

Frequently Asked Questions (FAQs)  
Reproductive Outcomes  
Wisconsin Environmental Public Health Tracking  
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**What is reproductive health?**

**What are reproductive health outcomes?**

**What is WI EPHT focusing on within reproductive health?**

**How are reproductive outcomes related to environmental health?**

**How is reproductive health related to environmental health?**

**Where can I find more information about reproductive health and outcomes?**

**Where do the reproductive health data come from?**

**Prematurity**

What is prematurity?

What is the relationship between prematurity and the environment?

What are the health effects related to prematurity?

What are the risk factors for premature birth?

Why do premature measures only include singleton births?

What can I do to avoid a premature baby?

**Low Birth Weight**

What is low birth weight?

What is the relationship between low birth weight and environmental health?

What are the health effects related with low birth weight?

What are the risk factors for low birth weight births?

What can I do to prevent having a low birth weight baby?

**Infant Mortality**

What is infant mortality?

What is a live birth?

What is the relationship between infant mortality and the environment?

What are the causes of and risk factors for infant mortality?

What can Healthcare Providers do to help reduce infant mortality rates?

What can communities and individuals do to help reduce infant mortality rates?

**Fertility and Infertility**

What are fertility and infertility?

How are fertility and infertility related to environmental health?

What are the risk factors for women?

What are the risk factors for men?

How can infertility be prevented?

**Total Fertility Rate**

What is total fertility rate?

Why is total fertility rate used as a measure of fertility and infertility?

**Sex Ratio at Birth**

What is sex ratio at birth?

Why is sex ratio at birth used as a measure of fertility and infertility?

How is sex ratio at birth related to environmental health?

## What is reproductive health?

Reproductive health refers to the diseases, disorders and conditions that affect the functioning of the male and female reproductive systems during all stages of life, including adolescence, pregnancy, childbirth, fertility.

Reproductive health is influenced by many factors. These include your age, lifestyle, habits, genetics, use of medicines and exposure to chemicals in the environment.

## What are reproductive outcomes?

Reproductive outcomes include disorders that occur as a result of poor reproductive health including birth defects, developmental disorders, fetal growth restriction, low birth weight, preterm birth, reduced fertility/infertility, impotence, and menstrual disorders.

From NIEHS: <http://www.niehs.nih.gov/health/topics/conditions/repro-health/index.cfm>

## What is WI EPHT focusing on within reproductive health?

The WI EPHT program is tracking certain outcomes and measures of reproductive health because causes of these outcomes may be related to the environment. The select measures are shown in the table below.

Outcomes	Measures
Fertility	<ul style="list-style-type: none"><li>• Births, general fertility rate and total fertility rate</li><li>• Sex Ratio at Birth</li></ul>
Prematurity	<ul style="list-style-type: none"><li>• Incidence (percent) of preterm births among singleton live born infants</li><li>• Incidence of very preterm births among singleton live born infants</li><li>• Incidence of very low birth weight births among singleton live born births</li></ul>
Fetal Growth Retardation	<ul style="list-style-type: none"><li>• Incidence (percent) low birth weight births among term singleton live born births</li></ul>
Infant mortality	<ul style="list-style-type: none"><li>• Infant mortality rate</li></ul>

The WI EPHT chose these categories because research has shown that exposure to environmental contaminants may hurt your reproductive health, but the exact causes remain uncertain. The reproductive outcome measures on this website are only a few of the many potential measures one could track. The data used to develop these measures are from state statistical birth and death files. In subsequent years, the WI EPHT program will also begin to track birth defects.

## **How are reproductive outcomes related to environmental health?**

The WI EPHT examines various measures of birth outcomes and infant deaths to explore changes in reproductive health outcomes over time and place. Examining these trends may provide some clues about how environmental factors may impact reproductive health.

## **How is reproductive health related to environmental health?**

Reproduction is the result of a very complex process. Exposure to chemicals in the environment can impact the ability to have babies, and proper growth and development in babies before and after they are born. Also, environmental contaminants may be especially toxic to growing babies while they are still in their mother's uterus, by crossing the placenta and making their way into the developing fetus. An example is mercury exposure which has been linked to birth defects and neurological disorders in children born to mothers who ate large amounts of mercury contaminated fish. Other environmental exposures occur through risks in behaviors, lifestyles, and conditions, such as smoking, substance abuse, poor nutrition, lack of prenatal care, medical problems, and chronic illness.

