

# **BIRTH DEFECTS AND OTHER ADVERSE PREGNANCY OUTCOMES IN ILLINOIS 2008-2012**

## **A REPORT ON COUNTY-SPECIFIC PREVALENCE**



Illinois Department of Public Health  
Division of Epidemiologic Studies

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## INTRODUCTION

The Illinois Department of Public Health (IDPH) records adverse pregnancy outcomes in infants with congenital anomalies (birth defects) and other serious neonatal conditions (listed in Table 1). Each year IDPH’s Adverse Pregnancy Outcomes Reporting System (APORS), Division of Epidemiologic Studies, obtains information on thousands of such births throughout the state. Information about congenital anomalies and other adverse pregnancy outcomes identified in newborn infants was first collected statewide by APORS in 1989. Table 1 shows the number of cases and rates of different neonatal conditions included in APORS case definition between 2008 and 2012. Since multiple adverse outcomes may coexist, it is possible for an infant to be counted in more than one of the categories in Table 1.

**Table 1. Frequency of Reported Infants Meeting APORS Case Criteria, 2008-2012**

| Infants                                 | 5-Year Total | Annual Average | Rate <sup>1</sup> | % APORS Cases |
|---|--------------|----------------|-------------------|---------------|
| Total APORS Cases                       | 62,122       | 12,424.4       | 745.7             | 100.0         |
| Birth Defects                           | 40,798       | 8,159.6        | 477.1             | 65.7          |
| Very Low Birth Weight                   | 16,256       | 3,251.2        | 195.1             | 26.2          |
| Positive for Controlled Substances      | 9,549        | 1,909.8        | 114.6             | 15.4          |
| Fetal Deaths                            | 4,875        | 975.0          | 58.5              | 7.8           |
| Died During Newborn Hospitalization     | 3,492        | 698.4          | 41.9              | 5.6           |
| Intrauterine Growth Restriction         | 4,424        | 884.8          | 53.1              | 7.1           |
| Congenital Infections                   | 3,259        | 651.8          | 39.1              | 5.2           |
| Retinopathy of Prematurity              | 2,473        | 494.6          | 29.7              | 4.0           |
| Endocrine, Metabolic or Immune Disorder | 921          | 184.2          | 11.1              | 1.5           |
| Blood Disorder                          | 652          | 130.4          | 7.8               | 1.0           |
| Infant Exposed to Alcohol               | 128          | 25.6           | 1.5               | 0.2           |

<sup>1</sup> Rate per 10,000 live births

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

Information about adverse pregnancy outcomes is collected for two major reasons. First, infants with a congenital anomaly or other problem often need special services to help assure that they reach their full potential. Therefore, these babies are referred to their local health departments for follow-up services. Second, the data are collected for surveillance and evaluation purposes. These may include describing disease patterns, tracking trends, and developing education and intervention strategies.

APORS is the most complete source of data on adverse pregnancy outcomes that exists in Illinois. All Illinois hospitals are mandated to report infants with adverse pregnancy outcomes born to Illinois women. (Perinatal centers in St. Louis also participate.) Prior to 2002, APORS

was considered a passive surveillance system, because it relied primarily on reports sent from hospitals, rather than having abstraction staff going to hospitals to identify cases. Passive systems, while relatively easy to operate, are generally thought to underestimate birth defect rates. Because of this, APORS has taken steps over the years to incorporate elements more characteristic of an active system of surveillance. Active systems utilize abstraction staff to review data from multiple sources on an ongoing basis to identify and verify birth defects (Centers for Disease Control and Prevention, [CDC], 2018). While resource intensive, this practice is generally recognized as improving case identification and quality.

In 2002, APORS began systematic active case verification whereby APORS staff review charts for infants reported with certain conditions that are likely to be associated with one or more birth defects. These conditions include: death before discharge, exposure to alcohol, a diabetic mother, a disturbance in neonatal tooth eruption, or one or more birth defects. As the charts are reviewed, APORS staff correct and add to information reported by hospitals.

Birth certificates (maintained by the IDPH’s Division of Vital Records) are an additional data source, allowing APORS to identify infants with very low birth weights or with certain birth defects who were unreported by the hospitals. The Division of Vital Records also provides information about fetal deaths from the death certificates.

APORS staff believes that the prevalence of infants prenatally exposed to controlled substances is subject to testing bias (Fornoff *et al.*) It is important that these infants and their families receive follow-up services, so prenatal drug exposure is still part of APORS case definition. However, since the results are not representative of Illinois newborns, further data is not presented.

This report includes two sections. The first describes the county-specific prevalence rates of six groups of major birth defects. In addition, a listing of the International Classification of Diseases – Ninth Revision Clinical Modification (ICD-9-CM) codes corresponding to each included birth defect is provided, together with a brief description of each defect. The second section provides similar information about other adverse pregnancy outcomes, including most of those listed in Table 1.

## METHODS

### *Calculation and Interpretation of Rates and Confidence Intervals*

Annual prevalence rates (per 10,000 live births) for selected adverse pregnancy outcomes identified during the newborn hospital stay or associated with a fetal death were calculated as

$$10,000 \times \frac{\text{number of infants with selected congenital anomaly}}{\text{number of live births}}$$

The numbers of live births were obtained from the IDPH’s master birth files. Occurrence of a specific adverse outcome is assumed to be a rare event, therefore following a Poisson distribution. Exact confidence intervals were calculated for each rate (Armitage and Berry, page 134) as

$$\mu_L = \frac{1}{2} \chi^2_{2x, 0.975}$$
$$\mu_U = \frac{1}{2} \chi^2_{2x+2, 0.025}$$

Where there are many birth defect cases, the confidence interval is narrow, indicating that the rate is stable. Where there are few birth defect cases, the confidence interval becomes very wide, indicating that the rate is not very stable. A small change in the number of infants born with the specific birth defect could result in a large change in the rate.

To compare two rates, it is important to look at their confidence intervals as well as their values. As a conservative approximation, if two confidence intervals overlap, then there is no evidence that the two rates are different. If two confidence intervals do not overlap, then the rates are said to be statistically different. In this report, 95% confidence intervals are used; where the confidence intervals do not overlap the rates are statistically different at the 5% level ( $p < 0.05$ ).

### ***Multiple Comparisons***

Since this report examines many adverse outcomes, the corresponding statistical tests are subject to the “multiple comparison problem.” For a given birth defect, the observed rate is an estimate of the true birth defect rate in the population. When two rates from different times or groups are compared, statisticians will assert that the observed rates are evidence of the groups having differing birth defect rates, if the observed rates are so different that the chance of them coming from the same underlying population is less than 5%. The 5% type I error rate, however, suggests that when 100 comparisons are made, on average, five will be “significantly different,” when, in fact, there is no difference between the two groups. Therefore, as more comparisons are made, more may be statistically significant, just by chance. In this report, no explicit corrections of the multiple comparison problem were made; instead, exact probabilities are reported. The smaller the reported probability, the more likely it is that the difference is not simply the result of chance.

### ***Map Illustrations***

The maps in this report were created using Tableau 2018.2. The categories were determined using natural break-points in the data. The maps are used to create a visual representation of birth defect prevalence rates and do not have any statistical significance associated with them.



## SECTION I

### BIRTH DEFECTS

Birth defects have long been a leading cause of infant mortality in the United States, and they contribute substantially to childhood morbidity and long-term disability. In 2012, birth defects were responsible for 20.9% of infant deaths in the U.S. (Heron M). In Illinois, birth defects were responsible for 15.8% of infant deaths in 2012, ranking as the second leading cause of these deaths (Illinois Department of Public Health [IDPH], 2019).

Known causes of birth defects include one or a combination of the following:

- Genetic disorders
- Exposures to chemicals, medications, or other substances during pregnancy
- Certain infections during pregnancy that expose the baby to viruses or bacteria
- Lack of certain nutrients before and during pregnancy, such as folic acid

The stage of fetal development at the time of exposure to one of the latter three causes is critical, as fetal development is particularly vulnerable to disruption in the first trimester of pregnancy. Despite an increasing understanding of factors that give rise to birth defects, the cause of most birth defects is complex and remains unknown.

While not all birth defects are preventable, a woman can plan to try to be as healthy as possible both before and during pregnancy to increase her chances of having a healthy baby. According to the CDC (CDC, 2019) Specific steps she can take include:

- Adopt a healthy active lifestyle
- Avoid harmful substances (alcohol, smoking, marijuana, illicit drugs)
- Get enough folic acid daily
- See a health care provider prior to pregnancy to discuss health conditions, medications, diet, and how to prevent infections
- Begin prenatal care as soon as she thinks she is pregnant

The life expectancy and quality of life for many individuals with birth defects has improved over the last several decades as new tests and treatments are available. Surgical techniques can correct certain birth defects before a baby is born and neonatal intensive care units are able to provide very specialized care and technology.

Between 2008 and 2012, more than 15,000 major birth defects were identified in Illinois newborns at a rate of 189.9 per 10,000 live births. Heart and circulatory system defects were the most commonly identified major defect in Illinois, accounting for 45.9% of the six major birth defects examined in this report.

Because a baby may be born with more than one birth defect, he or she may be counted in more than one birth defect group. A baby may even have more than one birth defect from the same birth defect group. Therefore, the data in this report cannot be used to determine the number of children with a particular group of birth defects.

## **CENTRAL NERVOUS SYSTEM DEFECTS**

Central nervous system defects involve the brain, spinal cord and associated tissues. These include neural tube defects (anencephaly, spina bifida and encephalocele), microcephalus and hydrocephalus. Because central nervous system defects are very severe, many affected babies will miscarry early in pregnancy. Additionally, since the defects are detectable in pregnancy either by alpha-fetoprotein testing or ultrasound screening, women may elect to terminate the pregnancy.

A description of each defect follows, together with Table 2 which gives the five-year prevalence rates for each defect for the state. Table 3 provides five-year prevalence rates for all major central nervous system defects combined by county. The observed rates may be substantially lower than the true rates because APORS does not collect birth defect information from miscarriages or elective abortions. Figures 1 and 2 provide prevalence rates for major central nervous system defects for selected counties in table and map formats, respectively.

*Anencephaly* is a serious defect that occurs when the upper part of the neural tube fails to close, resulting in the absence of a major portion of the brain, skull, and scalp. It includes craniorachischisis in which there is incomplete closure of both the skull and the spinal column. Nearly all babies born with this condition die soon after birth.

*Encephalocele* is a defect affecting the skull resulting in the protrusion of the meninges and portions of the brain through a bony midline defect in the skull. High mortality and morbidity are associated with this condition, and overall outcomes depend on the specific site and size of the lesion as well as whether other anomalies are present.

*Hydrocephalus* is an abnormal buildup of cerebrospinal fluid in the brain causing a widening of the ventricle spaces and creating pressure on the brain. This condition can occur alone or in conjunction with other malformations and may cause a variety of symptoms including a large head, seizures, vomiting, headaches, visual problems, and abnormal reflexes. It is often treated surgically by shunting the fluid out of the brain to be reabsorbed by the body (National Institutes of Health [NIH], 01/29/2019).

*Microcephalus* is an abnormally small head due to failure of proper brain development during pregnancy. This condition can range from mild to severe and may occur alone or in conjunction with other birth defects. Microcephaly can result in a range of issues including seizures, developmental delays, intellectual disability, and feeding, hearing, and vision

problems.

*Spina bifida* is a defect in which part of the spinal cord is exposed because of a bony defect in the vertebral column. It may be associated with hydrocephalus. The degree of disability depends on the extent and location of the malformation.

**Table 2. Total Number and Prevalence Rates of Major Central Nervous System Defects in Newborn Infants, Illinois, 2008-2012**

| Defect                     | ICD-9-CM Codes | Number | Rate <sup>1</sup> | 95% CI <sup>2</sup> |
|----------------------------|----------------|--------|-------------------|---------------------|
| Anencephalus               | 740.0-740.1    | 115    | 1.4               | (1.1, 1.7)          |
| Spina bifida <sup>3</sup>  | 741.00-741.93  | 240    | 2.9               | (2.5, 3.3)          |
| Encephalocele              | 742.0          | 56     | 0.7               | (0.5, 0.9)          |
| Microcephalus              | 742.1          | 440    | 5.3               | (4.8, 5.8)          |
| Hydrocephalus <sup>4</sup> | 742.3          | 597    | 7.2               | (6.6, 7.8)          |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

<sup>3</sup> Includes only spina bifida without anencephaly

<sup>4</sup> Includes only hydrocephaly without spina bifida or anencephaly.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 3. Total Number and Prevalence Rates of Major Central Nervous System Defects in Newborn Infants by County of Residence, 2008-2012**

| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 1,448 | 17.4              | 16.5                | 18.3  | Lee         | 0     | 0.0               | 0.0                 | 20.0  |
| Adams      | 10    | 24.7              | 11.9                | 45.5  | Livingston  | 2     | 8.5               | 1.0                 | 30.7  |
| Alexander  | 1     | 18.3              | 0.5                 | 102.2 | Logan       | 4     | 26.1              | 7.1                 | 66.9  |
| Bond       | 0     | 0.0               | 0.0                 | 42.1  | McDonough   | 7     | 47.5              | 19.1                | 97.8  |
| Boone      | 6     | 19.4              | 7.1                 | 42.3  | McHenry     | 24    | 13.7              | 8.8                 | 20.3  |
| Brown      | 0     | 0.0               | 0.0                 | 133.7 | McLean      | 24    | 22.5              | 14.4                | 33.5  |
| Bureau     | 7     | 39.2              | 15.8                | 80.8  | Macon       | 15    | 21.5              | 12.0                | 35.4  |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 1     | 4.1               | 0.1                 | 23.0  |
| Carroll    | 1     | 14.3              | 0.4                 | 79.8  | Madison     | 18    | 11.1              | 6.6                 | 17.5  |
| Cass       | 1     | 10.9              | 0.3                 | 60.8  | Marion      | 6     | 23.7              | 8.7                 | 51.6  |
| Champaign  | 23    | 19.2              | 12.1                | 28.7  | Marshall    | 1     | 16.3              | 0.4                 | 91.0  |
| Christian  | 4     | 21.1              | 5.7                 | 54.0  | Mason       | 3     | 41.4              | 8.5                 | 120.9 |
| Clark      | 1     | 10.4              | 0.3                 | 57.7  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 1     | 11.8              | 0.3                 | 65.8  | Menard      | 0     | 0.0               | 0.0                 | 58.3  |
| Clinton    | 1     | 4.8               | 0.1                 | 27.0  | Mercer      | 2     | 25.2              | 3.0                 | 90.9  |
| Coles      | 3     | 11.2              | 2.3                 | 32.8  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 708   | 19.2              | 17.9                | 20.7  | Montgomery  | 5     | 32.3              | 10.5                | 75.3  |
| Crawford   | 0     | 0.0               | 0.0                 | 35.9  | Morgan      | 6     | 31.9              | 11.7                | 69.5  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 3     | 34.6              | 7.1                 | 101.0 |
| DeKalb     | 5     | 8.0               | 2.6                 | 18.6  | Ogle        | 4     | 14.3              | 3.9                 | 36.6  |
| DeWitt     | 2     | 21.3              | 2.6                 | 76.9  | Peoria      | 48    | 35.8              | 26.4                | 47.4  |
| Douglas    | 5     | 37.2              | 12.1                | 86.8  | Perry       | 0     | 0.0               | 0.0                 | 35.3  |
| DuPage     | 93    | 17.2              | 13.8                | 21.0  | Piatt       | 3     | 35.6              | 7.3                 | 104.1 |
| Edgar      | 2     | 20.8              | 2.5                 | 75.2  | Pike        | 1     | 11.0              | 0.3                 | 61.1  |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 1     | 4.5               | 0.1                 | 24.8  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 2     | 16.4              | 2.0                 | 59.1  | Putnam      | 0     | 0.0               | 0.0                 | 140.3 |
| Ford       | 3     | 40.9              | 8.4                 | 119.6 | Randolph    | 0     | 0.0               | 0.0                 | 20.6  |
| Franklin   | 2     | 8.6               | 1.0                 | 31.0  | Richland    | 1     | 10.2              | 0.3                 | 56.9  |
| Fulton     | 2     | 10.9              | 1.3                 | 39.5  | Rock Island | 17    | 17.6              | 10.2                | 28.1  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 17    | 9.5               | 5.5                 | 15.2  |
| Greene     | 4     | 52.2              | 14.2                | 133.7 | Saline      | 2     | 12.9              | 1.6                 | 46.7  |
| Grundy     | 2     | 6.0               | 0.7                 | 21.8  | Sangamon    | 10    | 8.2               | 4.0                 | 15.2  |
| Hamilton   | 0     | 0.0               | 0.0                 | 78.2  | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 1     | 10.1              | 0.3                 | 56.5  | Scott       | 2     | 73.8              | 8.9                 | 266.6 |
| Hardin     | 1     | 48.5              | 1.2                 | 270.5 | Shelby      | 1     | 8.8               | 0.2                 | 48.9  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 1     | 35.1              | 0.9                 | 195.5 |
| Henry      | 6     | 21.8              | 8.0                 | 47.6  | Stephenson  | 4     | 15.8              | 4.3                 | 40.4  |
| Iroquois   | 0     | 0.0               | 0.0                 | 23.7  | Tazewell    | 22    | 26.8              | 16.8                | 40.6  |
| Jackson    | 2     | 5.9               | 0.7                 | 21.3  | Union       | 0     | 0.0               | 0.0                 | 39.0  |
| Jasper     | 0     | 0.0               | 0.0                 | 65.3  | Vermillion  | 12    | 22.1              | 11.4                | 38.7  |
| Jefferson  | 4     | 16.6              | 4.5                 | 42.4  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 2     | 17.5              | 2.1                 | 63.4  | Warren      | 2     | 19.6              | 2.4                 | 70.7  |
| Jo Daviess | 1     | 10.0              | 0.3                 | 55.5  | Washington  | 1     | 13.8              | 0.3                 | 76.6  |
| Johnson    | 1     | 17.0              | 0.4                 | 94.9  | Wayne       | 2     | 19.5              | 2.4                 | 70.3  |
| Kane       | 69    | 18.7              | 14.5                | 23.6  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 10    | 13.9              | 6.7                 | 25.6  | Whiteside   | 2     | 6.0               | 0.7                 | 21.6  |
| Kendall    | 15    | 16.6              | 9.3                 | 27.4  | Will        | 68    | 15.7              | 12.2                | 19.9  |
| Knox       | 10    | 37.4              | 17.9                | 68.7  | Williamson  | 2     | 5.2               | 0.6                 | 18.9  |
| Lake       | 48    | 11.2              | 8.2                 | 14.8  | Winnebago   | 29    | 15.2              | 10.2                | 21.8  |
| LaSalle    | 11    | 17.6              | 8.8                 | 31.5  | Woodford    | 6     | 26.4              | 9.7                 | 57.5  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

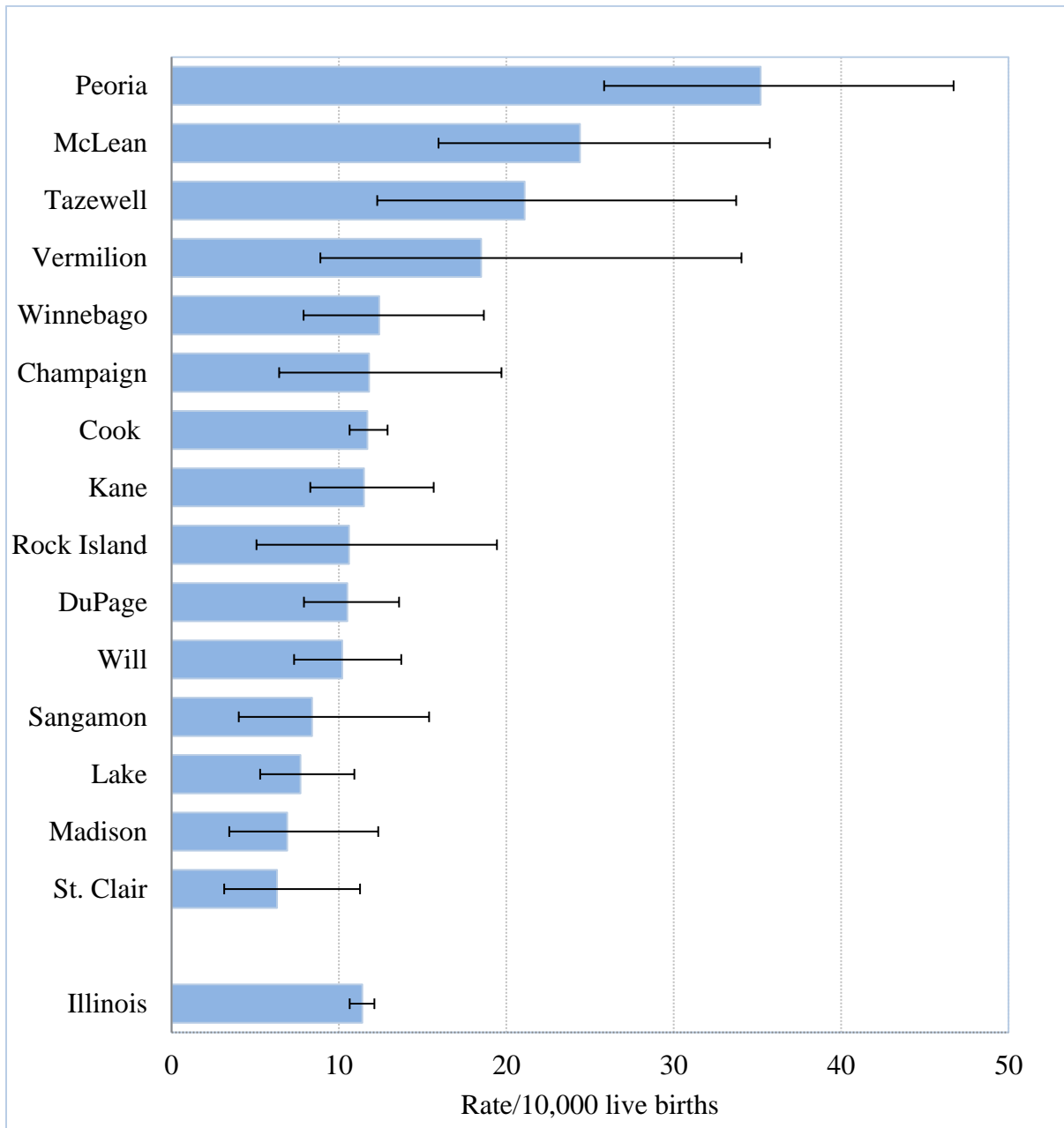
<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95 % confidence interval for rate

The number for Illinois includes one case for which county of residence is missing

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 1. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Major Central Nervous System Defects in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

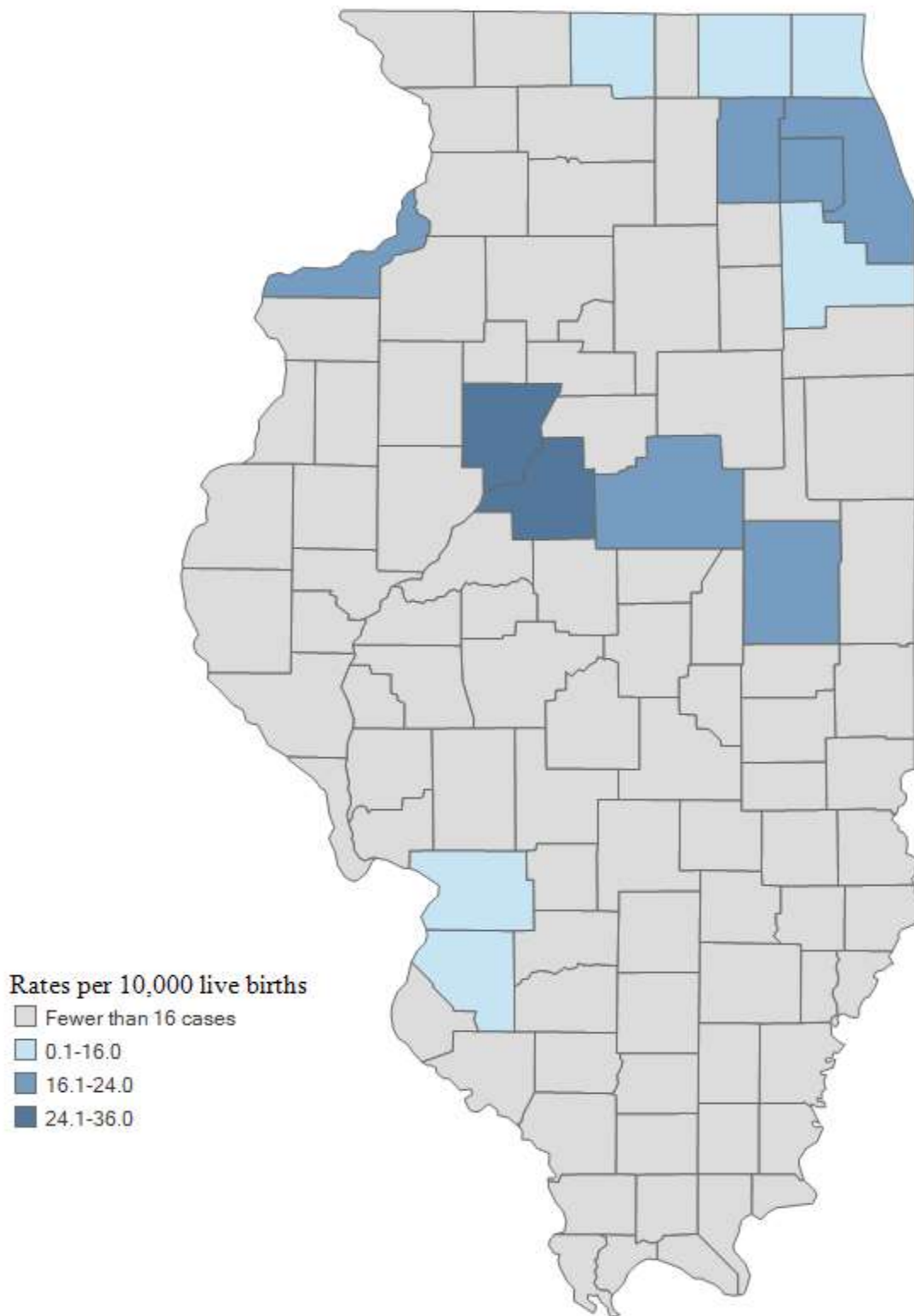


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 2. Map of Prevalence Rates for Major Central Nervous System Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## CARDIOVASCULAR SYSTEM DEFECTS

Cardiovascular system defects involve the heart and circulatory system. They are the most common group of birth defects in the U.S. and Illinois, with a rate of 87.2 identified cases per 10,000 live births in Illinois during the period of 2008-2012.

Cardiovascular defects can range from mild to severe and some are diagnosed during pregnancy while others are not discovered until after birth or later in life. CDC estimates that about 25% of congenital heart defects are considered critical (CDC, 01/31/2019). Babies born with critical heart defects need intervention, including surgical repair, during the first year of life to restore normal circulation as much as possible.

Because of advances in treatment, many people with cardiovascular defects can live longer lives. However, they often must maintain regular visits with a doctor throughout their lives as they can develop other health problems over time.

A description of each major defect follows, together with Table 4, which gives the five-year prevalence rates for each defect for the state. Table 5 provides five-year prevalence rates for all major cardiovascular system defects combined by county. Figures 2 and 3 provide prevalence rates for major central nervous system defects for selected counties in map and table formats, respectively.

*Common truncus* is the failure of the fetal truncus arteriosus to divide into the aorta and pulmonary artery. It can be corrected surgically, usually during the first months of life.

*Transposition of great arteries* is a defect in which the position of the aorta and the pulmonary artery is transposed. Immediate surgical correction is needed.

*Tetralogy of Fallot* is a defect consisting of four abnormalities that result in poorly oxygenated blood being pumped to the body. It can be treated surgically, usually soon after birth.

*Ventricular septal defect* is a hole in the wall between the lower chambers of the heart. The opening may resolve without treatment or may require surgical treatment.

*Atrial septal defect* is a hole in the wall between the upper chambers of the heart. The opening may resolve without treatment or may require surgical treatment.

*Atrioventricular septal defect* is a spectrum of septal defects arising from imperfect fusion of the endocardial cushions in the fetal heart. These defects are repaired surgically.

