Maternal Child Health (MCH) Indicators Resource Document

March 2019

Document Version History

Version #	Implemented By	Revision Date	Modifications
1	A. Arendt and B.J. Mattson	Mar 2019	

Purpose

This document is intended to provide guidance for calculating and reporting on common indicators used in Maternal and Child Health (MCH) using Ohio Vital Statistics data from the Bureau of Vital Statistics at the Ohio Department of Health (ODH). It was created by epidemiologists in the Bureau of Maternal, Child, and Family Health at the ODH. Any questions related to the content can be directed to Andrea Arendt at andrea.arendt@odh.ohio.gov or B.J. Mattson at bj.mattson@odh.ohio.gov.

Types of Vital Statistics Files Available in the Secure Ohio Public Health Information Warehouse (OPHIW)

A. Birth Files:
1. Occurrence: The Ohio Occurrence Live Births dataset contains virtually all variables in the Integrated Perinatal Health Information System (IPHIS)[1] birth registry database including data considered non-public. The occurrence dataset contains only births which occurred in Ohio from 2012 to the present. Only the original birth data is contained in the OPHIW[2]; amendments (such as paternity changes) are not transmitted into the OPHIW.
2. Residence: The Ohio Resident Live Births dataset contains all Ohio resident and all Ohio occurrence births from 2006 to the present in the download and only Ohio resident births in the reports. This file contains data without personal identifiers for use in analysis of common MCH indicators such as low birth weight
3. Restricted: The Restricted Access Ohio Resident Live Births dataset also contains all Ohio resident and all Ohio occurrence births from 2006 to the present in the download and only Ohio resident births in the reports. It additionally contains the personal identifier birth certificate number and more granular residence data (Census tract, latitude, longitude).

B. Ohio Resident Mortality File:

The mortality dataset contains all Ohio resident and all Ohio occurrence deaths from 2007 to the present in the download and in the reports. ODH receives death data for deaths that occurred within the state along with data shared by other states where Ohio residents have died. Data collection, processing, and analysis methods resulting in the creation of a death record are developed and recommended for nationwide use through cooperative activities of the jurisdictions and the National Center for Health Statistics (NCHS). Therefore, per our interjurisdictional agreement portions of data for Ohio residents who died in other states have been redacted.

C. Infant Mortality File:

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[1] The Ohio Department of Health Bureau of Vital Statistics uses a program called Integrated Perinatal Health Information System/Electronic Death Registration System (IPHIS/EDRS) to file and maintain birth and death records.

[2] The Ohio Public Health Information Warehouse (OPHIW) is a web-based application maintained by the Ohio Department of Health (ODH) that stores public health data, including Vital Statistics data, to support ongoing activities such as surveillance, investigations, assessments, etc.

A combination of the infant death data (death at less than or equal to 364 days of life) and corresponding birth data.

1. Death cohort or period file: every infant who dies within a calendar year.
2. Birth cohort file: every infant who is born within a specific year. While extremely valuable, it should be noted that birth cohort files may be a few years behind the current calendar year because of delays in collecting and reporting events.

D. Fetal Death File:

The fetal death dataset contains all Ohio resident and all Ohio occurrence fetal deaths from 1989 to the present in the download and in reports. Only fetal deaths of 20 or more completed weeks of gestation are included in the dataset. The fetal death dataset contains many of the same data elements as the birth certificate and death certificate. The earlier data years do not contain information in all the data elements.

Final statistical files refer to files that are "locked down" or no longer edited. These are generally for a full calendar year of events.

Preliminary files include data that are current as of the date issued but may be incomplete or have edits made before being "locked down". Preliminary files are made available to provide the most up-to-date information to users; however, these files should be used with caution and noted as preliminary whenever the files or summaries are shared.

General Principles in Conducting Analysis

Missing Data:

Records that have missing or unknown values in the variables of interest should be excluded from the analysis. For example, when looking at the percent of preterm births, it is recommended to exclude any records that have a missing value or a value of '99' (Unknown) for gestational age. As an example, percent preterm = (preterm births / (total births – births with unknown term)) * 100. If missing data is ≥ 10% for any measure, validity may be compromised, and results should be interpreted with caution.

Making inferences about changes over time:

To make inferences about changes over time, ODH recommends examining more than two years of data. A key consideration is that even if a rate seems to have changed in one year, the years immediately preceding and following that year should be included in the analysis. An increase or decrease for one year may not be meaningful, even when it is statistically significant, if it is not replicated in subsequent years. Rates based on small numbers may change dramatically annually, but without examining several years of data, this will not be apparent and may result in incorrect interpretations. For geographies with larger numbers, it may be sufficient to review the annual trends for years of data. For those areas with smaller numbers, it may be more appropriate to aggregate years of data and review rolling averages.

Small sample sizes and stable estimates:

There are a number of guidelines regarding when an estimate may be considered "stable". For reporting birth and death statistics, NCHS standards of reliability or precision are not met when a rate is calculated with fewer than 20 in the numerator (http://wonder.cdc.gov/wonder/help/lbd.html#Assurance of Confidentiality).

ODH statistics are suppressed due to instability or confidentiality requirements when the difference between the number of specific events (e.g., births with low birthweight) and the total number of events (e.g., all births) is less than 10, or the number of events is less than 10.

One way to increase cell size among sub-populations is to combine years of data. Using two or three years of data will increase the number in the sample and result in more stable estimates.

Sub-State Analyses:

Many options exist for looking at geographic areas in Ohio. However, the user must decide if the location of the residence of the decedent is of interest, or the location of the event. Ohio death certificates list the location of death in categories (e.g., residence, hospital, nursing home). If a full address is available and has been geocoded, the latitude and longitude may be available. For injury deaths, a similar categorization is used. In some cases, a geocoded location of death is available. Most MCH indicators provided by ODH are residence-based.

The county variable, "CountyC", in the ODH birth and mortality files indicates county of residence. The CountyC codes range from 001 (ADAMS) to 175 (WYANDOT), in alphabetical order. This is the variable ODH uses to report county-level statistics.

Groupings of counties with an urban-rural classification may be useful. The Centers for Medicaid Services (CMS) is one such classification. Counties classified as rural according to CMS are Adams, Auglaize, Brown, Carroll, Champaign, Clinton, Coshocton, Crawford, Darke, Defiance, Fayette, Fulton, Gallia, Guernsey, Hardin, Harrison, Henry, Highland, Hocking, Holmes, Jackson, Logan, Madison, Meigs, Mercer, Monroe, Morgan, Morrow, Noble, Ottawa, Paulding, Perry, Pike, Preble, Putnam, Shelby, Van Wert, Vinton, Washington, Williams, Wyandot. All other counties are considered Metropolitan.

Another option is to use the city of residence. CityC is the variable that designates the city of residence of the decedent. The CityC codes are five-digit codes (e.g., Columbus is 18000). This is the variable ODH uses to report city-level statistics. ODH recommends that the variable "limits" NOT be used as it is location based on self-report.

Other Geocoding Considerations.

The CityC and CountyC variables are populated with codes for counties and cities. The codes are based on the Federal Information Processing Series (FIPS) or American National Standards Institute (ANSI) place codes: https://www2.census.gov/geo/docs/reference/codes/files/st39_oh_places.txt. The codes are assigned by the federal government and are standard around the country. The CountyC codes are similar for every state, so a user needs to first confirm Ohio residence by checking to see that CountryC=US and StateC=OH. For example, most Columbus residents will have the values US/OH/049/18000 (US/OH/FRANKLIN/COLUMBUS).

The Bureau of Vital Statistics at ODH started enhancing residence data with geocoding in 2003. A geocoding enhancement took place in 2015 that altered the way that the CountyC and CityC

variables are populated. When a good quality street address/zip code is obtained from birth or death record, the CountyC and CityC variables are populated with the appropriate city or county code based on geocoded (exact longitude and latitude) information. In some cases (generally <5%), the geocoded results are considered to be of low quality. When this happens, the text values for city and county as they appear on the birth or death record are mapped to the CityC and CountyC codes. Prior to 2003, the values for CityC and CountyC were derived from place-name, residence data reported by informants for death certificates and mothers for birth certificates.

Note that there are cases where a birth or death is assigned to a county or city but not to a specific census tract and thus a difference in totals will occur. ODH Vital Statistics counts these deaths in official county and city statistics, even when a census tract cannot be assigned.

Reporting VS Data

Mortality data is not considered confidential in the state of Ohio; however, information from birth files is confidential. Therefore, if linked files are used, Ohio's data disclosure limitation standards must be met (i.e. there must be a difference of 10 or more between the numerator and denominator).

Common MCH Indicators Presented in this Resource Guide

Pre-pregnancy Risk Factors:

Pregnancy Risk Factors:

Birth Outcomes:

Mortality Rates:

System Issues:

* Indicates an indicator in Ohio's State Health Improvement Plan (SHIP)

Percent of mothers with an education level of high school or less

Goal

To increase the number of mothers with college or technical training

Definition

Numerator: Number of 18-24 year old mothers of live births where the mother has a high school diploma, GED, or less

Denominator: Number of 18-24 year old mothers of live births with a non-missing value for mother's education level

Units: 100

Text: Percent

Healthy People 2020 Objective

HP2020 ECBP-6 Increase the proportion of the population that completes high school education.

Data Sources

ODH Vital Statistics – Birth File

Significance

It has been well documented that infant mortality rates are higher among women with an education level at high school or less. Focusing on social determinants of health such as maternal education can give us insight into why some infants are at a greater risk for dying before their first birthday. It can also help us determine how to direct limited resources and help as advocate for policy changes that can improve infant mortality rates.

Data Notes

Health People 2020 objective ECBP-6 is based on the population of persons aged 18 to 24 years. For this reason, this is the age group we use when reporting education status of mothers in our Quarterly Infant Mortality Scorecard. You may want to use all mothers or different age group depending on your specific needs or interests.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

Mom_Age – Coded in years

MEduc – Mother's education
   1 = 8th grade or less
   2 = 9th through 12th grade; no diploma
   3 = High School Graduate or GED Completed
   4 = Some college credit, but no degree
   5 = Associate Degree
   6 = Bachelor's Degree
   7 = Master's Degree
   8 = Doctorate Degree or Professional Degree
   9 = Unknown

Sample SAS Code

```
Data OH_HighSchool;
Set Births;
* select unique 18-24 year old Ohio mothers of live births with known values of education;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And 18<=Mom_Age<=24  And 1<=
MEduc<=8;
If 3<=Meduc<=8 Then Mom_GE_HS_Num = 1; Else
If 1<=Meduc<=8 Then Mom_GE_HS_Num = 0;
Run;
Proc Freq Data=OH_HighSchool;
Tables Mom_GE_HS_Num;
Run;
```

Percent of women who are overweight or obese

Goal

To decrease the number of women of childbearing age who are overweight or obese

Definition

Numerator: Number of mothers of live births who were overweight or obese prior to pregnancy (according to calculated BMI from mother's pre-pregnancy weight and pre-pregnancy height)

Denominator: Number mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to MICH-16.5: Increase the proportion of women delivering a live birth who had a healthy weight prior to pregnancy

Data Sources

    ODH Vital Statistics – Birth File
    ODH Vital Statistics – Linked Infant Mortality Files

Significance

Obesity increases the risk for gestational diabetes, preeclampsia, miscarriage, and birth defects. Women who are obese are also more likely to have problems during labor and have an induction or cesarean.

