HOSPITAL REPORTING RATES OF ADVERSE PREGNANCY OUTCOMES IN 2020
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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 2020, 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

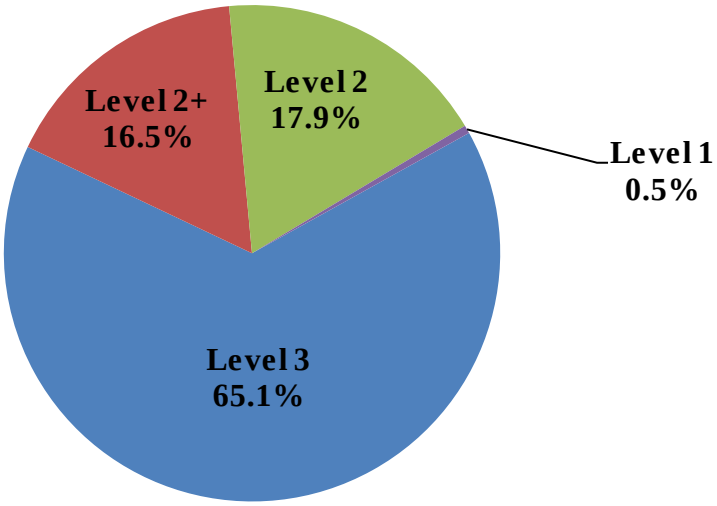
hospitals, which only provide services to newborns transferred from delivery hospitals, are excluded because no births take place there. Data for 2020 shows that 127,263 births took place at the 101 included Illinois Perinatal Network hospitals. The number of births is based on the provisional number of 2020 birth certificates filed by Illinois hospitals with IDPH's Division of Vital Records. These 101 hospitals reported 8,335 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 2020, case reporting rates among all hospitals ranged from 0.0% to 18.6% with the average being 6.5%, slightly less than the 2019 average of 6.7%. In Illinois, hospitals are certified at one of four levels, depending on the services they offer. Level 3 facilities care for patients requiring the most complex care and operate a neonatal intensive care unit (NICU). 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, 2020



Hospital Case Reporting Rates. When examining average reporting rates by level of care, the 23 Level 3 hospitals had the highest reporting rate at 8.6% (Table 1). The average reporting rate for Level 2+ hospitals was 4.6%, while Level 2 and Level 1 facilities reported at an average of 4.4%. (Tables 2, 3, and 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 2.1% to 18.6%. Among Level 2+ hospitals, rates ranged from 2.0% to 7.7%, while among Level 2 facilities, the range was 1.1% to 14.8%. Among the Level 1 hospitals, rates ranged from 0.0% to 11.1%.

Table 1. Case Reporting Rates in 2020 for Level 3 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
3-1	83	4.9	**3-13**	67	4.4
3-2	149	5.5	**3-14**	292	11.1
3-3	192	5.9	**3-15**	103	6.3
3-4	81	8.9	**3-16**	193	6.3
3-5	176	9.6	**3-17**	381	13.8
3-6	448	10.9	**3-18**	215	12.4
3-7	342	15.9	**3-19**	837	7.0
3-8	413	17.8	**3-20**	155	12.4
3-9	441	18.6	**3-21**	229	7.5
3-10	17	2.1	**3-22**	256	7.5
3-11	79	3.2	**3-23**	176	6.5
3-12	101	4.0	***Combined***	***5,426***	***8.6***

Table 2. Case Reporting Rates in 2020 for Level 2+ Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
2+-1	38	2.0	**2+-12**	22	2.0
2+-2	145	6.8	**2+-13**	98	5.7
2+-3	98	6.8	**2+-14**	37	5.8
2+-4	74	7.3	**2+-15**	33	2.6
2+-5	72	7.7	**2+-16**	28	2.8
2+-6	34	3.1	**2+-17**	30	3.1
2+-7	64	3.1	**2+-18**	49	4.7
2+-8	23	3.6	**2+-19**	37	4.8
2+-9	126	4.3	**2+-20**	112	5.0
2+-10	25	5.1	**2+-21**	76	5.0
2+-11	153	5.7	***Combined***	***1,374***	***4.6***

Table 3. Case Reporting Rates in 2020 for Level 2 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate	Hospital	Cases	Rate
2-1	15	1.9	**2-19**	31	4.7	**2-37**	7	3.5
2-2	10	4.1	**2-20**	8	4.7	**2-38**	6	3.8
2-3	50	4.2	**2-21**	61	5.0	**2-39**	26	3.8
2-4	47	4.4	**2-22**	14	5.1	**2-40**	9	3.8
2-5	40	4.4	**2-23**	5	2.1	**2-41**	17	4.0
2-6	36	4.5	**2-24**	8	2.3	**2-42**	96	7.6
2-7	61	4.5	**2-25**	8	2.4	**2-43**	37	8.8
2-8	18	2.8	**2-26**	24	2.5	**2-44**	60	9.1
2-9	10	2.9	**2-27**	7	2.5	**2-45**	134	9.3
2-10	10	3.1	**2-28**	19	2.5	**2-46**	86	9.7
2-11	38	5.2	**2-29**	6	2.7	**2-47**	65	9.8
2-12	80	6.0	**2-30**	11	1.1	**2-48**	16	14.8
2-13	91	6.2	**2-31**	14	1.2	**2-49**	12	1.8
2-14	15	6.3	**2-32**	4	1.2	**2-50**	10	1.9
2-15	22	6.4	**2-33**	15	1.4	**2-51**	14	1.9
2-16	20	7.4	**2-34**	33	1.7	***Combined***	***1,491***	***4.4***
2-17	21	7.5	**2-35**	9	1.7			
2-18	19	4.7	**2-36**	16	3.3			