*Pulmonary valve atresia and stenosis* is an absence or narrowing of the valve between the right ventricle and the pulmonary artery. Mild forms are relatively well tolerated and require no intervention. More severe forms are surgically corrected.

*Tricuspid atresia and stenosis* is the absence or pathological narrowing of the valve between the right atrium and ventricle. Severe cases are corrected surgically.

*Ebstein anomaly* is a deformation or displacement of the tricuspid valve with the septal and posterior leaflets being attached to the wall of the right ventricle. Only disabling cases are corrected surgically.

*Aortic valve stenosis* is a narrowing or obstruction of the aortic heart valve. This condition can be repaired surgically in some cases.

*Hypoplastic left heart syndrome* is a form of congenital heart disease in which the entire left half of the heart is underdeveloped. This condition can be surgically repaired or treated by transplantation. This condition is usually fatal in the first month of life if not treated.

*Coarctation of the aorta* is a defect in which the aorta is narrowed somewhere along its length. Surgical correction is recommended even for mild defects.

*Total anomalous pulmonary venous return (TAPVR)* occurs when all four pulmonary veins are abnormally connected to the heart. It results in poorly oxygenated blood being pumped to the body and must be surgically corrected.

**Table 4. Total Number and Prevalence Rates of Major Cardiovascular System Defects in Newborn Infants, Illinois, 2008 – 2012**

| Defect  | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |
|---|----------------|-------|-------------------|---------------------|
| Common truncus                                  | 745.0          | 47    | 0.6               | (0.4, 0.8)          |
| Transposition of great arteries                 | 745.1x         | 197   | 2.4               | (2.0, 2.7)          |
| Tetralogy of Fallot                             | 745.2          | 264   | 3.2               | (2.8, 3.6)          |
| Ventricular septal defect                       | 745.4          | 3,359 | 40.3              | (39.0, 41.7)        |
| Atrial septal defect                            | 745.5          | 2,056 | 24.7              | (23.6, 25.8)        |
| Endocardial cushion defect                      | 745.6x         | 405   | 4.9               | (4.4, 5.4)          |
| Pulmonary valve atresia/stenosis                | 746.01, 746.02 | 226   | 2.7               | (2.4, 3.1)          |
| Tricuspid valve atresia/stenosis                | 746.0          | 70    | 0.8               | (0.7, 1.1)          |
| Ebstein anomaly                                 | 746.2          | 46    | 0.6               | (0.4, 0.7)          |
| Aortic valve stenosis                           | 746.3          | 100   | 1.2               | (1.0, 1.5)          |
| Hypoplastic left heart syndrome                 | 746.7          | 167   | 2.0               | (1.7, 2.3)          |
| Coarctation of aorta                            | 747.10         | 264   | 3.2               | (2.8, 3.6)          |
| Total anomalous pulmonary venous return (TAPVR) | 747.41         | 60    | 0.7               | (0.5, 0.9)          |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



**Table 5. Total Number and Prevalence Rates of Major Cardiovascular System Defects in Newborn Infants by County of Residence, 2008-2012**

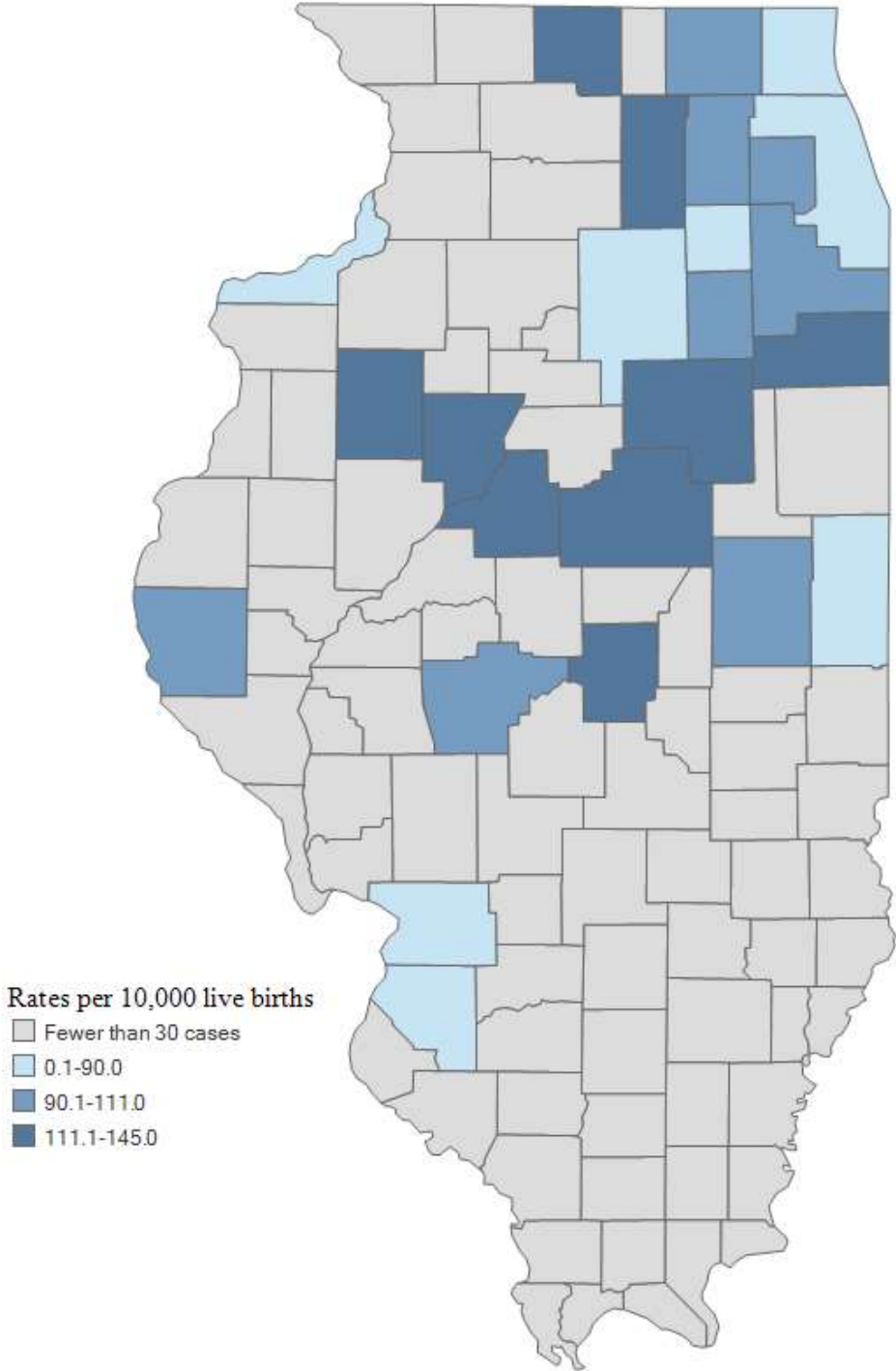
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 7,261 | 87.2              | 85.2                | 89.2  | Lee         | 7     | 37.9              | 15.2                | 78.0  |
| Adams      | 38    | 94.0              | 66.5                | 129.0 | Livingston  | 34    | 144.5             | 100.1               | 201.9 |
| Alexander  | 2     | 36.7              | 4.4                 | 132.6 | Logan       | 11    | 71.8              | 35.9                | 128.6 |
| Bond       | 4     | 45.7              | 12.4                | 116.9 | McDonough   | 25    | 169.5             | 109.7               | 250.2 |
| Boone      | 29    | 94.0              | 63.0                | 135.0 | McHenry     | 164   | 93.3              | 79.6                | 108.8 |
| Brown      | 1     | 36.2              | 0.9                 | 201.9 | McLean      | 127   | 119.0             | 99.2                | 141.6 |
| Bureau     | 18    | 100.8             | 59.8                | 159.4 | Macon       | 85    | 121.8             | 97.3                | 150.6 |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 15    | 61.9              | 34.6                | 102.1 |
| Carroll    | 7     | 100.3             | 40.3                | 206.6 | Madison     | 43    | 26.4              | 19.1                | 35.6  |
| Cass       | 8     | 87.3              | 37.7                | 172.1 | Marion      | 27    | 106.8             | 70.4                | 155.3 |
| Champaign  | 129   | 107.4             | 89.7                | 127.6 | Marshall    | 9     | 147.1             | 67.2                | 279.2 |
| Christian  | 25    | 131.9             | 85.3                | 194.6 | Mason       | 4     | 55.2              | 15.0                | 141.3 |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 3     | 35.4              | 7.3                 | 103.5 | Menard      | 6     | 94.8              | 34.8                | 206.3 |
| Clinton    | 7     | 33.9              | 13.6                | 69.8  | Mercer      | 3     | 37.7              | 7.8                 | 110.3 |
| Coles      | 17    | 63.6              | 37.0                | 101.8 | Monroe      | 1     | 5.9               | 0.2                 | 33.1  |
| Cook       | 3271  | 88.9              | 85.9                | 92.0  | Montgomery  | 12    | 77.5              | 40.0                | 135.3 |
| Crawford   | 4     | 38.9              | 10.6                | 99.7  | Morgan      | 15    | 79.9              | 44.7                | 131.7 |
| Cumberland | 1     | 16.5              | 0.4                 | 92.1  | Moultrie    | 4     | 46.1              | 12.6                | 118.0 |
| DeKalb     | 70    | 111.3             | 86.8                | 140.7 | Ogle        | 29    | 103.6             | 69.4                | 148.9 |
| DeWitt     | 9     | 95.7              | 43.8                | 181.8 | Peoria      | 184   | 137.2             | 118.1               | 158.5 |
| Douglas    | 8     | 59.5              | 25.7                | 117.3 | Perry       | 2     | 19.1              | 2.3                 | 69.1  |
| DuPage     | 537   | 99.0              | 90.8                | 107.8 | Piatt       | 9     | 106.9             | 48.9                | 202.9 |
| Edgar      | 2     | 20.8              | 2.5                 | 75.2  | Pike        | 6     | 65.8              | 24.1                | 143.2 |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 14    | 62.3              | 34.1                | 104.6 | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 9     | 73.6              | 33.6                | 139.7 | Putnam      | 4     | 152.1             | 41.4                | 389.4 |
| Ford       | 6     | 81.9              | 30.0                | 178.2 | Randolph    | 4     | 22.4              | 6.1                 | 57.3  |
| Franklin   | 3     | 12.9              | 2.7                 | 37.6  | Richland    | 0     | 0.0               | 0.0                 | 37.6  |
| Fulton     | 14    | 76.6              | 41.9                | 128.5 | Rock Island | 53    | 54.8              | 41.0                | 71.6  |
| Gallatin   | 2     | 70.4              | 8.5                 | 254.4 | St. Clair   | 60    | 33.4              | 25.5                | 43.0  |
| Greene     | 5     | 65.3              | 21.2                | 152.3 | Saline      | 5     | 32.3              | 10.5                | 75.4  |
| Grundy     | 36    | 108.6             | 76.0                | 150.3 | Sangamon    | 119   | 98.2              | 81.3                | 117.5 |
| Hamilton   | 3     | 63.6              | 13.1                | 185.7 | Schuyler    | 2     | 54.3              | 6.6                 | 196.3 |
| Hancock    | 10    | 101.3             | 48.6                | 186.3 | Scott       | 4     | 147.6             | 40.2                | 377.9 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 7     | 61.4              | 24.7                | 126.5 |
| Henderson  | 3     | 100.3             | 20.7                | 293.2 | Stark       | 7     | 245.6             | 98.7                | 506.1 |
| Henry      | 11    | 40.1              | 20.0                | 71.7  | Stephenson  | 14    | 55.2              | 30.2                | 92.6  |
| Iroquois   | 9     | 57.8              | 26.4                | 109.7 | Tazewell    | 111   | 135.2             | 111.2               | 162.8 |
| Jackson    | 9     | 26.5              | 12.1                | 50.4  | Union       | 1     | 10.6              | 0.3                 | 58.8  |
| Jasper     | 3     | 53.1              | 10.9                | 155.2 | Vermillion  | 44    | 81.1              | 59.0                | 108.9 |
| Jefferson  | 11    | 45.6              | 22.8                | 81.6  | Wabash      | 1     | 13.5              | 0.3                 | 75.2  |
| Jersey     | 6     | 52.6              | 19.3                | 114.6 | Warren      | 13    | 127.2             | 67.7                | 217.5 |
| Jo Daviess | 4     | 39.9              | 10.9                | 102.1 | Washington  | 2     | 27.5              | 3.3                 | 99.4  |
| Johnson    | 2     | 34.1              | 4.1                 | 123.1 | Wayne       | 5     | 48.7              | 15.8                | 113.6 |
| Kane       | 374   | 101.2             | 91.2                | 112.0 | White       | 1     | 11.5              | 0.3                 | 64.3  |
| Kankakee   | 85    | 118.5             | 94.6                | 146.5 | Whiteside   | 27    | 80.7              | 53.2                | 117.4 |
| Kendall    | 59    | 65.4              | 49.8                | 84.4  | Will        | 420   | 97.0              | 87.9                | 106.7 |
| Knox       | 35    | 130.8             | 91.1                | 181.9 | Williamson  | 7     | 18.3              | 7.4                 | 37.7  |
| Lake       | 343   | 79.8              | 71.6                | 88.7  | Winnebago   | 213   | 111.4             | 96.9                | 127.4 |
| LaSalle    | 47    | 75.2              | 55.2                | 100.0 | Woodford    | 21    | 92.4              | 57.2                | 141.2 |
| Lawrence   | 1     | 11.8              | 0.3                 | 65.9  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95 % confidence interval for rate

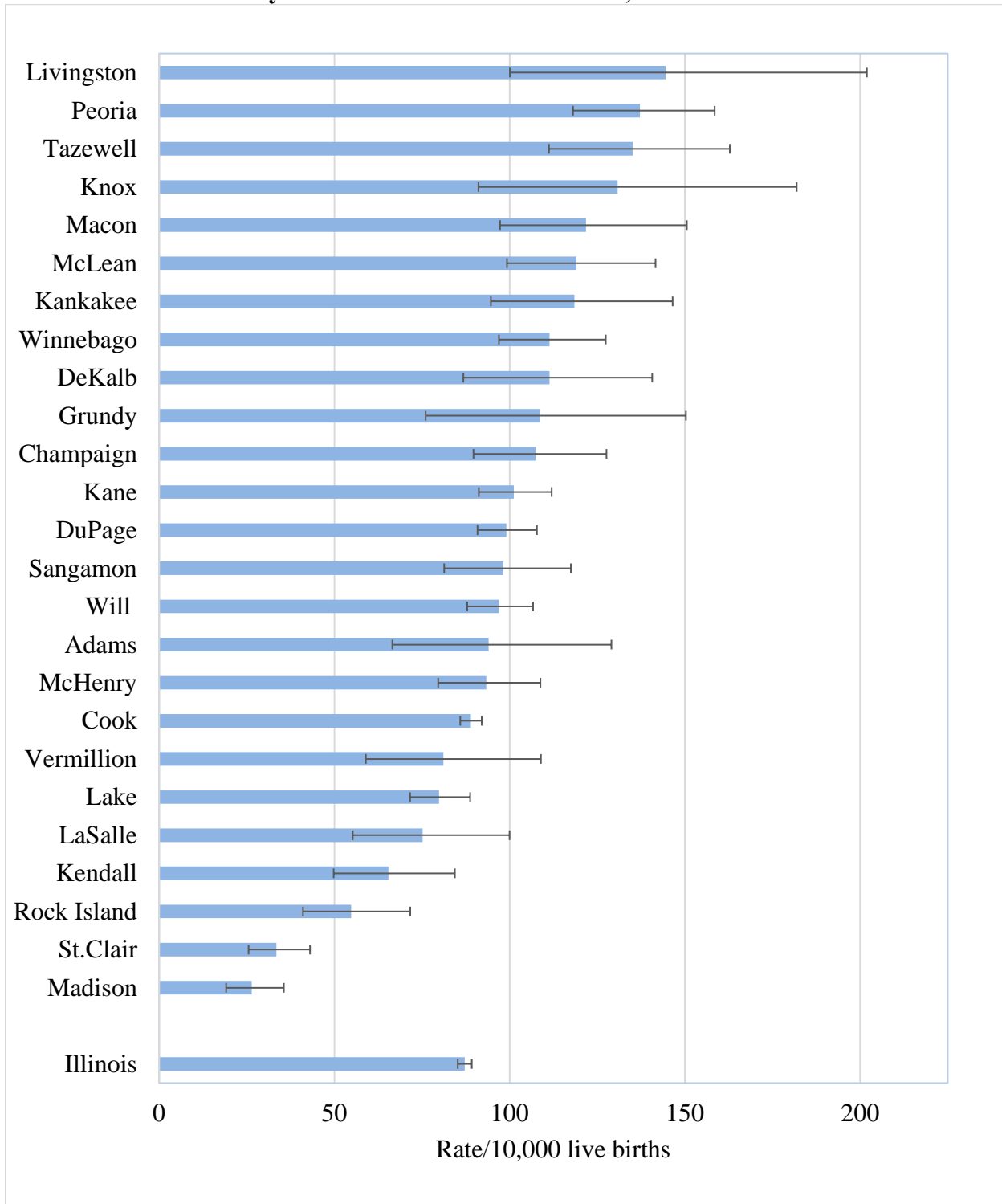
Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 3. Map of Prevalence Rates for Major Cardiovascular System Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 4.**  
**Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for**  
**Major Cardiovascular System Defects in Newborn Infants**  
**by Selected Counties of Residence,<sup>2</sup> 2008-2012**



<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 30 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## ALIMENTARY TRACT DEFECTS

Alimentary tract defects are made up of orofacial defects (cleft palate and lip, choanal atresia) and gastrointestinal defects (esophageal atresia, rectal and intestinal atresia and stenosis, and pyloric stenosis). Most of these defects can be repaired surgically. A description of each defect follows. Table 6 gives the five-year prevalence rates for each defect for the state. Table 7 provides five-year prevalence rates for all major alimentary tract defects combined by county. Figures 5 and 6 present prevalence rates for major alimentary tract defects for selected counties in table and map and formats, respectively.

*Cleft palate* is an opening in the roof of the mouth (the palate) due to a failure of the palatal shelves to fuse fully during embryonic development.

*Cleft lip* is the presence of one or two openings in the upper lip resulting from failure of the normal process of fusion of the lip during embryonic development. The opening can range in size and can be on one or both sides of the lip. Rarely, the opening is in the middle of the lip.

*Choanal atresia* is the narrowing or blockage of the nasal airway by membranous or bony tissue. Bilateral choanal atresia is a surgical emergency.

*Esophageal atresia* is a defect of the esophagus in which there are two separate sections that do not connect. It often occurs with a *tracheoesophageal fistula*, in which part of the esophagus is connected to the trachea. With these conditions, a baby is not able to pass food to the stomach and may have difficulty breathing. Surgical repair is necessary soon after diagnosis.

*Rectal, anal, and large intestinal atresia or stenosis* is the absence, abnormal localization, or blockage of the rectum, anus, or large intestine. It may be corrected surgically or bypassed.

*Pyloric Stenosis* is a narrowing of the opening (pylorus) between the stomach and small intestine.

*Hirschsprung disease* is the absence of nerves in the large intestine (bowel).

*Biliary atresia* is a congenital absence or closure of the major bile ducts that drain bile from the liver.

**Table 6. Total Number and Prevalence Rates of Major Alimentary Tract Defects  
in Newborn Infants, Illinois, 2008-2012**

| <b>Defect</b>                                    | <b>ICD-9-CM Codes</b> | <b>Cases</b> | <b>Rate<sup>1</sup></b> | <b>95% CI<sup>2</sup></b> |
|--|-----------------------|--------------|-------------------------|---------------------------|
| Cleft palate alone                               | 749.0x                | 417          | 5.0                     | (4.5, 5.5)                |
| Cleft lip (with or without cleft palate)         | 749.10-749.25         | 656          | 7.9                     | (7.3, 8.5)                |
| Choanal atresia                                  | 748.0                 | 85           | 1.0                     | (0.8, 1.3)                |
| Esophageal atresia/<br>tracheoesophageal fistula | 750.3                 | 183          | 2.2                     | (1.9, 2.5)                |
| Rectal, anal, large intestinal atresia/stenosis  | 751.2                 | 291          | 3.5                     | (3.1, 3.9)                |
| Pyloric stenosis                                 | 750.5                 | 51           | 0.6                     | (0.5, 0.8)                |
| Hirschsprung disease                             | 751.3                 | 68           | 0.8                     | (0.6,1.0)                 |
| Biliary atresia                                  | 751.61                | 12           | 0.1                     | (0.1,0.3)                 |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 7. Total Number and Prevalence Rates of Major Alimentary Tract Defects in Newborn Infants by County of Residence, 2008-2012**

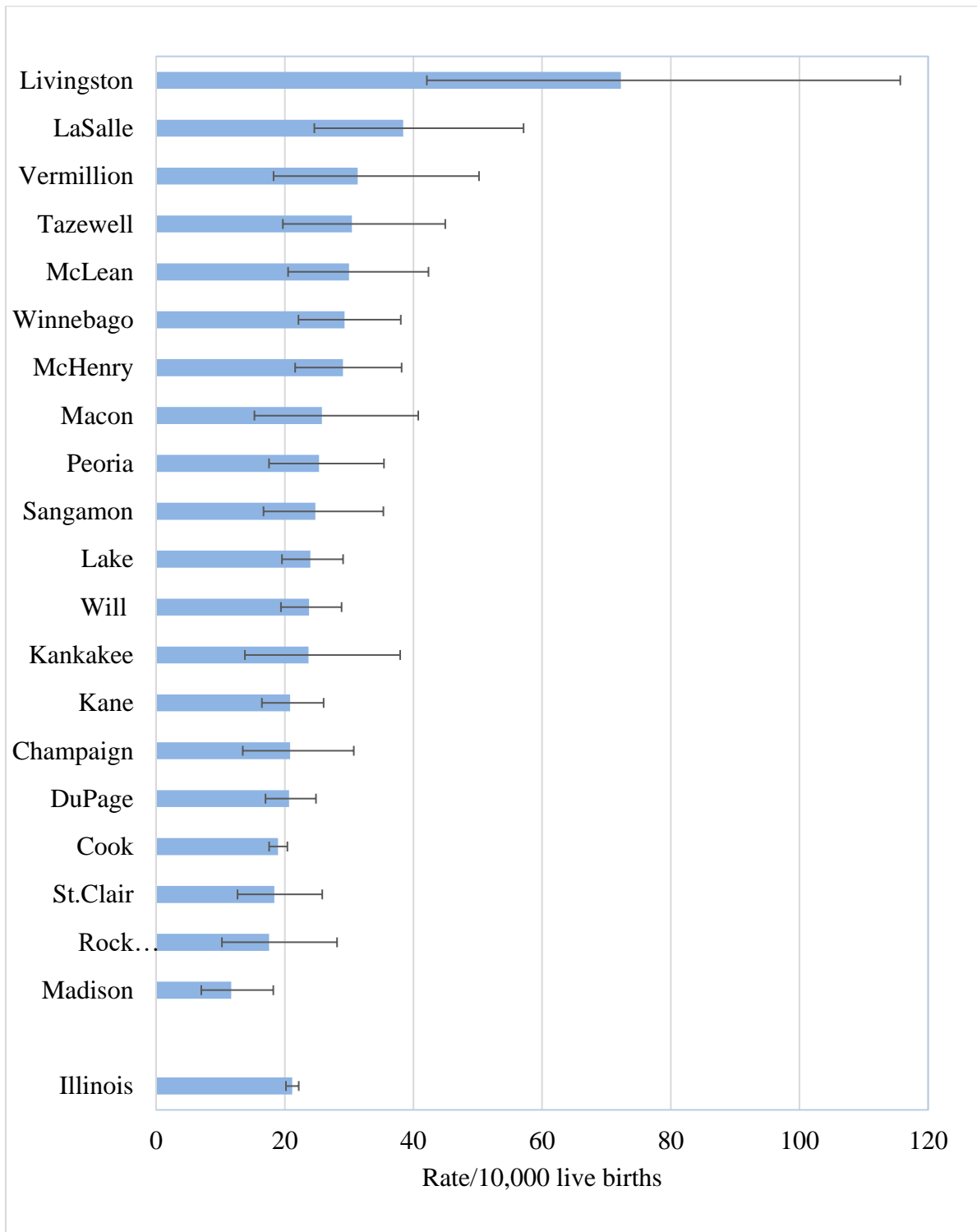
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 1,763 | 21.2              | 20.2                | 22.2  | Lee         | 7     | 37.9              | 15.2                | 78.0  |
| Adams      | 8     | 19.8              | 8.5                 | 39.0  | Livingston  | 17    | 72.2              | 42.1                | 115.7 |
| Alexander  | 1     | 18.3              | 0.5                 | 102.2 | Logan       | 7     | 45.7              | 18.4                | 94.2  |
| Bond       | 1     | 11.4              | 0.3                 | 63.6  | McDonough   | 4     | 27.1              | 7.4                 | 69.4  |
| Boone      | 13    | 42.1              | 22.4                | 72.1  | McHenry     | 51    | 29.0              | 21.6                | 38.2  |
| Brown      | 2     | 72.5              | 8.8                 | 261.8 | McLean      | 32    | 30.0              | 20.5                | 42.3  |
| Bureau     | 3     | 16.8              | 3.5                 | 49.1  | Macon       | 18    | 25.8              | 15.3                | 40.8  |
| Calhoun    | 1     | 37.7              | 1.0                 | 210.3 | Macoupin    | 5     | 20.6              | 6.7                 | 48.1  |
| Carroll    | 5     | 71.6              | 23.3                | 167.2 | Madison     | 19    | 11.7              | 7.0                 | 18.2  |
| Cass       | 2     | 21.8              | 2.6                 | 78.9  | Marion      | 4     | 15.8              | 4.3                 | 40.5  |
| Champaign  | 25    | 20.8              | 13.5                | 30.7  | Marshall    | 2     | 32.7              | 4.0                 | 118.1 |
| Christian  | 6     | 31.6              | 11.6                | 68.9  | Mason       | 1     | 13.8              | 0.3                 | 76.9  |
| Clark      | 1     | 10.4              | 0.3                 | 57.7  | Massac      | 3     | 33.8              | 7.0                 | 98.7  |
| Clay       | 2     | 23.6              | 2.9                 | 85.3  | Menard      | 0     | 0.0               | 0.0                 | 58.3  |
| Clinton    | 2     | 9.7               | 1.2                 | 35.0  | Mercer      | 3     | 37.7              | 7.8                 | 110.3 |
| Coles      | 7     | 26.2              | 10.5                | 53.9  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 697   | 19.0              | 17.6                | 20.4  | Montgomery  | 2     | 12.9              | 1.6                 | 46.6  |
| Crawford   | 1     | 9.7               | 0.2                 | 54.3  | Morgan      | 2     | 10.6              | 1.3                 | 38.5  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 4     | 46.1              | 12.6                | 118.0 |
| DeKalb     | 12    | 19.1              | 9.9                 | 33.3  | Ogle        | 8     | 28.6              | 12.3                | 56.3  |
| DeWitt     | 0     | 0.0               | 0.0                 | 39.2  | Peoria      | 34    | 25.3              | 17.6                | 35.4  |
| Douglas    | 4     | 29.8              | 8.1                 | 76.2  | Perry       | 3     | 28.7              | 5.9                 | 83.8  |
| DuPage     | 112   | 20.7              | 17.0                | 24.9  | Piatt       | 2     | 23.8              | 2.9                 | 85.8  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 2     | 21.9              | 2.7                 | 79.2  |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 1     | 64.5              | 1.6                 | 359.5 |
| Effingham  | 5     | 22.3              | 7.2                 | 52.0  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 4     | 32.7              | 8.9                 | 83.7  | Putnam      | 1     | 38.0              | 1.0                 | 211.8 |
| Ford       | 2     | 27.3              | 3.3                 | 98.6  | Randolph    | 2     | 11.2              | 1.4                 | 40.4  |
| Franklin   | 3     | 12.9              | 2.7                 | 37.6  | Richland    | 4     | 40.8              | 11.1                | 104.5 |
| Fulton     | 5     | 27.4              | 8.9                 | 63.8  | Rock Island | 17    | 17.6              | 10.2                | 28.1  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 33    | 18.4              | 12.7                | 25.8  |
| Greene     | 1     | 13.1              | 0.3                 | 72.7  | Saline      | 4     | 25.8              | 7.0                 | 66.2  |
| Grundy     | 9     | 27.1              | 12.4                | 51.5  | Sangamon    | 30    | 24.7              | 16.7                | 35.3  |
| Hamilton   | 0     | 0.0               | 0.0                 | 78.2  | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 3     | 30.4              | 6.3                 | 88.8  | Scott       | 0     | 0.0               | 0.0                 | 136.1 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 1     | 8.8               | 0.2                 | 48.9  |
| Henderson  | 1     | 33.4              | 0.8                 | 186.3 | Stark       | 2     | 70.2              | 8.5                 | 253.5 |
| Henry      | 8     | 29.1              | 12.6                | 57.4  | Stephenson  | 4     | 15.8              | 4.3                 | 40.4  |
| Iroquois   | 5     | 32.1              | 10.4                | 74.9  | Tazewell    | 25    | 30.5              | 19.7                | 45.0  |
| Jackson    | 3     | 8.8               | 1.8                 | 25.8  | Union       | 2     | 21.1              | 2.6                 | 76.3  |
| Jasper     | 1     | 17.7              | 0.4                 | 98.6  | Vermillion  | 17    | 31.3              | 18.3                | 50.2  |
| Jefferson  | 3     | 12.4              | 2.6                 | 36.3  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 1     | 8.8               | 0.2                 | 48.9  | Warren      | 0     | 0.0               | 0.0                 | 36.1  |
| Jo Daviess | 0     | 0.0               | 0.0                 | 36.8  | Washington  | 3     | 41.3              | 8.5                 | 120.6 |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 2     | 19.5              | 2.4                 | 70.3  |
| Kane       | 77    | 20.8              | 16.4                | 26.0  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 17    | 23.7              | 13.8                | 37.9  | Whiteside   | 11    | 32.9              | 16.4                | 58.8  |
| Kendall    | 14    | 15.5              | 8.5                 | 26.0  | Will        | 103   | 23.8              | 19.4                | 28.8  |
| Knox       | 4     | 14.9              | 4.1                 | 38.3  | Williamson  | 4     | 10.4              | 2.8                 | 26.7  |
| Lake       | 103   | 24.0              | 19.6                | 29.1  | Winnebago   | 56    | 29.3              | 22.1                | 38.0  |
| LaSalle    | 24    | 38.4              | 24.6                | 57.1  | Woodford    | 8     | 35.2              | 15.2                | 69.3  |
| Lawrence   | 3     | 35.5              | 7.3                 | 103.8 |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 5. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Major Alimentary Tract Defects in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