Data Notes

Vital statistics has information on pre-pregnancy weight and height.

BMI = (weight in pounds * 703)/height in inches^2 or weight in kilograms/height in meters^2. A BMI of less than 18.5 is considered underweight, 18.5 – 12.9 is normal, 25.0 – 29.9 is overweight and greater than or equal to 30.0 is obese.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
  T = Deduplicated Mom;
  F = Duplicate Mom

BMICategory
1 = Underweight (under 18.5)
2 = Normal (18.5-24.9)
3 = Overweight (25-29.9)
4 = Obese (over 30)
9 = Unknown

Sample SAS Code

```
Title 'Pre-pregnancy BMI categories';
Title2 'Add group 3 and 4 together for combined overweight and obese mothers';
Proc Format;
Value BMI_Grp (Max=20)
        1 = 'Underweight (<18.5)'
        2 = 'Normal (18.5-24.9)'
        3 = 'Overweight (25-29.9)'
        4 = 'Obese (>30.0)'
        9 = 'Unknown'              ;
Value GT_Over  (Max=24)
        1 , 2 = 'Not Overweight nor Obese'
        3 , 4 = 'Overweight or Obese';
Run;
Proc Freq Data=Births ;
* select unique Ohio mothers of live births with known values of grouped BMI;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  1<=BMICategory<=4;
Tables BMICategory;
Format BMICategory GT_Over.;
Run;
```

Percent of women with chronic diabetes

Goal

To increase the number of women of childbearing age with diabetes who have their diabetes under control.

Definition

Numerator: Number of mothers of live births with chronic diabetes

Denominator: Number of mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

None

Data Sources

   ODH Vital Statistics – Birth File
   ODH Vital Statistics – Linked Infant Mortality Files

Significance

Infants born to mothers with diabetes may be at increased risk for preterm birth, birth defects, miscarriage or stillbirth, being large for gestational age, having low blood glucose at birth, prolonged jaundice and respiratory distress. Additionally, the mother may have worsening of diabetic complications such as eye and kidney problems, urinary tract and vaginal infections, preeclampsia and difficult delivery or cesarean. These complication risks can be reduced with good blood glucose control before and during pregnancy.

Relevant Variables from OPHIW Files

   UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
      T = Deduplicated Mom;
      F = Duplicate Mom

   PDIAB (coded as Y, N, U)

Sample SAS Code

```
Title 'Percent of Mothers with Pre-Pregnancy Diabetes';
Proc Freq Data=Births ;
* select unique Ohio mothers of live births with known values of chronic diabetes;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And PDiab In ('Y','N');
Tables PDiab;
Run;
```

Percent of women with chronic hypertension

Goal

To reduce the number of women of childbearing age who have uncontrolled hypertension and receive proper prenatal care

Definition

Numerator: Number of mothers of live births with chronic hypertension (diagnosed prior to pregnancy)

Denominator: Number of mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

   None

Data Sources

   ODH Vital Statistics – Birth File
   ODH Vital Statistics – Linked Infant Mortality Files

Significance

According to the Centers for Disease Control and Prevention (CDC), the prevalence rate of hypertension among females aged 20 – 44 years old is 10.2%. Almost half (41.9%) of these have uncontrolled high blood pressure. Chronic hypertension increases a woman's likelihood of developing preeclampsia during pregnancy. About 1 in 4 pregnant women with chronic hypertension and about half of those with uncontrolled hypertension develop preeclampsia. Chronic hypertension is also a risk factor for intrauterine growth restriction, preterm labor, and placental abruption. The risk is greater for those women who develop preeclampsia or who have uncontrolled hypertension.

Relevant Variables from OPHIW Files

   UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
      T = Deduplicated Mom;
      F = Duplicate Mom

   PHYPE - chronic hypertension (coded as Y,N,U)

Sample SAS Code

```
Title 'Percent of Mothers with Pre-Pregnancy Hypertension';
Proc Freq Data=Births;
* select unique Ohio mothers of live births with known values of chronic hypertension;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  PHype In ('Y','N');
Tables PHype;
Run;
```

Percent of women with a previous pre-term birth

Goal

To reduce the number of women who have had a pre-term (birth < 37 weeks gestation) birth in the past.

Definition

Numerator: Number of mothers of live births born prior to 37 weeks gestation.

Denominator: Number of mothers with previous live with non-missing values for gestation.

Units: 100

Text: Percent

Healthy People 2020

Related to MICH-9.1: Reduce total preterm births.

Data Sources

ODH Vital Statistics – Birth File

Significance

According to the World Health Organization, an estimated 15 million preterm births occur every year. Almost 1 million children die each year due to complications of preterm birth. In low-income settings, half of the babies born at or below 32 weeks (2 months early) die due to a lack of feasible, cost-effective care, such as warmth, breastfeeding support, and basic care for infections and breathing difficulties. In high-income countries, almost all of these babies survive.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

PPB – Previous pre-term birth (Y, N, U)

Sample SAS Code

```
Title 'Percent of Mothers with Previous Preterm Birth';
Proc Freq Data=Births;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  PPB In ('Y','N');
Tables PPB;
Run;
```

Percent of mothers with less than 18 months between delivery and conception

Goal

Increase the number of women with interpregnancy intervals (IPI) of 18 months or longer

Definition

Numerator: Number of mothers of live births with interval <18 months

Denominator: Number of mothers of live births with a second or higher birth order

Units: 100

Text: Percent

Healthy People 2020 Objective

Data Sources

ODH Vital Statistics – Birth File

Significance

Research has shown that IPI, the length of time between a live birth and the next pregnancy, may affect risk of pregnancy complications. A span of less than 18 months was associated with increased risk of preterm birth, low birthweight, and small for gestational age. One recommendation to reduce adverse outcomes associated with short IPI is to provide information about and access to family planning services in the postpartum period.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

InterPregnancyIntervalCategoryCd
 1 = Under 12 Months
 2 = 12-17 Months
 3 = 18-23 Months
 4 = 24 + Months
 9 = Missing information

Sample SAS Code

```
Title 'Percent of Mothers with Inter-Pregnancy Interval < 18 Months';
Data IPI;
Set Births_Occurrence;
Where=StateC Eq 'OH' And UniqueBirthMom Eq 'T' And 1<=InterPregnancyIntervalCategoryCd
<=4;
If 1<= InterPregnancyIntervalCategoryCd <= 2
   Then Short_IPI = 1;
   Else Short_IPI = 0;
Run;
Proc Freq Data=IPI;
Tables Short_IPI;
Run;
```

Rate of teen pregnancy (15 – 17 years old)

Goal

To determine the rate at which teens (15 – 17 age group) give birth.

Definition

Numerator: Number of births to mothers between 15 – 17 years old.

Denominator: Number of live births.

Units: 1,000

Text: Rate

Healthy People 2020

None

Data Sources

ODH Vital Statistics – Birth File

Significance

According to the CDC, in 2014, a total of 249,078 babies were born to women aged 15–19 years, for a birth rate of 24.2 per 1,000 women in this age group(http://www.cdc.gov/teenpregnancy/about/). The U.S. teen pregnancy rate is substantially higher than in other western industrialized nations (http://www.cdc.gov/teenpregnancy/about/).

Data Notes

Could use the following sources for more information:
- National Survey of Family Growth (NSFG); Centers for Disease Control and Prevention, National Center for Health Statistics (CDC/NCHS)
- National Vital Statistics System-Natality (NVSS-N)
- Surveillance Data for Abortion; Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion (CDC/NCCDPHP)
- Guttmacher Institute Abortion Provider Survey (APS); Guttmacher Institute
- Bridged-Race Population Estimates; Centers for Disease Control and Prevention, National Center for Health Statistics and U.S. Census Bureau (CDC/NCHS and Census)

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

Mom_Age – Coded in years

Sample SAS Code

```
Data Teens_YesNo;
Set Births;
* select unique 15-17 year old Ohio mothers of live births with known values of mother's age;
Where STATEC EQ 'OH' And UniqueBirthMom Eq 'T' And Mom_Age < 99;
If 15<=Mom_Age<=17
   Then Teens = 1;
   Else Teens = 0;
Births = 1;
Run;
Proc Summary Data=Teens_YesNo;
Var Births Teens;
Output Out=Teen_YesNo_Sums Sum=;
Run;
Data Teen_Rates;
Set Teen_YesNo_Sums;
Teen_Rate = 1000* Teens / Births ;
Run;
Title 'Rate of Teen Pregnancy within Births';
Proc Print;
Run;
```

Percent of women with gestational diabetes

Goal

To decrease the number of pregnant women who develop gestational diabetes

Definition

Numerator: Number of mothers of live births with gestational diabetes

Denominator: Number of mothers of live births with non-missing values for gestational diabetes

Units: 100

Text: Percent

Healthy People 2020 Objective

None

Data Sources

   ODH Vital Statistics – Birth File
   ODH Vital Statistics – Linked Infant Mortality Files

Significance

Gestational diabetes is diagnosed in pregnant women who have never had diabetes before but have high blood glucose levels during pregnancy. The CDC estimates that the prevalence of gestational diabetes may be as high as 9.2% (DeSisto CL, Kim SY, Sharma AJ. Prevalence Estimates of Gestational Diabetes Mellitus in the United States, Pregnancy Risk Assessment Monitoring System (PRAMS), 2007–2010. Prev Chronic Dis 2014;11:130415. DOI: http://dx.doi.org/10.5888/pcd11.130415.).

Gestational diabetes occurs late in pregnancy and therefore doesn't cause the kind of birth defects seen in infants who were born to women who had diabetes prenatally. However, uncontrolled gestational diabetes causes increased risk of macrosomia (large for gestational age), low blood glucose at birth, and respiratory distress. Infants born with excess insulin, such as those born to mothers with high glucose, are at increased risk for obesity and type 2 diabetes.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
    T = Deduplicated Mom;
    F = Duplicate Mom

GDIAB – Gestational diabetes (Y, N, U)

Sample SAS Code

```
Title 'Percent of Mothers with Gestational Diabetes';
Proc Freq Data= Births;
* select unique Ohio mothers of live births with known values of chronic diabetes;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  GDiaB In ('Y','N');
Tables GDiaB;
Run;
```

Percent of women with gestational hypertension

Goal

To decrease the number of pregnant women who develop gestational hypertension

Definition

Numerator: Number of mothers of live births with pregnancy-induced hypertension

Denominator: Number of mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

None

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Linked Infant Mortality Files

Significance

Gestational hypertension can lead to serious birth complications like eclampsia, HELLP syndrome, and placental abruption as well as being associated with low birth weight and pre-term labor.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
  T = Deduplicated Mom;
  F = Duplicate Mom

GHYPE – gestational hypertension (coded as Y, N, U)

Sample SAS Code

```
Title 'Percent of Mothers with Gestational Hypertension';
Proc Freq Data=Births;
* select unique Ohio mothers of live births with
        known values of Gestational hypertension;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  GHype In ('Y','N');
Tables GHype;
Run;
```

Percent of women who quit smoking by the third trimester

Goal

To increase the number of women who quit smoking during pregnancy

Definition

Numerator: Number of mothers of live births who smoked in the three months prior to pregnancy but not in the third trimester

Denominator: Number of mothers of live births with non-missing values for smoking both pre-conception and in the 3rd trimester.