Both the male and female reproductive systems play a role in [pregnancy](#). Problems with these systems can affect [fertility](#) and the ability to have children. Reproductive problems occur in men and women.

The case of Diethylstilbestrol (DES) revealed exposure to toxic chemicals during pregnancy can have multi-generational impacts on reproduction. DES is a drug once prescribed during pregnancy to prevent miscarriages or premature deliveries. In the U.S. an estimated 5 to 10 million persons were exposed to DES from 1938 to 1971, including pregnant women prescribed DES and their children. In 1971, the Food and Drug Administration (FDA) advised physicians to stop prescribing DES. While the effects of some environmental exposures are known, many questions remain unanswered.

## **Where can I find more information about reproductive health and outcomes?**

For more information please visit the following websites:

<http://www.cdc.gov/reproductivehealth/index.htm>

<http://www.cdc.gov/reproductivehealth/MaternalInfantHealth/index.htm>

[http://www.cdc.gov/ncbddd/pregnancy\\_gateway/trouble.htm](http://www.cdc.gov/ncbddd/pregnancy_gateway/trouble.htm)

For more information about reproductive health and data sources in Wisconsin please visit the following websites:

<http://dhs.wisconsin.gov/births/index.htm>

## **Where do the reproductive health data come from?**

The data comes from the Wisconsin Vital Statistics Records Office statistical resident birth and death files. The WI EPHT uses the data to develop reproductive outcome measures. The live birth data comes from resident birth certificate statistical files. Infant death data are from a file of the year's resident infant deaths (death certificate data) with birth certificate data matched. Resident data tables include Wisconsin resident births and infant deaths, regardless of the state that the birth/death occurred. Birth locations (e.g. county assignments) are based on maternal residence at the time of birth.

## **The following are specific reproductive outcome topics:**

### **Prematurity**

#### **What is prematurity?**

A birth that is considered premature if the baby is born less than 37 weeks from the time the mother had her last menstrual period (was conceived) to the time the baby was born (called gestation). This means the baby was born

- More than three weeks before a baby's due date or,
- Before 8.5 months

To be a full term birth, a baby is born between 37 and 40+ weeks gestation.

More than a half million babies in the United States—that's 1 in every 8—are born premature each year. The preterm birth rate has risen 13% between 1996 and 2006 (from 9.90% in 1996 to 11.2% in 2006) in Wisconsin

#### **What is the relationship between prematurity and the environment?**

Increases in risk of prematurity or preterm delivery have been related to exposures during pregnancy to tobacco smoke, air pollution, lead, and some solvents. Other environmental exposures impacting preterm birth remain uncertain.

#### **What are the health effects related to prematurity?**

Prematurity is the leading cause of death among newborn babies. Being born premature is also a serious health risk for a baby. Some babies will require special care and spend weeks or months hospitalized. Those who survive may face lifelong problems such as—

- [intellectual disabilities](#),
- [cerebral palsy](#),
- breathing and respiratory problems,
- [vision and hearing loss](#), and
- feeding and digestive problems.

Although the more preterm a baby is born, the more severe his or her health problems are likely to be, even babies born just a few weeks early can have more health problems than full-term babies. For example, a baby born at 35 weeks is more likely to have jaundice, breathing problems, and longer hospital stays.

### **What are the risk factors for premature birth?**

There are some known risk factors that if avoided can lessen your risk for having a premature baby. Unfortunately, there is not a list of actions to be taken to guarantee not having a premature baby.

The known risk factors are—

- Carrying more than one baby (twins, triplets, quadruplets or more).
- Having a previous preterm birth.
- Problems with the uterus or cervix.
- Chronic health problems in the mother, such as high blood pressure, [diabetes](#), and [clotting disorders](#).
- Certain [infections during pregnancy](#).
- [Cigarette smoking](#), [alcohol use](#), or illicit drug use during pregnancy.

There are additional lifestyle and environmental risk factors that have been linked to prematurity but the scientific evidence supporting these links are unclear including:

- Late or no prenatal care,
- Domestic violence,
- Lack of social support,
- Stress,
- Long working hours with long periods of standing,
- Being underweight before pregnancy,
- Obesity,
- Marital status,
- Spacing of births (less than 6-9 months between birth and the beginning of the next pregnancy),
- Neighborhood-level characteristics
- Environmental chemicals (for example, exposure to air pollution and drinking water contaminated with chemical disinfection by-products or lead).

