

# EHDI-IS Evaluation Report Instructions and Form

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**Due upon completion of evaluation activities, no later than June 30<sup>th</sup> 2016**

The EHDI-IS Evaluation Report is designed for grantees to report on their evaluation outcomes for the Project Period. Please complete this report and send it as a single Word document to CDC EHDI via email to [ehdico-op@cdc.gov](mailto:ehdico-op@cdc.gov). Be sure to include attachments specified at the end of the reporting template.

## **What is the goal of this template?**

The goal of this reporting template is for grantees to create succinct comprehensive summaries of their evaluation results to share with a large range of audiences (e.g., management, program stakeholders, etc.). We are asking grantees to synthesize key information about the approach, activities, outcomes, and lessons learned into one piece.

The EHDI Evaluation Report serves to benefit EHDI grantees. For example: Grantees may cut and paste components of the report for a variety of purposes such as creating a 1-3 page summary of the cooperative agreement to share with stakeholders, submit as an abstract for a presentation, for newsletters or to post on a website, or for use in future FOAs.

## **What information is available to help fill out this report?**

Grantees can refer to documents they have already completed to write the report including: 1) FOA application; 2) Logic Model; 3) Evaluation Plan or previous evaluation reports, and 4) other documents and publications prepared about this cooperative agreement.

**Oklahoma State Department of Health  
Evaluation Report  
Early Hearing Detection and Intervention Program**

<b>1. Grantee Information</b>	
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<b>2. Introduction</b>
<p>This section includes what is being evaluated, including the timeframe, and project goals. Provided is a description that outlines what the OK NHSP sought to achieve and what the program did along the way.</p> <p>The purpose of the Oklahoma Newborn Hearing Screening Program (NHSP) evaluation was to determine the comprehensiveness of the data captured in the Oklahoma Neometrics tracking system. Three system attributes were evaluation: data quality, representativeness, and usefulness. The NHSP wanted to determine the completeness, accuracy and timeliness of the data reporting from Oklahoma birthing hospitals including one facility who piloted the safe and secure electronic data transfer of hearing results directly from the hospital hearing screening device. The Evaluation Plan assisted the program in gathering information to determine successes and well as reveal barriers providers may have, across Oklahoma birthing hospitals, in meeting the needs of children and families in regards to Early Hearing Detection and Intervention (EHDI).</p> <ul style="list-style-type: none"> <li>• A three-month trial was completed after full implementation of dCMS system and installation of electronic data linkage for St. John Medical Center. January-March 2016 hearing data was reviewed for and compared to the NHSP Neometrics database.</li> <li>• Hospital reports were reviewed covering data from the launch in June 2013 (including baseline data for 2011-2012 births) until the end of 2015. It is important to note hospitals reports are completed monthly along with an annual report comparison. Hospital reports are provided one quarter following the end of a previous quarter to allow infants in the Neonatal Intensive Care Unit the opportunity to discharge (ex. Quarter 1 covered January – March and but was reported in May/June).</li> <li>• A data match was completed between annual birthing data from Neometrics (EHDI data) and OK2Share (Vital Records) to complete the 2011-2016 EHDI Surveys.</li> </ul> <p>Related goals include:</p> <ul style="list-style-type: none"> <li>• <b>Goal 1:</b> Develop and maintain the EHDI-IS to accurately identify, match, and collect data that is unduplicated and individually identifiable through the EHDI process.</li> <li>• <b>Goal 2:</b> Collect and report individually data, including demographics, as defined in the CDC Hearing Screening and Follow-up Survey for every occurrent birth, about progress through the three components of the EHDI process.</li> <li>• <b>Goal 3:</b> Analyze EHDI data and utilize these findings the guide the development and enhancement of the EHDI-IS and educate stakeholders about the program’s successes, challenges, and future opportunities.</li> </ul>
<p>The finalized version of the program logic model has been included.</p>

### 3. Description of Key Stakeholders

This section includes a short description of the key stakeholders and their roles in the evaluation.

Stakeholder Name	Title and Affiliation	Contribution to Evaluation
Patricia Burk	Program Coordinator, Newborn Hearing Screening Program, Oklahoma State Department of Health/OK EHDI	<ul style="list-style-type: none"> <li>• Oversaw all programmatic and grant activities</li> <li>• Work with external partners (hospital leadership, IT messaging staff, Neometrics IT, etc.)</li> <li>• Development and implementation of Logical Model &amp; Evaluation Plan</li> <li>• Assist in comparing hearing screening equipment data to electronic data linkage</li> </ul>
Nazim Abdul Rahim	Quality Assurance/Data Coordinator, Newborn Hearing Screening Program, Oklahoma State Department of Health/OK EHDI	<ul style="list-style-type: none"> <li>• Collect data &amp; perform data management</li> <li>• Analyze and Evaluation all OK NHSP data</li> <li>• Assist with development and implementation of Logical Model &amp; Evaluation Plan</li> <li>• Assist in comparing hearing screening equipment data to electronic data linkage</li> <li>• Compile and disseminate quarterly hospital reports to Oklahoma hospitals</li> <li>• Complete data and trend analysis for individual hospitals</li> <li>• Develop state averages for Not Performed, Not Reported, and Refer Rates</li> </ul>
Samantha Siegman	Follow-up/Audiology Coordinator, Newborn Hearing Screening Program, Oklahoma State Department of Health/OK EHDI	<ul style="list-style-type: none"> <li>• Provide technical assistance, training and education to hospitals with high Not Performed, Not Reported, and Refer Rates</li> </ul>

