

# QUALITY OF ABSTRACTOR REVIEWS OF ADVERSE PREGNANCY OUTCOMES AMONG 2016 REVIEWED CHARTS

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## **PURPOSE**

Re-abstraction analyses are performed by the Illinois Department of Public Health’s Adverse Pregnancy Outcomes Reporting System (APORS) to assess the quality of APORS data, so that those interested in the program’s surveillance data understand the strengths and weaknesses of the data. Illinois uses primarily a passive case ascertainment system; hospitals report newborn infants who have birth defects and other high-risk medical conditions. APORS field staff then review selected medical records to assure the accuracy and completeness of birth defect reporting. An assessment of the accuracy of abstractor reviewing, and therefore, the quality of the reviewed APORS records, may be made by comparing the information completed by the abstractors with that found by re-abstracting a sample of charts and associated abstractor work.

The re-abstraction analysis identifies strengths and weaknesses in abstractor review and interpretation of medical charts. The analysis also produces results that are used to provide abstractor-specific feedback to improve case reviewing.

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### **METHODS**

The APORS abstractors review charts of selected infants on an ongoing basis. Abstractors are given a report of the hospital-provided information; they review the chart to determine whether a child meets the birth defect registry case definition; and if it is a case, they correct errors in the reported data and collect additional information. The case definition of the birth defect registry requires a child to have a defect reportable to the National Birth Defect Prevention Network (NBDPN). APORS had a case definition change (adding new rapid ascertainment birth defects) beginning August 1<sup>st</sup>, 2016 to collect information about birth defects suspected of being associated with exposure to the Zika virus. Addition of these new birth defects significantly increased the number of cases that needed to be abstracted, and the amount of information to be collected. In addition, APORS staff was reviewing these cases as rapidly as possible, shortening the time between discharge and abstraction. A list of the NBDPN-reportable defects is listed in Appendix A. During chart reviews, any changes, additions or deletions to a case are documented in the program's APORS Birth Defects System (ABDS) database. Within the database, the date, the source, and the individual making the changes are documented.

To perform the re-abstraction analysis, each month a randomized sample of cases reviewed during the previous month is selected. Any of the selected records that were provided on paper or electronic media are stored in a secure location for review; charts reviewed remotely are re-requested at a later date. When the review is completed, incorrect information is identified, and the associated data fields are counted. Appendix C lists the examined fields, and the reasons for their collection. Generally, information is expected to be exact. However, where text fields differ (such as mother names, infant names, and street names), the differences are manually reviewed to

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determine whether the difference is substantial, or whether the compared fields are easily recognized as the same with only minor typographical errors.

Some data elements (those necessary to identify the infant or to determine APORS case criteria) are considered more critical than others. Therefore, data elements are categorized as critical fields, major fields, or minor fields. Errors in critical fields or major fields are of more concern than those in minor fields (Appendix B).

