RATES OF HOSPITAL REPORTING OF ADVERSE PREGNANCY OUTCOMES IN 2019

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Adverse Pregnancy Outcomes Reporting System

PURPOSE

The Illinois Department of Public Health's (IDPH) regulations require hospitals to report adverse pregnancy outcomes identified in Illinois residents during the newborn hospital stay. In 2019, these included infants with birth defects, prematurity (less than 31 weeks), serious congenital infections, intrauterine growth restriction, retinopathy of prematurity, those who had other serious conditions, and those who died during the newborn stay (Appendix 1). Rates of adverse pregnancy outcome reporting are calculated by the Adverse Pregnancy Outcomes Reporting System (APORS) to compare the number of adverse pregnancy outcomes each hospital reported to the number of live births at that hospital. The results are used to provide hospital-specific feedback to improve the completeness of case reporting.

METHODS

Several hospitals are not included in this study for various reasons. Three out-of-state hospitals that are part of the Illinois Perinatal Network are not included because the number of births to

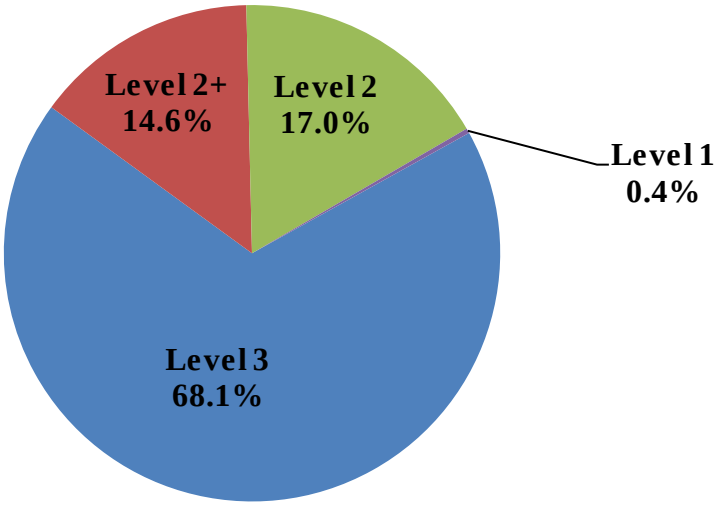
Illinois residents at those facilities is not available for this study period. Two additional hospitals are excluded because no births take place there; they provide services to newborns transferred from delivery hospitals. Data for 2019 shows that 133,957 births took place at the 112 included Illinois Perinatal Network hospitals. The number of births is based on the provisional number of 2019 birth certificates filed by Illinois hospitals with IDPH's Division of Vital Records. These 112 hospitals reported 8,966 cases to APORS either electronically or on paper forms provided by IDPH. Each hospital's case reporting rate was calculated as the percentage of reported cases among the total number of births at that hospital. The reporting rate for a hospital level was calculated as the number of cases reported by hospitals at that level divided by the total number of births at hospitals at that level.

RESULTS

Overall Case Reporting Rates. For 2019, case reporting rates among all hospitals ranged from 0.0% to 18.9% with the average being 6.7%, slightly less than 2018 average of 6.9%. In Illinois, hospitals are certified at one of four levels, depending on the services they offer. The Level 3 facilities care for patients requiring the most complex care and operate a neonatal intensive care unit (NICU). The Level 2+ hospitals provide care to newborns at moderate risk and operate a special care nursery (SCN) but not a NICU. Level 2 hospitals provide care to newborns at moderate risk, and have intermediate care nurseries, but do not operate a NICU or a SCN. Level 1 hospitals provide care to low-risk newborns and have only general care nurseries. Most APORS cases are reported by Level 3 facilities, with very few being born at Level 1 hospitals (Figure 1). Since mothers, whose babies have known or suspected adverse outcomes, are expected to deliver at Level 3 or 2+ hospitals to assure their babies receive the appropriate care,

the analyses of case completeness rates were reported separately for each care level. If a baby is transferred between hospitals, the highest-level facility is responsible for reporting the case.