### **Why do premature measures only include singleton births?**

Singleton births are births where only one child is born versus multiple or plural births that are commonly referred to twins or triplets. Singleton births are used to isolate the reproductive outcomes associated with environmental exposures, rather than due to changes in social or technological advances over time. The rise in multiple and plural births is most likely the result of increased reproductive technologies, such as fertility drugs, and not due to changing levels of environmental contaminants. Also, multiple/plural births are much more likely than singletons to be preterm. The premature measures using single births are:

- Percent of preterm births among singleton live born infants

- Incidence of preterm births among singleton live born infants
- Incidence of very low birth weight births among singleton born births

### **What can I do to avoid having a premature baby?**

Preterm birth can happen to anyone and many women who have a premature birth have no known risk factors. These are things you can do to improve your own health and lower your risk of having a premature baby at the same time:

- Quit smoking and avoid substances such as alcohol or drugs.
- If you plan to become pregnant, then see your health care provider for a medical checkup.
- Work with your health care provider to control diseases such as high blood pressure or diabetes.
- Get prenatal care early, as soon as you think you may be pregnant, and throughout the pregnancy. Discuss concerns during pregnancy with your health care provider, and seek medical attention for any warning signs or symptoms of preterm labor.

### **Low Birth Weight**

#### **What is low birth weight?**

Birth weight is the first weight of the newborn obtained after birth. A baby is considered low birth weight when it weighs less than 5.5 lbs (2500 grams) at birth.

The WI EPHT is using low birth weight to measure prematurity and fetal growth retardation.

#### **What is the relationship between low birth weight and environmental health?**

The condition of low birthweight has been associated with exposure during pregnancy to lead, solvents, pesticides, polycyclic aromatic hydrocarbons (PAHs) which are a group of over 100 contaminants produced by burning fuels such as coal (PAHs), and other types of air pollution.

A low birth weight birth can occur from being born too small or too early, or both. These conditions often have separate causes, where a specific factor may be related to one of these conditions but not the other. For example, smoking during pregnancy has been found to be more related to babies born too small (growth retardation) than born too early (prematurity). For this reason, when we look at low birth weight, we do not include premature babies in the data.

#### **What are the health effects?**

Compared to babies of normal weight, low birth weight babies may be at increased risk of illness from birth through the first six days of the baby's life (perinatal morbidity), infections, and the longer-term consequences of impaired development, such as delayed motor and social development or learning disabilities.

## **What are the risk factors for low birth weight births?**

A low birth weight birth can occur from being born too small or too early, or both. Low Birth Weight is associated with a number of risk factors:

- Maternal smoking,
- Maternal alcohol consumption
- Maternal inadequate weight gain
- women younger than 15 and older than 35,
- low income
- lack of education
- Stress
- Domestic violence or other abuse
- Unmarried mothers
- Woman who have had a previous preterm birth
- Exposure to air pollution (both indoor and outdoor) and drinking water contaminated with chemical disinfection by-products or lead may serve as examples of environmental risk factors.

## **What can I do to prevent having a low birth weight baby?**

Early and continuous prenatal care helps identify conditions and behavior that can result in low birth weight babies, such as smoking, drug and alcohol abuse, inadequate weight gain during pregnancy and repeat pregnancy in six months or less.

Infants born to teenage mothers are at higher risk of being born low birth weight babies and have a higher mortality rate.

There are some steps a woman can take to reduce her risk of having a low-birth weight baby.

- Quit smoking
- If you plan to become pregnant, then see your health care provider for a medical checkup.
- Work with your health care provider to control diseases such as high blood pressure or diabetes.
- Get prenatal care early, as soon as you think you may be pregnant, and throughout the pregnancy.
- Discuss concerns during pregnancy with your health care provider, and seek medical attention for any warning signs or symptoms of preterm labor.
- Take a daily multivitamin containing 400 micrograms of folic acid, starting before and throughout pregnancy

## **Infant Mortality**

**What is infant mortality?**

An infant death is a death occurring to a baby less than one year of age. Infant mortality is a measure of infant deaths. The infant mortality rate is the number of infant deaths per one thousand live births.