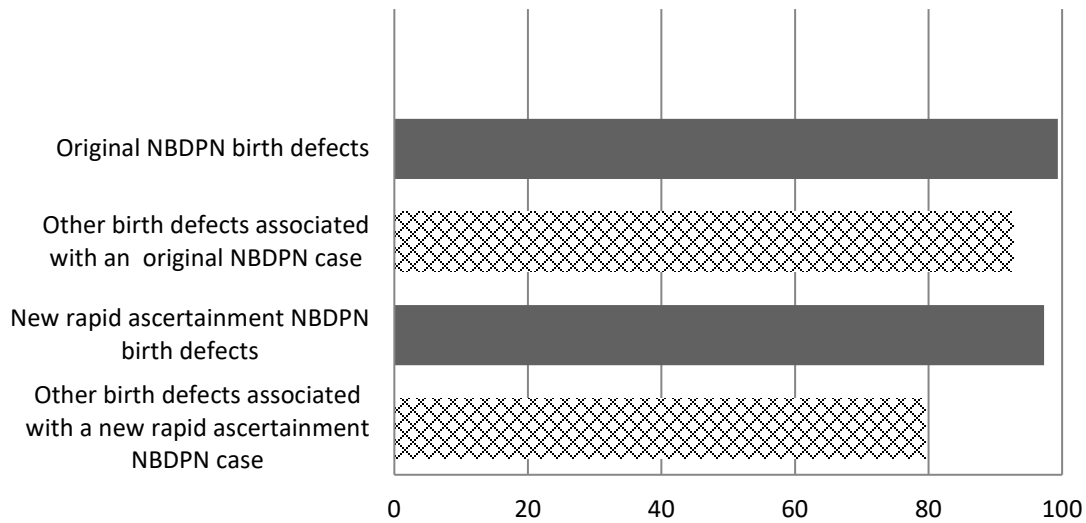
### **RESULTS**

There were a total of 152 cases re-abstracted among those infants initially abstracted in 2016. Each figure shows the percentage of original abstractions with the information correctly entered into ABDS. The report containing the precise numbers is included in Appendix B.

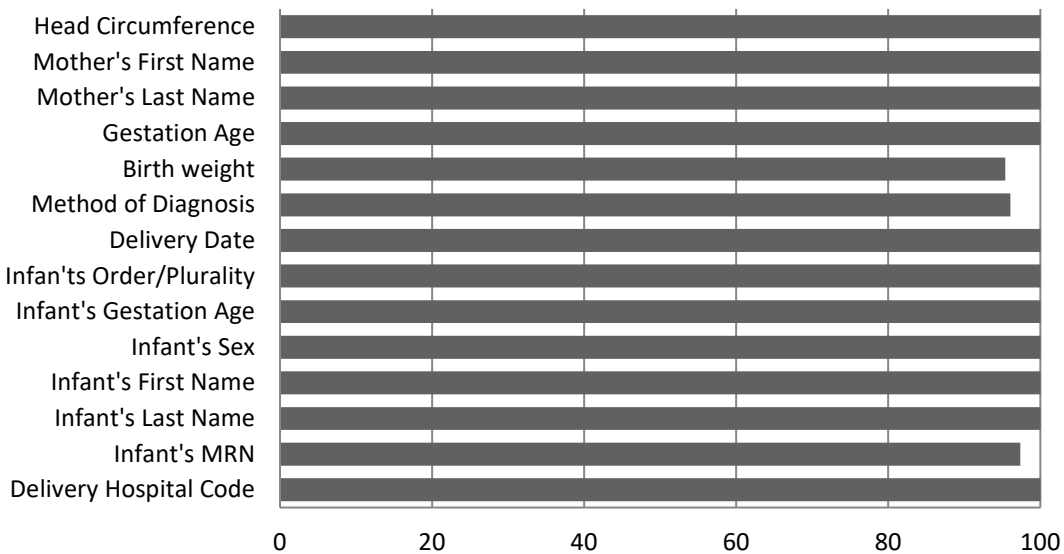
Figure 1 shows results for the most critical field in abstraction, infant diagnosis. The two solid bars represent the percentage of NBDPN birth defects identified for the original set of diagnosis and the new rapid ascertainment diagnosis. The two cross-hatched bars represent the accuracy percentage for collection of other birth defects diagnoses associated with a NBDPN case.

Figure 2 shows the major fields verified during abstraction, while Figure 3 shows the minor fields verified. Of the major fields, only the infant's medical record number (97.4%), method of diagnosis (96.1%) and birth weight (95.3%) were correct less than 98% of the time. There are only two minor fields that are below 98%; date of diagnosis (80.9%) and address (96.7%). Errors in these fields is due to incomplete staff training.