Figure 1. Percentage of APORS Cases Reported by Hospital Level, 2019



Hospital Case Reporting Rates. When examining average reporting rates by level of care, the 23 Level 3 hospitals had the highest reporting rate at 9.3% (Table 1). The average reporting rate for Level 2+ hospitals was 4.3%, while Level 2 facilities reported at an average of 4.1%. (Tables 2 and 3). Level 1 hospitals had the lowest average reporting rate among all levels at 2.5% (Table 4).

For each level of care, there were varied ranges of reporting rates among hospitals. Among Level 3 hospitals the reporting rates by hospital ranged from 2.7% to 18.9%. Among Level 2+ hospitals rates ranged from 2.1% to 7.0%, while among Level 2 facilities the range was 0.0% to 15.6%. Among the Level 1 hospitals rates ranged from 1.0% to 5.5%.

Table 1. Case Reporting Rates in 2019 for Level 3 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
3-1	144	8.2	**3-13**	174	6.0
3-2	927	8.0	**3-14**	185	5.8
3-3	201	7.1	**3-15**	271	8.0
3-4	69	2.7	**3-16**	311	11.4
3-5	515	18.9	**3-17**	365	18.5
3-6	196	15.5	**3-18**	361	15.7
3-7	286	11.9	**3-19**	150	7.9
3-8	202	12.8	**3-20**	246	7.5
3-9	176	8.5	**3-21**	345	12.5
3-10	96	9.4	**3-22**	261	7.3
3-11	443	10.3	**3-23**	155	5.7
3-12	24	2.9	***Combined***	***6,103***	***9.3***

Table 2. Case Reporting Rates in 2019 for Level 2+ Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
2+-1	45	2.8	**2+-13**	95	3.4
2+-2	31	2.9	**2+-14**	23	2.1
2+-3	23	3.5	**2+-15**	21	2.2
2+-4	34	3.5	**2+-16**	56	2.5
2+-5	120	4.8	**2+-17**	90	5.8
2+-6	109	5.0	**2+-18**	53	5.9
2+-7	19	5.2	**2+-19**	64	6.1
2+-8	43	5.2	**2+-20**	59	6.6
2+-9	30	3.0	**2+-21**	96	6.7
2+-10	52	3.0	**2+-22**	59	6.8
2+-11	41	3.1	**2+-23**	131	7.0
2+-12	17	3.2	***Combined***	***1,311***	***4.3***

Table 3. Case Reporting Rates in 2019 for Level 2 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate	Hospital	Cases	Rate
2-1	0	0.0	**2-21**	9	1.7	**2-41**	10	6.5
2-2	3	0.6	**2-22**	10	1.7	**2-42**	25	6.8
2-3	6	1.0	**2-23**	13	3.3	**2-43**	92	6.8
2-4	13	1.2	**2-24**	46	3.2	**2-44**	77	7.1
2-5	12	1.6	**2-25**	4	7.3	**2-45**	31	3.7
2-6	11	1.8	**2-26**	50	7.4	**2-46**	29	3.8
2-7	20	1.9	**2-27**	20	7.5	**2-47**	10	3.8
2-8	4	1.9	**2-28**	13	8.1	**2-48**	32	3.8
2-9	7	2.4	**2-29**	70	9.6	**2-49**	6	3.9
2-10	20	2.6	**2-30**	40	10.0	**2-50**	13	4.2
2-11	27	2.8	**2-31**	22	2.0	**2-51**	25	4.3
2-12	27	10.8	**2-32**	8	2.1	**2-52**	61	4.4
2-13	107	12.0	**2-33**	14	2.1	**2-53**	15	4.7
2-14	56	13.3	**2-34**	46	2.2	**2-54**	12	4.8
2-15	5	15.6	**2-35**	8	2.2	**2-55**	12	4.8
2-16	22	2.8	**2-36**	6	2.3	**2-56**	27	4.8
2-17	36	2.9	**2-37**	4	2.4	**2-57**	22	4.9
2-18	24	3.2	**2-38**	72	5.2	**2-58**	21	5.0
2-19	4	1.7	**2-39**	83	6.1	**2-59**	20	5.0
2-20	21	1.7	**2-40**	21	6.3	***Combined***	***1,524***	***4.1***

