Extremely Premature Births in Ohio, 2017

In 2017, 413 (0.3 percent) babies in Ohio were born at less than 23 weeks gestation, considered extremely premature. Sadly, almost all infants who were born this early died. This brief will take a closer look at these births and how they contribute to infant mortality in Ohio.

Key Findings

1. Although the percentage of infants born at less than 23 weeks was low, they disproportionately contributed to the infant mortality rate. The percent of infants born at less than 23 weeks gestation was 0.3 percent, while contributing to about 30 percent of infant deaths. Preventing these births from happening so early would decrease Ohio’s infant mortality rate.

2. In 2017, black babies were born at gestational ages of less than 23 weeks, three times more often than white babies. Black infants less than 23 weeks were born at a rate of 6.9 per 1,000 and white babies at a rate of 1.9 per 1,000. While the rate of white infants born at less than 23 weeks significantly decreased from 2010-2017, no significant improvements were observed in the rate of black infants born at less than 23 weeks.

3. Racial differences in extremely premature births contribute to racial disparities in infant mortality. In 2017, infants born at less than 23 weeks gestation accounted for 41.5 percent of black infant deaths and 22.5 percent of white infant deaths. This disparity was primarily due to a larger portion of black births happening at gestational ages of less than 23 weeks.

4. When comparing overall mortality rates among black infants (13.4) versus white infants (5.5) during 2013-2017, over half of the difference (or higher amount of black infant deaths), occurred among babies born at less than 23 weeks gestation.

5. Maternal characteristics other than race are common among births less than 23 weeks gestation. About 70 percent of extremely preterm births were to women living in Ohio Equity Institute and urban counties. Additionally, lack of first trimester prenatal care was observed in over one-third (36.1 percent) of women with births at less than 23 weeks.
Infants born at less than 23 weeks disproportionately contributed to infant mortality

Full term is defined as babies born at 37 weeks gestation or greater. Infant mortality is defined as the death of a live-born baby before his or her first birthday. An infant mortality rate is the number of babies who died during the first year of life per 1,000 live births.

While many babies born before 37 weeks can survive, and even thrive, babies born at less than 23 weeks are highly unlikely to survive. In 2017, the percent of infants born at less than 23 weeks was 0.3 percent, while 10.2 percent were born at 23-36 weeks, and 89.6 percent born at greater than 36 weeks gestation (Table 1).

Table 1: Distribution of All Live Births by Gestational Age, Ohio 2017

<table>
<thead>
<tr>
<th>Gestational Age at birth</th>
<th>Number of Births</th>
<th>Percent (%) of Total Live Births</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;16 weeks</td>
<td>121</td>
<td>0.09%</td>
</tr>
<tr>
<td>16-22 weeks</td>
<td>292</td>
<td>0.21%</td>
</tr>
<tr>
<td>23-27 weeks</td>
<td>768</td>
<td>0.56%</td>
</tr>
<tr>
<td>28-33 weeks</td>
<td>3,054</td>
<td>2.23%</td>
</tr>
<tr>
<td>34-36 weeks</td>
<td>10,074</td>
<td>7.36%</td>
</tr>
<tr>
<td>&gt;=37 weeks</td>
<td>122,586</td>
<td>89.55%</td>
</tr>
<tr>
<td>Total</td>
<td>136,895</td>
<td>100.00%</td>
</tr>
</tbody>
</table>

Although infants born at less than 23 weeks gestation made up a small proportion of live births in 2017, they accounted for almost a third of infant deaths (30.5 percent). In comparison, infants born at 23-36 weeks gestation accounted for 38.4 percent of infant deaths and those born at greater than 36 weeks made up 31.2 percent of infant deaths (Figure 1).

Figure 1: Percent of Births and Infant Deaths by Gestational Age in Weeks, Ohio 2017

0.3% of Infants were born at <23 weeks = 30.5% of all Infant Deaths happened among infants born at <23 weeks
Black babies are three times more likely to be born extremely premature than white babies

More black babies are born at gestational ages of less than 23 weeks compared to white babies. In 2017, black babies were born at less than 23 weeks gestation more than three times as often as white babies (6.9 vs 1.9 per 1,000 live births, respectively) (Figure 2).

**Figure 2: Extremely Preterm Births (<23 weeks gestation) by Race, Ohio 2017**

3 black babies in Ohio are born extremely premature......