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to MICH-11.3: Increase abstinence from cigarette smoking among pregnant women

Data Sources

ODH Vital Statistics – Birth File

Significance

Women who smoke during pregnancy are more likely to experience a fetal death or deliver a low birth weight baby. Further, secondhand smoke (SHS) is a mixture of mainstream smoke (exhaled by smoker) and the more toxic side stream smoke (from lit end of nicotine product) which is classified as a "known human carcinogen" by the US Environmental Protection Agency, the US National Toxicology Program, and the International Agency for Research on Cancer. Adverse effects of parental smoking on children have been a clinical and public health concern for decades and were documented in the 1986 U.S. Surgeon General Report. The only way to fully protect non-smokers from indoor exposure to SHS is to prevent all smoking in the space; separating smokers from non-smokers, cleaning the air, and ventilating buildings do not eliminate exposure. Unfortunately, millions (more than 60%) of children are exposed to SHS in their homes. These children have an increased frequency of ear infections; acute respiratory illnesses and related hospital admissions during infancy; severe asthma and asthma-related problems; lower respiratory tract infections leading to 7,500 to 15,000 hospitalizations annually in children under 18 months; and sudden infant death syndrome (SIDS). Higher intensity medical services are also required by children of parents who smoke including an increased need for intensive care unit services when admitted for flu, longer hospital stays; and more frequent use of breathing tubes during admissions.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

MotherSmokedBeforeQuitByLastTrim (Y, N, U): This is a derived variable calculated from the original birth certificate variables CIGPN (number of cigarettes smoked in in the three months prior to pregnancy) and CIGLN (number of cigarettes smoked in the last trimester of pregnancy).

Sample SAS Code

```
Title 'Percent of Mothers Who Smoked in theThree Months Prior To ';
Title2 'Pregnancy Then Quit';
Proc Freq Data=Births;
* select unique Ohio mothers of live births with known values of
MotherSmokedBeforeQuitByLastTrim;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  MotherSmokedBeforeQuitByLastTrim
In ('Y','N');
Tables MotherSmokedBeforeQuitByLastTrim;
Run;
```

Percent of women who smoked during the third trimester of pregnancy

Goal

To decrease the number of women who smoke during the third trimester of pregnancy

Definition

Numerator: Number of mothers of live births who smoked during the third trimester of pregnancy

Denominator: Number of mothers of live births with non-missing values for smoking during the third trimester of pregnancy.

Units: 100

Text: Percent

Healthy People 2020 Objective

MICH-11.3: Increase abstinence from cigarette smoking among pregnant women

Data Sources

ODH Vital Statistics – Birth File

Significance

Women who smoke during pregnancy are more likely to experience a fetal death or deliver a low birth weight baby. Further, secondhand smoke (SHS) is a mixture of mainstream smoke (exhaled by smoker) and the more toxic side stream smoke (from lit end of nicotine product) which is classified as a "known human carcinogen" by the US Environmental Protection Agency, the US National Toxicology Program, and the International Agency for Research on Cancer. Adverse effects of parental smoking on children have been a clinical and public health concern for decades and were documented in the 1986 U.S. Surgeon General Report. The only way to fully protect non-smokers from indoor exposure to SHS is to prevent all smoking in the space; separating smokers from non-smokers, cleaning the air, and ventilating buildings do not eliminate exposure. Unfortunately, millions (more than 60%) of children are exposed to SHS in their homes. These children have an increased frequency of ear infections; acute respiratory illnesses and related hospital admissions during infancy; severe asthma and asthma-related problems; lower respiratory tract infections leading to 7,500 to 15,000 hospitalizations annually in children under 18 months; and sudden infant death syndrome (SIDS). Higher intensity medical services are also required by children of parents who smoke including an increased need for intensive care unit services when admitted for flu, longer hospital stays; and more frequent use of breathing tubes during admissions.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
  T = Deduplicated Mom;
  F = Duplicate Mom

MotherSmokedLastTrimester (Y, N, U): This is a derived variable calculated from the original birth certificate variable CIGLN (number of cigarettes smoked in in the three months prior to pregnancy)

Sample SAS Code

```
Title 'Percent of Mothers Who Smoked in the Last Trimester of Pregnancy';
Proc Freq Data=Births;
* select unique Ohio mothers of live births with known values of MotherSmokedLastTrimester;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  MotherSmokedLastTrimester  In
('Y','N');
Tables MotherSmokedLastTrimester ;
Run;
```

Percent of Mothers Who Smoked Any Time During Pregnancy

Goal

To decrease the number of women who smoke during pregnancy

Definition

Numerator: Number of mothers of live births who smoked during any trimesters of pregnancy

Denominator: Number of mothers of live births with non-missing values for smoking during all trimesters of pregnancy.

Units: 100

Text: Percent

Healthy People 2020 Objective

MICH-11.3: Increase abstinence from cigarette smoking among pregnant women

Data Sources

ODH Vital Statistics – Birth File

Significance

Women who smoke during pregnancy are more likely to experience a fetal death or deliver a low birth weight baby. Further, secondhand smoke (SHS) is a mixture of mainstream smoke (exhaled by smoker) and the more toxic side stream smoke (from lit end of nicotine product) which is classified as a "known human carcinogen" by the US Environmental Protection Agency, the US National Toxicology Program, and the International Agency for Research on Cancer. Adverse effects of parental smoking on children have been a clinical and public health concern for decades and were documented in the 1986 U.S. Surgeon General Report. The only way to fully protect non-smokers from indoor exposure to SHS is to prevent all smoking in the space; separating smokers from non-smokers, cleaning the air, and ventilating buildings do not eliminate exposure. Unfortunately, millions (more than 60%) of children are exposed to SHS in their homes. These children have an increased frequency of ear infections; acute respiratory illnesses and related hospital admissions during infancy; severe asthma and asthma-related problems; lower respiratory tract infections leading to 7,500 to 15,000 hospitalizations annually in children under 18 months; and sudden infant death syndrome (SIDS). Higher intensity medical services are also required by children of parents who smoke including an increased need for intensive care unit services when admitted for flu, longer hospital stays; and more frequent use of breathing tubes during admissions.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
- T = Deduplicated Mom;
- F = Duplicate Mom

MotherSmokedAnyTimeDuring (Y, N, U): This is a derived variable calculated from the original birth certificate variables CIGFN (number of cigarettes smoked in in the first trimester of pregnancy), CIGSN number of cigarettes smoked in the second trimester of pregnancy , and CIGLN (number of cigarettes smoked in the last trimester of pregnancy)

Sample SAS Code

```
Title 'Percent of Mothers Who Smoked any time during the Pregnancy';
Proc Freq Data=Births;
* select unique Ohio mothers of live births with known values of MotherSmokedAnyTimeDuring;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  MotherSmokedAnyTimeDuring In ('Y','N');
Tables MotherSmokedAnyTimeDuring;
Run;
```

Percent of women who drank alcohol in the last 3 months of pregnancy

Goal

To reduce the percent of infants born with fetal alcohol exposure

Definition

Numerator: Number live births whose mothers who report drinking alcohol in the last 3 months of pregnancy

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) 2.11. Increase abstinence from alcohol among pregnant women.

Related to Maternal, Infant, and Child Health (MICH) 25. Reduce the occurrence of fetal alcohol syndrome.

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Linked Infant Mortality

Significance

Fetal alcohol spectrum disorders (FASDs), which result in life-long physical and cognitive or behavioral problems, are caused by drinking during pregnancy. Fetal alcohol syndrome (FAS) represents the severe end of FASDs, and is characterized by abnormal facial features (e.g., smooth ridge between nose and upper lip), lower than average height or weight, and central nervous system problems that create deficits in learning, memory, attention, communication, vision, and/or hearing. FASDs are preventable through abstinence from alcohol among pregnant women. Early diagnosis and intervention programs are critical to improve developmental outcomes for children with FAS.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
   T = Deduplicated Mom;
   F = Duplicate Mom

Mother_Drinks_Last – mother is reported as having alcohol during her last trimester (Y, N, U)

Sample SAS Code

```
Title 'Percent of Mothers Who Drank in the Last Trimester of Pregnancy';
Data OH_Drinking;
Set Births_Occurrence;
* select unique Ohio mothers of live births with known values of Mother_Drinks_Last;
Where StateC Eq 'OH' And UniqueBirthMom Eq 'T' And  Mother_Drinks_Last < 99;
If Mother_Drinks_Last = 0 Then Mom_Drank_3 = "N";
               Else Mom_Drank_3 = "Y";
Run;
Proc Freq Data=OH_Drinking ;
Tables Mom_Drank_3 ;
Run;
```

Percent of women who received prenatal care in the first trimester

Goal

To ensure early entrance into prenatal care to enhance pregnancy outcomes

Definition

Numerator: Number of mothers of live births with reported first prenatal visit during the first trimester (before 13 weeks' gestation)

Denominator: Number of mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) 10.1. Increase the proportion of pregnant women who receive prenatal care beginning in the first trimester.

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Linked Infant Mortality Files

Significance

Early identification of maternal disease and risks for complications of pregnancy or birth are the primary reason for first trimester entry into prenatal care. This can help ensure that women with complex problems and women with chronic illness or other risks are seen by specialists. Early high-quality prenatal care is critical to improving pregnancy outcomes.

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
    T = Deduplicated Mom;
    F = Duplicate Mom

Pren_Month - month of prenatal care entry. It is a character variable.
    '0' = 'none,
    '1'-'9' = (month),
    '-'=not classifiable (dash)

Sample SAS Code

```
Title 'Percent of Mothers Who Received 1st Trimester Prenatal Care';
Data  OH_Births;
* restrict to unique Ohio resident mothers with non-missing values of Pren_Month;
Set Births ;
Where (StateC Eq 'OH' And UniqueBirthMom Eq 'T' And Pren_Month NE '-';
* Pren_Month = month of prenatal care entry;
If Pren_Month In ('1','2','3') Then First_Tri_PNC=1;
Else First_Tri_PNC = 0;
Run;
Proc Freq Data=OH_Births;
Tables First_Tri_PNC;
Run;
```

Percent of women receiving adequate prenatal care: the Kotelchuck Index

Goal

To ensure adequate prenatal care to enhance pregnancy outcomes

Definition

Numerator: Number of mothers of live births receiving adequate prenatal care according to the Kotelchuck Index (a.k.a. The Adequacy of Prenatal Care Utilization Index (APNCU)).