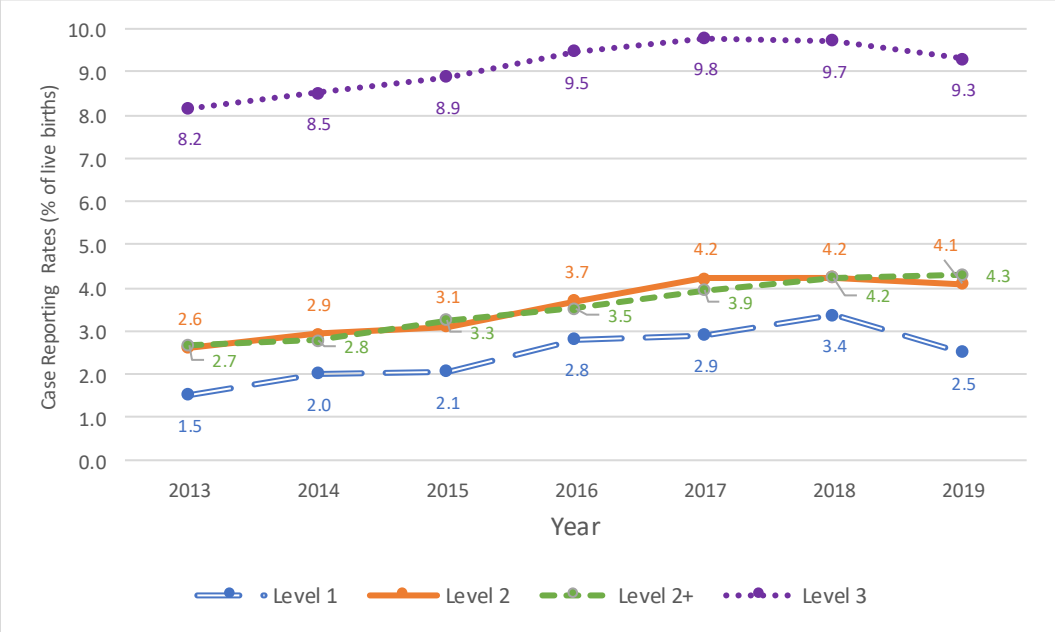
Table 4. Case Reporting Rates in 2019 for Level 1 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
1-1	3	1.6	**1-5**	3	1.4
1-2	8	5.5	**1-6**	3	2.5
1-3	7	3.3	**1-7**	3	1.8
1-4	1	1.0	***Combined***	***28***	***2.5***

DISCUSSION

During the period of 2013 to 2018, combined hospital reporting rates for each perinatal designation level had steadily increased, plateauing in 2018 for Level 2 and 3 hospitals (see Figure 2 below). In 2019, rates decreased for all levels except Level 2+ hospitals. The increases in case reporting during 2013 to 2018 were attributed to a number of factors, including the introduction of an electronic reporting system in 2013, which prompts the reporting of certain conditions on the birth certificate; improvements in technology utilized to identify reportable conditions; and increased case identification by hospital staffs as they adjusted to a revised APORS case definition.[1] Additionally, hospitals were prompted to report certain birth defects potentially related to the Zika virus in 2016 and 2017 when APORS engaged

Figure 2. Case Reporting Rates by Hospital Level, Illinois, 2013-2019



[1] Major changes to the case definition consisted of dropping very low birthweight (VLBW), marijuana exposure, patent foraman ovale (PFO), and patent ductus arteriosus (PDA. Conditions introduced included <31 weeks gestational age, triplet births, extracorporeal membrane oxygen (ECMO), hypoxic ischemic encephalopathy (HIE), Erb's Palsy, and maternal admission of illicit drug during pregnancy.

rapid case identification in cooperation with the Centers for Disease Control and Prevention (CDC). There is not an obvious reason why rates decreased in 2019 and APORS will be examining case reporting over a three-year period to assess whether there might be patterns that explain the decrease.

