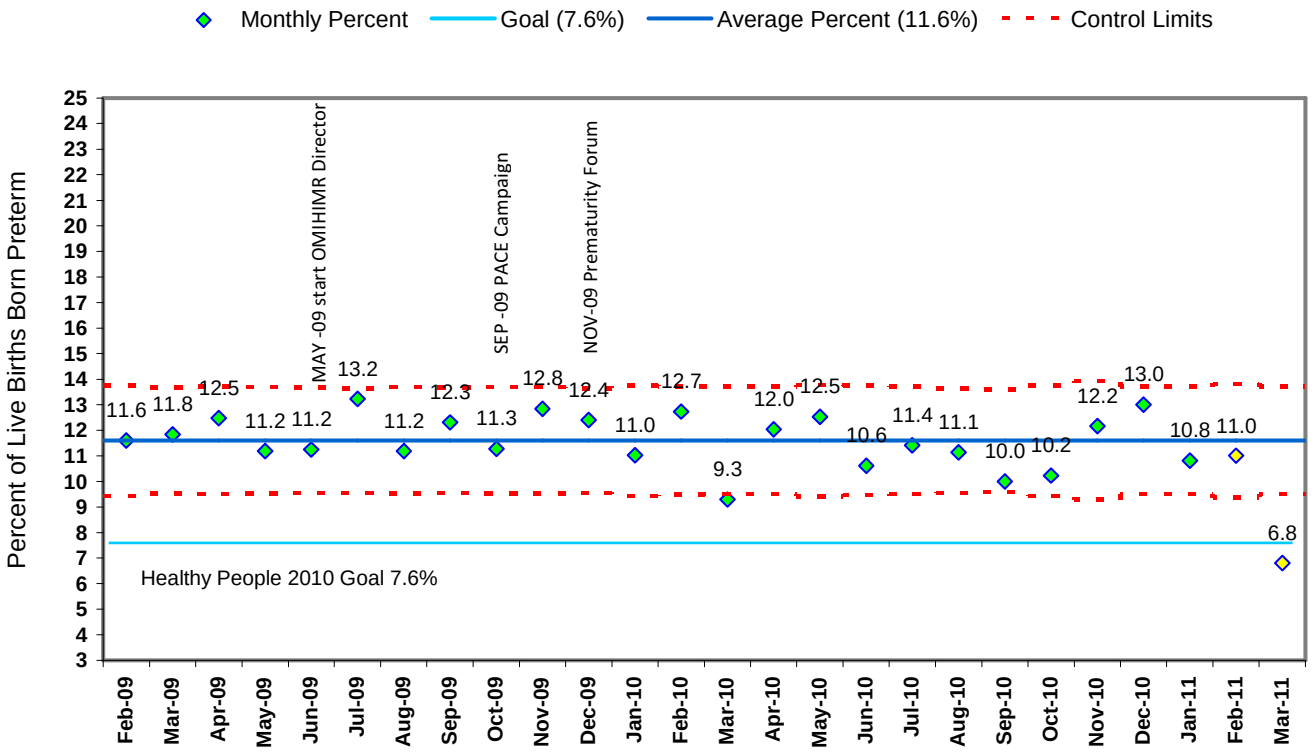
- Data for 2009-2011 are provisional
- Data Source: Ohio Department of Health Vital Statistics

Preterm Birth Rates

The preterm birth rate is the percentage of infants born before 37 weeks gestation. Pre-term birth is a significant risk factor of infant mortality and many other adverse health outcomes. The preterm birth rate in February (11.0%) was below the two-year average of 11.6%. The provisional rate for March (6.8%) was below the two-year average (Figure 4).

The preterm birth rate for January and February were lower than the two-year average of 11.6%.