### **What is a live birth?**

Live birth is the complete birth of a baby that must be breathing or showing other evidence of life, such as a heartbeat.

### **What is the relationship between infant mortality and the environment?**

The fetus and young child less than one years old (infant) may be particularly susceptible to harmful effects of environmental contaminants. Many environmental contaminants may be especially toxic to babies as they are growing in their mother's uterus (in utero).

However, specific health effects are often not well understood for years following the identification of a potentially harmful exposure. For this reason, it is useful for WI EPHT to track gross indicators of infant (child less than one years old) health, such as death (mortality). It is important to keep in mind that environmental exposure-related causes of infant mortality are only one piece of a puzzle. Many other factors such as access to and quality of health care, competency in childcare and understanding of injury prevention contribute to infant mortality.

Outdoor air pollution is one example of a connection between environmental health and infant death. Air pollution in the form of particulate matter (PM10) has been associated with a 10% increase in the rate of infant deaths occurring from 28 days after being born up through the first year of life (post-neonatal deaths).

### **What are the causes and risk factors of infant mortality?**

The leading causes of infant death include congenital abnormalities, pre-term, low birth weight, Sudden Infant Death Syndrome (SIDS), problems related to complications of pregnancy, and respiratory distress syndrome. Other causes include maternal smoking, drug and alcohol abuse, poor nutrition, stress, insufficient prenatal care, chronic illness or other medical problems.

### **What can healthcare providers do to help reduce infant mortality rates?**

Health care providers can advise their patients about factors that affect birth outcomes, such as maternal smoking, drug and alcohol abuse, poor nutrition, stress, insufficient prenatal care, chronic illness or other medical problems.

### **What can communities and individuals do to help reduce infant mortality rates?**

Communities can play an important role in this effort by encouraging pregnant women to seek prenatal care in the first three months of pregnancy. Also, it helps to educate pregnant women and family members on factors that affect infant mortality such as smoking, substance abuse, poor nutrition, lack of prenatal care, medical problems, and chronic illness.

In addition, educating parents and caregivers about SIDS will help. A sleeping infant should be placed on their backs because babies who sleep on their stomachs or sides are at higher risk for SIDS. A separate sleeping environment, such as a crib in the parents' bedroom, is sometimes recommended.

## **Infertility**

### **What are fertility and infertility?**

Fertility is the ability to conceive and have children, and the ability to become [pregnant](#) through normal sexual activity. [Infertility](#) is defined as the failure to conceive after a year of regular intercourse without contraception. Infertility is a term used by health care providers to describe problems in both men and women, where either the woman is unable to get pregnant, or the man is unable to impregnate a woman, after at least one year of trying.

In women, the term is used to describe those who are of normal childbearing age (15-54 years old), not those who can't get pregnant because they are near or past menopause. Women who are able to get pregnant but who cannot carry a pregnancy to term (birth) may also be considered infertile.

According to data from the National Survey of Family Growth, 12% of U.S. couples had impaired fertility in 2002, up 20% from 1995.

### **What is the relationship between infertility and the environment?**

Approximately 10% of problems with fertility are unknown, but some have thought environmental contaminants are a major contributor. Environmental contamination can have multi-generational impacts on reproduction that need to be studied and tracked long term.

There are many studies that suggest environmental exposure effects infertility:

- In 2006, a study by Barrett found exposures to a number of compounds, such as materials found in some plastics (phthalates), persistent contaminants produced as flame retardants and degreasers - polychlorinated biphenyls (PCBs), dioxin, and other pesticides may be affecting human fertility.
- In 2005, a study by Windham found environmental effects on menstrual/ovulatory function.
- In 2001, Skakkebaek hypothesized that two male reproductive birth defects—mislocation of the urethra opening on the penis (hypospadias) and undescended testicles (cryptorchidism)—along with testicular cancer, are related to exposure to endocrine disrupting compounds in the environment such as DDE and DDT, both pesticides previously used for mosquito control among other things in the United States and are currently used in some areas around the world.

According to the American Society of Reproductive Medicine, about one-third of infertility is caused by male factors, one-third by female factors, and one-third by both male and female. Male factors include low sperm count and sperm abnormalities, while female factors include ovulation disorder, a blocked fallopian tubes, and birth defects in the mom..