......for every 1 white baby

**Figure 3: Rate of Extremely Preterm Births (<23 weeks) by Race, Ohio 2010-2017**

*Statistically significant annual percent decrease of 12.45 among white births. Insignificant annual percent decrease of 2.43 among black births. Joinpoint software used to test for significant trends (p<0.05).

While the rate of white infants born at less than 23 weeks gestation has significantly decreased since 2010, there has not been a significant decrease among black infants born at less than 23 weeks gestation, thus widening the racial disparity gap (Figure 3).
Racial differences in extremely premature births contribute to racial disparities in infant mortality

Babies born at less than 23 weeks gestation are highly unlikely to survive. The contribution of extreme prematurity to infant mortality is more pronounced when observed by race. Because a larger proportion of black babies are born at less than 23 weeks (compared to white babies), a larger percentage are unlikely to survive. In 2017, 166 of 24,006 black births occurred at less than 23 weeks (0.7 percent), representing 144 of 347 black infant deaths (41.5 percent) (Figure 4). Comparatively, 194 of 99,849 white births occurred at less than 23 weeks (0.2 percent), representing 119 of 530 white infant deaths (22.5 percent) (Figure 5).

Figure 4: Black Births and Infant Deaths by Gestational Age in Weeks, Ohio 2017

- 0.7% of Black Infants were born at <23 weeks = 41.5% of Black Infant Deaths

Figure 5: White Births and Infant Deaths by Gestational Age in Weeks, Ohio 2017

- 0.2% of White Infants were born at <23 weeks = 22.5% of White Infant Deaths

In 2017, infants born at less than 23 weeks represented 0.7 percent of black live births and 0.2 percent of white live births. Unfortunately, these early births represented 41.5 percent of black infant deaths and 22.5 percent of white infant deaths (Figures 4 and 5).
Over half of the excess mortality was among babies born at less than 23 weeks gestation

The Ohio Department of Health (ODH) has expanded the ways we look at data, and one strategy is to examine excess mortality. Excess mortality is the difference in the rate of deaths experienced by one population of interest compared to a reference group. Due to the racial disparity among extreme prematurity, this brief identifies black infants as our population of interest and white infants as our reference group.

1. The first step in assessing excess mortality is to observe the infant mortality rates for each group. To provide enough numbers for a detailed look, we combined 5 years of data. During 2013-2017, the black infant mortality rate was 13.4 per 1,000 black births and the white infant mortality rate was 5.5 per 1,000 white births.

2. To calculate excess mortality, we took the difference between the black infant mortality rate of 13.4 and the white infant mortality rate of 5.5, which equals 7.9. This means that if the black infant mortality rate was reduced to the white infant mortality rate, we would save 7.9 black babies per 1,000 live black births. From 2013-2017, this equaled 935 black babies.

3. Finally, we took the total excess mortality and grouped it by gestational age. Over half (55 percent) of the excess deaths were babies born at less than 23 weeks gestation, 31 percent were babies born at 23-36 weeks, and 15 percent were babies born at full term (37 weeks or more) (Figure 6).

To reduce infant mortality and the disparity, prevention should focus on infants born at less than 23 weeks, since this group accounted for the largest proportion of excess black deaths.

Figure 6: Contribution of Excess Mortality among Black Infants Compared to White Infants by Gestational Age Group, Ohio 2013-2017

Among black infants, babies born at less than 23 weeks accounted for over half of the excess mortality.

Figure 6 represents the total number of black babies who would have survived during 2013-2017, if the black mortality rate was reduced to the white mortality rate.
Maternal characteristics, other than race, were common among extremely preterm births

We examined maternal characteristics among births at less than 23 weeks gestation, including socioeconomic characteristics, residence type, and maternal health and behaviors before and during pregnancy (Figures 7 and 8). In 2017, we identified the following prevalent socioeconomic characteristics among women with births at less than 23 weeks gestation:

- Unmarried (60.7 percent)
- Medicaid insured (54.6 percent)
- Living in Ohio Equity Institute (OEI) communities* (64.3 percent)
- Living in urban counties (65.3 percent)

Figure 7: Maternal Demographics Among Extremely Preterm Births (<23 weeks gestation), Ohio 2017

* The Ohio Institute for Equity in Birth Outcomes (OEI) counties are Butler, Cuyahoga, Franklin, Hamilton, Lucas, Mahoning, Montgomery, Stark, and Summit.
Furthermore, over a third of the women with extremely preterm births were obese before pregnancy (37.2 percent) and 45.2 percent did not receive first trimester prenatal care (Figure 8).