Figure 4. Preterm Birth Rate Surveillance Chart, Hamilton County Feb 2009 – March 2011*

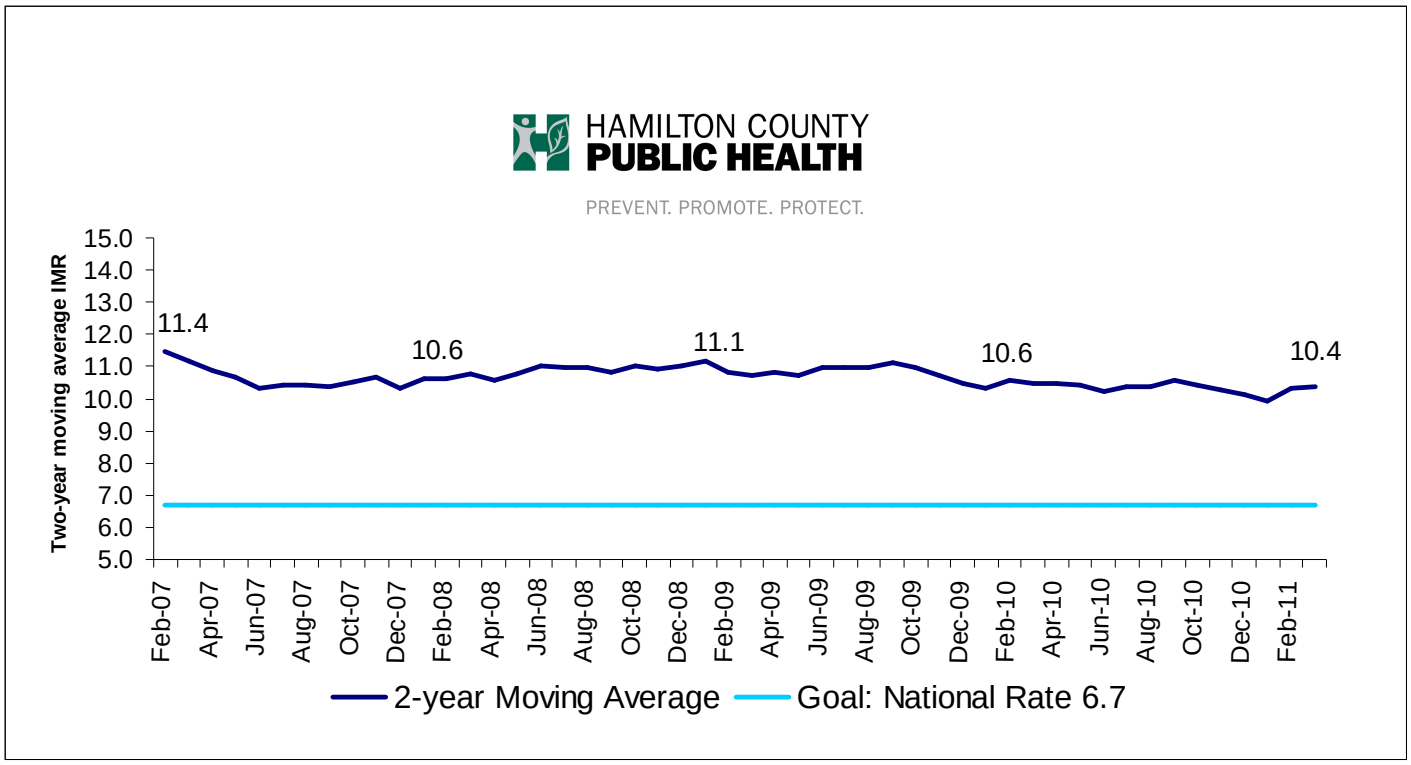


NOTE: The mean is calculated using two years of data from Feb 2009– Jan 2011. Yellow points are more likely to change in future reports.
*Data for 2009-2011 are provisional
Data Source: Ohio Department of Health Vital Statistics

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 24 month average of months immediately prior to and including the current month. The two-year moving average decreased from January 2007 (11.6) to March 2011(10.4) (Figure 5). The data for 2010 indicate that the two-year moving average has ranged from 10.1 -10.6 (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- March 2011*



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 2009-2011 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 (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. 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, 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 ODH. There were seven (23%) infant deaths in 2011 that were not yet filed at the time of this report (Table 1). As of April 11, 2011, PDS-B indicates one more infant death than PDS-A, this infant death has not been filed. Thus, 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 - 2011

Data Source	2009	2010	2011
	No. Infants < 1 yr.	No. Infants < 1 yr.	No. Infants < 1 yr.
PDS-A	111	114	23
PDS-B	111	115	30
Discrepancy	0	1	7

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.

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