Denominator: Number of mothers of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) 10.2: Increase the proportion of pregnant women who receive early and adequate prenatal care.

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Linked Infant Mortality Files

Significance

Early identification of maternal disease and risks for complications of pregnancy or birth are the primary reason for first trimester entry into prenatal care. This can help ensure that women with complex problems and women with chronic illness or other risks are seen by specialists. Early high-quality prenatal care is critical to improving pregnancy outcomes.

Data Notes

APNCU is a measure of prenatal care utilization that combines the month of pregnancy prenatal care begun with the number of prenatal visits. Rates can be classified as "intensive use," "adequate," "intermediate," or "less than adequate." For this measure, adequate prenatal care is defined as a score of either "adequate" or "intensive use."

Relevant Variables from OPHIW Files

UniqueBirthMom - Use for variables related to mother; deduplication due to multiple births (twins, triplets, etc.)
    T = Deduplicated Mom;
    F = Duplicate Mom

KotelchuckIndex
    1 = Inadequate
    2 = Intermediate
    3 = Adequate
    4 = Adequate Plus
    0 = Missing Information

Sample SAS Code

```
Title 'Percent of Mothers Who Received Adequate Prenatal Care';
Data OH_PNC;
* restrict to unique resident birth mothers with valid values for the Kotelchuck Index;
Set Births (Where=(StateC Eq 'OH' And UniqueBirthMom Eq 'T' And 1<=KotelchuckIndex<=4 ));
If 3 <= KotelchuckIndex <= 4
  Then Adequate_PNC = 1;
  Else Adequate_PNC = 0;
Run;
Proc Freq Data=OH_PNC;
Tables Adequate_PNC;
Run;
```

Percent of early preterm births (<32 weeks gestation)

Goal

To reduce the proportion of all preterm, early term, and early elective deliveries.

Definition

Numerator: Number of live births before 32 weeks of completed gestation.

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) Objective 9.3: Reduce live births at 32-33 weeks.

Related to MICH Objective 9.4: Reduce early preterm or births at less than 32 weeks' gestation.

Data Sources

ODH Vital Statistics – Birth File

Significance

Babies born preterm, before 37 completed weeks of gestation, are at increased risk of immediate life- threatening health problems, as well as long-term complications and developmental delays. Among preterm infants, complications that can occur during the newborn period include respiratory distress, jaundice, anemia, and infection, while long-term complications can include learning and behavioral problems, cerebral palsy, lung problems, and vision and hearing loss. As a result of these risks, preterm birth is a leading cause of infant death and childhood disability. Although the risk of complications is greatest among those babies who are born the earliest, even those babies born "late preterm" (34 to 36 weeks' gestation) and "early term" (37, 38 weeks' gestation) are more likely than full-term babies to experience morbidity and mortality.

Infants born to non-Hispanic Black women have the highest rates of preterm birth, particularly early preterm birth. In 2012, 16.5 percent of non-Hispanic Black infants were born preterm and 5.9 percent were born early preterm--these rates are 1.6 and 2.0 times the rates for infants born to non-Hispanic Whites women (10.3 and 2.9 percent, respectively).

Non-medically indicated early term births (37, 38 weeks) present avoidable risks of neonatal morbidity and costly NICU admission (Clark et al, 2009; Tita et al, 2009). Early elective delivery prior to 39 weeks is an endorsed perinatal quality measure by the Joint Commission, National Quality Forum, ACOG/NCQA, Leapfrog Group, and CMS/CHIPRA.

Data Notes

Based on obstetric/clinical estimate of gestation, following NCHS edits to replace as unknown if outside of 17-47 weeks.

Title V Block Grant NOM #5.2

Relevant Variables from OPHIW Files

OWGest – obstetric estimate of gestation

Sample SAS Code

```
Data EarlyPreterm_B;
Set Births;
* select Ohio live births with NCHS standard values of OWGest;
Where STATEC EQ 'OH' And 17<= OWGest <= 47;
If OWGest < 32 Then EarlyPreterm = 1; Else EarlyPreterm = 0;
Run;
Proc Freq Data= EarlyPreterm_B;
Tables EarlyPreterm;
Run;
```

Percent of preterm births (<37 weeks)

Goal

To reduce the proportion of all preterm, early term, and early elective deliveries.

Definition

Numerator: Number of live births before 37 weeks of complete gestation

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 9.1: Reduce total preterm births (PTB).

Data Sources

ODH Vital Statistics – Birth File

Significance

Babies born preterm, before 37 completed weeks of gestation, are at increased risk of immediate life- threatening health problems, as well as long-term complications and developmental delays. Among preterm infants, complications that can occur during the newborn period include respiratory distress, jaundice, anemia, and infection, while long-term complications can include learning and behavioral problems, cerebral palsy, lung problems, and vision and hearing loss. As a result of these risks, preterm birth is a leading cause of infant death and childhood disability. Although the risk of complications is greatest among those babies who are born the earliest, even those babies born "late preterm" (34 to 36 weeks' gestation) and "early term" (37, 38 weeks' gestation) are more likely than full-term babies to experience morbidity and mortality.

Infants born to non-Hispanic Black women have the highest rates of preterm birth, particularly early preterm birth. In 2012, 16.5 percent of non-Hispanic Black infants were born preterm and 5.9 percent were born early preterm--these rates are 1.6 and 2.0 times the rates for infants born to non-Hispanic Whites women (10.3 and 2.9 percent, respectively).

Non-medically indicated early term births (37, 38 weeks) present avoidable risks of neonatal morbidity and costly NICU admission (Clark et al, 2009; Tita et al, 2009). Early elective delivery

prior to 39 weeks is an endorsed perinatal quality measure by the Joint Commission, National Quality Forum, ACOG/NCQA, Leapfrog Group, and CMS/CHIPRA.

Data Notes

Based on obstetric/clinical estimate of gestation, following NCHS edits to replace as unknown if outside of 17-47 weeks.

Title V Block Grant NOM #5.1

Relevant Variables from OPHIW Files

OWGest – obstetric estimate of gestation

Sample SAS Code

```
Data OH_Preterm_B;
Set Births;
* select Ohio live births with NCHS standard values of OWGest;
Where STATEC EQ 'OH' And 17<= OWGest <= 47;
If OWGest < 37 Then Preterm = 1; Else Preterm = 0;
Run;
Proc Freq Data=OH_Preterm_B;
Tables Preterm;
Run;
```

Percent of low birth weight deliveries (<2,500 grams)

Goal

To reduce the proportion of low birth weight deliveries

Definition

Numerator: Number of live births weighing less than 2,500 grams

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 8.1: Reduce low birth weight (LBW).

Data Sources

ODH Vital Statistics – Birth File

Significance

The general category of low birth weight infants includes pre-term infants and infants with intrauterine growth retardation. Many risk factors have been identified for low birth weight babies including: both young and old maternal age, poverty, late prenatal care, smoking, substance abuse, and multiple births. Advanced maternal age and in vitro fertilization has increased the number of multiple births. Multiple births often result in shortened gestation and low or very low birth weight infants. In 2010, 68% of all infant deaths occurred to the 8.2% of low birth weight infants and over half (53%) of all infant deaths occurred to the 1.5% of very low birth weight infants.

Infants born to non-Hispanic Black women have the highest rates of low birth weight, particularly very low birth weight. In 2012, 13.2 percent of non-Hispanic Black infants were born low birthweight and 2.9 percent were born at very low birth weight--these rates are 1.9 and 2.6 times the rates for infants born to non-Hispanic Whites women (7.0 and 1.1 percent, respectively)

Data Notes

Follows NCHS birth weight edits to replace as unknown if outside of 227-8165 grams or grossly incompatible with both the obstetric estimate and LMP-based estimate of gestational age.

Relevant Variables from OPHIW Files

Weight – edited birthweight field, if weight <227 or >8165 grams then edited to 9999 (unknown)

Sample SAS Code

```
Data OH_LowWt;
Set Births;
* select Ohio live births with known values of WEIGHT;
Where StateC Eq 'OH' And  Weight < 9999;
If Weight < 2500
   Then LBW  = 1;
   Else LBW  = 0;
Run;
Proc Freq Data= OH_LowWt;
Tables LBW;
Run;
```

Percent of very low birth weight deliveries (<1,500 grams)

Goal

To reduce the proportion of low birth weight deliveries

Definition

Numerator: Number of live births weighing less than 1,500 grams

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

Identical to MICH Objective 8.2: Reduce very low birth weight (VLBW).

Data Sources

ODH Vital Statistics – Birth File

Significance

The general category of low birth weight infants includes pre-term infants and infants with intrauterine growth retardation. Many risk factors have been identified for low birth weight babies including: both young and old maternal age, poverty, late prenatal care, smoking, substance abuse, and multiple births. Advanced maternal age and in vitro fertilization has increased the number of multiple births. Multiple births often result in shortened gestation and low or very low birth weight infants. In 2010, 68% of all infant deaths occurred to the 8.2% of low birth weight infants and over half (53%) of all infant deaths occurred to the 1.5% of very low birth weight infants.

Infants born to non-Hispanic Black women have the highest rates of low birth weight, particularly very low birth weight. In 2012, 13.2 percent of non-Hispanic Black infants were born low birthweight and 2.9 percent were born at very low birth weight--these rates are 1.9 and 2.6 times the rates for infants born to non-Hispanic Whites women (7.0 and 1.1 percent, respectively).

Data Notes

Follows NCHS birth weight edits to replace as unknown if outside of 227-8165 grams or grossly incompatible with both the obstetric estimate and LMP-based estimate of gestational age.

Relevant Variables from OPHIW Files

Weight – edited birthweight field, if weight <227 or >8165 grams then edited to 9999

Sample SAS Code

```
Data OH_VeryLowWt;
Set Births;
* select Ohio live births with known values of WEIGHT;
Where StateC EQ 'OH' And  Weight < 9999;
If Weight < 1500
   Then VLBW = 1;
   Else VLBW = 0;
Run;
Proc Freq Data= OH_VeryLowWt;
Tables VLBW;
Run;
```

Percent small for gestational age

Goal

To determine the percentage of live-born infants whose birth weight is at or below the 10th percentile for a given gestational age.

Definition

Numerator: Number of live births whose birth weight ≤10th percentile for a given gestational age.

Denominator: Number of live births plus infant births of <32 weeks of gestation with non-missing values for birth weight ≤10th percentile for a given gestational age.

Units: 100

Text: Percent

Healthy People 2020

None

Data Sources

ODH Vital Statistics – Birth File

National Vital Statistics System (NVSS) Records

Significance

Small for gestational age infants are at increased risk for hypoxia, meconium aspiration, hypoglycemia, polycythemia, difficulty maintaining body temperature, abnormal neurologic symptoms (low APGAR), and death.