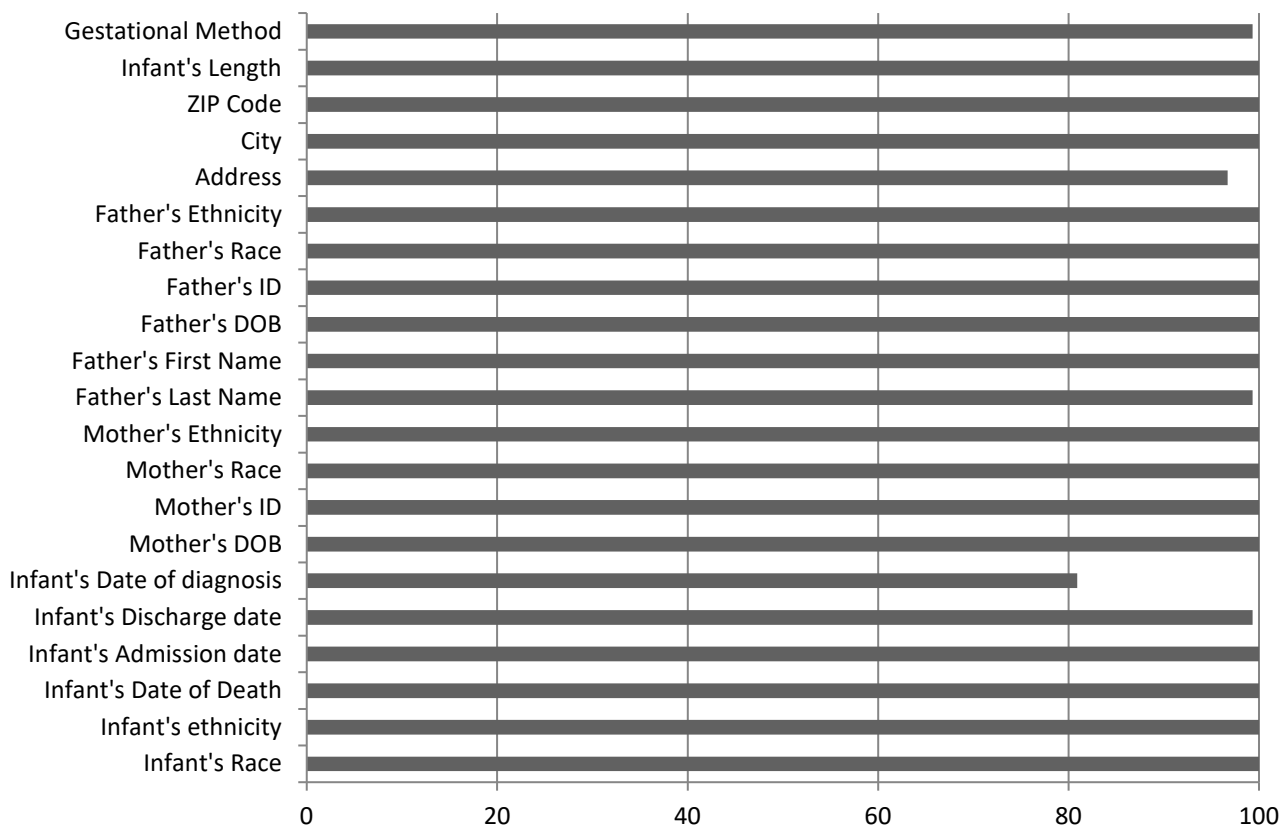
**Figure 1. Percentage of Infants with Diagnosis Reported Correctly**



**Figure 2. Percentage of Major Fields Reported Correctly**



**Figure 3. Percentage of Minor Fields Reported Correctly**



**DISCUSSION**

Overall abstractors do a very good job of obtaining the correct information. Demographics, race, and ethnicity for infant, mother, and father have not always been easily obtained by abstractors in the past, even though they are important for surveillance and data analysis. When a hospital submits an APORS report to the program it has access to not only the infant chart but to the mother’s chart as well. The abstractors do not have always this access and several fields may have been reported from the mother’s chart and may not be contained in the infant’s chart. The abstractors have access

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Department of Vital Records. Abstractors can look up information that is not available to them in the chart. While birth certificates are not reliable it is better than having missing information.

APORS staff is trained on how to use and search this system. New staff are encouraged, if they are not finding the child in IVRS, to have a more experienced staff member assist with the search.

Through the new rapid ascertainment collection procedures, that involve review of some maternal charts, APORS has discovered that, occasionally, not all the medical record is contained in the charts provided to us. We have worked with a few hospitals and discovered that the medical records department are not receiving all parts of a patient's chart. Those hospitals where this problem has been identified are working to provide more complete charts for review in the future.