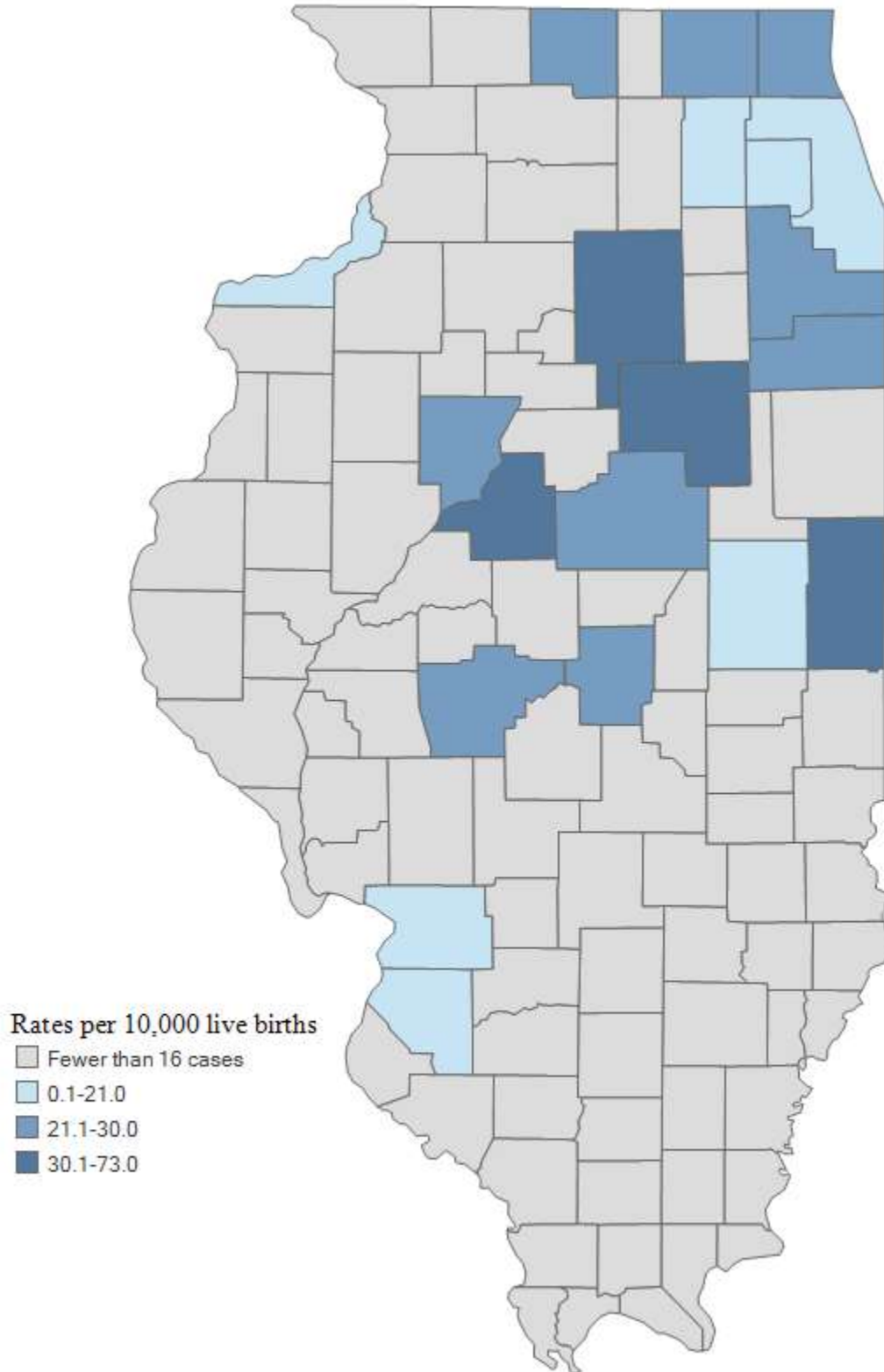


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 6. Map of Prevalence Rates for Major Alimentary Tract Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



## GENITOURINARY DEFECTS

These defects affect the male and female reproductive organs and urinary tracts. Some are relatively minor, common defects that may be readily repaired by surgery. Others are more serious and potentially life-threatening malformations. A description of each defect follows, together with Table 8, which gives the five-year prevalence rates for each defect for the state. Table 9 provides five-year prevalence rates for all major genitourinary defects combined by county. Figures 7 and 8 present prevalence rates for major genitourinary defects for selected counties in table and map and formats, respectively.

*Renal agenesis/hypoplasia* is the absence or maldevelopment of the kidneys; it may be bilateral or unilateral. Newborns with bilateral renal agenesis often die of respiratory failure within a few hours of birth. Unilateral renal agenesis may not be detected during the perinatal period.

*Bladder exstrophy* occurs when the bladder is formed inside-out. Part of the abdominal wall and bladder wall are missing. This condition is usually repaired surgically.

*Hypospadias* is a relatively common abnormality that appears as an abnormal penile opening on the underside of the penis rather than at the end. The condition may be surgically corrected if needed for cosmetic, urologic, or reproductive reasons.

*Epispadias* is a rare congenital defect in which the urethra opens on the top surface of the penis. Surgical correction is aimed at correcting incontinence and permitting sexual function.

**Table 8. Total Number and Prevalence Rates of Major Genitourinary System Defects in Newborn Infants, Illinois, 2008-2012**

| Defect                    | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |
|---------------------------|----------------|-------|-------------------|---------------------|
| Renal agenesis/hypoplasia | 753.0          | 411   | 4.9               | (4.5, 5.4)          |
| Bladder exstrophy         | 753.5          | 21    | 0.3               | (0.2, 0.4)          |
| Hypospadias               | 752.61         | 2,214 | 26.6              | (25.5, 27.7)        |
| Epispadias                | 752.62         | 92    | 1.1               | (0.9, 1.4)          |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 9. Total Number and Prevalence Rates of Major Genitourinary System Defects in Newborn Infants by County of Residence, 2008-2012**

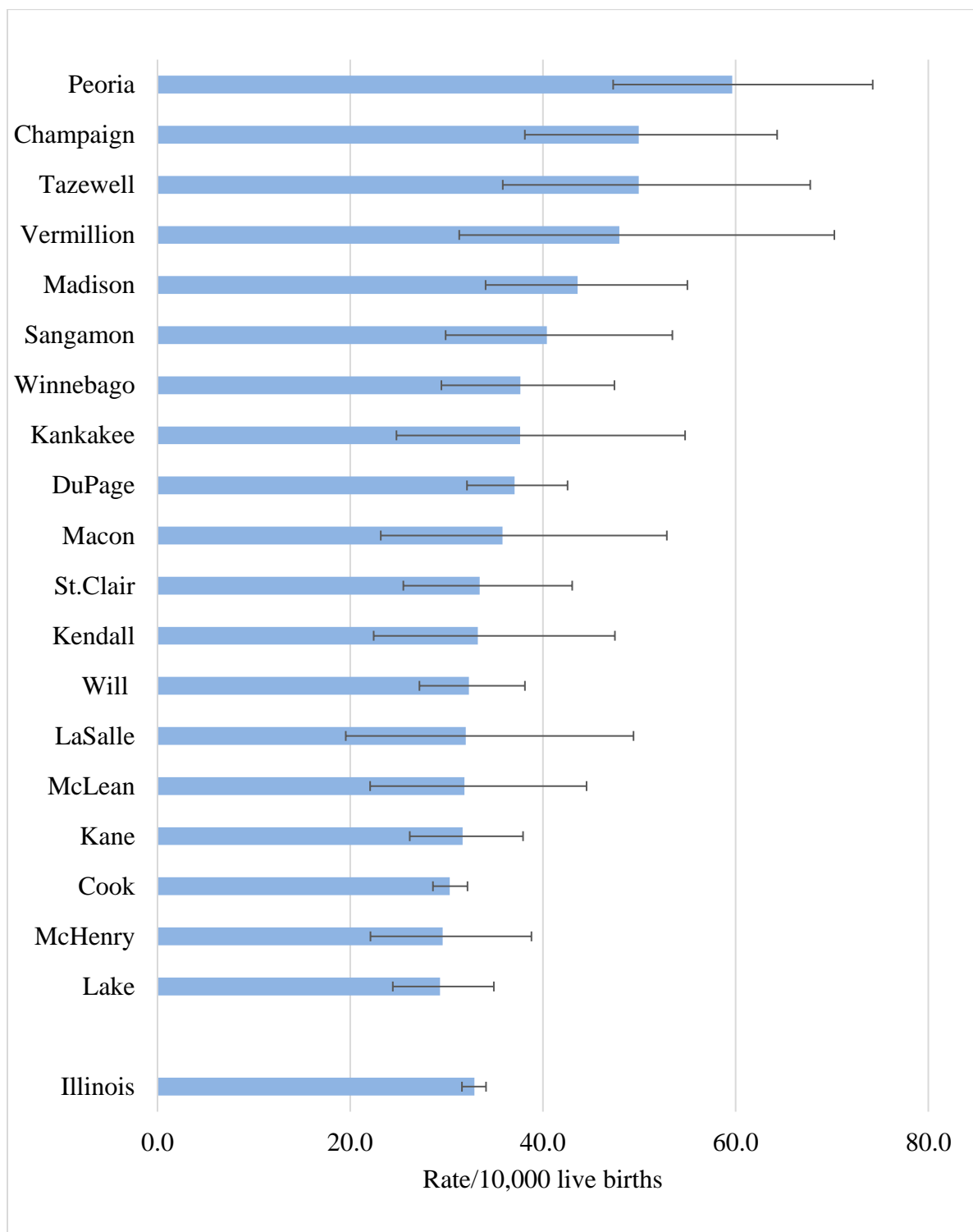
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 2,738 | 32.9              | 31.6                | 34.1  | Lee         | 7     | 37.9              | 15.2                | 78.0  |
| Adams      | 10    | 24.7              | 11.9                | 45.5  | Livingston  | 6     | 25.5              | 9.4                 | 55.5  |
| Alexander  | 1     | 18.3              | 0.5                 | 102.2 | Logan       | 10    | 65.3              | 31.3                | 120.1 |
| Bond       | 1     | 11.4              | 0.3                 | 63.6  | McDonough   | 10    | 67.8              | 32.5                | 124.7 |
| Boone      | 9     | 29.2              | 13.3                | 55.4  | McHenry     | 52    | 29.6              | 22.1                | 38.8  |
| Brown      | 0     | 0.0               | 0.0                 | 133.7 | McLean      | 34    | 31.9              | 22.1                | 44.5  |
| Bureau     | 13    | 72.8              | 38.8                | 124.5 | Macon       | 25    | 35.8              | 23.2                | 52.9  |
| Calhoun    | 1     | 37.7              | 1.0                 | 210.3 | Macoupin    | 12    | 49.5              | 25.6                | 86.5  |
| Carroll    | 1     | 14.3              | 0.4                 | 79.8  | Madison     | 71    | 43.6              | 34.1                | 55.0  |
| Cass       | 1     | 10.9              | 0.3                 | 60.8  | Marion      | 9     | 35.6              | 16.3                | 67.6  |
| Champaign  | 60    | 50.0              | 38.1                | 64.3  | Marshall    | 1     | 16.3              | 0.4                 | 91.0  |
| Christian  | 7     | 36.9              | 14.8                | 76.1  | Mason       | 4     | 55.2              | 15.0                | 141.3 |
| Clark      | 1     | 10.4              | 0.3                 | 57.7  | Massac      | 2     | 22.5              | 2.7                 | 81.4  |
| Clay       | 3     | 35.4              | 7.3                 | 103.5 | Menard      | 1     | 15.8              | 0.4                 | 88.0  |
| Clinton    | 9     | 43.6              | 19.9                | 82.7  | Mercer      | 1     | 12.6              | 0.3                 | 70.1  |
| Coles      | 7     | 26.2              | 10.5                | 53.9  | Monroe      | 3     | 17.8              | 3.7                 | 52.1  |
| Cook       | 1,116 | 30.3              | 28.6                | 32.2  | Montgomery  | 6     | 38.7              | 14.2                | 84.3  |
| Crawford   | 1     | 9.7               | 0.2                 | 54.3  | Morgan      | 3     | 16.0              | 3.3                 | 46.7  |
| Cumberland | 3     | 49.6              | 10.2                | 144.9 | Moultrie    | 2     | 23.0              | 2.8                 | 83.2  |
| DeKalb     | 19    | 30.2              | 18.2                | 47.2  | Ogle        | 15    | 53.6              | 30.0                | 88.4  |
| DeWitt     | 2     | 21.3              | 2.6                 | 76.9  | Peoria      | 80    | 59.6              | 47.3                | 74.2  |
| Douglas    | 6     | 44.6              | 16.4                | 97.2  | Perry       | 4     | 38.2              | 10.4                | 97.9  |
| DuPage     | 201   | 37.1              | 32.1                | 42.6  | Piatt       | 2     | 23.8              | 2.9                 | 85.8  |
| Edgar      | 3     | 31.2              | 6.4                 | 91.2  | Pike        | 1     | 11.0              | 0.3                 | 61.1  |
| Edwards    | 1     | 28.0              | 0.7                 | 156.1 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 12    | 53.4              | 27.6                | 93.3  | Pulaski     | 1     | 30.6              | 0.8                 | 170.4 |
| Fayette    | 8     | 65.4              | 28.2                | 128.9 | Putnam      | 2     | 76.0              | 9.2                 | 274.7 |
| Ford       | 2     | 27.3              | 3.3                 | 98.6  | Randolph    | 7     | 39.1              | 15.7                | 80.7  |
| Franklin   | 6     | 25.7              | 9.4                 | 56.0  | Richland    | 0     | 0.0               | 0.0                 | 37.6  |
| Fulton     | 10    | 54.7              | 26.2                | 100.6 | Rock Island | 14    | 14.5              | 7.9                 | 24.3  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 60    | 33.4              | 25.5                | 43.0  |
| Greene     | 6     | 78.3              | 28.7                | 170.5 | Saline      | 3     | 19.4              | 4.0                 | 56.6  |
| Grundy     | 16    | 48.3              | 27.6                | 78.4  | Sangamon    | 49    | 40.4              | 29.9                | 53.4  |
| Hamilton   | 1     | 21.2              | 0.5                 | 118.0 | Schuyler    | 5     | 135.9             | 44.1                | 317.1 |
| Hancock    | 5     | 50.7              | 16.4                | 118.2 | Scott       | 1     | 36.9              | 0.9                 | 205.6 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 8     | 70.2              | 30.3                | 138.3 |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 1     | 35.1              | 0.9                 | 195.5 |
| Henry      | 10    | 36.4              | 17.5                | 67.0  | Stephenson  | 9     | 35.5              | 16.2                | 67.3  |
| Iroquois   | 6     | 38.5              | 14.1                | 83.9  | Tazewell    | 41    | 49.9              | 35.8                | 67.7  |
| Jackson    | 4     | 11.8              | 3.2                 | 30.2  | Union       | 2     | 21.1              | 2.6                 | 76.3  |
| Jasper     | 0     | 0.0               | 0.0                 | 65.3  | Vermillion  | 26    | 47.9              | 31.3                | 70.2  |
| Jefferson  | 0     | 0.0               | 0.0                 | 15.3  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 1     | 8.8               | 0.2                 | 48.9  | Warren      | 3     | 29.4              | 6.1                 | 85.8  |
| Jo Daviess | 0     | 0.0               | 0.0                 | 36.8  | Washington  | 6     | 82.5              | 30.3                | 179.6 |
| Johnson    | 1     | 17.0              | 0.4                 | 94.9  | Wayne       | 0     | 0.0               | 0.0                 | 35.9  |
| Kane       | 117   | 31.7              | 26.2                | 37.9  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 27    | 37.6              | 24.8                | 54.8  | Whiteside   | 12    | 35.9              | 18.5                | 62.6  |
| Kendall    | 30    | 33.3              | 22.4                | 47.5  | Will        | 140   | 32.3              | 27.2                | 38.1  |
| Knox       | 12    | 44.8              | 23.2                | 78.3  | Williamson  | 10    | 26.1              | 12.5                | 48.0  |
| Lake       | 126   | 29.3              | 24.4                | 34.9  | Winnebago   | 72    | 37.7              | 29.5                | 47.4  |
| LaSalle    | 20    | 32.0              | 19.5                | 49.4  | Woodford    | 8     | 35.2              | 15.2                | 69.3  |
| Lawrence   | 1     | 11.8              | 0.3                 | 65.9  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 7. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Major Genitourinary Defects in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

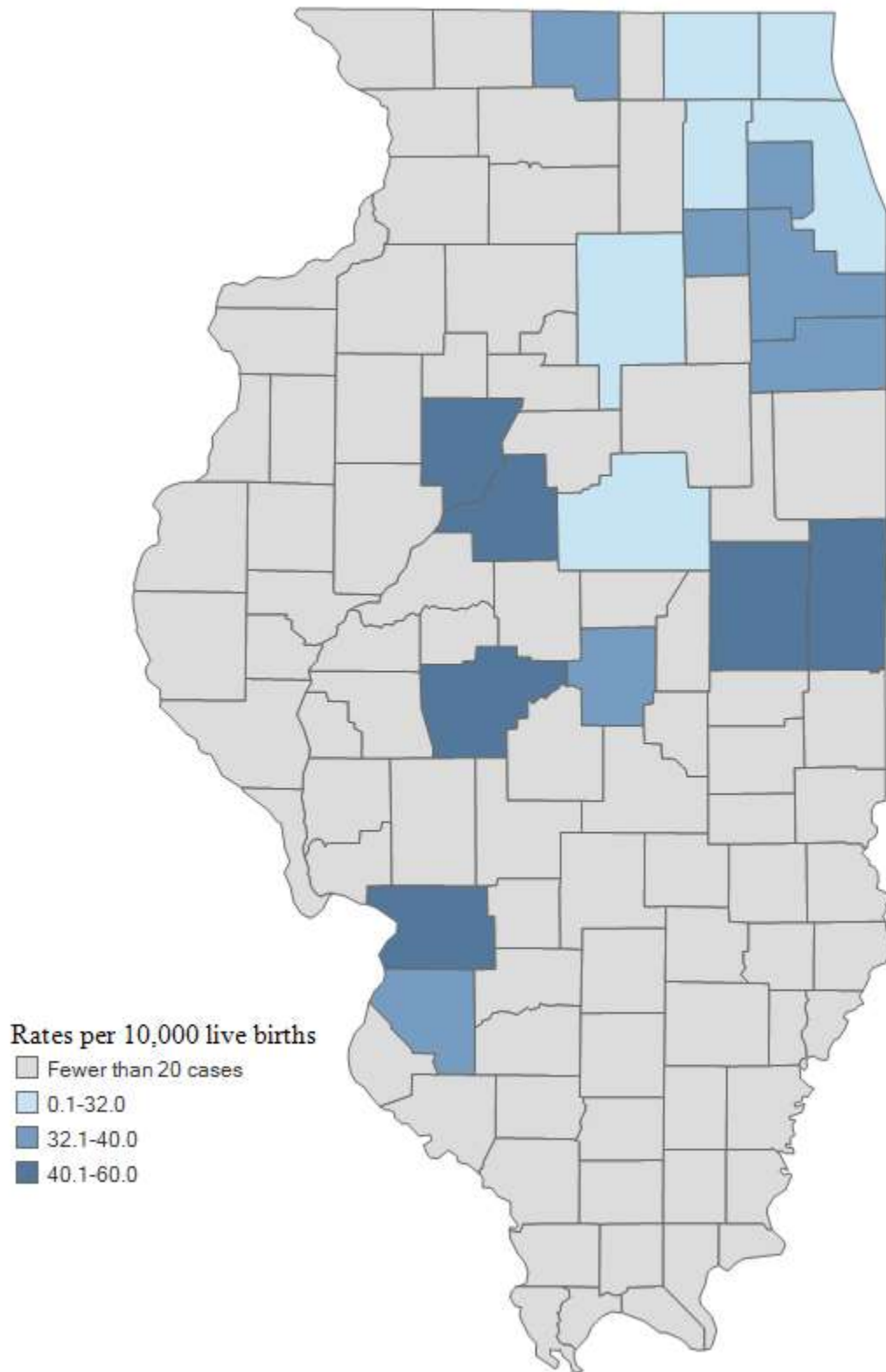


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 8. Map of Prevalence Rates for Major Genitourinary Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## MUSCULOSKELETAL DEFECTS

These malformations make up a diverse group of defects that includes developmental dysplasia of the hip—a relatively common disorder—and several more rare and serious conditions. A description of each defect follows, together with Table 10, which gives the five-year prevalence rates for each defect for the State. Table 11 provides five-year prevalence rates for all major musculoskeletal defects combined by county. Figures 9 and 10 present prevalence rates for major musculoskeletal defects for selected counties in table and map formats, respectively.

*Reduction deformities* may affect upper or lower limbs. They may result in a shortening or absence of one or both limbs.

*Abdominal wall defects* include gastroschisis (a herniation of the abdominal contents through a defect in the abdominal wall) and omphalocele (protrusion of the intestines or other organs through the belly button in which the organs are covered by a thin layer of tissue). For both conditions, surgery is usually needed soon after birth to put the organs back in the abdomen. For extensive conditions the intervention may be done in stages.

*Developmental dysplasia of the hip* is an abnormal development of the hip joint, in which a neonate's hips easily become dislocated.

*Club foot* is a congenital structural foot deformity that may involve the lower leg, ankle and foot joints, ligaments, and tendons. The condition can usually be treated without surgery.

*Diaphragmatic hernia* occurs when contents of the abdomen protrude through a defect in the diaphragm, impeding lung growth. Surgical repair is needed soon after birth.

**Table 10. Total Number and Prevalence Rates of Major Musculoskeletal Defects in Newborn Infants, Illinois, 2008-2012**

| Defect                             | ICD-9-CM Codes       | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |
|------------------------------------|----------------------|-------|-------------------|---------------------|
| Limb reduction deformity           | 755.2 – 755.4        | 385   | 4.6               | (4.2, 5.1)          |
| Gastroschisis                      | 756.73               | 315   | 3.8               | (3.4, 4.2)          |
| Omphalocele                        | 756.72               | 155   | 1.9               | (1.6, 2.2)          |
| Developmental dysplasia of the hip | 754.30,754.31,754.35 | 242   | 2.9               | (2.6, 3.3)          |
| Diaphragmatic hernia               | 756.6                | 201   | 2.4               | (2.1, 2.8)          |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 11. Total Number and Prevalence Rates of Major Musculoskeletal Defects in Newborn Infants by County of Residence, 2008-2012**