Data Notes

Infants with birth weight below the 10th percentile. The reference levels are from Nicole M. Talge, Lanay M. Mudd, Alla Sikorskii, Olga Basso United States Birth Weight Reference Corrected For Implausible Gestational Age Estimates May 2014, Volume 133 / Issue 5. These reference weights are used by CityMatCH.

Relevant Variables from OPHIW Files

Plur – number born at this delivery
OWGest – obstetric estimate of gestation

Weight – edited birthweight field, if weight <227 or >8165 grams then edited to 9999

Sample SAS Code

```sas
Data OH_SGA_Births;
Set Births;
*  select Ohio resident singleton births with an identified gender;
Where StateC Eq "OH" And Plur = 1 And ISex In ("M", "F");
SGA = 0;
If ISex Eq "M" Then Do;
  If OWGest = 22 And Weight <  375 Then SGA = 1; Else
  If OWGest = 23 And Weight <  436 Then SGA = 1; Else
  If OWGest = 24 And Weight <  497 Then SGA = 1; Else
  If OWGest = 25 And Weight <  561 Then SGA = 1; Else
  If OWGest = 26 And Weight <  629 Then SGA = 1; Else
  If OWGest = 27 And Weight <  706 Then SGA = 1; Else
  If OWGest = 28 And Weight <  802 Then SGA = 1; Else
  If OWGest = 29 And Weight <  924 Then SGA = 1; Else
  If OWGest = 30 And Weight < 1068 Then SGA = 1; Else
  If OWGest = 31 And Weight < 1231 Then SGA = 1; Else
  If OWGest = 32 And Weight < 1415 Then SGA = 1; Else
  If OWGest = 33 And Weight < 1627 Then SGA = 1; Else
  If OWGest = 34 And Weight < 1859 Then SGA = 1; Else
  If OWGest = 35 And Weight < 2105 Then SGA = 1; Else
  If OWGest = 36 And Weight < 2355 Then SGA = 1; Else
  If OWGest = 37 And Weight < 2588 Then SGA = 1; Else
  If OWGest = 38 And Weight < 2782 Then SGA = 1; Else
  If OWGest = 39 And Weight < 2926 Then SGA = 1; Else
  If OWGest = 40 And Weight < 3017 Then SGA = 1; Else
  If OWGest = 41 And Weight < 3065 Then SGA = 1; Else
  If OWGest = 42 And Weight < 3082 Then SGA = 1; Else
  If OWGest = 43 And Weight < 3067 Then SGA = 1; Else
  If OWGest = 44 And Weight < 3027 Then SGA = 1;
End;
If ISex Eq "F" Then Do;
  If OWGest = 22 And Weight <  354 Then SGA = 1; Else
  If OWGest = 23 And Weight <  416 Then SGA = 1; Else
  If OWGest = 24 And Weight <  473 Then SGA = 1; Else
  If OWGest = 25 And Weight <  529 Then SGA = 1; Else
  If OWGest = 26 And Weight <  597 Then SGA = 1; Else
  If OWGest = 27 And Weight <  677 Then SGA = 1; Else
  If OWGest = 28 And Weight <  770 Then SGA = 1; Else
  If OWGest = 29 And Weight <  882 Then SGA = 1; Else
  If OWGest = 30 And Weight < 1018 Then SGA = 1; Else
  If OWGest = 31 And Weight < 1166 Then SGA = 1; Else
  If OWGest = 32 And Weight < 1335 Then SGA = 1; Else
```

```
    If OWGest = 33 And Weight < 1538 Then SGA = 1; Else
    If OWGest = 34 And Weight < 1772 Then SGA = 1; Else
    If OWGest = 35 And Weight < 2021 Then SGA = 1; Else
    If OWGest = 36 And Weight < 2261 Then SGA = 1; Else
    If OWGest = 37 And Weight < 2477 Then SGA = 1; Else
    If OWGest = 38 And Weight < 2665 Then SGA = 1; Else
    If OWGest = 39 And Weight < 2810 Then SGA = 1; Else
    If OWGest = 40 And Weight < 2904 Then SGA = 1; Else
    If OWGest = 41 And Weight < 2958 Then SGA = 1; Else
    If OWGest = 42 And Weight < 2985 Then SGA = 1; Else
    If OWGest = 43 And Weight < 2981 Then SGA = 1; Else
    If OWGest = 44 And Weight < 2952 Then SGA = 1;
End;
Run;
Proc Freq Data=OH_SGA_Births;
Tables SGA;
Run;
```

Percent of early term births (37-38 weeks gestation)

Goal

To reduce the proportion of all preterm, early term, and early elective deliveries.

Definition

Numerator: Number of live births born at 37-38 weeks of completed gestation

Denominator: Number of live births

Units: 100

Text: Percent

Healthy People 2020 Objective

None

Data Sources

ODH Vital Statistics – Birth File

Significance

Babies born preterm, before 37 completed weeks of gestation, are at increased risk of immediate life- threatening health problems, as well as long-term complications and developmental delays. Among preterm infants, complications that can occur during the newborn period include respiratory distress, jaundice, anemia, and infection, while long-term complications can include learning and behavioral problems, cerebral palsy, lung problems, and vision and hearing loss. As a result of these risks, preterm birth is a leading cause of infant death and childhood disability. Although the risk of complications is greatest among those babies who are born the earliest, even those babies born "late preterm" (34 to 36 weeks' gestation) and "early term" (37-38 weeks' gestation) are more likely than full-term babies to experience morbidity and mortality.

Infants born to non-Hispanic Black women have the highest rates of preterm birth, particularly early preterm birth. In 2012, 16.5 percent of non-Hispanic Black infants were born preterm and 5.9 percent were born early preterm--these rates are 1.6 and 2.0 times the rates for infants born to non-Hispanic Whites women (10.3 and 2.9 percent, respectively).

Non-medically indicated early term births (37-38 weeks) present avoidable risks of neonatal morbidity and costly NICU admission (Clark et al, 2009; Tita et al, 2009). Early elective delivery prior to 39 weeks is an endorsed perinatal quality measure by the Joint Commission, National Quality Forum, ACOG/NCQA, Leapfrog Group, and CMS/CHIPRA.

Data Notes

Based on obstetric/clinical estimate of gestation, following NCHS edits to replace as unknown if outside of 17-47 weeks.

Title V Block Grant NOM #6

Relevant Variables from OPHIW Files

OWGest – obstetric estimate of gestation

Sample SAS Code

```
Data EarlyTerm_B;
Set Births;
* select Ohio live births with NCHS standard values of OWGest;
Where STATEC EQ 'OH' And 17<= OWGest <= 47;
If 37 <=  OWGest <= 38 Then EarlyTerm = 1; Else EarlyTerm = 0;
Run;
Proc Freq Data= EarlyTerm_B;
Tables EarlyTerm;
Run;
```

Fetal mortality rate

Goal

To decrease the fetal mortality rate

Definition

Numerator: Number of fetal deaths (20 or more weeks of gestation)

Denominator: Number of live births plus fetal deaths (20 or more weeks gestation)

Units: 1,000

Text: Rate

Healthy People 2020

MICH – 1.1: Reduce the rate of fetal deaths at 20 or more weeks of gestation.

Data Sources

ODH Vital Statistics - Fetal Mortality File
ODH Vital Statistics - Birth File

Significance

Shows the health of a specified population. According to the CDC National Vital Statistics Reports an estimate which states that there are more than 1 million fetal losses per year in the United States (http://www.cdc.gov/nchs/data/nvsr/nvsr64/nvsr64_08.pdf).

Relevant Variables from OPHIW Files

OWGest– obstetric estimate of gestation

Sample SAS Code

```
Title "Fetal Mortality Rate";
Data OH_Births;
Set Births;
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Fetal;
Set Fetal;
Where StateC Eq 'OH' And OWGest >= 20;
Fetal_Death = 1;
Run;
Proc Summary Data= OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data= OH_Fetal;
Var Fetal_Death;
Output Out=Fetal_Sums Sum=;
Run;
Data Fetal_Mort_Rate;
Merge Birth_Sums  Fetal_Sums;
Fetal_Rate = 1000 * Fetal_Death /  (Births + Fetal_Death);
Run;
Proc Print Data=Fetal_Mort_Rate;
Var Fetal_Death Births  Fetal_Rate;
Run;
```

Perinatal mortality rate per 1,000 live births plus fetal deaths, definition I

Goal

To reduce the rate of perinatal deaths.

Definition

Numerator: Number of fetal deaths 28 weeks or more gestation plus early neonatal deaths occurring under 7 days

Denominator: Number of live births plus fetal deaths at 28 completed weeks of gestation or more

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) Objective 1.2: Reduce the rate of fetal and infant deaths during the perinatal period (28 weeks of gestation to 7 days after birth).

Data Sources

ODH Vital Statistics - Fetal Mortality File
ODH Vital Statistics - Birth File
ODH Vital Statistics - Mortality File

Significance

Perinatal mortality reflects the health of pregnant woman, newborns, the pregnancy environment, and early newborn care.

Perinatal mortality is particularly high for non-Hispanic Black women. In 2006, the rate for non-Hispanic black women (11.76) was the highest among the racial and ethnic groups and was more than twice the rate for non-Hispanic white women.

Data Notes

Relevant Variables from OPHIW Files

AgeType
1 = Years
2 = Months
4 = Days
5 = Hours
6 = Minutes
9 = Unknown (Not Classifiable)

Age – Units of age – 1 - 135, 999 = Unknown

OWGest – Obstetric estimate of gestation

FileNo_D – death certificate filing number

Sample SAS Code

```
Title1 "Perinatal Mortality Definition 1";
Title2 "Fetal Deaths from OWGest >= 28 Plus Infant Deaths < 7 days";
Data OH_Births;
Set Births;
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Peri_Deaths;
Set Deaths;
Where StateC Eq 'OH';
If Missing (FileNo)=0 And ((AgeType = 4 and Age < 7) Or (5<= AgeType <=6)  )
Then Peri_Death = 1;
Else Peri_Death = 0;
Run;
Data OH_Peri_Fetal;
Set Fetal;
Where StateC Eq 'OH' And 28 <= OWGest < 99;
Peri_Fetal_Deaths = 1;
Run;
Proc Summary Data= OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data= OH_Peri_Deaths;
Var Peri_Death ;
Output Out=Death_Sums Sum=;
Run;
Proc Summary Data= OH_Peri_Fetal;
Var  Peri_Fetal_Deaths ;
Output Out=Fetal_Sums Sum=;
Run;
Data Peri_Mort;
Merge Birth_Sums Death_Sums Fetal_Sums;
```

```
Numerator   = Peri_Fetal_Deaths + Peri_Death;
Denominator = Births + Peri_Fetal_Deaths;
Perinatal_Rate = Round (1000  * Numerator / Denominator,.1);
Run;
Proc Print Data=Peri_Mort;
Var Peri_Fetal_Deaths Peri_Death Births Numerator Denominator Perinatal_Rate;
Run;
;
```

Perinatal mortality rate per 1,000 live births plus fetal deaths, definition 2

Goal

To reduce the rate of perinatal deaths.