## **What are the risk factors for women?**

The cause of infertility can rest in the woman or the man, or can be from unknown factors or a combination of factors listed below:

- age
- stress
- poor diet
- athletic training
- being overweight or underweight
- tobacco smoking
- alcohol
- sexually transmitted diseases (STDs)
- health problems that cause hormonal changes

Some health issues also increase the risk of fertility problems.

- irregular periods or no menstrual periods
- very painful periods
- endometriosis
- pelvic inflammatory disease
- more than one miscarriage

## **What are the risk factors for men?**

The number and quality of a man's sperm can be affected by his overall health and lifestyle. Some things that may reduce sperm number and/or quality include:

- alcohol
- drugs
- environmental toxins, including pesticides and lead
- smoking cigarettes
- medicines
- radiation treatment and chemotherapy for cancer
- age

## **How can infertility be prevented?**

Infertility is a complex problem – it does not have a single cause because getting pregnant is a multi-step chain of events.

Most healthy women under the age of 30 shouldn't worry about infertility unless they've been trying to get pregnant for at least a year. At this point, women should talk to their doctors about a fertility evaluation. Men should also talk to their doctors if this much time has passed.

In some cases, women should talk to their doctors sooner. Women in their 30s who've been trying to get pregnant for six months should speak to their doctors as soon as possible. A woman's chances of having a baby decrease rapidly every year after the age of 30. So getting a complete and timely fertility evaluation is especially important.

No matter how old you are, it's always a good idea to talk to a doctor before you start trying to get pregnant. Doctors can help you prepare your body for a healthy baby. They can also answer questions on fertility and give tips on conceiving.

## **Total Fertility Rate**

### **What is the total fertility rate (TFR)?**

The Total Fertility Rate (TFR) is a measure that compares fertility across different groups. It is the percent of average number of births to a group of 1,000 women if they experienced the age-specific birth rates observed in a given year.  $TFR = \text{Sum of age-specific fertility rates} * 5$

### **Why is total fertility rate used as a measure of fertility and infertility for WI EPHT?**

Rates can provide background into how fertility varies geographically in relation to changes in potentially related environmental risk factors and how it has varied over time within the United States.

Several measures have been used to track fertility from the global down to the local level. Typically, the general fertility rate (GFR) (# of live births/women of reproductive age 15-44) and the total fertility rate (TFR) are used. The total fertility rate differs from the general fertility rate because it adjusts for age-specific differences in fertility and allows for a more true comparison of rates across time and place.

Similar to the GFR, the TFR may not be specific enough to track specific changes related to environmental risk factors; however, if the estimate of 10% is correct, then this measure can be used with other measures including measures of ambient concentrations of pollutants to look for potential associations with population level changes in fertility and generate some well informed hypothesis or areas for future investigations.

## **Sex Ratio**

### **What is sex ratio at birth?**

The sex ratio at birth is the ratio of male to female births. This ratio of total males/total females born in a geographic area (e.g., state, county, zip code, census tract, block group) at a certain time (one birth year or multiple years) is referred to as the Sex Ratio (SR).

The expected sex ratio at birth (male to female) is 1.05. The sex ratio at birth is calculated as the number of male births divided by female births times 1,000, for example, the sex ratio at birth of 1.05 is reported as 1,050 male births per 1,000 female births. This ratio has been found to be

significant in evolution to ensure that the population has the appropriate number of males and females of reproductive age to keep the population sustained

### **Why is sex ratio at birth used as a measure of fertility and infertility?**

The sex ratio at birth is the ratio of male to female births. The expected sex ratio is 1.05. Population growth is, in part, related to the number of live male children. If the ratio goes down or up it means the overall balance in fertility has changed. Numerous studies have reported changes in the ratio of males to females at birth with a reduction in male relative to female births in different countries.

### **What is the relationship between sex ratio at birth and the environment?**

Although the mechanism which determines the sex of the infant is not completely understood, some have suggested that environmental hazards can affect how many males are born due to exposure to endocrine disrupting chemicals or contaminants impacting gene-expression found in the environment.

Some examples of environmental exposures that affect the sex determination of the infant are:

- Endocrine disrupters,
- Increase in parental smoking,
- Gestation length, and
- Parental age