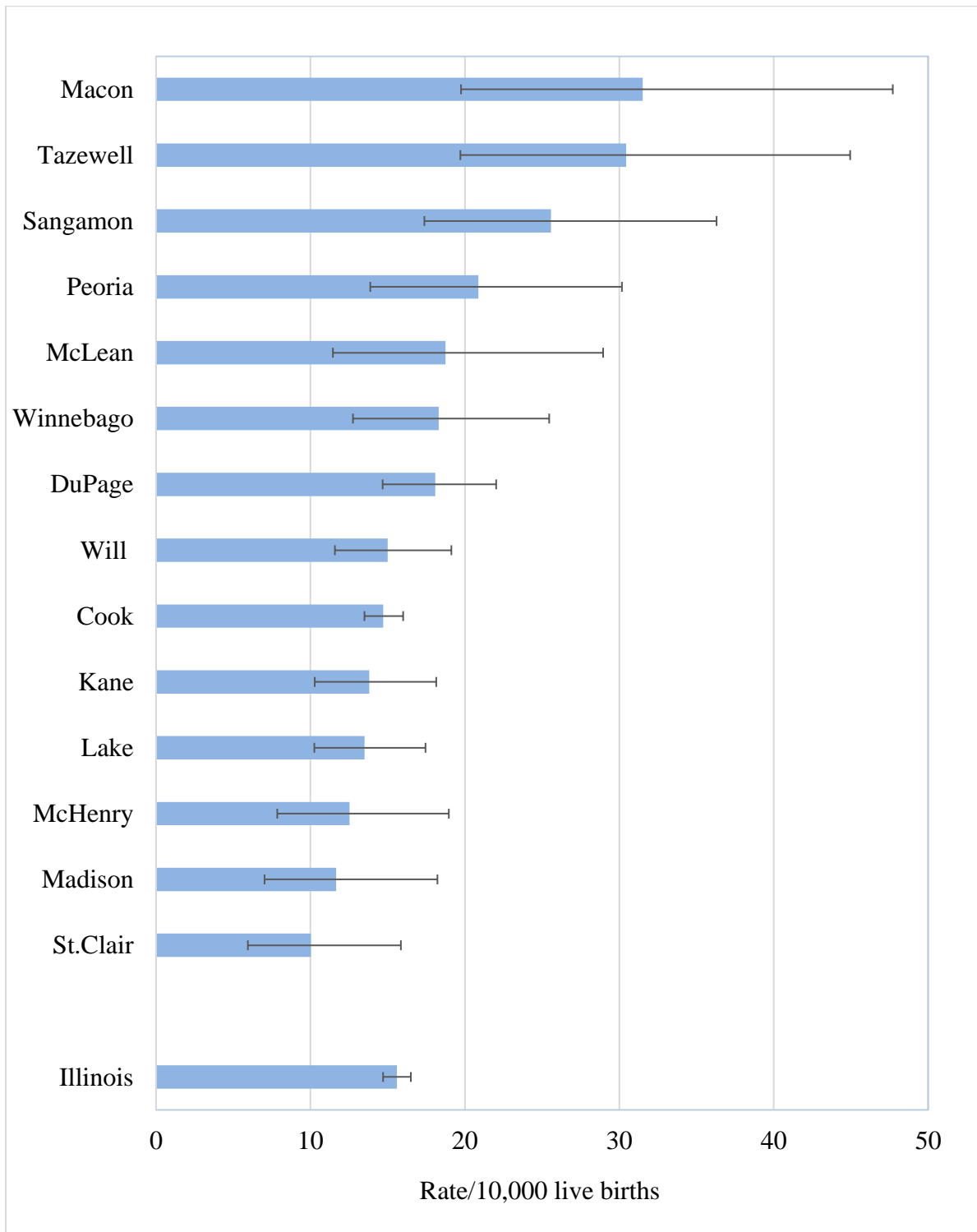
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 1,298 | 15.6              | 14.7                | 16.5  | Lee         | 4     | 21.6              | 5.9                 | 55.4  |
| Adams      | 7     | 17.3              | 7.0                 | 35.7  | Livingston  | 9     | 38.2              | 17.5                | 72.6  |
| Alexander  | 1     | 18.3              | 0.5                 | 102.2 | Logan       | 6     | 39.2              | 14.4                | 85.3  |
| Bond       | 5     | 57.1              | 18.5                | 133.2 | McDonough   | 2     | 13.6              | 1.6                 | 49.0  |
| Boone      | 8     | 25.9              | 11.2                | 51.1  | McHenry     | 22    | 12.5              | 7.8                 | 19.0  |
| Brown      | 1     | 36.2              | 0.9                 | 201.9 | McLean      | 20    | 18.7              | 11.5                | 29.0  |
| Bureau     | 5     | 28.0              | 9.1                 | 65.4  | Macon       | 22    | 31.5              | 19.7                | 47.7  |
| Calhoun    | 1     | 37.7              | 1.0                 | 210.3 | Macoupin    | 5     | 20.6              | 6.7                 | 48.1  |
| Carroll    | 1     | 14.3              | 0.4                 | 79.8  | Madison     | 19    | 11.7              | 7.0                 | 18.2  |
| Cass       | 2     | 21.8              | 2.6                 | 78.9  | Marion      | 3     | 11.9              | 2.4                 | 34.7  |
| Champaign  | 14    | 11.7              | 6.4                 | 19.6  | Marshall    | 2     | 32.7              | 4.0                 | 118.1 |
| Christian  | 3     | 15.8              | 3.3                 | 46.2  | Mason       | 1     | 13.8              | 0.3                 | 76.9  |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 1     | 11.8              | 0.3                 | 65.8  | Menard      | 0     | 0.0               | 0.0                 | 58.3  |
| Clinton    | 1     | 4.8               | 0.1                 | 27.0  | Mercer      | 1     | 12.6              | 0.3                 | 70.1  |
| Coles      | 4     | 15.0              | 4.1                 | 38.3  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 541   | 14.7              | 13.5                | 16.0  | Montgomery  | 2     | 12.9              | 1.6                 | 46.6  |
| Crawford   | 1     | 9.7               | 0.2                 | 54.3  | Morgan      | 8     | 42.6              | 18.4                | 83.9  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 5     | 57.6              | 18.7                | 134.4 |
| DeKalb     | 6     | 9.5               | 3.5                 | 20.8  | Ogle        | 2     | 7.1               | 0.9                 | 25.8  |
| DeWitt     | 5     | 53.2              | 17.3                | 124.1 | Peoria      | 28    | 20.9              | 13.9                | 30.2  |
| Douglas    | 1     | 7.4               | 0.2                 | 41.5  | Perry       | 1     | 9.6               | 0.2                 | 53.3  |
| DuPage     | 98    | 18.1              | 14.7                | 22.0  | Piatt       | 1     | 11.9              | 0.3                 | 66.2  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 4     | 43.9              | 12.0                | 112.3 |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 3     | 13.4              | 2.8                 | 39.0  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 2     | 16.4              | 2.0                 | 59.1  | Putnam      | 0     | 0.0               | 0.0                 | 140.3 |
| Ford       | 2     | 27.3              | 3.3                 | 98.6  | Randolph    | 0     | 0.0               | 0.0                 | 20.6  |
| Franklin   | 4     | 17.1              | 4.7                 | 43.9  | Richland    | 2     | 20.4              | 2.5                 | 73.7  |
| Fulton     | 6     | 32.8              | 12.0                | 71.4  | Rock Island | 10    | 10.3              | 5.0                 | 19.0  |
| Gallatin   | 1     | 35.2              | 0.9                 | 196.2 | St. Clair   | 18    | 10.0              | 5.9                 | 15.9  |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 1     | 6.5               | 0.2                 | 36.0  |
| Grundy     | 2     | 6.0               | 0.7                 | 21.8  | Sangamon    | 31    | 25.6              | 17.4                | 36.3  |
| Hamilton   | 1     | 21.2              | 0.5                 | 118.0 | Schuyler    | 1     | 27.2              | 0.7                 | 151.4 |
| Hancock    | 3     | 30.4              | 6.3                 | 88.8  | Scott       | 2     | 73.8              | 8.9                 | 266.6 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 3     | 26.3              | 5.4                 | 76.9  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 0     | 0.0               | 0.0                 | 129.4 |
| Henry      | 4     | 14.6              | 4.0                 | 37.3  | Stephenson  | 4     | 15.8              | 4.3                 | 40.4  |
| Iroquois   | 3     | 19.3              | 4.0                 | 56.3  | Tazewell    | 25    | 30.5              | 19.7                | 45.0  |
| Jackson    | 4     | 11.8              | 3.2                 | 30.2  | Union       | 1     | 10.6              | 0.3                 | 58.8  |
| Jasper     | 2     | 35.4              | 4.3                 | 127.9 | Vermillion  | 14    | 25.8              | 14.1                | 43.3  |
| Jefferson  | 4     | 16.6              | 4.5                 | 42.4  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 2     | 17.5              | 2.1                 | 63.4  | Warren      | 1     | 9.8               | 0.2                 | 54.5  |
| Jo Daviess | 1     | 10.0              | 0.3                 | 55.5  | Washington  | 0     | 0.0               | 0.0                 | 50.7  |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 1     | 9.7               | 0.2                 | 54.3  |
| Kane       | 51    | 13.8              | 10.3                | 18.1  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 15    | 20.9              | 11.7                | 34.5  | Whiteside   | 4     | 12.0              | 3.3                 | 30.6  |
| Kendall    | 7     | 7.8               | 3.1                 | 16.0  | Will        | 65    | 15.0              | 11.6                | 19.1  |
| Knox       | 3     | 11.2              | 2.3                 | 32.8  | Williamson  | 4     | 10.4              | 2.8                 | 26.7  |
| Lake       | 58    | 13.5              | 10.2                | 17.4  | Winnebago   | 35    | 18.3              | 12.8                | 25.5  |
| LaSalle    | 15    | 24.0              | 13.4                | 39.6  | Woodford    | 11    | 48.4              | 24.2                | 86.6  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 9. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Major Musculoskeletal Defects in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

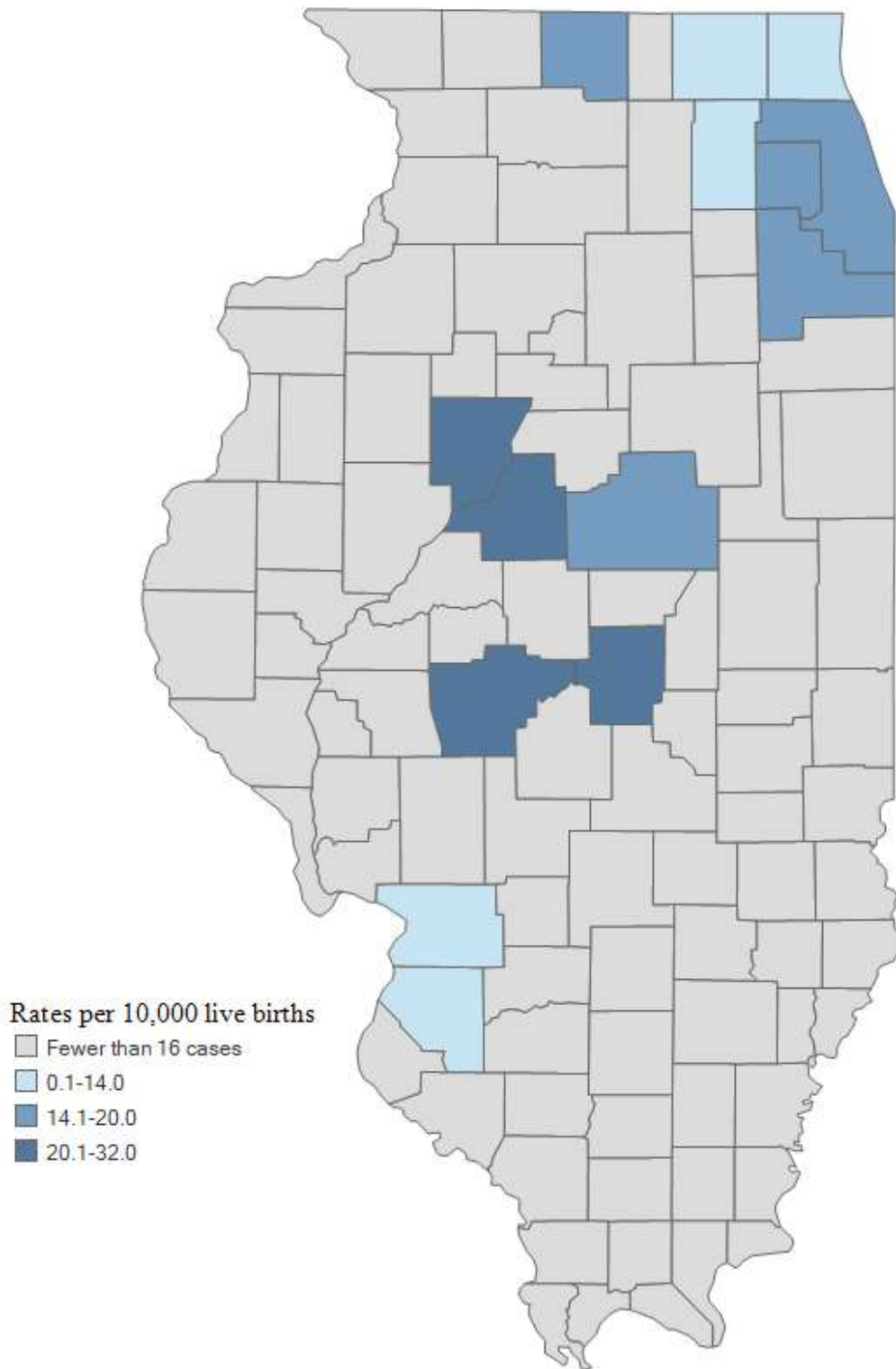


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 10. Map of Prevalence Rates for Major Musculoskeletal Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



## CHROMOSOMAL CONDITIONS

Chromosomal conditions arise from abnormal numbers of chromosomes or from breaks or deletions in specific fragments of the chromosomes. APORS collects information about three conditions, called “trisomies”, in which a baby is born with an extra copy of a specific chromosome. This extra copy affects the growth and development of the body and brain. Congenital heart defects (especially septal defects) are very common among these infants and are a major cause of death. A description of each condition collected by APORS follows, together with Table 12, which gives the five-year prevalence rates for each condition for the state. Table 13 provides five-year prevalence rates for all major chromosomal defects combined by county. Figures 11 and 12 present prevalence rates for major chromosomal defects for selected counties in table and map formats, respectively.

*Patau syndrome (trisomy 13)* is associated with the presence of a third number 13 chromosome. Newborns have numerous organ defects, physical abnormalities, and profound developmental disabilities. Most die in the first days or weeks of life due to severe life-threatening medical problems.

*Down syndrome (trisomy 21)* is associated with the presence of a third number 21 chromosome. This causes distinctive physical features, including short stature and a characteristic facial appearance. Most individuals with Down syndrome have mild to moderate intellectual disability. They may also have other health problems such as hearing loss, sleep apnea, ear infections, and congenital heart defects. Early and ongoing interventions, including speech, physical, and occupational therapies are helpful in assuring everyone will attain his or her potential.

*Edward syndrome (trisomy 18)* is associated with the presence of a third number 18 chromosome. It causes heart and other organ defects, major physical abnormalities, and severe developmental disabilities. Few children afflicted with this disease survive beyond one year of life, and those who do survive usually have profound disabilities.

**Table 12. Total Number and Prevalence Rates of Major Chromosomal Defects in Newborn Infants, Illinois, 2008 – 2012**

| Defect                       | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |
|------------------------------|----------------|-------|-------------------|---------------------|
| Patau syndrome (trisomy 13)  | 758.1          | 105   | 1.3               | (1.0, 1.5)          |
| Down syndrome (trisomy 21)   | 758.0          | 1,028 | 12.3              | (11.6, 13.1)        |
| Edward syndrome (trisomy 18) | 758.2          | 185   | 2.2               | (1.9, 2.6)          |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 13. Total Number and Prevalence Rates of Major Chromosomal Defects in Newborn Infants by County of Residence, 2008-2012**

| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 1,318 | 15.8              | 15.0                | 16.7  | Lee         | 2     | 10.8              | 1.3                 | 39.1  |
| Adams      | 15    | 37.1              | 20.8                | 61.2  | Livingston  | 3     | 12.7              | 2.6                 | 37.3  |
| Alexander  | 0     | 0.0               | 0.0                 | 67.7  | Logan       | 3     | 19.6              | 4.0                 | 57.3  |
| Bond       | 2     | 22.8              | 2.8                 | 82.5  | McDonough   | 3     | 20.3              | 4.2                 | 59.4  |
| Boone      | 10    | 32.4              | 15.5                | 59.6  | McHenry     | 31    | 17.6              | 12.0                | 25.0  |
| Brown      | 0     | 0.0               | 0.0                 | 133.7 | McLean      | 15    | 14.1              | 7.9                 | 23.2  |
| Bureau     | 3     | 16.8              | 3.5                 | 49.1  | Macon       | 7     | 10.0              | 4.0                 | 20.7  |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 2     | 8.3               | 1.0                 | 29.8  |
| Carroll    | 1     | 14.3              | 0.4                 | 79.8  | Madison     | 19    | 11.7              | 7.0                 | 18.2  |
| Cass       | 1     | 10.9              | 0.3                 | 60.8  | Marion      | 6     | 23.7              | 8.7                 | 51.6  |
| Champaign  | 17    | 14.2              | 8.2                 | 22.7  | Marshall    | 0     | 0.0               | 0.0                 | 60.3  |
| Christian  | 0     | 0.0               | 0.0                 | 19.5  | Mason       | 0     | 0.0               | 0.0                 | 50.9  |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 2     | 23.6              | 2.9                 | 85.3  | Menard      | 2     | 31.6              | 3.8                 | 114.1 |
| Clinton    | 2     | 9.7               | 1.2                 | 35.0  | Mercer      | 1     | 12.6              | 0.3                 | 70.1  |
| Coles      | 3     | 11.2              | 2.3                 | 32.8  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 597   | 16.2              | 15.0                | 17.6  | Montgomery  | 1     | 6.5               | 0.2                 | 36.0  |
| Crawford   | 0     | 0.0               | 0.0                 | 35.9  | Morgan      | 3     | 16.0              | 3.3                 | 46.7  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 0     | 0.0               | 0.0                 | 42.5  |
| DeKalb     | 10    | 15.9              | 7.6                 | 29.3  | Ogle        | 4     | 14.3              | 3.9                 | 36.6  |
| DeWitt     | 2     | 21.3              | 2.6                 | 76.9  | Peoria      | 23    | 17.1              | 10.9                | 25.7  |
| Douglas    | 3     | 22.3              | 4.6                 | 65.2  | Perry       | 1     | 9.6               | 0.2                 | 53.3  |
| DuPage     | 107   | 19.7              | 16.2                | 23.8  | Piatt       | 1     | 11.9              | 0.3                 | 66.2  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 2     | 21.9              | 2.7                 | 79.2  |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 2     | 8.9               | 1.1                 | 32.2  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 1     | 8.2               | 0.2                 | 45.6  | Putnam      | 0     | 0.0               | 0.0                 | 140.3 |
| Ford       | 2     | 27.3              | 3.3                 | 98.6  | Randolph    | 4     | 22.4              | 6.1                 | 57.3  |
| Franklin   | 1     | 4.3               | 0.1                 | 23.9  | Richland    | 0     | 0.0               | 0.0                 | 37.6  |
| Fulton     | 0     | 0.0               | 0.0                 | 20.2  | Rock Island | 10    | 10.3              | 5.0                 | 19.0  |
| Gallatin   | 1     | 35.2              | 0.9                 | 196.2 | St. Clair   | 13    | 7.2               | 3.9                 | 12.4  |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 2     | 12.9              | 1.6                 | 46.7  |
| Grundy     | 2     | 6.0               | 0.7                 | 21.8  | Sangamon    | 23    | 19.0              | 12.0                | 28.5  |
| Hamilton   | 1     | 21.2              | 0.5                 | 118.0 | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 1     | 10.1              | 0.3                 | 56.5  | Scott       | 2     | 73.8              | 8.9                 | 266.6 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 2     | 17.5              | 2.1                 | 63.4  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 1     | 35.1              | 0.9                 | 195.5 |
| Henry      | 3     | 10.9              | 2.3                 | 31.9  | Stephenson  | 3     | 11.8              | 2.4                 | 34.6  |
| Iroquois   | 3     | 19.3              | 4.0                 | 56.3  | Tazewell    | 13    | 15.8              | 8.4                 | 27.1  |
| Jackson    | 6     | 17.7              | 6.5                 | 38.5  | Union       | 1     | 10.6              | 0.3                 | 58.8  |
| Jasper     | 3     | 53.1              | 10.9                | 155.2 | Vermillion  | 6     | 11.1              | 4.1                 | 24.1  |
| Jefferson  | 5     | 20.7              | 6.7                 | 48.4  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 1     | 8.8               | 0.2                 | 48.9  | Warren      | 1     | 9.8               | 0.2                 | 54.5  |
| Jo Daviess | 0     | 0.0               | 0.0                 | 36.8  | Washington  | 1     | 13.8              | 0.3                 | 76.6  |
| Johnson    | 1     | 17.0              | 0.4                 | 94.9  | Wayne       | 0     | 0.0               | 0.0                 | 35.9  |
| Kane       | 66    | 17.9              | 13.8                | 22.7  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 8     | 11.2              | 4.8                 | 22.0  | Whiteside   | 5     | 14.9              | 4.9                 | 34.9  |
| Kendall    | 21    | 23.3              | 14.4                | 35.6  | Will        | 70    | 16.2              | 12.6                | 20.4  |
| Knox       | 3     | 11.2              | 2.3                 | 32.8  | Williamson  | 2     | 5.2               | 0.6                 | 18.9  |
| Lake       | 77    | 17.9              | 14.1                | 22.4  | Winnebago   | 41    | 21.4              | 15.4                | 29.1  |
| LaSalle    | 6     | 9.6               | 3.5                 | 20.9  | Woodford    | 3     | 13.2              | 2.7                 | 38.6  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

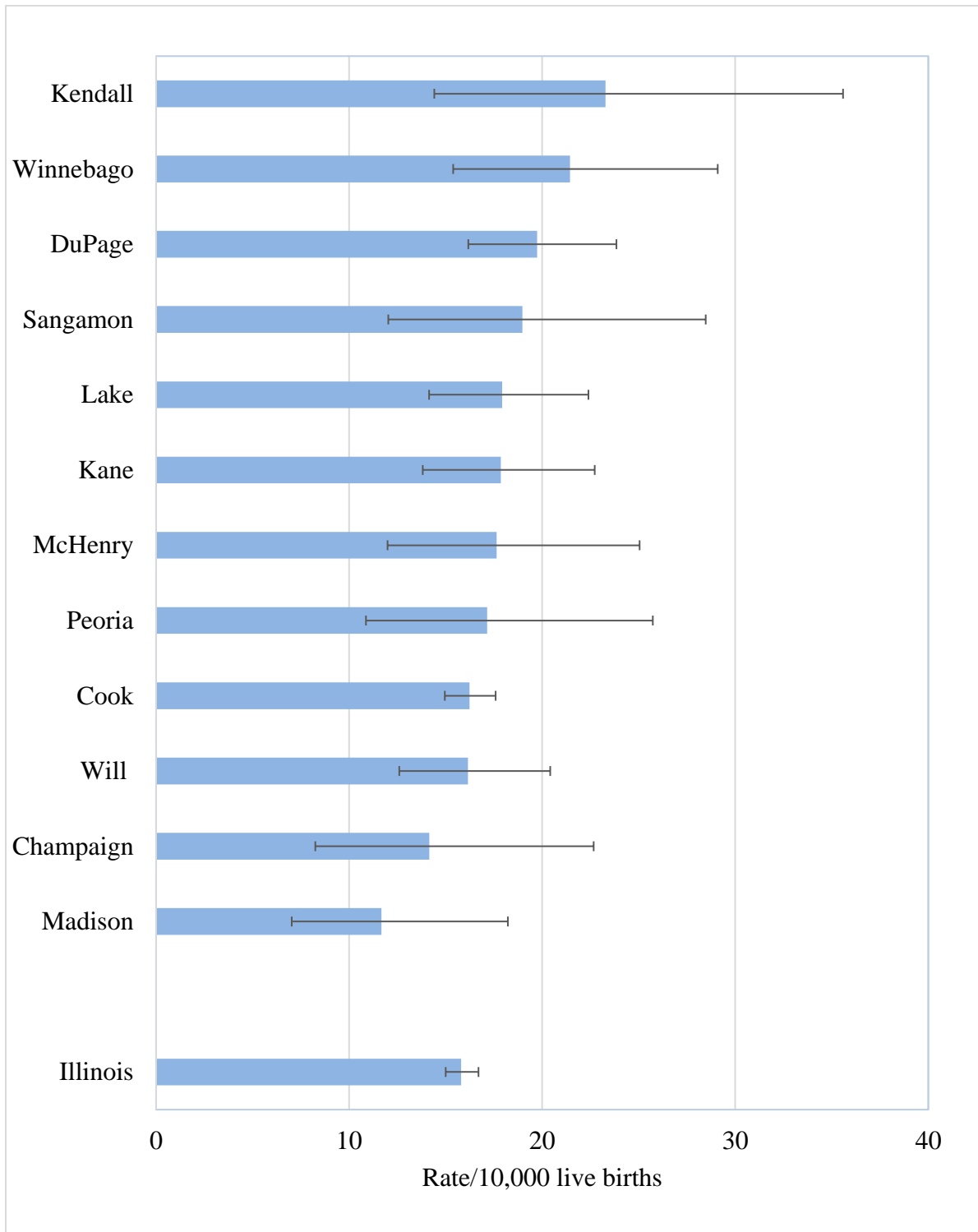
<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

The number for Illinois includes one case for which county of residence is missing.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 11. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Major Chromosomal Defects in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

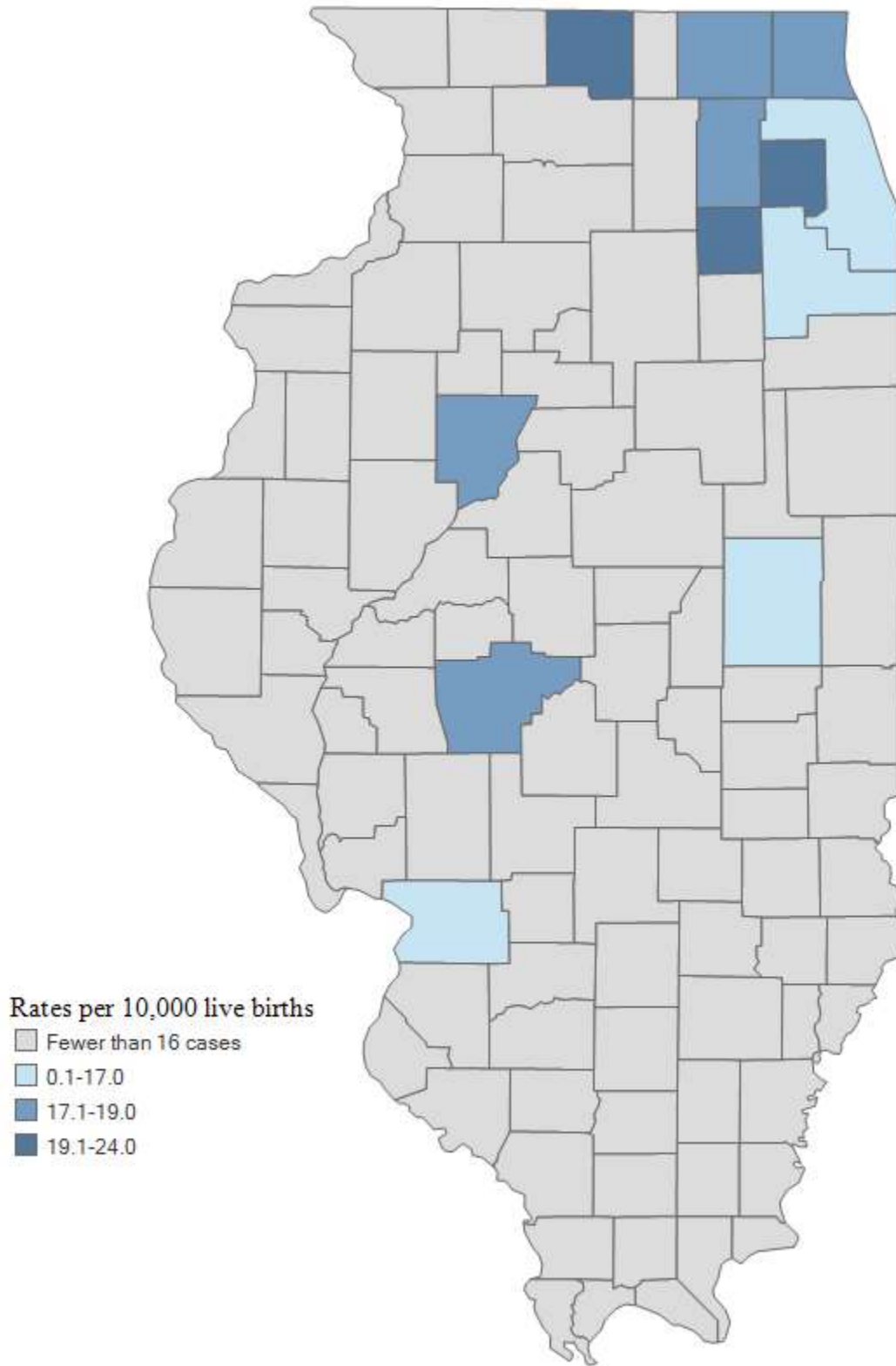


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 12. Map of Prevalence Rates for Major Chromosomal Defects in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## SECTION II

### OTHER ADVERSE PREGNANCY OUTCOMES

#### VERY LOW BIRTH WEIGHT

Children born weighing less than 1,500 grams (about 3 pounds 5 ounces) are considered to have very low birth weights. In 2012, 1.4% of Illinois infants had very low birth weights (IDPH, 2015), mirroring that of the U.S. (Martin, et al.) While medical advances over the years have increased the survival of these infants, disorders relating to short gestation and low birth weight remain the second leading cause of infant death in the U.S. and the leading cause of infant death in Illinois (17.8 and 26.3% respectively) (Heron M, and IDPH, 2019).

There are several risk factors that can lead to premature births, and thus very low birth weight infants. These include, but are not limited to:

- Previous pre-term births
- Multiple gestation pregnancies
- Use of assisted reproductive technology
- Having a short cervix or a cervix that shortens during the second trimester of pregnancy
- Certain medical conditions including infections, high blood pressure, and diabetes
- Being either underweight or obese prior to pregnancy
- Being of African American and American Indian/Alaska Native races
- Maternal age either younger than 18 or older than 35
- Short inter-pregnancy interval
- Late or no prenatal care
- Smoking, drinking alcohol, or using illicit drugs during pregnancy (NIH, March 2019)

While some risk factors listed are modifiable, others are not, and research is ongoing to identify additional causes. Regardless of the causes, very low birth weight infants who survive have more chronic conditions (blindness, deafness, intellectual disabilities, and cerebral palsy), more limitations in daily activities, and poorer overall health in their first few years of life than newborns with normal birth weights. Also, very low birth weight has been associated with poorer receptive language skills (Singer *et al.*) and with poor behavioral and educational outcomes (Saigal).

Table 14 provides five-year prevalence rates for infants with very low birth weights reported to APORS by county, and Figures 13 and 14 present prevalence rates for selected counties in Illinois.