APORS continued to have problems in hiring and retaining abstractors. APORS began the 2016 year with only one trained abstractor, one new abstractor and one part-time abstractor, leaving one open position. The trained abstractor left on a leave of absence beginning June of 2016, leaving only one abstractor with less than a year experience and one part-time abstractor. With these multiple vacancies and the increased work load for rapid ascertainment APORS began hiring temporary workers, coding externs and having central office staff, who don't normally complete abstraction, assisted in this endeavor. While this did allow the work to be completed, the abstraction quality suffered due to the need to learn changes in abstraction rules, constant staffing turnovers, and increased work load on existing staff. The data shows that after rapid ascertainment began the correct number of abstractions was significantly lower than earlier in the year. When reviewing charts for rapid ascertainment, however, APORS staff were not always looking at completed charts; some of the infants were still in the hospital at the time of review.

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Identifying diagnoses is the weakest, and the most difficult, part of APORS reporting for hospital nurseries. APORS staff is aware that, when an APORS report is completed at discharge, not all consultation reports or diagnostic test results are in the chart and so hospitals may not include all diagnoses in their original report. Generally, abstractors should have access to all reports and diagnostic test results at the time of chart review and are expected to add any additionally identified diagnosis.

Reviewing infant charts can be challenging and time consuming. Not all charts are electronic or searchable and review can involve reading tens of thousands of pages. Hospitals do not always maintain complete charts as more care is being outsourced at facilities through contracted doctors and diagnostic facilities; records may also not be stored at the hospital. This does not excuse inaccurate collection of data, it does help explain part of the problems faced by abstractors and allows the central office to identify alternative approaches to help field staff in these types of cases. Increased training has been provided to abstractors, and APORS staff are requesting additional information from the hospitals and questioning why referenced diagnostic tests are not in the completed chart. This does increase the time taken to complete a single chart abstraction but demonstrates increased diligence by APORS field staff in improving accuracy in abstraction.

Many of the errors identified in this study were in charts that were reviewed rapidly and remotely, additional diagnoses are likely to have been added to the medical record between the original abstraction and the review for this study. It is probable that this is the basis for the significant decrease in accuracy of this field. If we exclude the remote access the percentages of new rapid ascertainment NBDPN birth defects would increase from 97.3 to 98.7% and other birth defects

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associated with a new rapid ascertainment NBDPN case would increase from 79.6 to 91.5%.

Additionally, the address field is subject to this same dilemma, if the infant has moved in between times of abstraction the address in the chart will not match.

Constantly changing staff, cross training of staff and increased workload have resulted in a decrease in accurate abstraction; future re-abstraction studies are expected to demonstrate an improvement in this area, if staff longevity can be achieved.

*Individual Abstractor Assessments.* The study results were used to review the quality of reporting by each abstractor in terms of identification of birth defects and accuracy of demographic information. All current abstractors and trained staff members met or exceeded our expectations given their level of training. The APORS Manager and Abstractor Liaison will continue to re-abstract cases from a random sampling within a short period of time of the original abstraction to provide prompt feedback and, as necessary, remediation, of cases to the individual abstractors.

## **CONCLUSION**

It was noted that staff tend to make more errors when abstracting cases from hospitals that are not ones they are not familiar with. To accommodate this weakness APORS staff have been notified of the problem and encouraged to slow down when reviewing unfamiliar hospitals, additionally abstractor training exercises will be written to appear in a more unusual format and abstractors occasionally will be given charts of unfamiliar facilities for abstraction. New employees struggle to understand when a diagnosis is a birth defect. APORS central office has therefore been working to provide different types of training and improve medical understanding of staff to help make this differentiation and decrease the number of errors in this area. APORS continues to have extremely



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complicated charts abstracted by more than one staff member, and to improve communication between field and central office staff to develop a stronger working rapport. The APORS Manager and Abstractor Liaison will discuss the findings of this report with APORS staff, placing particular emphasis on the need to collect accurate diagnoses and methods of diagnosis, to ascertain what further steps can be taken to improve accuracy in abstraction.