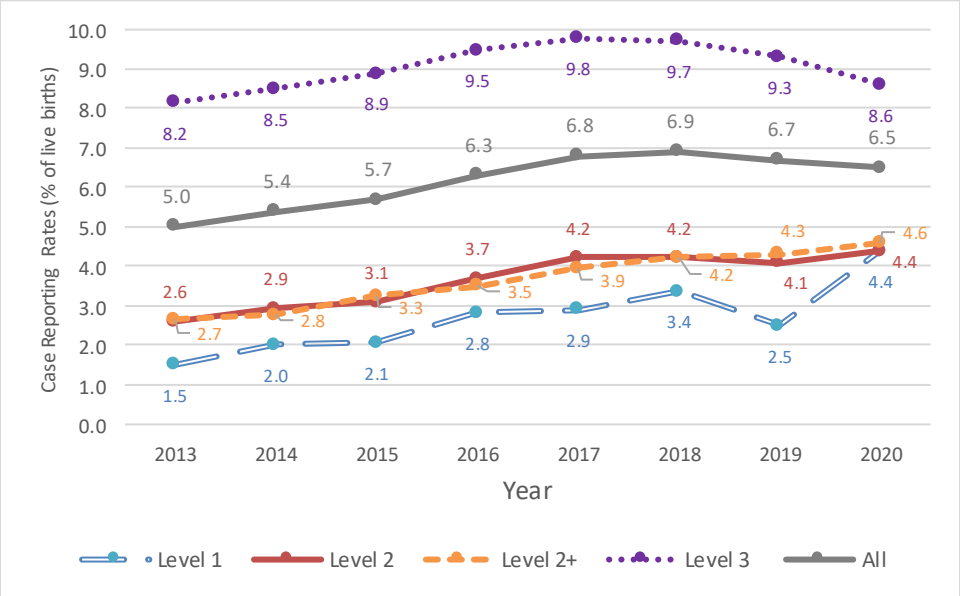
Table 4. Case Reporting Rates in 2020 for Level 1 Hospitals

Hospital	Cases	Rate	Hospital	Cases	Rate
1-1	6	2.4	**1-5**	4	2.7
1-2	5	3.5	**1-6**	14	11.1
1-3	0	0.0	***Combined***	***44***	***4.4***
1-4	15	7.2			

DISCUSSION

When examining the period of 2013 to 2020 (see Figure 2), overall reporting rates peaked in 2018 followed by slight decreases in 2019 and 2020. While there is not an obvious reason for the decreases, changes in the proportion of preterm births in Illinois may be a partial explanation. The proportion of early preterm births (less than 31 weeks gestation) in Illinois decreased slightly in 2019 (1.3%) and 2020 (1.2%) from a nearly steady 1.4% during 2013 to 2018. The proportion of preterm births (less than 37 weeks gestation), which had been rising during the period (from 10.0% in 2013 to 10.7% in 2019), decreased in 2020 to 10.3%. When reviewing types of cases reported for 2018-2020, APORS found larger percentage drops in case reporting for conditions associated with prematurity (such as ventilator dependence, retinopathy of prematurity, bronchopulmonary dysplasia, triplet births) when compared with other conditions.

Figure 2. Case Reporting Rates by Hospital Level, Illinois, 2013-2020



Another factor which may have contributed to overall lower APORS reporting rates in 2020 was the slight increase in the proportion of home births in Illinois (0.71%). During the period of 2013-2019, the proportion of home births had ranged from 0.48% to 0.56%.

Among hospital perinatal designation levels, combined reporting rates steadily increased, plateauing in 2018 for Level 2 and 3 hospitals (see Figure 2). In 2019, rates decreased for all levels except Level 2+ hospitals. In 2020, rates decreased for Level 3 hospitals, while rates for all other levels increased to the highest levels of the entire period (2013-2020). These increases are likely in part due to effects of the COVID-19 pandemic in which transfer protocols were altered to accommodate the influx of patients in hospitals. The proportion of cases reported by Level 3 hospitals decreased to 65.1% in 2020 compared with 68.1% in 2019, while proportions for all other levels increased (Level 2+ increased to 16.5% in 2020 from 14.6% in 2019; Level 2 increased to 17.9% from 17.0%; Level 1 increased to 0.5% from 0.4%.)

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. 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.)	*Peripheral pulmonic stenosis (PPS)*	*Skin tag*
Dacrostenosis	*Persistent fetal circulation*	*Syndactyly*
Incomplete or redundant penile foreskin	*Polydactyly*	*Tongue tie*
Isolated choroid plexus cyst	*Preauricular sinus*	*Two-vessel cord*
Isolated simian crease	*Prenatal diagnosis of hydronephrosis, caliectasis, or pelviectasis*	*Umbilical hernia*
Patent ductus arteriosus (PDA)	*Sacral dimple with visualized base or post-natal imaging ruling out problem*	*Undescended testes*
Patent foraman ovale (PFO)		*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	Hepatitis B (disease or prenatal exposure)	Rubella
Confirmed septicemia (sepsis)	Herpes	Syphilis (disease or exposure to active disease)
Cytomegalovirus	Listeriosis	Tetanus neonatorum
Gonococcal conjunctivitis neonatorium	Meningitis	
Group B streptococcus	Necrotizing enterocolitis leading to surgery	

Endocrine, metabolic, or immune disorders

Combined immunity deficiency	Hypothyroidism

Blood disorder

Coagulation defects	Constitutional aplastic anemia	Hereditary hemolytic anemia	Leukemia

Other conditions

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