**Table14. Total Number and Prevalence Rates of Infants with Very Low Birth Weights (<1,500 g) by County of Residence, 2008-2012**

| County     | Cases  | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|--------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |        |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 16,256 | 195.1             | 192.1               | 198.2 | Lee         | 34    | 184.0             | 127.4               | 257.1 |
| Adams      | 58     | 143.5             | 109.0               | 185.5 | Livingston  | 36    | 153.0             | 107.2               | 211.8 |
| Alexander  | 6      | 110.1             | 40.4                | 239.6 | Logan       | 30    | 196.0             | 132.2               | 279.7 |
| Bond       | 24     | 274.0             | 175.5               | 407.6 | McDonough   | 34    | 230.5             | 159.6               | 322.1 |
| Boone      | 66     | 213.9             | 165.5               | 272.2 | McHenry     | 256   | 145.7             | 128.4               | 164.7 |
| Brown      | 4      | 144.9             | 39.5                | 371.1 | McLean      | 181   | 169.7             | 145.8               | 196.2 |
| Bureau     | 16     | 89.6              | 51.2                | 145.6 | Macon       | 157   | 224.9             | 191.1               | 263.0 |
| Calhoun    | 5      | 188.7             | 61.3                | 440.3 | Macoupin    | 29    | 119.6             | 80.1                | 171.8 |
| Carroll    | 11     | 157.6             | 78.7                | 282.0 | Madison     | 249   | 152.9             | 134.5               | 173.1 |
| Cass       | 17     | 185.6             | 108.1               | 297.1 | Marion      | 39    | 154.2             | 109.7               | 210.8 |
| Champaign  | 228    | 189.9             | 166.0               | 216.2 | Marshall    | 5     | 81.7              | 26.5                | 190.7 |
| Christian  | 43     | 226.8             | 164.1               | 305.5 | Mason       | 22    | 303.4             | 190.2               | 459.4 |
| Clark      | 10     | 103.5             | 49.6                | 190.4 | Massac      | 5     | 56.3              | 18.3                | 131.4 |
| Clay       | 7      | 82.6              | 33.2                | 170.3 | Menard      | 12    | 189.6             | 98.0                | 331.1 |
| Clinton    | 24     | 116.2             | 74.5                | 172.9 | Mercer      | 7     | 88.1              | 35.4                | 181.4 |
| Coles      | 42     | 157.1             | 113.2               | 212.3 | Monroe      | 14    | 83.1              | 45.5                | 139.5 |
| Cook       | 8,303  | 225.7             | 220.9               | 230.7 | Montgomery  | 22    | 142.0             | 89.0                | 215.0 |
| Crawford   | 17     | 165.5             | 96.4                | 265.0 | Morgan      | 39    | 207.7             | 147.7               | 283.9 |
| Cumberland | 9      | 148.8             | 68.0                | 282.4 | Moultrie    | 16    | 184.3             | 105.4               | 299.3 |
| DeKalb     | 96     | 152.7             | 123.7               | 186.5 | Ogle        | 56    | 200.1             | 151.2               | 259.9 |
| DeWitt     | 23     | 244.7             | 155.1               | 367.1 | Peoria      | 286   | 213.2             | 189.2               | 239.4 |
| Douglas    | 16     | 119.0             | 68.0                | 193.3 | Perry       | 17    | 162.5             | 94.7                | 260.2 |
| DuPage     | 926    | 170.8             | 159.9               | 182.1 | Piatt       | 11    | 130.6             | 65.2                | 233.8 |
| Edgar      | 12     | 124.9             | 64.5                | 218.1 | Pike        | 14    | 153.5             | 83.9                | 257.6 |
| Edwards    | 0      | 0.0               | 0.0                 | 103.3 | Pope        | 2     | 129.0             | 15.6                | 466.1 |
| Effingham  | 23     | 102.4             | 64.9                | 153.7 | Pulaski     | 5     | 152.9             | 49.6                | 356.8 |
| Fayette    | 13     | 106.3             | 56.6                | 181.8 | Putnam      | 1     | 38.0              | 1.0                 | 211.8 |
| Ford       | 11     | 150.1             | 74.9                | 268.5 | Randolph    | 21    | 117.4             | 72.7                | 179.5 |
| Franklin   | 39     | 167.1             | 118.8               | 228.4 | Richland    | 10    | 102.0             | 48.9                | 187.7 |
| Fulton     | 31     | 169.6             | 115.2               | 240.7 | Rock Island | 129   | 133.3             | 111.3               | 158.4 |
| Gallatin   | 5      | 176.1             | 57.2                | 410.9 | St. Clair   | 327   | 182.2             | 163.0               | 203.1 |
| Greene     | 24     | 313.3             | 200.7               | 466.2 | Saline      | 30    | 193.8             | 130.8               | 276.7 |
| Grundy     | 49     | 147.8             | 109.3               | 195.4 | Sangamon    | 245   | 202.1             | 177.6               | 229.1 |
| Hamilton   | 3      | 63.6              | 13.1                | 185.7 | Schuyler    | 4     | 108.7             | 29.6                | 278.3 |
| Hancock    | 11     | 111.4             | 55.6                | 199.4 | Scott       | 2     | 73.8              | 8.9                 | 266.6 |
| Hardin     | 1      | 48.5              | 1.2                 | 270.5 | Shelby      | 18    | 157.9             | 93.6                | 249.5 |
| Henderson  | 4      | 133.8             | 36.5                | 342.5 | Stark       | 4     | 140.4             | 38.2                | 359.4 |
| Henry      | 25     | 91.0              | 58.9                | 134.4 | Stephenson  | 40    | 157.7             | 112.6               | 214.7 |
| Iroquois   | 25     | 160.6             | 103.9               | 237.0 | Tazewell    | 141   | 171.7             | 144.6               | 202.5 |
| Jackson    | 57     | 168.0             | 127.2               | 217.7 | Union       | 14    | 147.8             | 80.8                | 248.0 |
| Jasper     | 11     | 194.7             | 97.2                | 348.4 | Vermillion  | 112   | 206.5             | 170.1               | 248.5 |
| Jefferson  | 43     | 178.2             | 129.0               | 240.0 | Wabash      | 9     | 121.5             | 55.5                | 230.6 |
| Jersey     | 10     | 87.7              | 42.1                | 161.3 | Warren      | 8     | 78.3              | 33.8                | 154.2 |
| Jo Daviess | 8      | 79.8              | 34.4                | 157.2 | Washington  | 8     | 110.0             | 47.5                | 216.8 |
| Johnson    | 8      | 136.3             | 58.8                | 268.5 | Wayne       | 7     | 68.2              | 27.4                | 140.4 |
| Kane       | 626    | 169.4             | 156.4               | 183.2 | White       | 8     | 92.3              | 39.8                | 181.8 |
| Kankakee   | 147    | 204.9             | 173.1               | 240.8 | Whiteside   | 40    | 119.5             | 85.4                | 162.8 |
| Kendall    | 138    | 153.0             | 128.5               | 180.7 | Will        | 820   | 189.3             | 176.5               | 202.7 |
| Knox       | 66     | 246.6             | 190.7               | 313.8 | Williamson  | 55    | 143.6             | 108.2               | 187.0 |
| Lake       | 717    | 166.8             | 154.9               | 179.5 | Winnebago   | 381   | 199.3             | 179.8               | 220.3 |
| LaSalle    | 96     | 153.6             | 124.4               | 187.5 | Woodford    | 30    | 132.0             | 89.0                | 188.4 |
| Lawrence   | 10     | 118.3             | 56.8                | 217.6 |             |       |                   |                     |       |

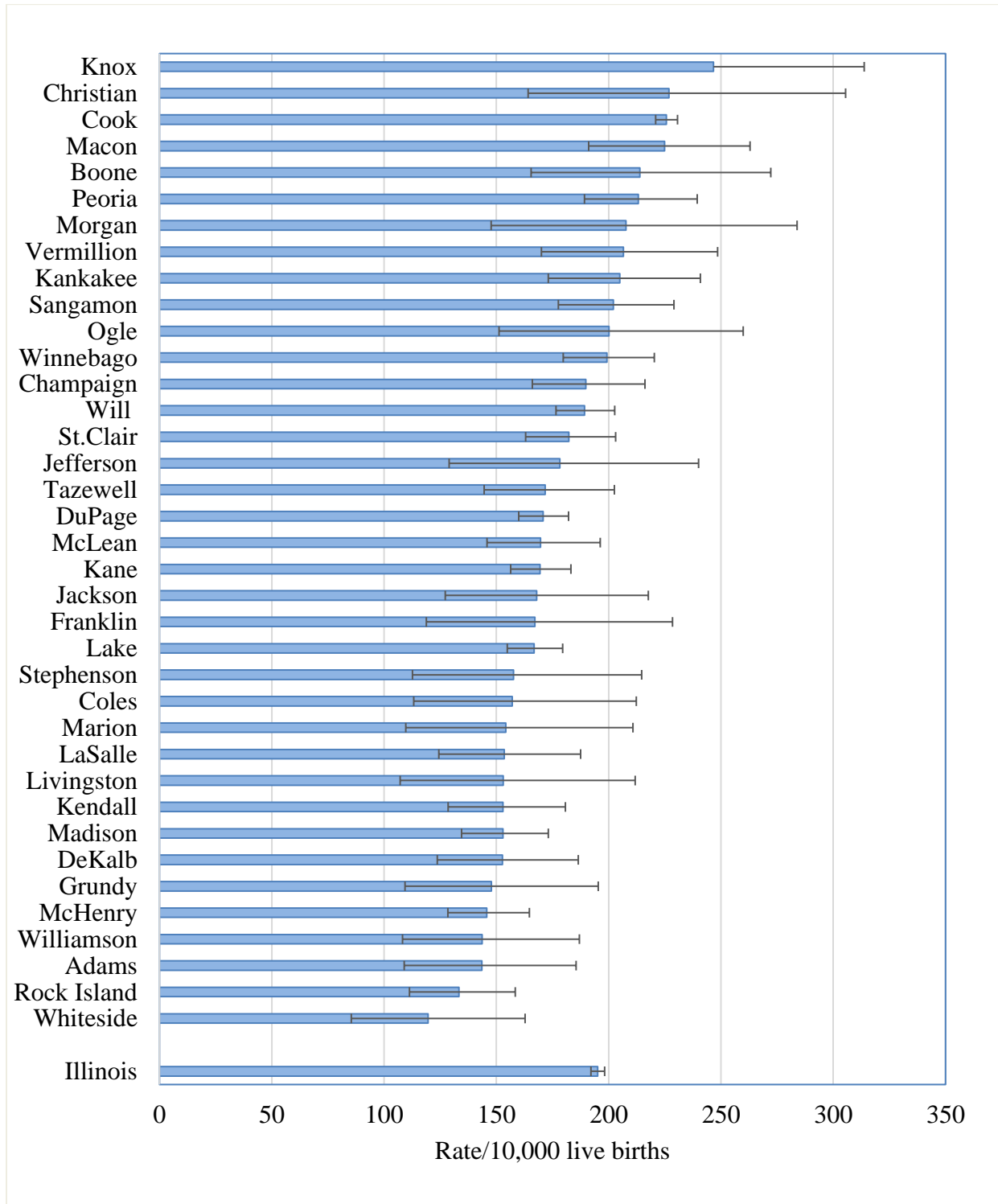
<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

The number for Illinois includes 50 cases for which county of residence is missing.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 13. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals  
for Very Low Birth Weight Infants  
by Selected Counties of Residence,<sup>2</sup> 2008-2012**

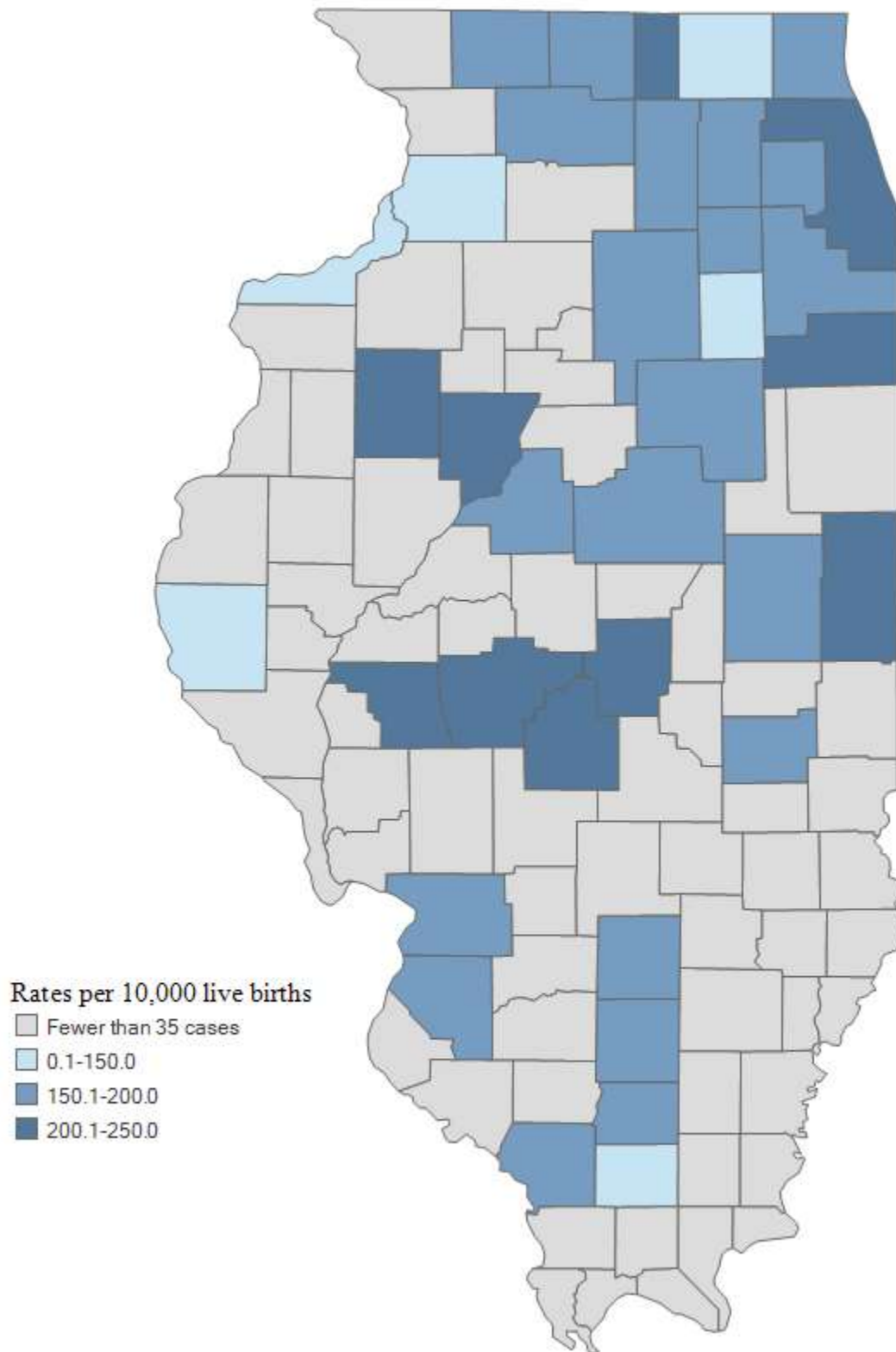


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 35 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 14. Map of Prevalence Rates for Infants with Very Low Birth Weights (1,500g), by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



## SERIOUS CONGENITAL INFECTIONS

Congenital infections may be either viral or bacterial. Infants may have been exposed *in utero* (by transfer across the placental barrier) or during delivery. A description of each condition collected by APORS follows, together with Table 15, which gives the five-year prevalence rates for each condition for the state. Table 16 provides five-year prevalence rates for all serious congenital infections combined by county. Figures 15 and 16 present prevalence rates for all serious congenital infections for selected counties in table and map formats, respectively.

*Chlamydia* is caused by the *Chlamydia trachomatis* bacterium. Infection can lead to dangerous complications during pregnancy and birth. If a pregnant woman is untreated, her baby can develop conjunctivitis (threatening eyesight) or pneumonia. Chlamydia also can lead to premature birth or low birth weight.

*Cytomegalovirus (CMV)* is a common virus that infects many people but may show no symptoms. Pregnant women can pass the virus to their baby through the placenta when infected for the first time or if infected again during pregnancy. The baby may or may not show signs of infection at birth. Congenital infection may cause hearing loss, intellectual disability, vision loss, and seizures. Tests may be done on a baby within a few weeks of birth to determine whether the baby is infected, and the baby may be treated to lessen the severity of health problems associated with the disease.

*Gonorrhea* is caused by the *Neisseria gonorrhoeae* bacterium. Gonorrhea can be passed from an infected woman to her newborn infant during delivery, causing neonatal conjunctivitis. Most states require that the eyes of newborns be treated with silver nitrate or other medication immediately after birth to prevent gonococcal infection of the eyes, which can lead to blindness.

*Group B streptococcus (GBS)* is a bacterium that can be part of normal flora in the body and is carried by about 25% of women. The bacteria can cause pneumonia and meningitis in infants who are exposed during delivery. All pregnant women should be tested for the bacteria, and, if positive, treated with antibiotics during labor to prevent disease in the baby.

*Hepatitis B virus (HBV)* can be passed to a baby during delivery. A baby may be asymptomatic, but as he or she grows up, liver damage may be present. About 80% of liver cancers are caused by HBV infections. A vaccine has been used since 1982 to prevent hepatitis B.

*Herpes* in a newborn is usually a result of exposure to the herpes simplex virus II (HSV-2) during vaginal delivery. The infection rate is about 50% in primary maternal infection and about 5% in a recurrent infection. The most common clinical symptom is the presence of cutaneous vesicles. In 20% of cases, there is major systemic involvement, central nervous system involvement, or both. Less than 10% of babies with neurologic disease develop normally. The overall mortality rate among infants with untreated infection is 65%.

*Listeriosis* is caused by infection with the bacterium *Listeria monocytogenes*; half of all infected newborns will die from the illness. Babies infected during pregnancy may be born

prematurely, have a blood infection (sepsis), and may have a serious, whole body infection called granulomatosis infantisepticum. When a baby is infected during childbirth, symptoms usually appear about two weeks after birth; these babies typically have meningitis or sepsis.

*Rubella*, or German measles, is caused by the rubella virus. If a woman contracts this virus during pregnancy, the baby may miscarry or be born with birth defects including deafness, cataracts, heart defects, low birthweight, intellectual disabilities, and damage to the liver and spleen.

*Sepsis* may be caused by any of several infections. It is reportable if the infection is confirmed and is invasive. Once the organism has invaded the bloodstream, the infection may lead to pneumonia, septicemia, arthritis, endocarditis, or meningitis.

*Syphilis (congenital)* is caused by the *Treponema pallidum* bacterium. It can infect the baby either by transplacental passage of bacteria or from contact with an infectious lesion during delivery. Congenital syphilis can cause miscarriage, stillbirth, prematurity or death shortly after birth. Without immediate treatment, infection can cause many health problems in the baby including deformed bones, anemia, blindness, deafness, enlarged liver and spleen, and meningitis (CDC).

*Tetanus infection* in newborns is caused when an infant is exposed to the bacterium *Clostridium tetani* during delivery. The bacteria produce a neurotoxin that selectively blocks inhibitory nerve transmission from the spinal cord to the muscles, allowing the muscles to go into severe spasm. Without treatment, two out of three newborns with tetanus will die.

**Table 15. Total Number and Prevalence Rates of Serious Congenital Infections in Newborn Infants, Illinois, 2008-2012**

| Defect                           | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|----------------------------------|----------------|-------|-------------------|---------------------|-------|
|                                  |                |       |                   | Lower               | Upper |
| Chlamydial infections            | 079.88, 079.98 | 4     | 0.0               | 0.0                 | 0.1   |
| Cytomegalovirus                  | 771.1          | 115   | 1.4               | 1.1                 | 1.7   |
| Gonococcal infections            | 098.0 - 098.89 | 3     | 0.0               | 0.0                 | 0.1   |
| Group B streptococcus            | 041.02         | 245   | 2.9               | 2.6                 | 3.3   |
| Hepatitis B                      | 774.4          | 11    | 0.1               | 0.1                 | 0.2   |
| Prenatal exposure to hepatitis B | V01.7B         | 958   | 11.5              | 10.8                | 12.3  |
| Herpes and other infections      | 771.2          | 75    | 0.9               | 0.7                 | 1.1   |
| Listeriosis                      | 027.0          | 1     | 0.0               | 0.0                 | 0.1   |
| Rubella                          | 771.0          | 1     | 0.0               | 0.0                 | 0.1   |
| Sepsis (confirmed septicemia)    | 771.8          | 1,657 | 19.9              | 18.9                | 20.9  |
| Syphilis                         | 090.0 - 090.9  | 189   | 2.3               | 2.0                 | 2.6   |
| Tetanus neonatorum               | 771.3          | 0     | 0.0               | 0.0                 | 0.0   |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table16. Total Number and Prevalence Rates of Serious Congenital Infections in Newborn Infants by County of Residence, 2008-2012**

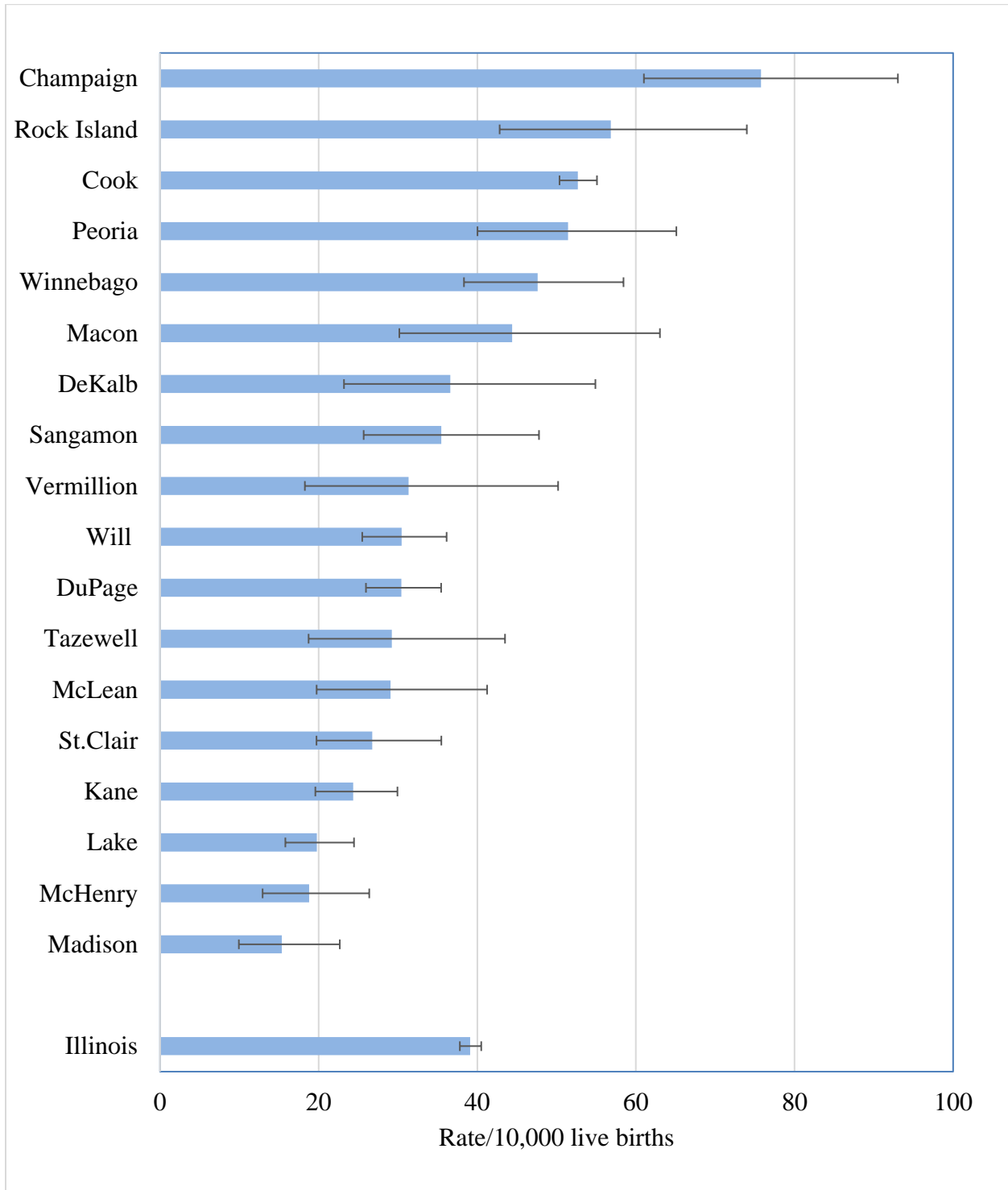
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 3,259 | 39.1              | 37.8                | 40.5  | Lee         | 0     | 0.0               | 0.0                 | 20.0  |
| Adams      | 8     | 19.8              | 8.5                 | 39.0  | Livingston  | 4     | 17.0              | 4.6                 | 43.5  |
| Alexander  | 0     | 0.0               | 0.0                 | 67.7  | Logan       | 6     | 39.2              | 14.4                | 85.3  |
| Bond       | 3     | 34.2              | 7.1                 | 100.1 | McDonough   | 3     | 20.3              | 4.2                 | 59.4  |
| Boone      | 14    | 45.4              | 24.8                | 76.1  | McHenry     | 33    | 18.8              | 12.9                | 26.4  |
| Brown      | 1     | 36.2              | 0.9                 | 201.9 | McLean      | 31    | 29.1              | 19.7                | 41.2  |
| Bureau     | 7     | 39.2              | 15.8                | 80.8  | Macon       | 31    | 44.4              | 30.2                | 63.0  |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 6     | 24.8              | 9.1                 | 53.9  |
| Carroll    | 1     | 14.3              | 0.4                 | 79.8  | Madison     | 25    | 15.4              | 9.9                 | 22.7  |
| Cass       | 2     | 21.8              | 2.6                 | 78.9  | Marion      | 7     | 27.7              | 11.1                | 57.0  |
| Champaign  | 91    | 75.8              | 61.0                | 93.0  | Marshall    | 1     | 16.3              | 0.4                 | 91.0  |
| Christian  | 7     | 36.9              | 14.8                | 76.1  | Mason       | 5     | 69.0              | 22.4                | 160.9 |
| Clark      | 2     | 20.7              | 2.5                 | 74.8  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 0     | 0.0               | 0.0                 | 43.6  | Menard      | 1     | 15.8              | 0.4                 | 88.0  |
| Clinton    | 2     | 9.7               | 1.2                 | 35.0  | Mercer      | 3     | 37.7              | 7.8                 | 110.3 |
| Coles      | 8     | 29.9              | 12.9                | 58.9  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 1,938 | 52.7              | 50.4                | 55.1  | Montgomery  | 6     | 38.7              | 14.2                | 84.3  |
| Crawford   | 2     | 19.5              | 2.4                 | 70.3  | Morgan      | 4     | 21.3              | 5.8                 | 54.5  |
| Cumberland | 1     | 16.5              | 0.4                 | 92.1  | Moultrie    | 1     | 11.5              | 0.3                 | 64.2  |
| DeKalb     | 23    | 36.6              | 23.2                | 54.9  | Ogle        | 9     | 32.2              | 14.7                | 61.1  |
| DeWitt     | 3     | 31.9              | 6.6                 | 93.3  | Peoria      | 69    | 51.4              | 40.0                | 65.1  |
| Douglas    | 3     | 22.3              | 4.6                 | 65.2  | Perry       | 1     | 9.6               | 0.2                 | 53.3  |
| DuPage     | 165   | 30.4              | 26.0                | 35.4  | Piatt       | 2     | 23.8              | 2.9                 | 85.8  |
| Edgar      | 3     | 31.2              | 6.4                 | 91.2  | Pike        | 4     | 43.9              | 12.0                | 112.3 |
| Edwards    | 1     | 28.0              | 0.7                 | 156.1 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 5     | 22.3              | 7.2                 | 52.0  | Pulaski     | 1     | 30.6              | 0.8                 | 170.4 |
| Fayette    | 3     | 24.5              | 5.1                 | 71.7  | Putnam      | 1     | 38.0              | 1.0                 | 211.8 |
| Ford       | 4     | 54.6              | 14.9                | 139.7 | Randolph    | 2     | 11.2              | 1.4                 | 40.4  |
| Franklin   | 2     | 8.6               | 1.0                 | 31.0  | Richland    | 1     | 10.2              | 0.3                 | 56.9  |
| Fulton     | 1     | 5.5               | 0.1                 | 30.5  | Rock Island | 55    | 56.8              | 42.8                | 74.0  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 48    | 26.8              | 19.7                | 35.5  |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 0     | 0.0               | 0.0                 | 23.8  |
| Grundy     | 4     | 12.1              | 3.3                 | 30.9  | Sangamon    | 43    | 35.5              | 25.7                | 47.8  |
| Hamilton   | 1     | 21.2              | 0.5                 | 118.0 | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 5     | 50.7              | 16.4                | 118.2 | Scott       | 0     | 0.0               | 0.0                 | 136.1 |
| Hardin     | 1     | 48.5              | 1.2                 | 270.5 | Shelby      | 3     | 26.3              | 5.4                 | 76.9  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 1     | 35.1              | 0.9                 | 195.5 |
| Henry      | 6     | 21.8              | 8.0                 | 47.6  | Stephenson  | 5     | 19.7              | 6.4                 | 46.0  |
| Iroquois   | 4     | 25.7              | 7.0                 | 65.8  | Tazewell    | 24    | 29.2              | 18.7                | 43.5  |
| Jackson    | 6     | 17.7              | 6.5                 | 38.5  | Union       | 1     | 10.6              | 0.3                 | 58.8  |
| Jasper     | 4     | 70.8              | 19.3                | 181.3 | Vermillion  | 17    | 31.3              | 18.3                | 50.2  |
| Jefferson  | 6     | 24.9              | 9.1                 | 54.1  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 0     | 0.0               | 0.0                 | 32.4  | Warren      | 0     | 0.0               | 0.0                 | 36.1  |
| Jo Daviess | 2     | 19.9              | 2.4                 | 72.0  | Washington  | 0     | 0.0               | 0.0                 | 50.7  |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 2     | 19.5              | 2.4                 | 70.3  |
| Kane       | 90    | 24.4              | 19.6                | 29.9  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 13    | 18.1              | 9.6                 | 31.0  | Whiteside   | 10    | 29.9              | 14.3                | 55.0  |
| Kendall    | 12    | 13.3              | 6.9                 | 23.2  | Will        | 132   | 30.5              | 25.5                | 36.1  |
| Knox       | 8     | 29.9              | 12.9                | 58.9  | Williamson  | 2     | 5.2               | 0.6                 | 18.9  |
| Lake       | 85    | 19.8              | 15.8                | 24.5  | Winnebago   | 91    | 47.6              | 38.3                | 58.4  |
| LaSalle    | 13    | 20.8              | 11.1                | 35.6  | Woodford    | 8     | 35.2              | 15.2                | 69.3  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 15. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Serious Congenital Infections in Newborn Infants for Selected Counties of Residence,<sup>2</sup> 2008-2012**