The overall quality of case review by abstractors is excellent, while there is a decline in the accuracy for the diagnosis field after the change in case definition, all but one of the fields are accurate at 95% or above. APORS must rely on quality control studies to assess data quality and indicate areas for improvement. APORS staff should continue to use the re-abstraction study reports as tools to educate abstractors and to identify areas for improvement.

The APORS Abstractor Liaison will continue to provide ongoing training and working closely with abstractors to improve accuracy in chart review. In the future, APORS staff will continue to use re-abstraction studies to assure quality chart review and to use multiple quality control reports as tools to educate abstractors and to remediate when improvements are needed.

APPENDIX A

**Original National Birth Defect Prevention Network (NBDPN) Reportable Conditions**

Anencephalus	Encephalocele
Aniridia	Esophageal atresia/tracheoesophageal fistula
Anophthalmia/microphthalmia	Gastroschisis
Anotia/microtia	Holoprosencephaly/Arhinencephaly
Aortic valve stenosis	Hypoplastic left heart syndrome
Atrial septal defect	Hypospadias
Atrioventricular septal defects	Interrupted aortic arch
Biliary atresia	Microcephaly
Bladder exstrophy	Omphalocele
Choanal atresia	Pulmonary valve atresia and stenosis
Cleft lip	Rectal and large intestinal atresia and stenosis
Cleft palate	Reduction deformities of limbs
Cloacal exstrophy	Renal agenesis/hypoplasia
Clubfoot	Single ventricle
Coarctation of aorta	Small intestinal atresia/stenosis
Common truncus/Truncus arteriosus	Spina bifida
Congenital cataract	Total Anomalous Pulmonary Venous Connection
Congenital posterior urethral valves	Tetralogy of Fallot
Craniosynostosis	Turner Syndrome
Deletion 22q11	Transposition of great arteries
Diaphragmatic hernia	Tricuspid valve atresia and stenosis
Double Outlet Right Ventricle	Trisomy 13 (Patau syndrome)
Down syndrome	Trisomy 18 (Edwards syndrome)
Ebstein anomaly	Ventricular septal defects

**Additional National Birth Defect Prevention Network Reportable Conditions  
Added in August 2016**

Abnormal cortical gyral patterns	Hydranencephaly
Arthrogyposis/congenital contractures	Hydrocephaly
Cerebellar abnormalities	Intracranial calcifications
Cerebral/cortical atrophy	Intraocular calcifications
Chorioretinal anomalies	Optic nerve abnormalities
Coloboma	Other major brain abnormalities
Congenital deafness	Porencephaly
Corpus callosum anomalies	Septo-optic dysplasia
Fetal brain disruption sequence	

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APPENDIX B

**Variables Included in the Re-abstraction Analysis and Complete Percentages of All Fields Assessed**

Field	Major/minor	Percentage
Delivery hospital code	Major	100.0
Infant’s medical record number	Major	97.4
Infant’s last name	Major	100.0
Infant’s first name	Major	100.0
Infant’s sex	Major	100.0
Infant’s race	Minor	100.0
Infant’s Hispanic ethnicity	Minor	100.0
Infant's Gestational Age	Major	100.0
Infant's Order/Plurality	Major	100.0
Infant's date of death	Minor	100.0
Admission date	Minor	100.0
Delivery date	Major	100.0
Discharge date	Minor	99.3
Diagnoses*	Critical	99.3/92.8/97.3/79.6
Method of diagnosis	Major	96.1
Date of diagnosis	Minor	80.9
Birth weight	Major	95.4
Mother’s last name	Major	100.0
Mother’s first name	Major	100.0
Mother's date of birth	Minor	100.0
Mother's ID	Minor	100.0
Mother's Race	Minor	100.0
Mother's Ethnicity	Minor	100.0
Father's last name	Minor	99.3
Father's first name	Minor	100.0
Father's date of birth	Minor	100.0
Father's ID	Minor	100.0
Father's Race	Minor	100.0
Father's ethnicity	Minor	100.0
Address	Minor	96.7
City	Minor	100.0
ZIP code	Minor	100.0
Head circumference	Major	100.0
Length	Minor	100.0
Gestational method	Minor	99.3

\*The four numbers indicate changes in accuracy of abstractor review as case definition and collection changes occurred.