As discussed in previous reports, variability persists in case reporting rates among hospitals providing the same level of care. These variations may be due to differences in populations served, transfer protocols between hospitals, and types of specialty care offered. It is also possible that not all cases are being identified and reported to APORS, which may be more pronounced during times of staff turnover.

To that end, APORS strives to maximize case identification by providing training, education, and support to hospitals. Hospital specific training is provided on an ongoing basis as needed for new hospital reporters, and statewide webinars are held several times per year to provide up-to-date reporting information on selected topics and to allow an open question-and-answer forum between hospital reporting staff and APORS staff. Hospitals have access to a dedicated SharePoint site online where they can access manuals, training videos, webinar recordings, and other materials. APORS also provides prompt follow-up to hospital inquiries through the use of a dedicated email address hospitals utilize to communicate with the APORS team. Finally, quality control reports are provided periodically to hospitals throughout the year to assist with assessment of timely and complete reporting. APORS will maintain these supports and develop new approaches as needed to further assist with case identification so that babies and families are provided the assistance needed after leaving the hospital.

Appendix 1
Conditions for APORS Hospital Nursery Reporting

Gestational age less than 31 completed weeks (based on physician's assessment)

Multiple birth, triplets, or higher order

Infant death (before discharge from the newborn stay) Expiration after showing signs of life including breathing, heartbeat, pulsation of the umbilical cord, or definite movement of voluntary muscles. May have a zero APGAR score. A birth certificate should be issued.

Prenatal drug exposure

Diagnosis of a positive toxicology for any drug (except marijuana or drugs administered during labor and delivery)
Signs of drug toxicity or withdrawal (in the infant)
Children of mothers who admit to illicit drug use during pregnancy (except marijuana)

Birth defect or congenital anomaly *(except as listed below)*

Congenital pigment anomalies (stork bites, Mongolian spots, etc.)
Dacrostenosis
Incomplete or redundant penile foreskin
Isolated choroid plexus cyst
Isolated simian crease
Patent ductus arteriosus (PDA)
Patent foraman ovale (PFO)
Peripheral pulmonic stenosis (PPS)
Persistent fetal circulation
Polydactyly
Preauricular sinus
Prenatal diagnosis of hydronephrosis, caliectasis, or pelviectasis
Sacral dimple with visualized base or post-natal imaging ruling out problem
Skin tag
Syndactyly
Tongue tie
Two-vessel cord
Umbilical hernia
Undescended testes
Vascular harmatomas (small or insignificant birth marks, port wine stains, strawberry nevi etc.)

Serious congenital infections *(Excludes: Hepatitis C or HIV exposure, neonatal candidiasis (thrush), conjunctivitis, dacrocystitis, infective mastitis and omphalitis, and HIV)*

Chlamydia
Confirmed septicemia (sepsis)
Cytomegalovirus
Gonococcal conjunctivitis neonatorium
Group B streptococcus
Hepatitis B (disease or prenatal exposure)
Herpes
Listeriosis
Meningitis
Necrotizing enterocolitis leading to surgery
Rubella
Syphilis (disease or exposure to active disease)
Tetanus neonatorum

Endocrine, metabolic or immune disorders

Combined immunity deficiency
Hypothyroidism

Blood disorder

Coagulation defects
Constitutional aplastic anemia
Hereditary hemolytic anemia
Leukemia

Other conditions

Bronchopulmonary dysplasia
Cerebral lipidoses
Chorioretinitis
Conditions leading to ECMO
Conditions leading to > 72 hours on a ventilator
Endocardial fibroelastosis
Erb's palsy
Fetal alcohol syndrome
HIE leading to cooling treatment
Intrauterine growth restriction leading to SGA
IVH grade III or IV
Neurofibromatosis
Occlusion of cerebral arteries
Retinopathy of prematurity
Strabismus
Seizures