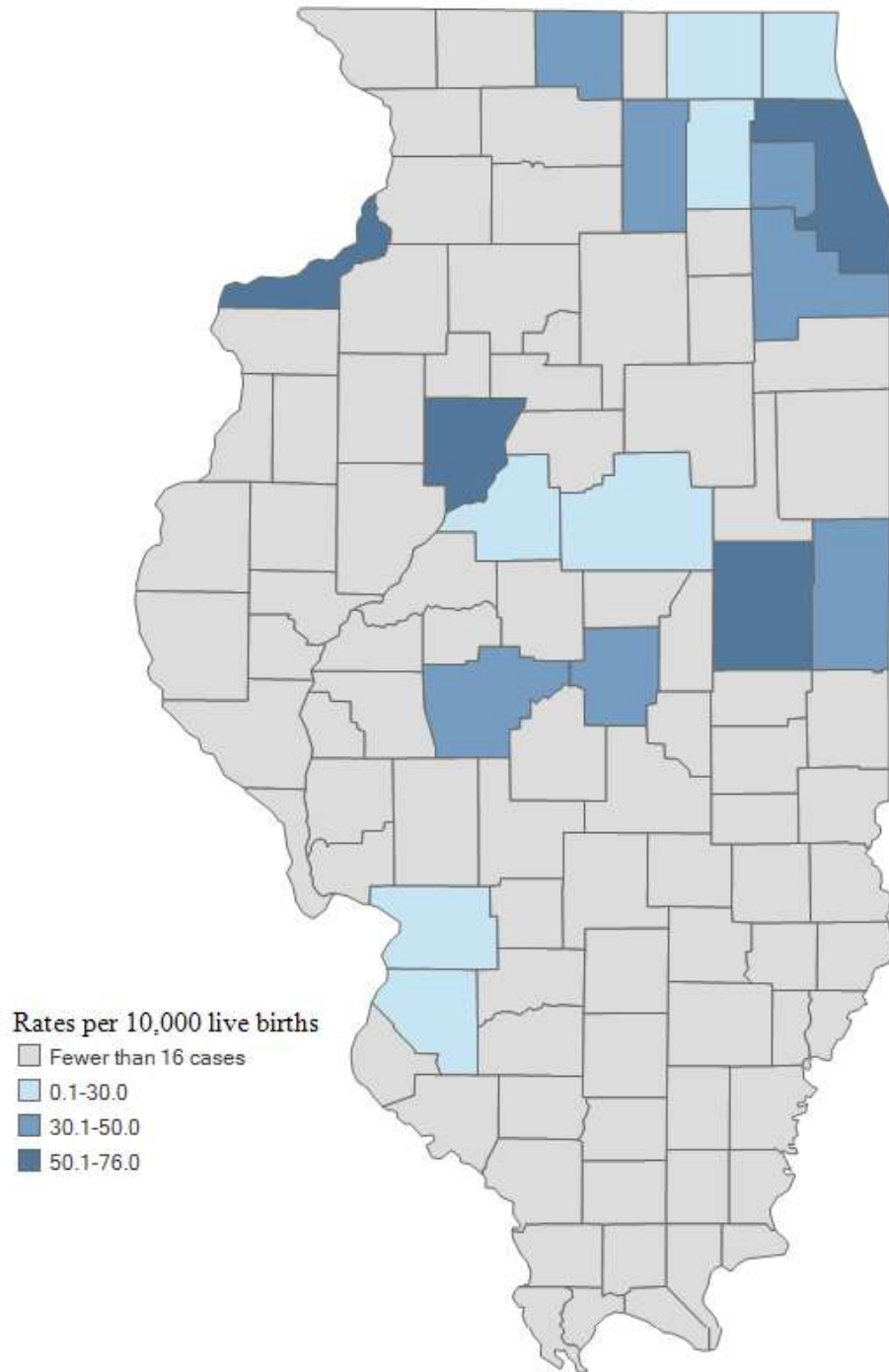


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 16. Map of Prevalence Rates  
for Serious Congenital Infections in Newborn Infants  
by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## PERINATAL DEATHS

Perinatal deaths refer to a combination of fetal deaths of at least 20 weeks gestation and neonatal deaths (under 28 days old). APORS collects information from hospitals about neonatal deaths that occur while the baby is still in the hospital for the newborn stay. Additionally, information about fetal deaths is obtained from the IDPH’s Division of Vital Records. Data on elective abortions are not included. Table 17 provides five-year prevalence rates for perinatal deaths for the state. Table 18 provides five-year prevalence rates for perinatal deaths by county. Figures 17 and 18 present five-year prevalence rates by selected counties in Illinois.

**Table 17. Total Number and Prevalence Rates of Perinatal Deaths, Illinois, 2008 – 2012**

| Defect                     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|----------------------------|-------|-------------------|---------------------|-------|
|                            |       |                   | Lower               | Upper |
| Fetal deaths               | 4,875 | 58.5              | 56.9                | 60.2  |
| Deaths during newborn stay | 3,492 | 41.9              | 40.5                | 43.3  |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System , January 2019

**Table18. Total Number and Prevalence Rates of Perinatal Deaths by County of Residence, 2008-2012**

| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 8,367 | 100.4             | 98.3                | 102.6 | Lee         | 16    | 86.6              | 49.5                | 140.6 |
| Adams      | 31    | 76.7              | 52.1                | 108.9 | Livingston  | 29    | 123.2             | 82.5                | 177.0 |
| Alexander  | 2     | 36.7              | 4.4                 | 132.6 | Logan       | 14    | 91.4              | 50.0                | 153.4 |
| Bond       | 9     | 102.7             | 47.0                | 195.0 | McDonough   | 21    | 142.4             | 88.1                | 217.6 |
| Boone      | 26    | 84.3              | 55.1                | 123.5 | McHenry     | 129   | 73.4              | 61.3                | 87.2  |
| Brown      | 5     | 181.2             | 58.8                | 422.8 | McLean      | 107   | 100.3             | 82.2                | 121.2 |
| Bureau     | 14    | 78.4              | 42.9                | 131.6 | Macon       | 87    | 124.6             | 99.8                | 153.7 |
| Calhoun    | 4     | 150.9             | 41.1                | 386.5 | Macoupin    | 29    | 119.6             | 80.1                | 171.8 |
| Carroll    | 4     | 57.3              | 15.6                | 146.7 | Madison     | 135   | 82.9              | 69.5                | 98.1  |
| Cass       | 9     | 98.3              | 44.9                | 186.5 | Marion      | 23    | 90.9              | 57.7                | 136.5 |
| Champaign  | 113   | 94.1              | 77.5                | 113.1 | Marshall    | 0     | 0.0               | 0.0                 | 60.3  |
| Christian  | 19    | 100.2             | 60.3                | 156.5 | Mason       | 11    | 151.7             | 75.7                | 271.5 |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 4     | 45.0              | 12.3                | 115.3 |
| Clay       | 5     | 59.0              | 19.2                | 137.8 | Menard      | 2     | 31.6              | 3.8                 | 114.1 |
| Clinton    | 12    | 58.1              | 30.0                | 101.5 | Mercer      | 5     | 62.9              | 20.4                | 146.8 |
| Coles      | 25    | 93.5              | 60.5                | 138.0 | Monroe      | 8     | 47.5              | 20.5                | 93.6  |
| Cook       | 4,212 | 114.5             | 111.1               | 118.0 | Montgomery  | 13    | 83.9              | 44.7                | 143.5 |
| Crawford   | 8     | 77.9              | 33.6                | 153.5 | Morgan      | 16    | 85.2              | 48.7                | 138.4 |
| Cumberland | 6     | 99.2              | 36.4                | 215.9 | Moultrie    | 10    | 115.2             | 55.2                | 211.9 |
| DeKalb     | 51    | 81.1              | 60.4                | 106.7 | Ogle        | 29    | 103.6             | 69.4                | 148.9 |
| DeWitt     | 15    | 159.6             | 89.3                | 263.2 | Peoria      | 162   | 120.8             | 102.9               | 140.9 |
| Douglas    | 11    | 81.8              | 40.9                | 146.4 | Perry       | 8     | 76.5              | 33.0                | 150.7 |
| DuPage     | 511   | 94.2              | 86.2                | 102.8 | Piatt       | 7     | 83.1              | 33.4                | 171.3 |
| Edgar      | 2     | 20.8              | 2.5                 | 75.2  | Pike        | 8     | 87.7              | 37.9                | 172.8 |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 1     | 64.5              | 1.6                 | 359.5 |
| Effingham  | 11    | 49.0              | 24.4                | 87.6  | Pulaski     | 1     | 30.6              | 0.8                 | 170.4 |
| Fayette    | 9     | 73.6              | 33.6                | 139.7 | Putnam      | 2     | 76.0              | 9.2                 | 274.7 |
| Ford       | 2     | 27.3              | 3.3                 | 98.6  | Randolph    | 11    | 61.5              | 30.7                | 110.1 |
| Franklin   | 20    | 85.7              | 52.3                | 132.3 | Richland    | 5     | 51.0              | 16.6                | 119.1 |
| Fulton     | 19    | 103.9             | 62.6                | 162.3 | Rock Island | 73    | 75.4              | 59.1                | 94.9  |
| Gallatin   | 1     | 35.2              | 0.9                 | 196.2 | St. Clair   | 134   | 74.7              | 62.6                | 88.4  |
| Greene     | 10    | 130.5             | 62.6                | 240.1 | Saline      | 17    | 109.8             | 64.0                | 175.8 |
| Grundy     | 16    | 48.3              | 27.6                | 78.4  | Sangamon    | 124   | 102.3             | 85.1                | 122.0 |
| Hamilton   | 3     | 63.6              | 13.1                | 185.7 | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 5     | 50.7              | 16.4                | 118.2 | Scott       | 1     | 36.9              | 0.9                 | 205.6 |
| Hardin     | 1     | 48.5              | 1.2                 | 270.5 | Shelby      | 6     | 52.6              | 19.3                | 114.6 |
| Henderson  | 1     | 33.4              | 0.8                 | 186.3 | Stark       | 1     | 35.1              | 0.9                 | 195.5 |
| Henry      | 15    | 54.6              | 30.6                | 90.1  | Stephenson  | 18    | 70.9              | 42.0                | 112.1 |
| Iroquois   | 12    | 77.1              | 39.8                | 134.6 | Tazewell    | 71    | 86.5              | 67.5                | 109.1 |
| Jackson    | 24    | 70.7              | 45.3                | 105.2 | Union       | 5     | 52.8              | 17.1                | 123.2 |
| Jasper     | 1     | 17.7              | 0.4                 | 98.6  | Vermillion  | 68    | 125.4             | 97.4                | 159.0 |
| Jefferson  | 15    | 62.2              | 34.8                | 102.5 | Wabash      | 1     | 13.5              | 0.3                 | 75.2  |
| Jersey     | 5     | 43.9              | 14.2                | 102.4 | Warren      | 3     | 29.4              | 6.1                 | 85.8  |
| Jo Daviess | 3     | 29.9              | 6.2                 | 87.4  | Washington  | 4     | 55.0              | 15.0                | 140.9 |
| Johnson    | 4     | 68.1              | 18.6                | 174.5 | Wayne       | 5     | 48.7              | 15.8                | 113.6 |
| Kane       | 332   | 89.8              | 80.4                | 100.0 | White       | 5     | 57.7              | 18.7                | 134.6 |
| Kankakee   | 68    | 94.8              | 73.6                | 120.2 | Whiteside   | 25    | 74.7              | 48.4                | 110.3 |
| Kendall    | 82    | 90.9              | 72.3                | 112.8 | Will        | 429   | 99.0              | 89.9                | 108.9 |
| Knox       | 41    | 153.2             | 109.9               | 207.9 | Williamson  | 33    | 86.2              | 59.3                | 121.0 |
| Lake       | 374   | 87.0              | 78.4                | 96.3  | Winnebago   | 197   | 103.0             | 89.2                | 118.5 |
| LaSalle    | 56    | 89.6              | 67.7                | 116.3 | Woodford    | 23    | 101.2             | 64.1                | 151.8 |
| Lawrence   | 2     | 23.7              | 2.9                 | 85.5  |             |       |                   |                     |       |

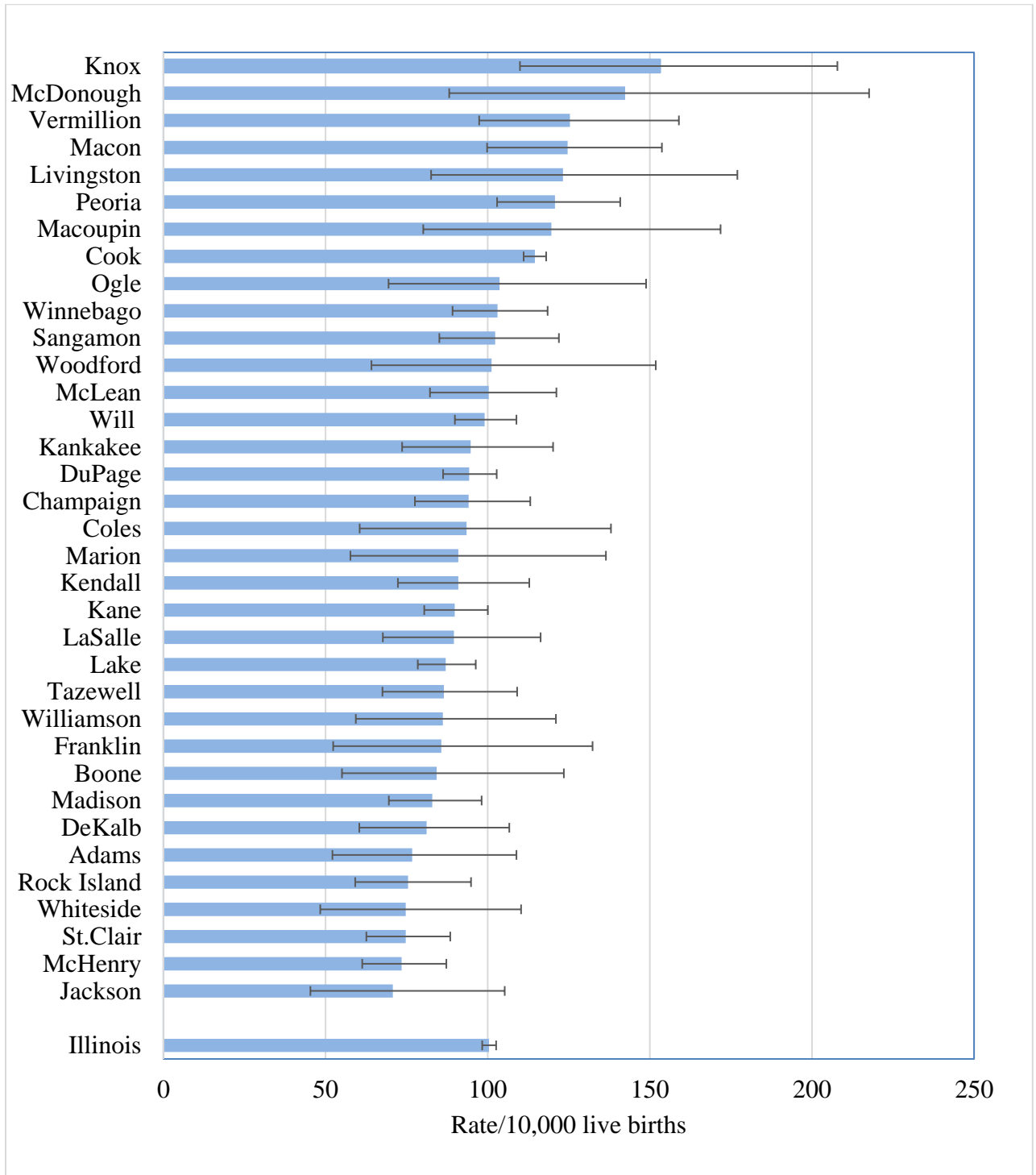
<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

The number for Illinois includes five cases for which county of residence is missing

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting Systems, January 2019

**Figure 17. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Perinatal Deaths for Selected Counties of Residence,<sup>2</sup> 2008-2012**



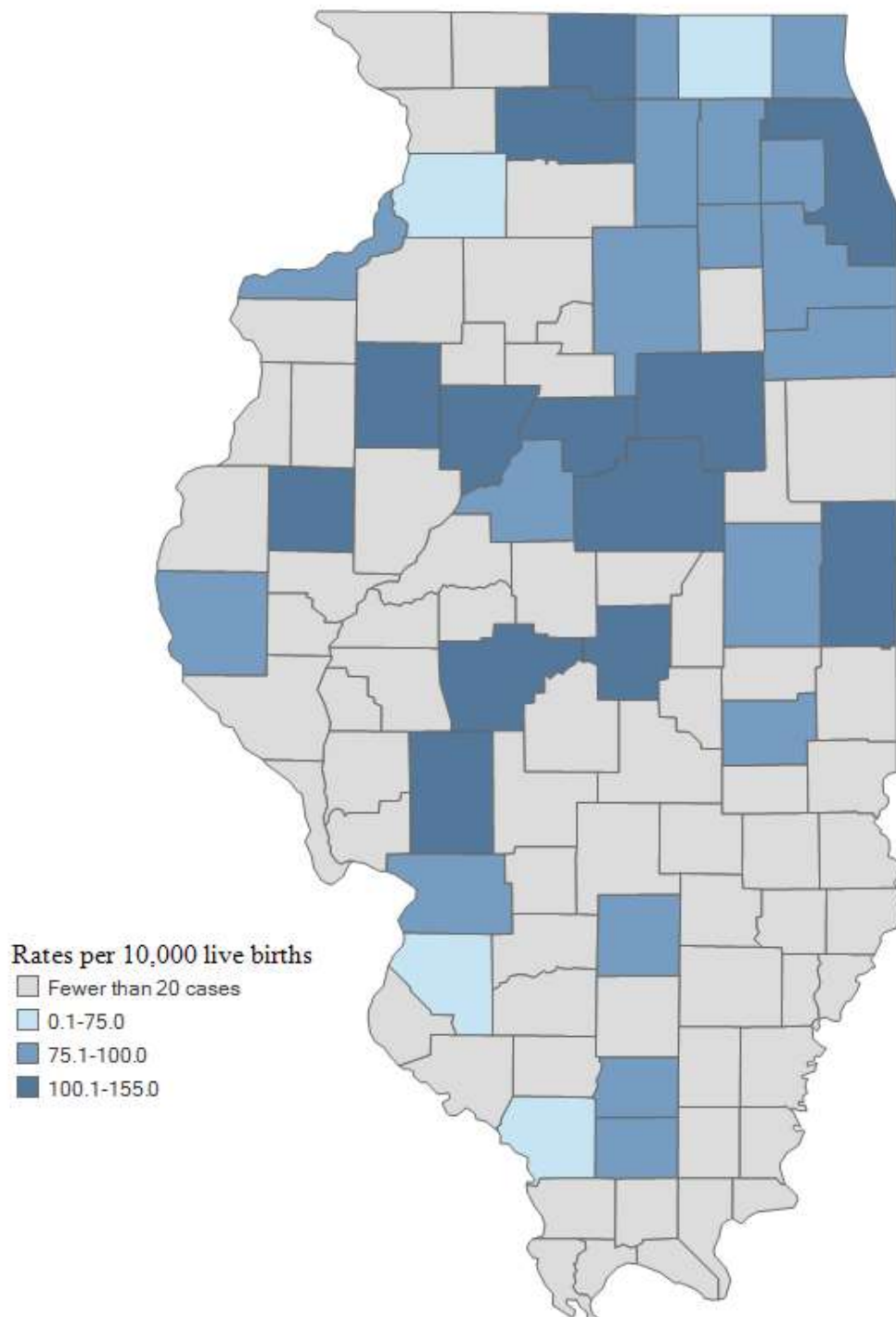
<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 20 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



**Figure 18. Map of Prevalence Rates for Perinatal Deaths by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## ENDOCRINE, METABOLIC, OR IMMUNE DISORDERS

APORS works closely with the Newborn Metabolic Screening program at IDPH to compile information on endocrine, metabolic, and immune disorders in newborns. Descriptions of the conditions follow. Table 19 provides five-year prevalence rates for the state. Table 20 provides five-year prevalence rates by county. Figures 19 and 20 present prevalence rates for endocrine, metabolic, or immune disorders for selected counties in table and map formats, respectively.

*Adrenogenital syndrome* is a group of disorders that lead to an overproduction of androgens.

Female newborns have ambiguous genitalia; male newborns have no obvious abnormality but appear to enter puberty as early as two to three years of age. Some forms are more severe – in the salt-losing form, babies develop symptoms (dehydration, electrolyte changes, and cardiac arrhythmias) soon after birth. Untreated, this condition can lead to death within days.

*Cystic fibrosis* is a genetic disease that causes the body to produce an abnormally thick, sticky mucus due to the faulty transport of sodium and chloride within cells lining organs such as the lungs and pancreas. The thick mucus also obstructs the pancreas, preventing enzymes from reaching the intestines to help digest food. This leads to malnutrition and stunted growth.

*Immune deficiency diseases* occur when one or more parts of the immune system are missing.

There are more than 100 known forms of congenital immune deficiencies (HIV infections do not fit in this category). Many children with immune deficiencies must avoid contagious situations. If a child is diagnosed at birth or soon after with a severe combined immune deficiency, he or she can receive a bone marrow transplant with hopes of reconstituting the missing immune system.

*Inborn errors of metabolism* include hundreds of genetic disorders affecting metabolism. These errors interfere with the synthesis of proteins, carbohydrates, fats, and enzymes. Absence or excesses of normal or abnormal metabolites can lead to disease and death. Many inborn errors of metabolism are untreatable; others require restrictions or extremely high dosages of certain nutrients.

*Neonatal hypothyroidism* is characterized by decreased thyroid hormone production at birth. If untreated, hypothyroidism leads to severe defects including poor vision, developmental disabilities, muscle weakness, and severe lethargy. If diagnosed and treated soon after birth, growth and mental development can proceed relatively normally.