Definition

Numerator: Number of fetal deaths 20 weeks or more gestation plus neonatal deaths occurring under 28 days

Denominator: Number of live births plus fetal deaths at 20 completed weeks of gestation or more

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) Objective 1.2: Reduce the rate of fetal and infant deaths during the perinatal period (28 weeks of gestation to 7 days after birth).

Data Sources

ODH Vital Statistics - Fetal Mortality File
ODH Vital Statistics - Birth File
ODH Vital Statistics - Mortality File

Significance

Perinatal mortality reflects the health of pregnant woman, newborns, the pregnancy environment, and early newborn care.

Perinatal mortality is particularly high for non-Hispanic Black women. In 2006, the rate for non-Hispanic black women (11.76) was the highest among the racial and ethnic groups and was more than twice the rate for non-Hispanic white women.

Data Notes

Relevant Variables from OPHIW Files

DLMP_Mo, DLMP_Dy, DLMP_Yr, - Month, Day, and year of last menstrual period

AgeType
1 = Years
2 = Months
4 = Days
5 = Hours
6 = Minutes
9 = Unknown (Not Classifiable)

Age – Units of age – 1 - 135, 999 = Unknown

OWGest – Obstetric estimate of gestation

FileNo_D – death certificate filing number

Sample SAS Code

```
Title1 "Perinatal Mortality Definition 2";
Title2 "Fetal Deaths from Gest_Calc >= 20 Plus Infant Deaths < 28 days";
Data OH_Births;
Set Births;
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Peri_Deaths;
Set Deaths;
Where StateC Eq 'OH';
If Missing (FileNo)=0 And Postneonatal_Indicator = "N"
Then Peri_Death = 1;
Else Peri_Death = 0;
Run;
Data OH_Peri_Fetal;
Set Fetal;
Where StateC Eq 'OH' And 20 <= OWGest_Calc < 99;
Peri_Fetal_Deaths = 1;
Run;
Proc Summary Data= OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data= OH_Peri_Deaths;
Var Peri_Death ;
Output Out=Death_Sums Sum=;
Run;
Proc Summary Data= OH_Peri_Fetal;
Var Peri_Fetal_Deaths   ;
Output Out=Fetal_Sums Sum=;
Run;
```

```sas
Data Peri_Mort;
Merge Birth_Sums Death_Sums Fetal_Sums;
Numerator   = Peri_Fetal_Deaths + Peri_Death;
Denominator = Births + Peri_Fetal_Deaths;
Perinatal_Rate = Round(1000 * Numerator / Denominator,.1);
Run;
Proc Print Data=Peri_Mort;
Var Peri_Fetal_Deaths Peri_Death Births Numerator Denominator Perinatal_Rate;
Run;
```

Infant mortality rate per 1,000 live births

Goal

To reduce the rate of infant death.

Definition

Numerator: Number of deaths to infants from birth through 364 days of age

Denominator: Number of live births

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 1.3: Reduce the rate of all infant deaths (within 1 year).

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Death File

Significance

The U.S. infant mortality rate has substantially declined over the last century. Based on preliminary data for 2011, 23,910 infants died before age one year, representing an infant mortality rate of 6.05 deaths per 1,000 live births, which is the lowest infant mortality rate recorded in the U.S. However, significant disparities continue to persist in U.S. infant deaths between racial groups, especially for Blacks and American Indians and Alaskan Natives. The non-Hispanic Black infant mortality rate (12.2 deaths per 1,000 live births in 2010) is nearly two and half times the rate among non-Hispanic Whites and Hispanics. (Child Health USA 2013: Department of Health and Human Services, HRSA). Infant mortality continues to be an extremely complex health issue with many medical, social, and economic determinants, including race/ethnicity, maternal age, education, smoking and health status.

Sample SAS Code

```
Title 'Infant mortality';
Data OH_Births;
Set Births
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Death;
Set Deaths
Where StateC Eq 'OH' And Age=0;
Deaths = 1;
Run;
Proc Summary Data = OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data = OH_Infant_Deaths;
Var Deaths;
Output Out=Death_Sums Sum=;
Run;
Data Infant_Rates;
Merge Birth_Sums  Death_Sums;
Infant_Rate     = 1000 * Deaths     /  Births;
Run;
Proc Print Data=Infant_Rates;
Var Births Deaths Infant_Rate;
Run;
```

Neonatal mortality rate per 1,000 live births

Goal

To reduce the rate of neonatal deaths.

Definition

Numerator: Number of deaths to infants under 28 days

Denominator: Number of live births

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 1.4: Reduce the rate of neonatal deaths (within the first 28 days of life).

Data Sources

ODH Vital Statistics – Birth File

ODH Vital Statistics – Death File

Significance

The preliminary U.S. neonatal infant mortality rate was 4.06 deaths per 1,000 live births in 2011, accounting for two-thirds of all infant deaths. Neonatal mortality is related to gestational age, low birth weight, congenital malformations and health problems originating in the perinatal period, such as infections or birth trauma.

A significant disparity exists in neonatal deaths between racial groups, especially for infants born to Black women. Non-Hispanic black women had the highest neonatal mortality rate in 2010 at 7.45, 2.2 times that for non-Hispanic white women (3.35).

Relevant Variables from OPHIW Files

Postneonatal_Indicator – N=Neonatal, P=Post-neonatal

Sample SAS Code

```
Title 'Neonatal Mortality';
Data OH_Births;
Set Births
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Death;
Set Deaths
Where StateC Eq 'OH' And Age=0;
If Postneonatal_Indicator eq 'N'
   Then Neonates = 1;
   Else Neonates = 0;
Run;
Proc Summary Data = OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data = OH_Infant_Deaths;
Var Neonates;
Output Out=Death_Sums Sum=;
Run;
Data Infant_Rates;
Merge Birth_Sums  Death_Sums;
Neonatal_Rate    = 1000 * Neonates    /  Births;
Run;
Proc Print Data=Infant_Rates;
Var Births Deaths Infant_Rate
Neonates Neonatal_Rate;
Run;
```

Post neonatal mortality rate per 1,000 live births

Goal

To reduce the rate of post-neonatal deaths.

Definition

Numerator: Number of deaths to infants 28 through 364 days of age

Denominator: Number of live births

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 1.5: Reduce the rate of post-neonatal deaths (between 28 days and 1 year).

Data Sources

   ODH Vital Statistics – Birth File
   ODH Vital Statistics – Death File

Significance

Postneonatal mortality is generally related to Sudden Unexpected Infant Death (SUID)/Sudden Infant Death Syndrome (SIDS), unintentional injuries and congenital malformations. In 2011, the preliminary

U.S. postneonatal mortality rate was 2.01 deaths per 1,000 live births.

Similar to overall infant mortality, infants of non-Hispanic black (4.01) and AIAN (4.00) women had the highest postneonatal mortality rates of any group—more than twice those for non-Hispanic white women (1.82) in 2010.

Relevant Variables from OPHIW Files

   Postneonatal_Indicator – N=Neonatal, P=Post-neonatal

Sample SAS Code

```
Title 'Postneonatal mortality';
Data OH_Births;
Set Births;
Where StateC Eq 'OH';
Births = 1;
Run;
Data OH_Infant_Deaths;
Set Deaths;
Where StateC Eq 'OH';
If Postneonatal_Indicator eq 'P'
    Then PostNeonates = 1;
    Else PostNeonates = 0;
Run;
Proc Summary Data= OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data= OH_Infant_Deaths;
Var PostNeonates;
Output Out=Death_Sums Sum=;
Run;
Data Infant_Rates;
Merge Birth_Sums  Death_Sums;
Postneonatal_Rate = 1000 * PostNeonates / Births;
Run;
Proc Print Data=Infant_Rates;
Var Births PostNeonates Postneonatal_Rate;
Run;
```

Sleep-related Sudden Unexpected Infant Death (SUID) rate per 1,000 live births

Goal

To reduce the rate of SUID

Definition

Numerator: Number of SUID deaths to infants

Denominator: Number of live births

Units: 1,000

Text: Rate

Healthy People 2020 Objective

Identical to Maternal, Infant, and Child Health (MICH) Objective 1.9: Reduce the rate of infant deaths from sudden unexpected infant deaths (includes SIDS, Unknown Cause, Accidental Suffocation, and Strangulation in Bed).

Data Sources

ODH Vital Statistics – Birth File
ODH Vital Statistics – Death File

Significance

Sleep-related SUIDs are the leading cause of death in infants from one month up to one year (postneonatal deaths) and the third leading cause of all infant deaths. In 2010, there were a total of 3,610 or 0.9 sudden unexpected infant deaths (SUID) per 1,000 live births, accounting for 43 percent of postneonatal deaths and 15 percent of all infant deaths.

SUID rates vary greatly by race and ethnicity. In 2010, SUID rates were highest for infants born to American Indian/Alaska Native and non-Hispanic Black mothers (1.82 and 1.77 per 1,000, respectively); these rates were more than twice the rate among infants born to non-Hispanic Whites (0.87 per 1,000).

Data Notes

Title V Block Grant NOM #9.5

SUID includes sudden infant death syndrome (SIDS), accidental suffocation and strangulation in bed (ASSB), and unknown cause (ICD 10 codes R95, W75, and R99).

Relevant Variables from OPHIW Files

   ACME_UC – underlying cause of death code using ICD 10

Sample SAS Code

```
Data OH_Births;
Set Births
Where StateC Eq 'OH';
Births = 1;
Run;
Data SUID_Death;
Set Period_IM;
Where StateC Eq 'OH;
* ACME_UC = underlying cause of death;
If substr(ACME_UC,1,3) in ('R95','R99','W75')
   Then SUID = 1;
   Else SUID = 0;
Run;
Proc Summary Data = OH_Births;
Var Births;
Output Out=Birth_Sums Sum=;
Run;
Proc Summary Data=SUID_Death;
Var SUID;
Output Out=SUID_Sums Sum=;
Data SUID_Rates;
Merge Birth_Sums  SUID_Sums;
SUID_Rate = 1000 * SUID /  Births;
Run;
Proc Print Data=SUID_Rates;
Var Births SUID SUID_Rate;
Run;
```

Percent of infant deaths by modified Dollfus classification

Goal

To identify target areas for prevention efforts.

Definition

Numerator: Number of deaths to infants within each modified Dollfus classification

Denominator: Number of live births with valid coding for the modified Dollfus classification

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) Objective 1.3: Reduce the rate of all infant deaths (within 1 year).

Data Sources

ODH Vital Statistics – Period-Linked Infant Mortality File

Significance

Using the modified Dollfus classification for infant cause of death identifies areas in which interventions may be useful to reduce deaths.