These preventable risk factors are important for identifying intervention opportunities at different stages of pre-pregnancy and pregnancy to prevent extremely preterm births and reduce infant mortality. However, much is unexplained regarding the relationships between some of these maternal characteristics and extreme prematurity. Additionally, these risk factors do not completely explain the racial disparity among babies born earlier than 23 weeks.

**Figure 8: Maternal Behaviors and Health Status Among Extremely Preterm Births (<23 weeks gestation), Ohio 2017**

<table>
<thead>
<tr>
<th>Pre-Pregnancy: Maternal Health and Behaviors</th>
<th>Percent (%)</th>
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<tbody>
<tr>
<td>Over Weight</td>
<td>22.9</td>
</tr>
<tr>
<td>Obese</td>
<td>37.2</td>
</tr>
<tr>
<td>Smoked Before Pregnancy</td>
<td>22.1</td>
</tr>
<tr>
<td>Prior Preterm Birth</td>
<td>11.4</td>
</tr>
<tr>
<td>Interpregnancy Interval &lt;18 Month*</td>
<td>31.5</td>
</tr>
<tr>
<td>Primiparous (1st Birth)</td>
<td>24.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Pregnancy: Maternal Health and Behaviors</th>
<th>Percent (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any Smoking During Pregnancy</td>
<td>20.0</td>
</tr>
<tr>
<td>WIC Enrollment</td>
<td>24.1</td>
</tr>
<tr>
<td>Not 1st Trimester Prenatal Care</td>
<td>45.2</td>
</tr>
<tr>
<td>Twin or Higher Order Pregnancy</td>
<td>18.9</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Delivery</th>
<th>Percent (%)</th>
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<tbody>
<tr>
<td>Born Inadequate Level Hospital</td>
<td>22.8</td>
</tr>
</tbody>
</table>

*Among women with a prior birth*
Data Sources and Methods

This report contains data from the births and period linked birth/infant death data sets, which are part of Ohio’s Vital Statistics System. The births data set contains all live births reported from birth certificates and was restricted during analyses to only Ohio residents. The period linked birth/infant death data set includes all infant deaths under age one year reported on death certificates and all live births reported from birth certificates. Only residents of Ohio are included in the period linked birth/infant death data set. The period linked birth/infant death data set is the primary data set for analyzing infant mortality trends and patterns in Ohio and mirrors the system used nationally. It is also the primary source for examining race and Hispanic-origin infant mortality and for examining factors related to birth. Race and Hispanic origin are self-reported by the mother on the birth certificate and are included in the birth and period linked birth/infant death data sets.

Definitions

Extreme Prematurity: Live births before 23 weeks of gestation. This definition is specific to this report.

Father not Listed on Birth Certificate: The birth certificate contained no information about the father of the infant. Lack of information about the father is sometimes used to indicate lack of paternal support for the pregnancy and infant.

Inadequate Hospital Level: An infant born in a hospital without the appropriate level of care given the infants gestational age and/or birth weight. Levels of neonatal care are prescribed through the Ohio Revised Code.

Infant Death: The death of a live-born baby before his or her first birthday.

Infant Mortality Rate: The number of infant deaths in a specific year divided by the number of live births within that same year, multiplied by 1,000.

Interpregnancy Interval: Time interval between the delivery date of the prior live birth and the conception date of the recent live birth.

Mother: An Ohio resident woman physically giving birth to the infant.

Obese: Refers to a mother’s body mass index (BMI) that was greater than 30 kg/m² before becoming pregnant.

OEI: The Ohio Institute for Equity in Birth Outcomes is a partnership between ODH and nine urban communities to improve birth outcomes and reduce racial disparities in infant deaths.

Overweight: Refers to a mother’s body mass index (BMI) that was greater than 24.9 kg/m² and less than 30 kg/m², before becoming pregnant.

Prematurity: Live births before 37 completed weeks of gestation.

Primiparous: This is the mother’s first live birth.

Race: Infants and mothers identified as black and white race excluded those of Hispanic ethnicity.

WIC Enrollment: The Special Supplemental Nutrition Program for Women, Infants, and Children is a Federal program administered by the state to income eligible women and their children up to age five. The program improves pregnancy outcomes by providing or referring to support services.
References


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