**Table 19. Total Number and Prevalence Rates of Endocrine, Metabolic, or Immune Disorders in Newborn Infants, Illinois, 2008 – 2012**

| Defect                      | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|-----------------------------|----------------|-------|-------------------|---------------------|-------|
|                             |                |       |                   | Lower               | Upper |
| Adrenogenital syndrome      | 255.2          | 52    | 0.6               | 0.5                 | 0.8   |
| Cystic fibrosis             | 277.00, 277.01 | 176   | 2.1               | 1.8                 | 2.4   |
| Hypothyroidism              | 243            | 465   | 5.6               | 5.1                 | 6.1   |
| Immune deficiency disease   | 279.2          | 3     | 0.0               | 0.0                 | 0.1   |
| Inborn errors of metabolism | 270.0 - 273.9  | 225   | 2.7               | 2.4                 | 3.1   |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 20. Total Number and Prevalence Rates of Endocrine, Metabolic, or Immune Disorders in Newborn Infants by County of Residence, 2008-2012**

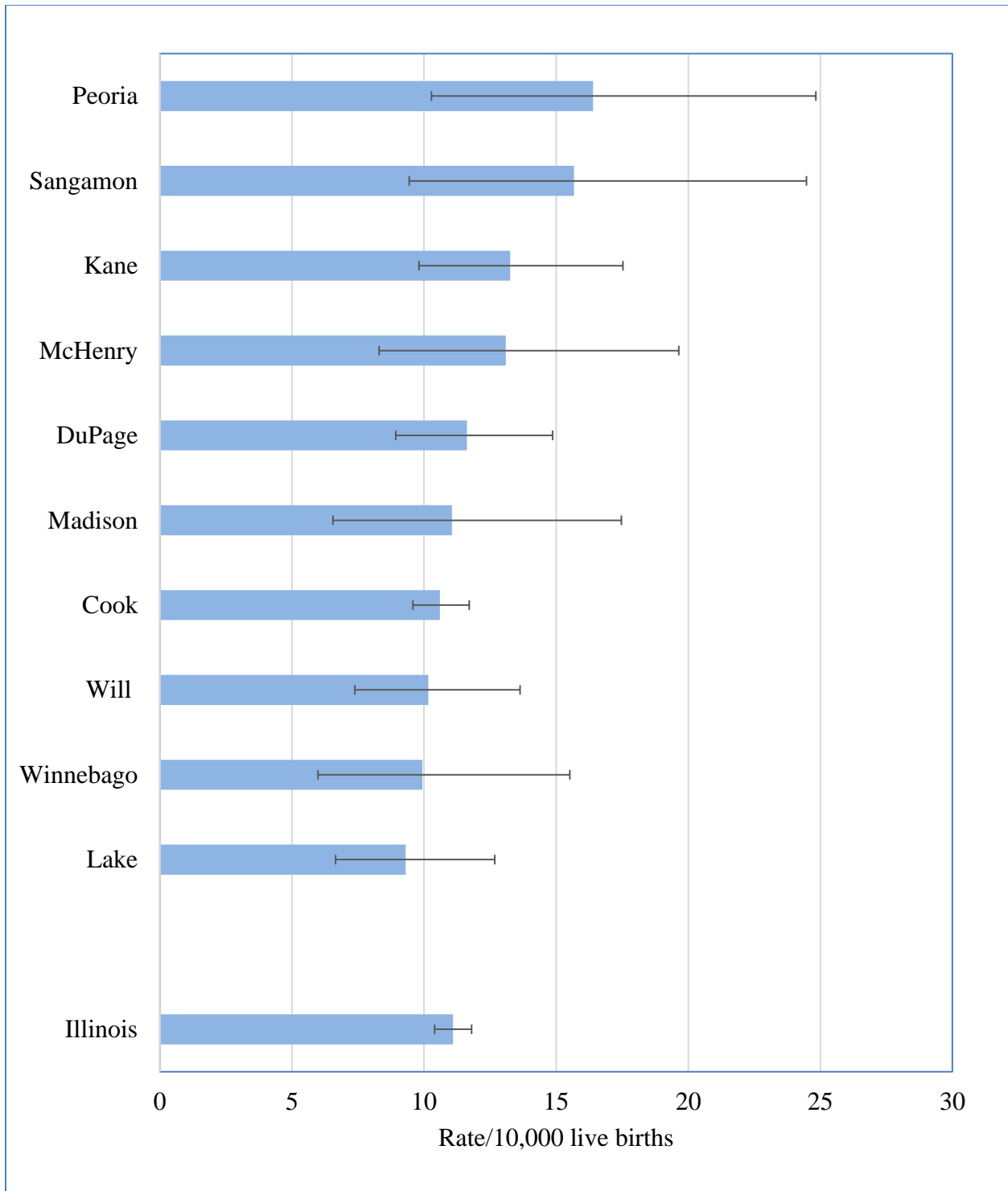
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 921   | 11.1              | 10.4                | 11.8  | Lee         | 0     | 0.0               | 0.0                 | 20.0  |
| Adams      | 5     | 12.4              | 4.0                 | 28.9  | Livingston  | 4     | 17.0              | 4.6                 | 43.5  |
| Alexander  | 0     | 0.0               | 0.0                 | 67.7  | Logan       | 1     | 6.5               | 0.2                 | 36.4  |
| Bond       | 2     | 22.8              | 2.8                 | 82.5  | McDonough   | 2     | 13.6              | 1.6                 | 49.0  |
| Boone      | 3     | 9.7               | 2.0                 | 28.4  | McHenry     | 23    | 13.1              | 8.3                 | 19.6  |
| Brown      | 2     | 72.5              | 8.8                 | 261.8 | McLean      | 9     | 8.4               | 3.9                 | 16.0  |
| Bureau     | 0     | 0.0               | 0.0                 | 20.7  | Macon       | 11    | 15.8              | 7.9                 | 28.2  |
| Calhoun    | 1     | 37.7              | 1.0                 | 210.3 | Macoupin    | 4     | 16.5              | 4.5                 | 42.3  |
| Carroll    | 0     | 0.0               | 0.0                 | 52.8  | Madison     | 18    | 11.1              | 6.6                 | 17.5  |
| Cass       | 1     | 10.9              | 0.3                 | 60.8  | Marion      | 6     | 23.7              | 8.7                 | 51.6  |
| Champaign  | 14    | 11.7              | 6.4                 | 19.6  | Marshall    | 0     | 0.0               | 0.0                 | 60.3  |
| Christian  | 0     | 0.0               | 0.0                 | 19.5  | Mason       | 0     | 0.0               | 0.0                 | 50.9  |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 1     | 11.3              | 0.3                 | 62.7  |
| Clay       | 0     | 0.0               | 0.0                 | 43.6  | Menard      | 1     | 15.8              | 0.4                 | 88.0  |
| Clinton    | 3     | 14.5              | 3.0                 | 42.5  | Mercer      | 0     | 0.0               | 0.0                 | 46.4  |
| Coles      | 5     | 18.7              | 6.1                 | 43.6  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 390   | 10.6              | 9.6                 | 11.7  | Montgomery  | 5     | 32.3              | 10.5                | 75.3  |
| Crawford   | 0     | 0.0               | 0.0                 | 35.9  | Morgan      | 7     | 37.3              | 15.0                | 76.8  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 2     | 23.0              | 2.8                 | 83.2  |
| DeKalb     | 7     | 11.1              | 4.5                 | 22.9  | Ogle        | 4     | 14.3              | 3.9                 | 36.6  |
| DeWitt     | 0     | 0.0               | 0.0                 | 39.2  | Peoria      | 22    | 16.4              | 10.3                | 24.8  |
| Douglas    | 5     | 37.2              | 12.1                | 86.8  | Perry       | 2     | 19.1              | 2.3                 | 69.1  |
| DuPage     | 63    | 11.6              | 8.9                 | 14.9  | Piatt       | 0     | 0.0               | 0.0                 | 43.8  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 2     | 21.9              | 2.7                 | 79.2  |
| Edwards    | 1     | 28.0              | 0.7                 | 156.1 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 5     | 22.3              | 7.2                 | 52.0  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 3     | 24.5              | 5.1                 | 71.7  | Putnam      | 1     | 38.0              | 1.0                 | 211.8 |
| Ford       | 1     | 13.6              | 0.3                 | 76.0  | Randolph    | 5     | 28.0              | 9.1                 | 65.3  |
| Franklin   | 1     | 4.3               | 0.1                 | 23.9  | Richland    | 1     | 10.2              | 0.3                 | 56.9  |
| Fulton     | 4     | 21.9              | 6.0                 | 56.0  | Rock Island | 10    | 10.3              | 5.0                 | 19.0  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 13    | 7.2               | 3.9                 | 12.4  |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 1     | 6.5               | 0.2                 | 36.0  |
| Grundy     | 2     | 6.0               | 0.7                 | 21.8  | Sangamon    | 19    | 15.7              | 9.4                 | 24.5  |
| Hamilton   | 0     | 0.0               | 0.0                 | 78.2  | Schuyler    | 3     | 81.5              | 16.8                | 238.2 |
| Hancock    | 1     | 10.1              | 0.3                 | 56.5  | Scott       | 0     | 0.0               | 0.0                 | 136.1 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 1     | 8.8               | 0.2                 | 48.9  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 0     | 0.0               | 0.0                 | 129.4 |
| Henry      | 2     | 7.3               | 0.9                 | 26.3  | Stephenson  | 1     | 3.9               | 0.1                 | 22.0  |
| Iroquois   | 1     | 6.4               | 0.2                 | 35.8  | Tazewell    | 14    | 17.1              | 9.3                 | 28.6  |
| Jackson    | 2     | 5.9               | 0.7                 | 21.3  | Union       | 1     | 10.6              | 0.3                 | 58.8  |
| Jasper     | 1     | 17.7              | 0.4                 | 98.6  | Vermillion  | 11    | 20.3              | 10.1                | 36.3  |
| Jefferson  | 2     | 8.3               | 1.0                 | 29.9  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 4     | 35.1              | 9.6                 | 89.8  | Warren      | 0     | 0.0               | 0.0                 | 36.1  |
| Jo Daviess | 1     | 10.0              | 0.3                 | 55.5  | Washington  | 0     | 0.0               | 0.0                 | 50.7  |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 1     | 9.7               | 0.2                 | 54.3  |
| Kane       | 49    | 13.3              | 9.8                 | 17.5  | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 8     | 11.2              | 4.8                 | 22.0  | Whiteside   | 3     | 9.0               | 1.8                 | 26.2  |
| Kendall    | 8     | 8.9               | 3.8                 | 17.5  | Will        | 44    | 10.2              | 7.4                 | 13.6  |
| Knox       | 6     | 22.4              | 8.2                 | 48.8  | Williamson  | 1     | 2.6               | 0.1                 | 14.6  |
| Lake       | 40    | 9.3               | 6.6                 | 12.7  | Winnebago   | 19    | 9.9               | 6.0                 | 15.5  |
| LaSalle    | 3     | 4.8               | 1.0                 | 14.0  | Woodford    | 2     | 8.8               | 1.1                 | 31.8  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 19. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals For Endocrine, Metabolic, or Immune Disorders in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

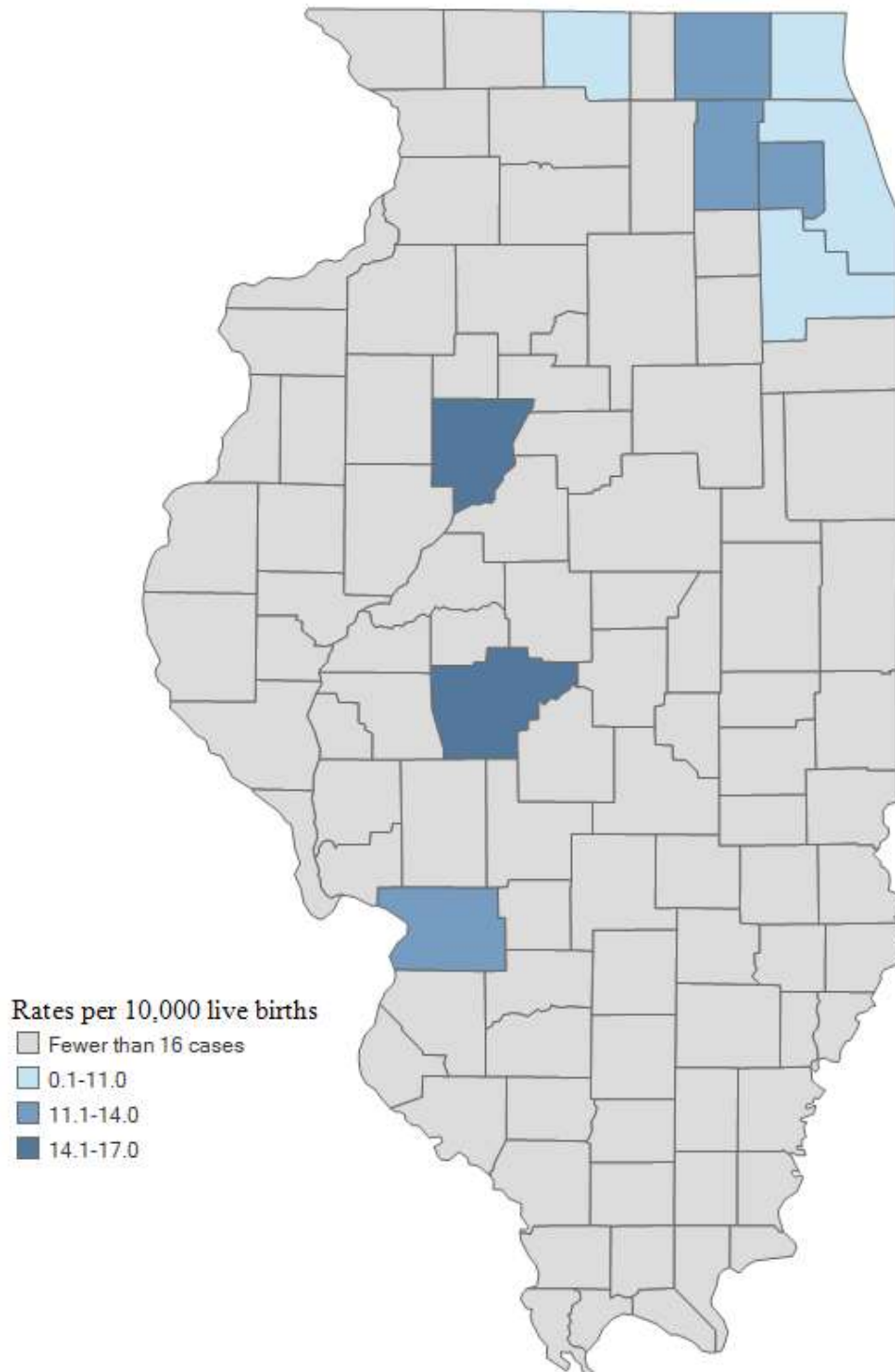


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 20. Map of Prevalence Rates for Endocrine, Metabolic, or Immune Disorders in Newborn Infants by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## BLOOD DISORDERS

APORS collects information on congenital blood disorders including anemias, leukemias, and coagulation defects. Descriptions of these conditions follow, together with Table 21, which gives the five-year prevalence rates for each condition for the state. Table 22 provides five-year prevalence rates by county. Figures 21 and 22 present prevalence rates for blood disorders for selected counties in table and map formats, respectively.

*Leukemia* is cancer of the blood cells. When it develops, the body produces large numbers of abnormal white blood cells. Acute lymphocytic leukemia is seen most commonly in children. Children with leukemia may have anemia; swollen lymph nodes, liver, or spleen; and bone or joint pain. In acute leukemia, the abnormal cells may collect in the central nervous system leading to headaches, confusion, loss of muscle control, and seizures. Leukemia also can affect the eyes, skin, testicles, digestive tract, kidneys, lungs, or other parts of the body.

*Hereditary hemolytic anemia* is a condition characterized by an inadequate number of circulating red blood cells (anemia), caused by premature destruction of red blood cells. There are several types of hereditary hemolytic anemia including sickle cell anemia, hemoglobin SC disease, sickle beta thalassemia, and spherocytosis. Symptoms include fatigue, shortness of breath, rapid heart rate, and jaundice.

*Constitutional aplastic anemia* is a hereditary, often fatal bone marrow failure disease that occurs when the bone marrow is hypoplastic. Bone marrow transplantation replaces the defective bone marrow of a patient with healthy cells from a normal donor and can cure the disease in about 80% of cases where a sibling with identical tissue type is the donor. Growth factors are also being used in treatment.

*Coagulation defects* are a group of inherited blood disorders characterized by a deficiency in one or more of the factors that make up the blood clotting system. Each condition may be severe, moderate, or mild. In hemophilia, easy bruising and internal bleeding are characteristic. In the severe forms, repeated bleeding into joints is a problem and can lead to long-term joint damage. Treatment consists of intravenous replacement of the missing clotting factors.

**Table 21. Total Number and Prevalence Rates of Blood Disorders  
in Newborn Infants, Illinois, 2008-2012**

| Defect                         | ICD-9-CM<br>Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|--------------------------------|-------------------|-------|-------------------|---------------------|-------|
|                                |                   |       |                   | Lower               | Upper |
| Coagulation defects            | 286.x             | 60    | 0.7               | 0.5                 | 0.9   |
| Constitutional aplastic anemia | 284.x             | 3     | 0.0               | 0.0                 | 0.1   |
| Hereditary hemolytic anemia    | 282.x             | 584   | 7.0               | 6.5                 | 7.6   |
| Leukemia                       | 204.00 - 208.91   | 5     | 0.1               | 0.0                 | 0.1   |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



**Table 22. Total Number and Prevalence Rates of Blood Disorders in Newborn Infants by County of Residence, 2008-2012**

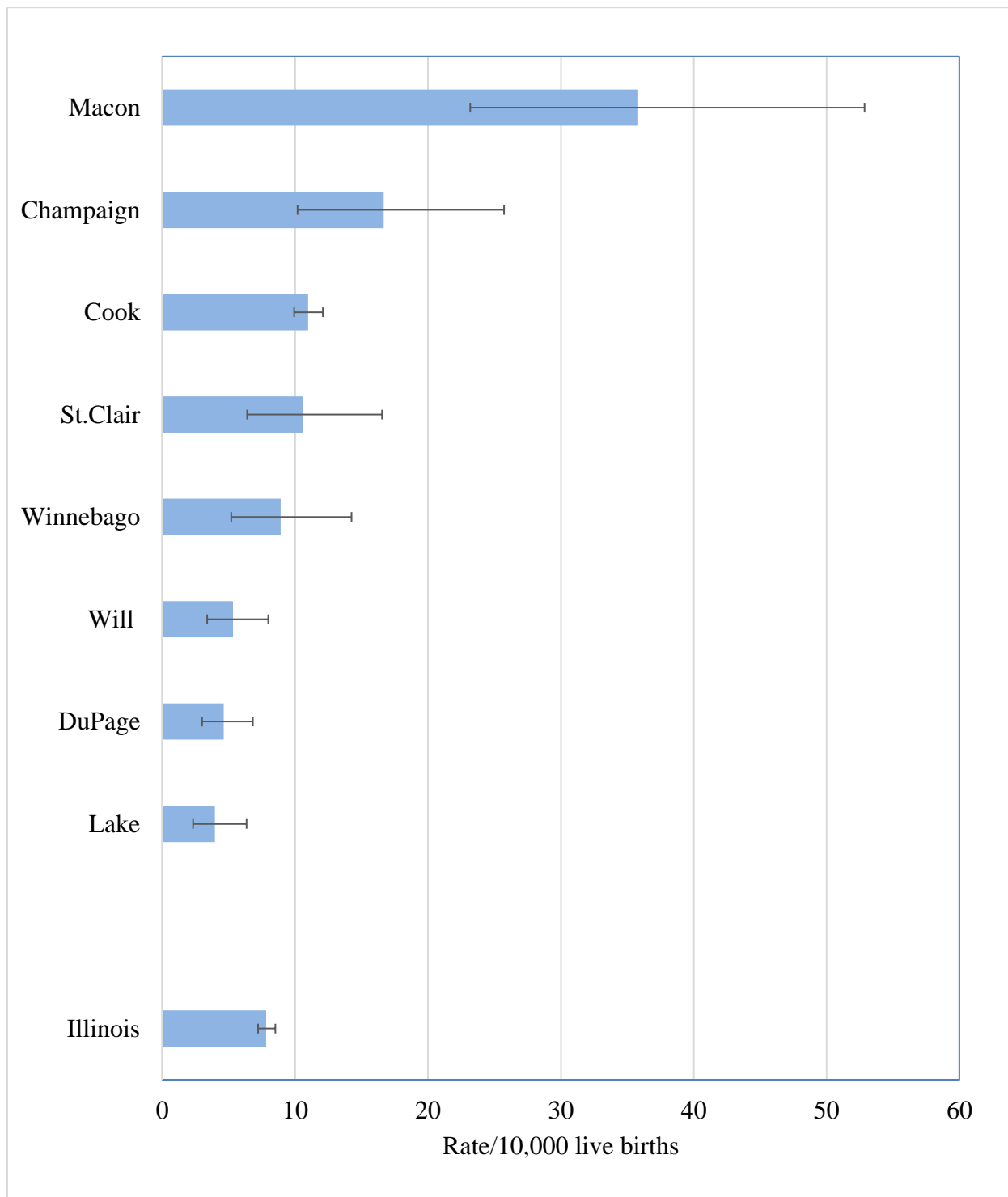
| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 652   | 7.8               | 7.2                 | 8.5   | Lee         | 0     | 0.0               | 0.0                 | 20.0  |
| Adams      | 1     | 2.5               | 0.1                 | 13.8  | Livingston  | 0     | 0.0               | 0.0                 | 15.7  |
| Alexander  | 0     | 0.0               | 0.0                 | 67.7  | Logan       | 0     | 0.0               | 0.0                 | 24.1  |
| Bond       | 0     | 0.0               | 0.0                 | 42.1  | McDonough   | 2     | 13.6              | 1.6                 | 49.0  |
| Boone      | 0     | 0.0               | 0.0                 | 12.0  | McHenry     | 7     | 4.0               | 1.6                 | 8.2   |
| Brown      | 0     | 0.0               | 0.0                 | 133.7 | McLean      | 5     | 4.7               | 1.5                 | 10.9  |
| Bureau     | 1     | 5.6               | 0.1                 | 31.2  | Macon       | 25    | 35.8              | 23.2                | 52.9  |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 0     | 0.0               | 0.0                 | 15.2  |
| Carroll    | 0     | 0.0               | 0.0                 | 52.8  | Madison     | 5     | 3.1               | 1.0                 | 7.2   |
| Cass       | 0     | 0.0               | 0.0                 | 40.3  | Marion      | 0     | 0.0               | 0.0                 | 14.6  |
| Champaign  | 20    | 16.7              | 10.2                | 25.7  | Marshall    | 0     | 0.0               | 0.0                 | 60.3  |
| Christian  | 3     | 15.8              | 3.3                 | 46.2  | Mason       | 0     | 0.0               | 0.0                 | 50.9  |
| Clark      | 0     | 0.0               | 0.0                 | 38.2  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 0     | 0.0               | 0.0                 | 43.6  | Menard      | 0     | 0.0               | 0.0                 | 58.3  |
| Clinton    | 0     | 0.0               | 0.0                 | 17.9  | Mercer      | 0     | 0.0               | 0.0                 | 46.4  |
| Coles      | 3     | 11.2              | 2.3                 | 32.8  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 403   | 11.0              | 9.9                 | 12.1  | Montgomery  | 0     | 0.0               | 0.0                 | 23.8  |
| Crawford   | 0     | 0.0               | 0.0                 | 35.9  | Morgan      | 1     | 5.3               | 0.1                 | 29.7  |
| Cumberland | 0     | 0.0               | 0.0                 | 61.0  | Moultrie    | 0     | 0.0               | 0.0                 | 42.5  |
| DeKalb     | 2     | 3.2               | 0.4                 | 11.5  | Ogle        | 0     | 0.0               | 0.0                 | 13.2  |
| DeWitt     | 0     | 0.0               | 0.0                 | 39.2  | Peoria      | 8     | 6.0               | 2.6                 | 11.8  |
| Douglas    | 2     | 14.9              | 1.8                 | 53.8  | Perry       | 0     | 0.0               | 0.0                 | 35.3  |
| DuPage     | 25    | 4.6               | 3.0                 | 6.8   | Piatt       | 0     | 0.0               | 0.0                 | 43.8  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 0     | 0.0               | 0.0                 | 40.4  |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 0     | 0.0               | 0.0                 | 16.4  | Pulaski     | 2     | 61.2              | 7.4                 | 220.9 |
| Fayette    | 1     | 8.2               | 0.2                 | 45.6  | Putnam      | 0     | 0.0               | 0.0                 | 140.3 |
| Ford       | 1     | 13.6              | 0.3                 | 76.0  | Randolph    | 0     | 0.0               | 0.0                 | 20.6  |
| Franklin   | 0     | 0.0               | 0.0                 | 15.8  | Richland    | 0     | 0.0               | 0.0                 | 37.6  |
| Fulton     | 0     | 0.0               | 0.0                 | 20.2  | Rock Island | 9     | 9.3               | 4.3                 | 17.7  |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 19    | 10.6              | 6.4                 | 16.5  |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 0     | 0.0               | 0.0                 | 23.8  |
| Grundy     | 1     | 3.0               | 0.1                 | 16.8  | Sangamon    | 14    | 11.5              | 6.3                 | 19.4  |
| Hamilton   | 0     | 0.0               | 0.0                 | 78.2  | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 0     | 0.0               | 0.0                 | 37.4  | Scott       | 0     | 0.0               | 0.0                 | 136.1 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 1     | 8.8               | 0.2                 | 48.9  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 0     | 0.0               | 0.0                 | 129.4 |
| Henry      | 0     | 0.0               | 0.0                 | 13.4  | Stephenson  | 0     | 0.0               | 0.0                 | 14.5  |
| Iroquois   | 0     | 0.0               | 0.0                 | 23.7  | Tazewell    | 1     | 1.2               | 0.0                 | 6.8   |
| Jackson    | 3     | 8.8               | 1.8                 | 25.8  | Union       | 0     | 0.0               | 0.0                 | 39.0  |
| Jasper     | 0     | 0.0               | 0.0                 | 65.3  | Vermillion  | 4     | 7.4               | 2.0                 | 18.9  |
| Jefferson  | 0     | 0.0               | 0.0                 | 15.3  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 0     | 0.0               | 0.0                 | 32.4  | Warren      | 0     | 0.0               | 0.0                 | 36.1  |
| Jo Daviess | 0     | 0.0               | 0.0                 | 36.8  | Washington  | 0     | 0.0               | 0.0                 | 50.7  |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 0     | 0.0               | 0.0                 | 35.9  |
| Kane       | 15    | 4.1               | 2.3                 | 6.7   | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 2     | 2.8               | 0.3                 | 10.1  | Whiteside   | 0     | 0.0               | 0.0                 | 11.0  |
| Kendall    | 4     | 4.4               | 1.2                 | 11.4  | Will        | 23    | 5.3               | 3.4                 | 8.0   |
| Knox       | 1     | 3.7               | 0.1                 | 20.8  | Williamson  | 0     | 0.0               | 0.0                 | 9.6   |
| Lake       | 17    | 4.0               | 2.3                 | 6.3   | Winnebago   | 17    | 8.9               | 5.2                 | 14.2  |
| LaSalle    | 4     | 6.4               | 1.7                 | 16.4  | Woodford    | 0     | 0.0               | 0.0                 | 16.2  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 21. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals  
For Blood Disorders in Newborn Infants  
by Selected Counties of Residence,<sup>2</sup> 2008-2012**

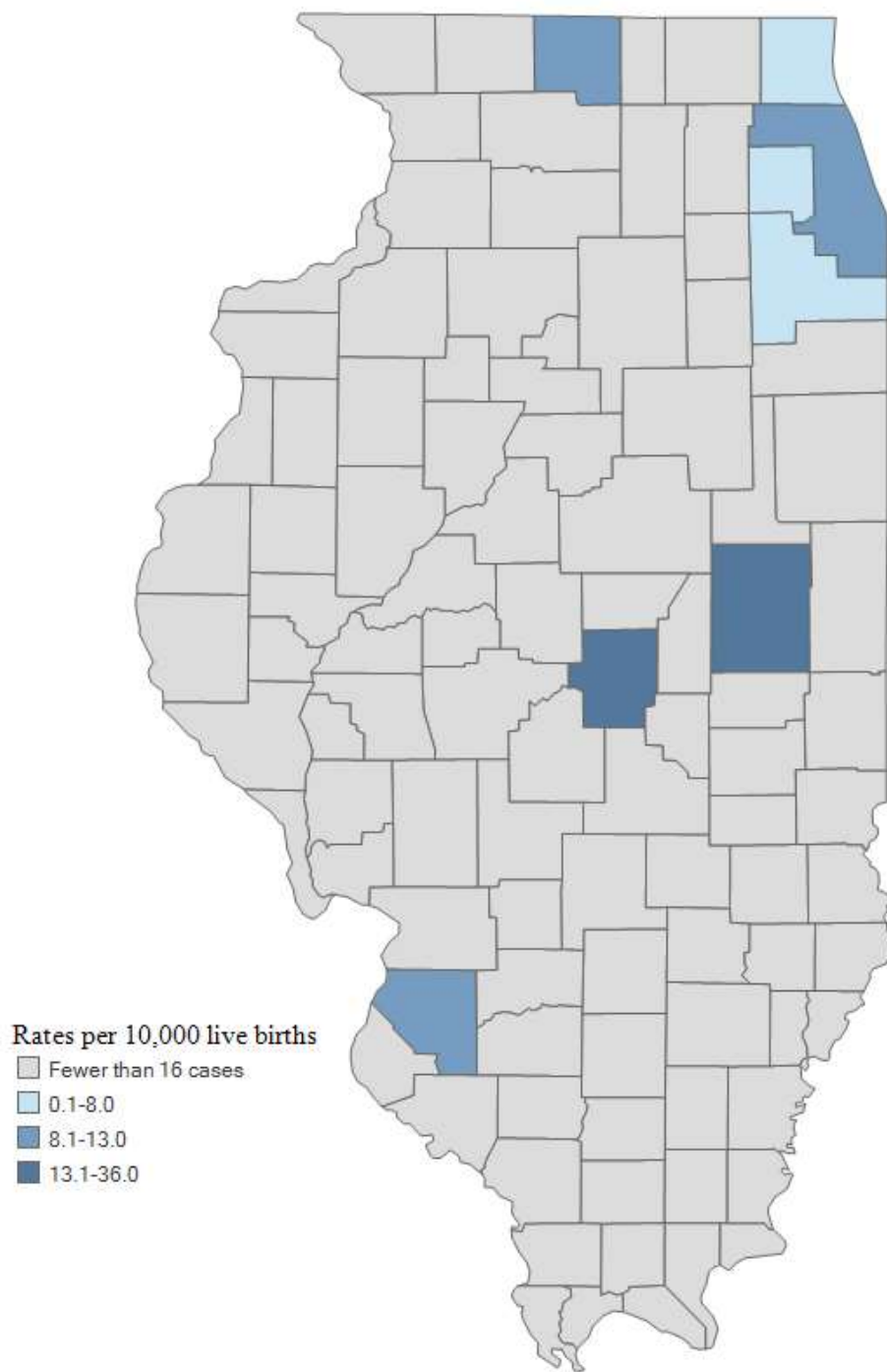


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 22. Map of Prevalence Rates  
for Blood Disorders in Newborn Infants  
by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## **FETAL ALCOHOL EXPOSURE**

When alcohol is ingested by a pregnant woman, it easily passes across the placenta to the fetus and can adversely affect the development of the baby. This can occur during any trimester, so no amount of alcohol is considered “safe” during any stage of pregnancy.

Multiple birth defects associated with “classical” fetal alcohol syndrome consist of the following: intrauterine growth restriction, delayed development with decreased mental functioning (mild to severe), facial abnormalities (including microcephaly), heart defects, and limb abnormalities of joints, hands, feet, fingers and toes.

Fetal alcohol syndrome is rarely diagnosed in newborn infants. The data collected by APORS includes babies diagnosed with fetal alcohol spectrum disorders as well as those affected by or significantly exposed to alcohol as reported by Illinois hospitals. Table 23 gives five-year prevalence rates for significantly alcohol exposed infants by county.