Relevant Variables from OPHIW Files

DollfusCategoryCd
DollfusSubcategoryCd

Sample SAS Code

```
Title 'Modified Dolphus categories for infant mortality';
Proc Format;
Value Dollfus  (Max=20)
   1 = 'Prematurity        '
   2 = 'Congenital         '
   3 = 'SIDS               '
   4 = 'OB conditions      '
   5 = 'Birth asphyxia     '
   6 = 'Perinatal infections'
   7 = 'Other infections   '
   8 = 'External           '
   9 = 'Other              '   ;
Value DollfusSub (Max=81)
   1 = 'Short gestation and low birth weight                      '
   2 = 'Birth trauma, neonatal hemorrhage, hematologic disorder'
   3 = 'RDS, interstitial emphysema, pulmonary hemorrhage, atelectasis'
   4 = 'Chronic RDS and perinatal respiratory disease'
   5 = 'Necrotizing enterocolitis'
   6 = 'Neonatal cardiac failure and perinatal CV disease'
   7 = 'Congenital'
   8 = 'SIDS'
   9 = 'Incompetent Cervix, PRoM'
  10 = 'Multiple pregnancy'
  11 = 'Placenta problems'
  12 = 'Birth asphyxia'
  13 = 'Strep meningitis'
  14 = 'Maternal infection'
  15 = 'Chorioamnionitis'
  16 = 'Bacterial sepsis, congenital pneumonia, and other perinatal infections'
  17 = 'Other infections and parasitic disease'
  18 = 'Bacterial haemophilus and pneumococcal meningitis'
  19 = 'Influenza, pneumonia, and other respiratory infections'
  20 = 'Transportation accidents'
  21 = 'Falls'
  22 = 'Accidental drowning, submersion, suffocation, asphyxiation, aspiration'
  23 = 'Assault, intentional injuries'
  24 = 'Injuries, undetermined intent'
  25 = 'Other unintentional injury'
  26 = 'All other causes'   ;
Run;
Proc Freq Data=Warehous.IM_Period0718;
* select Ohio live births with non-missing values DollfusCategoryCd;
Where StateC EQ 'OH' And Missing ;
Tables DollfusCategoryCd DollfusSubcategoryCd ;
Format
   DollfusCategoryCd    Dollfus.
   DollfusSubcategoryCd DollfusSub.;
Run;
```

Percent of non-medically indicated early elective deliveries

Goal

To reduce the proportion of all preterm, early term, and early elective deliveries.

Definition

Numerator: Number of inductions or cesareans without labor or spontaneous rupture of membranes among deliveries at 37-38 weeks' gestation without conditions possibly justifying elective delivery (<39 weeks according to The Joint Commission)

Denominator: Number of deliveries at 37-38 weeks' gestation without conditions possibly justifying elective delivery <39 weeks according to The Joint Commission

Units: 100

Text: Percent

Healthy People 2020 Objective

None

Data Sources

ODH Vital Statistics – Birth File

Significance

Babies born preterm, before 37 completed weeks of gestation, are at increased risk of immediate life- threatening health problems, as well as long-term complications and developmental delays. Among preterm infants, complications that can occur during the newborn period include respiratory distress, jaundice, anemia, and infection, while long-term complications can include learning and behavioral problems, cerebral palsy, lung problems, and vision and hearing loss. As a result of these risks, preterm birth is a leading cause of infant death and childhood disability. Although the risk of complications is greatest among those babies who are born the earliest, even those babies born "late preterm" (34 to 36 weeks' gestation) and "early term" (37-38 weeks' gestation) are more likely than full-term babies to experience morbidity and mortality.

Infants born to non-Hispanic Black women have the highest rates of preterm birth, particularly early preterm birth. In 2012, 16.5 percent of non-Hispanic Black infants were born preterm and 5.9 percent were born early preterm--these rates are 1.6 and 2.0 times the rates for infants born to non-Hispanic Whites women (10.3 and 2.9 percent, respectively).

Non-medically indicated early term births (37-38 weeks) present avoidable risks of neonatal morbidity and costly NICU admission (Clark et al, 2009; Tita et al, 2009). Early elective delivery prior to 39 weeks is an endorsed perinatal quality measure by the Joint Commission, National Quality Forum, ACOG/NCQA, Leapfrog Group, and CMS/CHIPRA.

Data Notes

Title V Block Grant NOM #7

Sample SAS Code

```sas
Title ' Early Term Elective Deliveries';
Data Early_Term;
Set Births;
* Select Ohio resident singleton births who are Early Term;
Where StateC= 'OH' And Plur = 1 And OWGest In (37,38);
/* Medical exclusions */;
If PHype Eq 'Y'     /* Hypertension - Prepregnancy         */
Or GHype Eq 'Y'     /* Hypertension - Gestational          */
Or EHype Eq 'Y'     /* Eclampsia                           */
Or PDiab Eq 'Y'     /* Diabetes - Prepregnancy             */
Or GDiab Eq 'Y'     /* Diabetes - Gestational              */
Or NVPR  Eq 'Y'     /* Non-Vertex Presentation             */
Or Pres  Eq '3'     /* Other - Fetal Presentation at Birth */
Or Anen  Eq 'Y'     /* Anencephaly                         */
Or MNSB  Eq 'Y'     /* Meningomyelocele/Spina Bifida       */
Or DOWT  Eq 'Y'     /* Down Syndrome                       */
Or CDIT  Eq 'Y'     /* Suspected Chromosomal Disorder      */
Or CCHD  Eq 'Y'     /* Cyanotic Congenital Heart Disease   */
Or CDH   Eq 'Y'     /* Diaphragmatic Hernia                */
Or Omph  Eq 'Y'     /* Omphalocele                         */
Or Gast  Eq 'Y'     /* Gastroschisis                       */
Or FInt  Eq 'Y'     /* Fetal Intolerance of Labor          */
Or PRoM  Eq 'Y'     /* Premature Rupture of the Membranes  */
Or ProL  Eq 'Y'     /* Prolonged Labor                     */
Or Chor  Eq 'Y'     /* Chorioamnionitis                    */
Or POPO  >  0       /* Other Previous Poor Pregnancy Outcome */
Then Delete  ;      /* The preceding conditions are excluded */

/* Method Of Delivery */
/* Inductions  */
If IndL = 'Y'   Then Induction = 1;  /* YES Induction */
          Else Induction = 0;  /* NO  Induction */
/* Cesareans  */
If Rout = 4     Then Cesarean  = 1;  /* YES Cesarean */
          Else Cesarean  = 0;  /* NO  Cesarean */
/* Induction and Cesarean Mutually Exclusive*/
If Induction = 1 Then Cesarean  = 0;  /*If  YES Induction
                      Then NO  Cesarean*/

/* Non-Medically Indicated Deliveries */
/* Indication = Any Condition from the TJC List Available on the Birth Certificate*/
```

```
If (FInt  = "Y" or PRoM = "Y" or ProL = "Y" or Chor = "Y")
   Then Indication = 1;
   Else Indication = 0;
/* Non-Medically Indicated Induction =
   Induction without Indication */
If (Induction = 1 and Indication = 0)
   Then NMIinduction = 1;
   Else NMIinduction = 0;
/* Cesarean with Attempt of Labor*/
/* Attempt of Labor = YES Attempt of Labor and YES Cesarean*/
If (TLAB = 'Y' and Cesarean = 1)
   Then Attempt = 1;
   Else Attempt = 0;
/* Non-Medically Indicated Cesarean = Cesarean without Indication
   and without an Attempt of Labor*/
If (Cesarean = 1 and Indication = 0 and Attempt = 0)
   Then NMIcesarean = 1;
   Else NMIcesarean = 0;
/* Non-Medically Indicated Early Term Delivery =
   Early Term Delivery and Non-Medically Indicated Delivery */
If (NMIinduction = 1 or NMIcesarean = 1)
   Then EarlyNMID = 1;
   Else EarlyNMID = 0;
Run;
Proc Freq Data=Early_Term;
Tables NMIcesarean EarlyNMID;
Run;
```

Percent of very low birth weight (VLBW) infants born in a hospital with a level III+ Neonatal Intensive Care Unit (NICU)

Goal

To ensure that higher risk mothers and newborns deliver at appropriate level hospitals.

Definition

Numerator: Number of VLBW infants born in a hospital with a level III or higher NICU

Denominator: Number of VLBW infants (< 1500 grams)

Units: 100

Text: Percent

Healthy People 2020 Objective

Related to Maternal, Infant, and Child Health (MICH) Objective 33: Increase the proportion of VLBW infants born at level III hospitals or subspecialty perinatal centers

Data Sources

ODH Vital Statistics – Birth File

Significance

Very low birth weight infants (<1,500 grams or 3.25 pounds) are the most fragile newborns. Although they represented less than 2% of all births in 2010, VLBW infants accounted for 53% of all infant deaths, with a risk of death over 100 times higher than that of normal birth weight infants (≥2,500 grams or 5.5 pounds). VLBW infants are significantly more likely to survive and thrive when born in a facility with a level-III Neonatal Intensive Care Unit (NICU), a subspecialty facility equipped to handle high-risk neonates. In 2012, the AAP provided updated guidelines on the definitions of neonatal levels of care to include level I (basic care), level II (specialty care), and levels III and IV (subspecialty intensive care) based on the availability of appropriate personnel, physical space, equipment, and organization. Given overwhelming evidence of improved outcomes, the AAP recommends that VLBW and/or very preterm infants (<32 weeks' gestation) be born in only level III or IV facilities. This measure is endorsed by the National Quality Forum (#0477).

Data Notes

Hospital Data Levels change over time. For the most recent hospital level listings, please contact the Maternity Licensure Program in the Bureau of Survey and Certification at the Ohio Department of Health.

Telephone: (614) 995-7466
Fax: (614) 564-2475
E-mail: community@odh.ohio.gov

Relevant variables from Maternity Licensure Program

NICU_Level – Please see table in Appendix B.

Relevant Variables from OPHIW Files

BirthWeightCatgCD
1=very low birth weight (<1500g)
2=low birth weight (1500-2499g)
3=normal birthweight (2500-3999g)
4=high birth weight (4000+g)
5=unknown birth weight

Sample SAS Code

```
Title1 'Percent of very low birth weight (VLBW) infants born in a hospital';
Title2 'with a level III+ Neonatal Intensive Care Unit (NICU)';
Data Low_At_NICU;
Set Warehous.Births_O_1218
   (Where=(StateC="OH" And Missing(SFN)=0 And BirthWeightCatgCD = 1) );
If SFN In
    ('B018', 'B033', 'B082', 'B121', 'B052', 'B028',
     'B047', 'B086', 'B087', 'B143', 'B090', 'B094', 'B104',
     'B133', 'B043', 'B120', 'B112', 'B114', 'B250', 'B146',
     'B083', 'B057', 'B005', 'B144', 'B002', 'B113')
   Then Level3 = 1;
   Else Level3 = 0;;
Run;
Proc Freq Data=Low_At_NICU;
Tables Level3;
Run;
```

Appendix I: SAS Code for Geographic Formats

```
Proc Format;   /* State codes */
Value $ FIPS  (NotSorted Max=10) /* Character form of county FIPS code */
   '0' = 'Ohio      '
 '001' = 'Adams     ' '003' = 'Allen     ' '005' = 'Ashland   ' '007' = 'Ashtabula '
 '009' = 'Athens    ' '011' = 'Auglaize  ' '013' = 'Belmont   ' '015' = 'Brown     '
 '017' = 'Butler    ' '019' = 'Carroll   ' '021' = 'Champaign ' '023' = 'Clark     '
 '025' = 'Clermont  ' '027' = 'Clinton   ' '029' = 'Columbiana' '031' = 'Coshocton '
 '033' = 'Crawford  ' '035' = 'Cuyahoga  ' '037' = 'Darke     ' '039' = 'Defiance  '
 '041' = 'Delaware  ' '043' = 'Erie      ' '045' = 'Fairfield ' '047' = 'Fayette   '
 '049' = 'Franklin  ' '051' = 'Fulton    ' '053' = 'Gallia    ' '055' = 'Geauga    '
 '057' = 'Greene    ' '059' = 'Guernsey  ' '061' = 'Hamilton  ' '063' = 'Hancock   '
 '065' = 'Hardin    ' '067' = 'Harrison  ' '069' = 'Henry     ' '071' = 'Highland  '
 '073' = 'Hocking   ' '075' = 'Holmes    ' '077' = 'Huron     ' '079' = 'Jackson   '
 '081' = 'Jefferson ' '083' = 'Knox      ' '085' = 'Lake      ' '087' = 'Lawrence  '
 '089' = 'Licking   ' '091' = 'Logan     ' '093' = 'Lorain    ' '095' = 'Lucas     '
 '097' = 'Madison   ' '099' = 'Mahoning  ' '101' = 'Marion    ' '103' = 'Medina    '
 '105' = 'Meigs     ' '107' = 'Mercer    ' '109' = 'Miami     ' '111' = 'Monroe    '
 '113' = 'Montgomery' '115' = 'Morgan    ' '117' = 'Morrow    ' '119' = 'Muskingum '
 '121' = 'Noble     ' '123' = 'Ottawa    ' '125' = 'Paulding  ' '127' = 'Perry     '
 '129' = 'Pickaway  ' '131' = 'Pike      ' '133' = 'Portage   ' '135' = 'Preble    '
 '137' = 'Putnam    ' '139' = 'Richland  ' '141' = 'Ross      ' '143' = 'Sandusky  '
 '145' = 'Scioto    ' '147' = 'Seneca    ' '149' = 'Shelby    ' '151' = 'Stark     '
 '153' = 'Summit    ' '155' = 'Trumbull  ' '157' = 'Tuscarawas' '159' = 'Union     '
 '161' = 'Van Wert  ' '163' = 'Vinton    ' '165' = 'Warren    ' '167' = 'Washington'
 '169' = 'Wayne     ' '171' = 'Williams  ' '173' = 'Wood      ' '175' = 'Wyandot   '
 '999' = 'Unknown   ';
;
Proc Format;  /* County and City codes for OEI areas */
Value OEIctyF  (Max=25)   /* County codes, OEI areas */
  0 = ' 0 Non-Participating County'
  1 = ' 1 Butler County'
  2 = ' 2 Cuyahoga County'
  3 = ' 3 Franklin County'
  4 = ' 4 Hamilton County'
  5 = ' 5 Lorain County'
  6 = ' 6 Lucas County'
  7 = ' 7 Mahoning County'
  8 = ' 8 Montgomery County'
  9 = ' 9 Stark County'
 10 = '10 Summit County';

Value OEIcityF (Max=40) )   /* OEI areas */
  0 = ' 0 Non-Participating County '
  1 = ' 1 Hamilton in Butler County '
  2 = ' 2 Cleveland in Cuyahoga County'
  3 = ' 3 Columbus, mostly in Franklin County'
  4 = ' 4 Cincinnati in Hamilton County'
  5 = ' 5 Elyria in Lorain County'
  6 = ' 6 Toledo in Lucas County'
  7 = ' 7 Youngstown, mostly in Mahoning County'
  8 = ' 8 Dayton in Montgomery County'
  9 = ' 9 Canton in Stark County'
 10 = '10 Akron in Summit County';
```

```
Value $City (Max=15)    /* Top 20 geocoded cities for infant deaths 2007-2014 */
  '01000' = 'Akron        '
  '12000' = 'Canton       '
  '15000' = 'Cincinnati   '
  '16000' = Cleveland     '
  '17848' = 'Columbiana   '
  '18000' = 'Columbus     '
  '21000' = 'Dayton       '
  '23380' = 'East Cleveland'
  '25256' = 'Elyria       '
  '25704' = 'Euclid       '
  '25970' = 'Fairfield    '
  '33012' = 'Hamilton     '
  '43554' = 'Lima         '
  '44856' = 'Lorain       '
  '47138' = 'Mansfield    '
  '49840' = 'Middletown   '
  '54040' = 'Newark       '
  '74118' = 'Springfield  '
  '77000' = 'Toledo       '
  '80892' = 'Warren       '
  '88000' = 'Youngstown   ';

Value CMS_Type (Max=11)                    /* using numeric FIPS */
   3,  5,  7,  9, 13, 17, 23, 25, 29, 35, 41, 43, 45, 49, 55, 57,
  61, 63, 77, 81, 83, 85, 87, 89, 93, 95, 99,101,103,109,113,119,
 129,133,139,141,143,145,147,151,153,155,157,159,165,169,173
= 'Metro '
   1, 11, 15, 19, 21, 27, 31, 33, 37, 39, 47, 51, 53, 59, 65, 67, 69,
  71, 73, 75, 79, 91, 97,105,107,117,123,127,131,135,137,149,161,167,
 171,175,111,115,121,125,163
= ' Rural '
   Other
= 'Unknown' ;
Run;
```

Appendix B Level 3 NICU as of 05/01/2018

County	City	Facility	Zip	SFN	New SFN	StateID	ADDRESS	State	Maternity_Level	NICU_Level
CUYAHOGA	CLEVELAND	CLEVELAND CLINIC CHILDREN'S	44195	B018	OHL03355	0113MAT	9500 EUCLID AVE	OH	3	3
CUYAHOGA	CLEVELAND	FAIRVIEW HOSPITAL	44111	B033	OHL03337	0095MAT	18101 LORAIN AVE	OH	3	3
CUYAHOGA	CLEVELAND	METROHEALTH MEDICAL CENTER	44109	B082	OHL03338	0096MAT	2500 METROHEALTH DR	OH	3	3
CUYAHOGA	CLEVELAND	UNIVERSITY HOSPITALS CLEVELAND MEDICAL CENTER	44106	B121	OHL03340	0098MAT	11100 EUCLID AVE	OH	3	3
CUYAHOGA	MAYFIELD HEIGHTS	HILLCREST HOSPITAL	44124	B052	OHL03360	0118MAT	6780 MAYFIELD RD	OH	3	3
FRANKLIN	COLUMBUS	DOCTORS HOSPITAL	43228	B028	OHL03283	0024MAT	5100 W BROAD ST	OH	3	3
FRANKLIN	COLUMBUS	GRANT MEDICAL CENTER	43215	B047	OHL03284	0025MAT	111 S GRANT AVE	OH	3	3
FRANKLIN	COLUMBUS	MOUNT CARMEL EAST	43213	B086	OHL03285	0026MAT	6001 E BROAD ST	OH	3	3
FRANKLIN	COLUMBUS	MOUNT CARMEL WEST	43222	B087	OHL03286	0027MAT	793 W STATE ST	OH	3	3
FRANKLIN	COLUMBUS	NATIONWIDE CHILDREN'S HOSPITAL	43205	B143	OHL03281	0022MAT	700 CHILDREN'S DR	OH	3	3
FRANKLIN	COLUMBUS	OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER	43210	B090	OHL03287	0028MAT	410 W TENTH AVE	OH	3	3
FRANKLIN	COLUMBUS	OHIOHEALTH RIVERSIDE METHODIST HOSPITAL	43214	B094	OHL03288	0029MAT	3535 OLENTANGY RIVER RD	OH	3	3
FRANKLIN	WESTERVILLE	MOUNT CARMEL ST. ANN'S	43081	B104	OHL03290	0031MAT	500 S CLEVELAND AVE	OH	3	3
HAMILTON	CINCINNATI	CINCINNATI CHILDREN'S HOSPITAL MEDICAL CENTER	45229	B133	OHL03397	0155MAT	3333 BURNET AVE - MAIL LOCATION 1013	OH	3	3
HAMILTON	CINCINNATI	GOOD SAMARITAN HOSPITAL	45220	B043	OHL03400	0158MAT	375 DIXMYTH AVE	OH	3	3
HAMILTON	CINCINNATI	UNIVERSITY OF CINCINNATI MEDICAL CENTER	45219	B120	OHL03403	0161MAT	234 GOODMAN ST	OH	3	3
LUCAS	TOLEDO	MERCY HEALTH - ST. VINCENT MEDICAL CTR	43608	B112	OHL03351	0109MAT	2213 CHERRY ST	OH	3	3
LUCAS	TOLEDO	PROMEDICA TOLEDO HOSPITAL	43606	B114	OHL03352	0110MAT	2142 N COVE BLVD	OH	3	3
MAHONING	BOARDMAN	ST ELIZABETH BOARDMAN HEALTH CENTER	44512	B250	OHL41762	0200MAT	8401 MARKET ST	OH	3	3

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MONTGOMERY	DAYTON	DAYTON CHILDREN'S HOSPITAL	45404	B146	OHL03293	0034MAT	ONE CHILDREN'S PLAZA	OH	3	3
MONTGOMERY	DAYTON	MIAMI VALLEY HOSPITAL	45409	B083	OHL03295	0036MAT	1 WYOMING ST	OH	3	3
MONTGOMERY	KETTERING	KETTERING MEDICAL CENTER	45429	B057	OHL03298	0039MAT	3535 SOUTHERN BLVD	OH	3	3
STARK	CANTON	AULTMAN HOSPITAL - AULTMAN BIRTH CE	44710	B005	OHL03322	0063MAT	2600 SIXTH ST SW	OH	3	3
SUMMIT	AKRON	AKRON CHILDREN'S HOSPITAL	44308	B144	OHL03317	0058MAT	ONE PERKINS SQ	OH	3	3
SUMMIT	AKRON	CLEVELAND CLINIC AKRON GENERAL	44307	B002	OHL03318	0059MAT	1 AKRON GENERAL AVE	OH	3	3
SUMMIT	AKRON	SUMMA HEALTH SYSTEM - AKRON CAMPUS	44304	B113	OHL03319	0060MAT	525 E MARKET ST	OH	3	3