There is no figure illustrating the data since only Cook and Winnebago counties had more than 16 cases.

**Table 23. Total Number and Prevalence Rates of Newborn Infants with Fetal Alcohol Exposure by County of Residence, 2008-2012**

| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 128   | 1.5               | 1.3                 | 1.8   | Lee         | 0     | 0.0               | 0.0                 | 20.0  |
| Adams      | 0     | 0.0               | 0.0                 | 9.1   | Livingston  | 0     | 0.0               | 0.0                 | 15.7  |
| Alexander  | 0     | 0.0               | 0.0                 | 67.7  | Logan       | 1     | 6.5               | 0.2                 | 36.4  |
| Bond       | 1     | 11.4              | 0.3                 | 63.6  | McDonough   | 0     | 0.0               | 0.0                 | 25.0  |
| Boone      | 2     | 6.5               | 0.8                 | 23.4  | McHenry     | 0     | 0.0               | 0.0                 | 2.1   |
| Brown      | 0     | 0.0               | 0.0                 | 133.7 | McLean      | 3     | 2.8               | 0.6                 | 8.2   |
| Bureau     | 1     | 5.6               | 0.1                 | 31.2  | Macon       | 3     | 4.3               | 0.9                 | 12.6  |
| Calhoun    | 0     | 0.0               | 0.0                 | 139.2 | Macoupin    | 0     | 0.0               | 0.0                 | 15.2  |
| Carroll    | 0     | 0.0               | 0.0                 | 52.8  | Madison     | 2     | 1.2               | 0.1                 | 4.4   |
| Cass       | 0     | 0.0               | 0.0                 | 40.3  | Marion      | 0     | 0.0               | 0.0                 | 14.6  |
| Champaign  | 4     | 3.3               | 0.9                 | 8.5   | Marshall    | 0     | 0.0               | 0.0                 | 60.3  |
| Christian  | 0     | 0.0               | 0.0                 | 19.5  | Mason       | 0     | 0.0               | 0.0                 | 50.9  |
| Clark      | 1     | 10.4              | 0.3                 | 57.7  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 0     | 0.0               | 0.0                 | 43.6  | Menard      | 0     | 0.0               | 0.0                 | 58.3  |
| Clinton    | 0     | 0.0               | 0.0                 | 17.9  | Mercer      | 0     | 0.0               | 0.0                 | 46.4  |
| Coles      | 2     | 7.5               | 0.9                 | 27.0  | Monroe      | 0     | 0.0               | 0.0                 | 21.9  |
| Cook       | 30    | 0.8               | 0.6                 | 1.2   | Montgomery  | 0     | 0.0               | 0.0                 | 23.8  |
| Crawford   | 0     | 0.0               | 0.0                 | 35.9  | Morgan      | 0     | 0.0               | 0.0                 | 19.6  |
| Cumberland | 1     | 16.5              | 0.4                 | 92.1  | Moultrie    | 0     | 0.0               | 0.0                 | 42.5  |
| DeKalb     | 0     | 0.0               | 0.0                 | 5.9   | Ogle        | 1     | 3.6               | 0.1                 | 19.9  |
| DeWitt     | 0     | 0.0               | 0.0                 | 39.2  | Peoria      | 0     | 0.0               | 0.0                 | 2.8   |
| Douglas    | 0     | 0.0               | 0.0                 | 27.4  | Perry       | 0     | 0.0               | 0.0                 | 35.3  |
| DuPage     | 1     | 0.2               | 0.0                 | 1.0   | Piatt       | 0     | 0.0               | 0.0                 | 43.8  |
| Edgar      | 0     | 0.0               | 0.0                 | 38.4  | Pike        | 0     | 0.0               | 0.0                 | 40.4  |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 0     | 0.0               | 0.0                 | 238.0 |
| Effingham  | 2     | 8.9               | 1.1                 | 32.2  | Pulaski     | 0     | 0.0               | 0.0                 | 112.8 |
| Fayette    | 1     | 8.2               | 0.2                 | 45.6  | Putnam      | 0     | 0.0               | 0.0                 | 140.3 |
| Ford       | 0     | 0.0               | 0.0                 | 50.3  | Randolph    | 0     | 0.0               | 0.0                 | 20.6  |
| Franklin   | 0     | 0.0               | 0.0                 | 15.8  | Richland    | 0     | 0.0               | 0.0                 | 37.6  |
| Fulton     | 0     | 0.0               | 0.0                 | 20.2  | Rock Island | 0     | 0.0               | 0.0                 | 3.8   |
| Gallatin   | 0     | 0.0               | 0.0                 | 129.9 | St. Clair   | 2     | 1.1               | 0.1                 | 4.0   |
| Greene     | 0     | 0.0               | 0.0                 | 48.2  | Saline      | 0     | 0.0               | 0.0                 | 23.8  |
| Grundy     | 0     | 0.0               | 0.0                 | 11.1  | Sangamon    | 1     | 0.8               | 0.0                 | 4.6   |
| Hamilton   | 0     | 0.0               | 0.0                 | 78.2  | Schuyler    | 0     | 0.0               | 0.0                 | 100.2 |
| Hancock    | 0     | 0.0               | 0.0                 | 37.4  | Scott       | 0     | 0.0               | 0.0                 | 136.1 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 0     | 0.0               | 0.0                 | 32.4  |
| Henderson  | 0     | 0.0               | 0.0                 | 123.4 | Stark       | 0     | 0.0               | 0.0                 | 129.4 |
| Henry      | 0     | 0.0               | 0.0                 | 13.4  | Stephenson  | 1     | 3.9               | 0.1                 | 22.0  |
| Iroquois   | 0     | 0.0               | 0.0                 | 23.7  | Tazewell    | 2     | 2.4               | 0.3                 | 8.8   |
| Jackson    | 0     | 0.0               | 0.0                 | 10.9  | Union       | 0     | 0.0               | 0.0                 | 39.0  |
| Jasper     | 0     | 0.0               | 0.0                 | 65.3  | Vermillion  | 5     | 9.2               | 3.0                 | 21.5  |
| Jefferson  | 0     | 0.0               | 0.0                 | 15.3  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 0     | 0.0               | 0.0                 | 32.4  | Warren      | 0     | 0.0               | 0.0                 | 36.1  |
| Jo Daviess | 0     | 0.0               | 0.0                 | 36.8  | Washington  | 0     | 0.0               | 0.0                 | 50.7  |
| Johnson    | 0     | 0.0               | 0.0                 | 62.8  | Wayne       | 0     | 0.0               | 0.0                 | 35.9  |
| Kane       | 2     | 0.5               | 0.1                 | 2.0   | White       | 0     | 0.0               | 0.0                 | 42.5  |
| Kankakee   | 0     | 0.0               | 0.0                 | 5.1   | Whiteside   | 4     | 12.0              | 3.3                 | 30.6  |
| Kendall    | 0     | 0.0               | 0.0                 | 4.1   | Will        | 3     | 0.7               | 0.1                 | 2.0   |
| Knox       | 0     | 0.0               | 0.0                 | 13.8  | Williamson  | 1     | 2.6               | 0.1                 | 14.6  |
| Lake       | 11    | 2.6               | 1.3                 | 4.6   | Winnebago   | 40    | 20.9              | 14.9                | 28.5  |
| LaSalle    | 0     | 0.0               | 0.0                 | 5.9   | Woodford    | 0     | 0.0               | 0.0                 | 16.2  |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

<sup>2</sup> 95% confidence intervals for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

## OTHER ADVERSE PREGNANCY OUTCOMES

APORS collects information on a variety of other adverse outcomes in newborns. Descriptions of these conditions follow, together with Table 24, which gives the five-year prevalence rates for each condition for the state. Table 25 provides five-year prevalence rates by county. Figures 23 and 24 present prevalence rates for other adverse outcomes for selected counties in table and map formats, respectively.

*Neurofibromatosis (NF)* is a genetic disease in which patients develop multiple soft tumors under the skin and throughout the nervous system. NF occurs in about one of every 4,000 births and may cause speech impairment, learning disabilities, and attention deficit disorder in children, as well as loss of hearing, weakness of facial muscles, headache, poor balance, and uncoordinated walking. Cataracts frequently develop at an unusually early age. The chance of brain tumors developing is unusually high.

*Retinopathy of prematurity (ROP)* is an eye disease that occurs in some premature babies. The last 12 weeks of a full-term pregnancy are particularly active for the growth of the fetal eye. In premature infants, the normal growth of the retinal vessels stops, and abnormal new vessels begin to grow and spread in the retina. The infant may become blind. Most infants with mild ROP usually develop normal central vision. However, some may have late complications, including strabismus, amblyopia, myopia, glaucoma, and late onset retinal detachment.

*Chorioretinitis* is an inflammation of the uveal tract, which lines the inside of the eye behind the cornea. It almost always affects the retina, usually following an active microbial invasion of the tissues. Toxoplasmosis and cytomegalovirus are the most common causes. Onset is insidious: vision gradually becomes blurred, pain is minimal, mild photophobia is present, and the pupil is often constricted and/or irregular in shape. The disease can last months to years, sometimes with remissions and exacerbations, and may cause permanent damage with marked visual loss.

*Strabismus* is a condition in which the eyes do not point in the same direction. Esotropia (crossed eyes) is the most common type of strabismus in infants. Sometimes the eye turn is always in the same eye; however, sometimes the turn alternates from one eye to the other. An eye doctor needs to determine whether the eye turn is true or pseudo strabismus. A baby's eyes should be straight and parallel by three or four months of age. Strabismus can be caused by a defect in muscles or the part of the brain that controls eye movement. It is especially common in children who have disorders that affect the brain.

*Endocardial fibroelastosis (EFE)* is a rare heart disorder that affects infants and children. It is characterized by a thickening within the muscular lining of the heart chambers due to an increase in the amount of supporting connective tissue and elastic fibers. The symptoms of EFE are related to the overgrowth of fibrous tissues causing abnormal enlargement of the heart (cardiac hypertrophy), especially the left ventricle. Impaired heart and lung function eventually lead to congestive heart failure.

*Intrauterine growth restriction (IUGR)* occurs when the unborn baby is at or below the 10th weight percentile for his or her gestational age. There are many IUGR risk factors involving the mother and the baby. A mother is at risk for having an infant with IUGR if she has poor weight gain and nutrition during pregnancy, uses substances (like tobacco, narcotics, or alcohol) that can cause abnormal development, or if she has preeclampsia or chronic kidney disease. Additionally, an unborn baby may suffer from IUGR if it is exposed to an infection, has a birth defect, or has placenta or umbilical cord defects. Babies who suffer from IUGR are at an increased risk for death, hypoglycemia, hypothermia, and abnormal development of the nervous system.

*Cerebral lipidoses* are inherited genetic defects that result in a deficiency in different enzymes involved with fat storage. The absence of the enzyme prevents the lysosome in the cells of the body from performing its natural recycling function, and various materials are inappropriately stored in the cells of the brain and central nervous system. This leads to a variety of progressive mental and physical deterioration over time. Some patients survive into adulthood, but others with more severe symptoms or conditions die in their teens or earlier.

**Table 24. Total Number and Prevalence Rates of Other Adverse Pregnancy Outcomes in Newborn Infants, Illinois, 2008-2012**

| Defect                          | ICD-9-CM Codes | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|---------------------------------|----------------|-------|-------------------|---------------------|-------|
|                                 |                |       |                   | Lower               | Upper |
| Cerebral lipidoses              | 330.1          | 0     | 0                 | 0.0                 | 0.1   |
| Chorioretinitis                 | 363.20-363.22  | 3     | 0.0               | 0.0                 | 0.1   |
| Endocardial fibroelastosis      | 425.3          | 8     | 0.1               | 0.0                 | 0.2   |
| Intrauterine growth restriction | 764.90-764.99  | 4,424 | 53.1              | 51.5                | 54.7  |
| Neurofibromatosis               | 237.70-237.72  | 3     | 0.0               | 0.0                 | 0.1   |
| Occlusion of cerebral arteries  | 434.00-434.91  | 170   | 2.0               | 1.7                 | 2.4   |
| Retinopathy of prematurity      | 362.20-362.27  | 2,473 | 29.7              | 28.5                | 30.9  |
| Strabismus                      | 378.00-378.9   | 15    | 0.2               | 0.1                 | 0.3   |

<sup>1</sup> Rate per 10,000 live births

<sup>2</sup> 95% confidence interval for rate

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Table 25. Total Number and Prevalence Rates of Other Adverse Pregnancy Outcomes in Newborn Infants by County of Residence, 2008-2012**

| County     | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       | County      | Cases | Rate <sup>1</sup> | 95% CI <sup>2</sup> |       |
|------------|-------|-------------------|---------------------|-------|-------------|-------|-------------------|---------------------|-------|
|            |       |                   | Lower               | Upper |             |       |                   | Lower               | Upper |
| ILLINOIS   | 7,096 | 85.2              | 83.2                | 87.2  | Lee         | 14    | 75.8              | 41.4                | 127.1 |
| Adams      | 42    | 103.9             | 74.9                | 140.5 | Livingston  | 16    | 68.0              | 38.9                | 110.4 |
| Alexander  | 2     | 36.7              | 4.4                 | 132.6 | Logan       | 14    | 91.4              | 50.0                | 153.4 |
| Bond       | 7     | 79.9              | 32.1                | 164.6 | McDonough   | 23    | 155.9             | 98.8                | 234.0 |
| Boone      | 37    | 119.9             | 84.4                | 165.3 | McHenry     | 101   | 57.5              | 46.8                | 69.9  |
| Brown      | 5     | 181.2             | 58.8                | 422.8 | McLean      | 96    | 90.0              | 72.9                | 109.9 |
| Bureau     | 11    | 61.6              | 30.8                | 110.3 | Macon       | 61    | 87.4              | 66.8                | 112.2 |
| Calhoun    | 1     | 37.7              | 1.0                 | 210.3 | Macoupin    | 19    | 78.4              | 47.2                | 122.4 |
| Carroll    | 8     | 114.6             | 49.5                | 225.8 | Madison     | 91    | 55.9              | 45.0                | 68.6  |
| Cass       | 6     | 65.5              | 24.0                | 142.6 | Marion      | 28    | 110.7             | 73.6                | 160.0 |
| Champaign  | 203   | 169.0             | 146.6               | 194.0 | Marshall    | 4     | 65.4              | 17.8                | 167.3 |
| Christian  | 28    | 147.7             | 98.1                | 213.4 | Mason       | 11    | 151.7             | 75.7                | 271.5 |
| Clark      | 3     | 31.1              | 6.4                 | 90.8  | Massac      | 0     | 0.0               | 0.0                 | 41.5  |
| Clay       | 10    | 118.1             | 56.6                | 217.1 | Menard      | 6     | 94.8              | 34.8                | 206.3 |
| Clinton    | 12    | 58.1              | 30.0                | 101.5 | Mercer      | 2     | 25.2              | 3.0                 | 90.9  |
| Coles      | 12    | 44.9              | 23.2                | 78.4  | Monroe      | 7     | 41.6              | 16.7                | 85.6  |
| Cook       | 3,424 | 93.1              | 90.0                | 96.3  | Montgomery  | 16    | 103.3             | 59.0                | 167.7 |
| Crawford   | 10    | 97.4              | 46.7                | 179.1 | Morgan      | 11    | 58.6              | 29.2                | 104.8 |
| Cumberland | 6     | 99.2              | 36.4                | 215.9 | Moultrie    | 8     | 92.2              | 39.8                | 181.6 |
| DeKalb     | 30    | 47.7              | 32.2                | 68.1  | Ogle        | 22    | 78.6              | 49.3                | 119.0 |
| DeWitt     | 11    | 117.0             | 58.4                | 209.4 | Peoria      | 167   | 124.5             | 106.3               | 144.9 |
| Douglas    | 11    | 81.8              | 40.9                | 146.4 | Perry       | 5     | 47.8              | 15.5                | 111.6 |
| DuPage     | 491   | 90.6              | 82.7                | 98.9  | Piatt       | 5     | 59.4              | 19.3                | 138.6 |
| Edgar      | 8     | 83.2              | 35.9                | 164.0 | Pike        | 11    | 120.6             | 60.2                | 215.8 |
| Edwards    | 0     | 0.0               | 0.0                 | 103.3 | Pope        | 1     | 64.5              | 1.6                 | 359.5 |
| Effingham  | 35    | 155.8             | 108.5               | 216.7 | Pulaski     | 2     | 61.2              | 7.4                 | 220.9 |
| Fayette    | 14    | 114.5             | 62.6                | 192.1 | Putnam      | 1     | 38.0              | 1.0                 | 211.8 |
| Ford       | 9     | 122.8             | 56.1                | 233.1 | Randolph    | 5     | 28.0              | 9.1                 | 65.3  |
| Franklin   | 16    | 68.6              | 39.2                | 111.3 | Richland    | 6     | 61.2              | 22.5                | 133.3 |
| Fulton     | 12    | 65.6              | 33.9                | 114.7 | Rock Island | 38    | 39.3              | 27.8                | 53.9  |
| Gallatin   | 1     | 35.2              | 0.9                 | 196.2 | St. Clair   | 120   | 66.9              | 55.4                | 80.0  |
| Greene     | 12    | 156.7             | 80.9                | 273.6 | Saline      | 7     | 45.2              | 18.2                | 93.2  |
| Grundy     | 28    | 84.4              | 56.1                | 122.0 | Sangamon    | 142   | 117.1             | 98.7                | 138.1 |
| Hamilton   | 1     | 21.2              | 0.5                 | 118.0 | Schuyler    | 2     | 54.3              | 6.6                 | 196.3 |
| Hancock    | 10    | 101.3             | 48.6                | 186.3 | Scott       | 4     | 147.6             | 40.2                | 377.9 |
| Hardin     | 0     | 0.0               | 0.0                 | 179.1 | Shelby      | 10    | 87.7              | 42.1                | 161.3 |
| Henderson  | 4     | 133.8             | 36.5                | 342.5 | Stark       | 3     | 105.3             | 21.7                | 307.6 |
| Henry      | 21    | 76.5              | 47.3                | 116.9 | Stephenson  | 41    | 161.6             | 116.0               | 219.2 |
| Iroquois   | 10    | 64.2              | 30.8                | 118.1 | Tazewell    | 83    | 101.1             | 80.5                | 125.3 |
| Jackson    | 29    | 85.5              | 57.2                | 122.7 | Union       | 7     | 73.9              | 29.7                | 152.3 |
| Jasper     | 7     | 123.9             | 49.8                | 255.3 | Vermillion  | 47    | 86.7              | 63.7                | 115.2 |
| Jefferson  | 14    | 58.0              | 31.7                | 97.3  | Wabash      | 0     | 0.0               | 0.0                 | 49.8  |
| Jersey     | 2     | 17.5              | 2.1                 | 63.4  | Warren      | 5     | 48.9              | 15.9                | 114.2 |
| Jo Daviess | 7     | 69.8              | 28.1                | 143.8 | Washington  | 2     | 27.5              | 3.3                 | 99.4  |
| Johnson    | 1     | 17.0              | 0.4                 | 94.9  | Wayne       | 3     | 29.2              | 6.0                 | 85.4  |
| Kane       | 213   | 57.6              | 50.2                | 65.9  | White       | 2     | 23.1              | 2.8                 | 83.3  |
| Kankakee   | 28    | 39.0              | 25.9                | 56.4  | Whiteside   | 10    | 29.9              | 14.3                | 55.0  |
| Kendall    | 53    | 58.8              | 44.0                | 76.8  | Will        | 353   | 81.5              | 73.2                | 90.4  |
| Knox       | 28    | 104.6             | 69.5                | 151.2 | Williamson  | 16    | 41.8              | 23.9                | 67.9  |
| Lake       | 288   | 67.0              | 59.5                | 75.2  | Winnebago   | 163   | 85.3              | 72.7                | 99.4  |
| LaSalle    | 48    | 76.8              | 56.6                | 101.8 | Woodford    | 14    | 61.6              | 33.7                | 103.3 |
| Lawrence   | 0     | 0.0               | 0.0                 | 43.7  |             |       |                   |                     |       |

<sup>1</sup> Per 10,000 live births

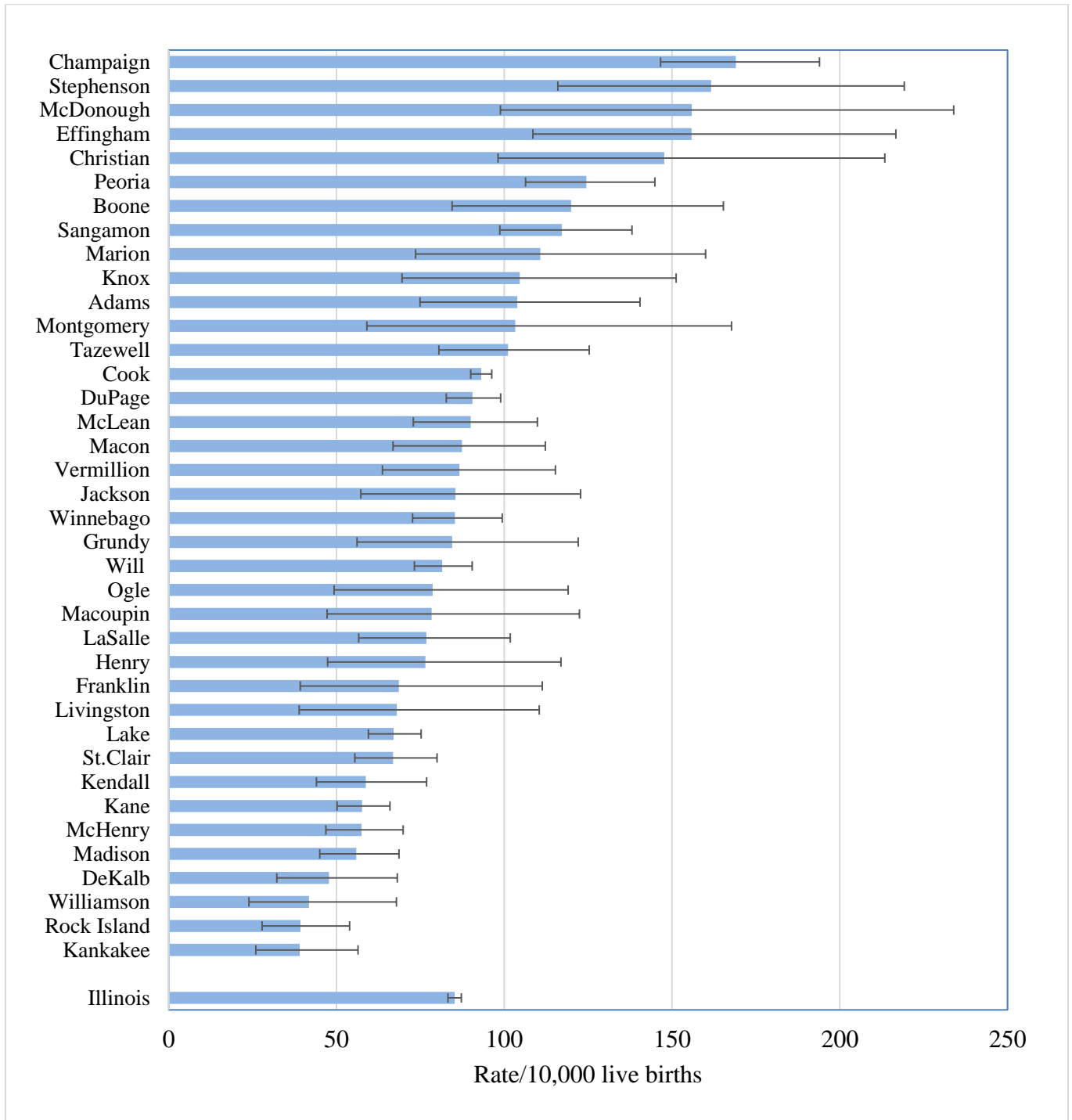
<sup>2</sup> 95% confidence interval for rate

The number for Illinois two cases for which county of residence is missing.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019



**Figure 23. Prevalence Rates<sup>1</sup> and 95% Confidence Intervals for Other Adverse Pregnancy Outcomes in Newborn Infants by Selected Counties of Residence,<sup>2</sup> 2008-2012**

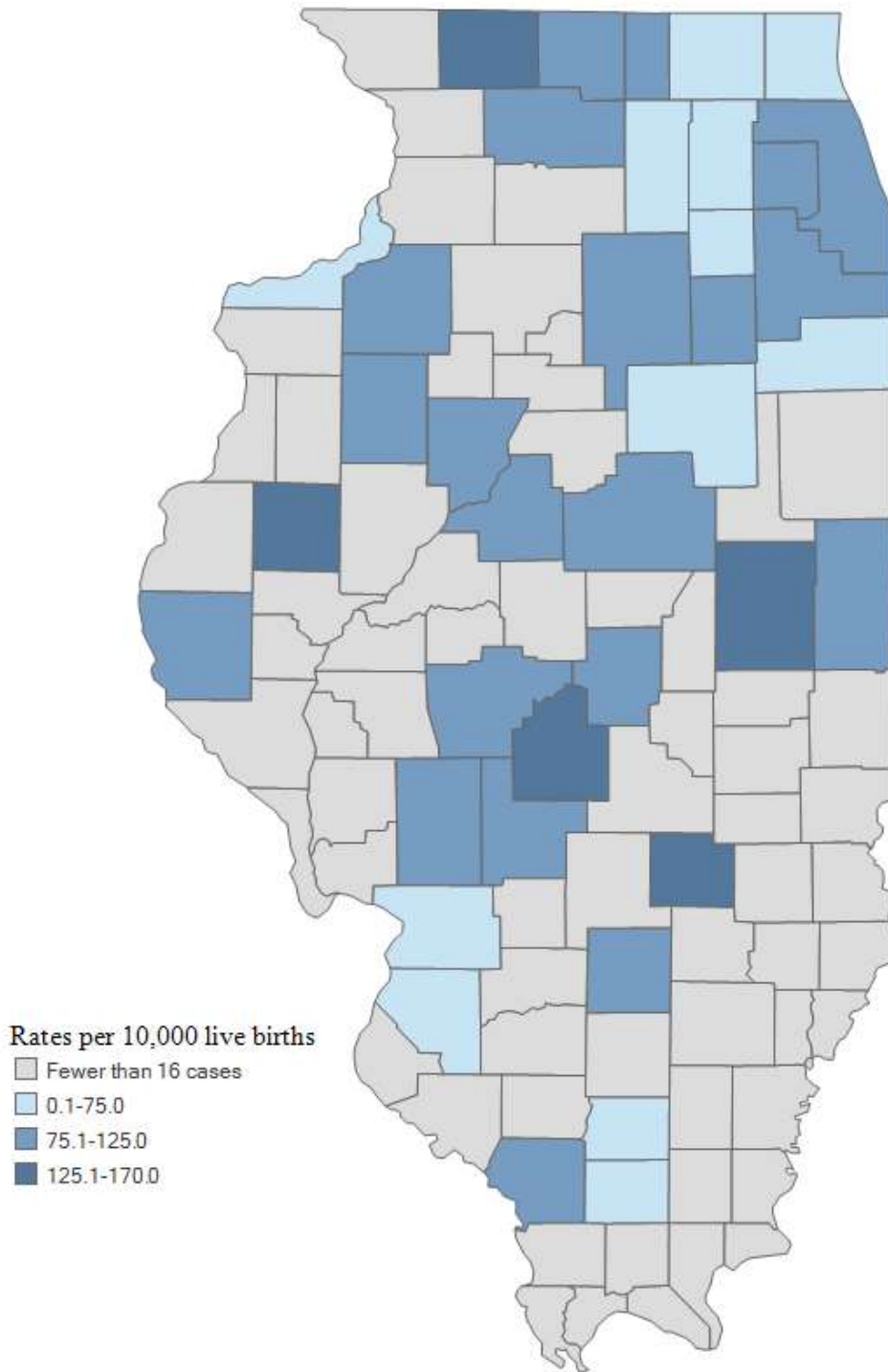


<sup>1</sup> Rates per 10,000 live births

<sup>2</sup> Only counties with 16 or more cases are presented.

Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

**Figure 24. Map of Prevalence Rates for Newborn Infants with Other Adverse Pregnancy Outcomes, by Selected Counties of Residence, 2008-2012**



Source: Illinois Department of Public Health, Adverse Pregnancy Outcomes Reporting System, January 2019

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