Mary McCalip	Administrative Assistant II, Newborn Hearing Screening Program, Oklahoma State Department of Health/OK EHDI	<ul style="list-style-type: none"> <li>Request missing/conflicting results from Oklahoma birthing hospitals weekly</li> <li>Data entry of hearing results not entered on bloodspot filter papers</li> </ul>
Allen Badgett	Messaging Expert, Oklahoma Office of Management and Enterprise Services (OMES)	<ul style="list-style-type: none"> <li>Assist with hospital data linkage messaging components utilizing the CDC PHINMS system</li> </ul>
Doni Antonelli	Project Manager, Client Services, Neometrics, a division of Natus Medical Incorporated	<ul style="list-style-type: none"> <li>IT assistance/project management of the OK Neometrics device Case Management System</li> </ul>
Christina Rossi	Systems Consultant II, Client Services, Neometrics, a division of Natus Medical Incorporated	<ul style="list-style-type: none"> <li>IT assistance/project management of the OK Neometrics Case Management System</li> </ul>
Mary Rapp Sharon Pollock Jill Burger	St. John Medical Center Nursery Leadership Team	<ul style="list-style-type: none"> <li>Assist with hospital linkage of hearing screening data transfer</li> <li>Connection with hospital IT to complete transfer and troubleshoot issues</li> </ul>
OK2SHARE team	Vital Statistics Data Management personnel, OSDH Center for Health Statistics	<ul style="list-style-type: none"> <li>Upkeep of the interactive web query system of Oklahoma birthing statistics</li> </ul>

#### 4. Evaluation Approach – How did you assess the EHDI system?

This section describes in greater detail particular activities that were critical to delivering outcomes, an overview of the evaluation method and any limitations in the methodology.

##### **System Attribute: Data Quality**

To evaluate data quality, the NHSP reviewed daily letters prior to sending out to parents and physicians. This included looking for missing or incomplete results (ie. only one ear screened). Requests for updates were completed on a weekly basis. Hospital data was analyzed via the hospital report process (see below). Data cleaning methods were implemented utilizing the Neometrics data tracking system and Microsoft Excel software. Hospital specific monthly data was reviewed on a quarterly basis.

The NHSP device Case Management System (dCMS) on the new Neometrics server platform was tested and implemented into the Live Production system over the course of this Cooperative Agreement. However, there were obstacles with automation of the electronic data linkage process as far as the printing of daily letters based on data received from the hearing equipment. One barrier encountered was inconsistency of equipment data sent to the NHSP. This is due to one hospital having expired Public Health Information Network Messaging System (PHINMS) certificates needed to utilize the CDC software. Another barrier encountered at ten additional sites consisted of coding errors in the data transfer (file size, missing serial numbers). The NHSP worked with the hospital vendor's Information Technology, the OSDH/OMES, and Neometrics to address such issues in order to facilitate completion of data transfer, ensuring all hearing results were received from the 11 birthing hospitals and their hearing equipment.

Due to coding issues, data could not be compared for the ten birthing hospitals that had a contracted vendor. Therefore, a data match process was completed utilizing data sent from St. John Medical Center. Data was abstracted from the Neometrics CMS module, which includes individualized hearing results received at the NHSP via bloodspot filter paper, as well as other updates sent via fax, email or telephone. Each case was compared to the raw data electronically sent to the Neometrics dCMS module from the hospital's hearing screening equipment. The program was able to identify filters marked as: Pass but results were actually Refer, Pass but results were actually incomplete, and Refer but actually Passed.

#### **System Attribute: Representativeness**

To evaluate representativeness, the NHSP reviewed the last 6 years of data reported to the CDC via the CDC Hearing Screening and Follow-up Surveys from 2009-2014. The percent of live births reported through Neometrics via the bloodspot filter paper was compared with the vital records annual report via the OK2SHARE database. Beginning in 2009, the data was abstracted via a query in the Neometrics data system. Trained staff was not available for statistical analysis. Therefore, duplicates of individual children may have occurred due to the inability to link multiple bloodspot filter papers for a child if demographics did not meet laboratory standards.

The Quality Assurance/Data Coordinator was hired in 2011 and made changes to the quality assurance process in 2011. In 2012, additional modifications were made to review data on a quarterly (vs annual) basis, which allowed for more accuracy per individual birthing hospital. This enhanced the program's ability to look at individual children and their various bloodspot specimens to ensure reduction in duplication. As hospital reports were launched, data was monitored every 3 months per hospital location to provide a more accurate account of current screening, reporting, and refers at facilities. By 2014, The NHSP learned that cleaning the data quarterly with enhanced modifications to Neometrics queries produced more accuracy in individualized patient chart/results. However, it was also determined that hospital reports on a monthly basis were unfeasible and that not waiting a full quarter could yield incomplete results for a facility due to the number of infants still inpatient in the Neonatal Intensive Care Unit (NICU).

### **System Attribute: Usefulness**

To evaluate usefulness, the NHSP reviewed the hospital quarterly report process and associated data. Based on the 2011-2012 analysis of individual patient data regarding newborn hearing screening at each individual Oklahoma hospital, baseline data was categorized for quarterly and annual hospital reports. When creating the concern levels of the Refer Rates, the NHSP also took into consideration 1) the Joint Committee on Infant Hearing (JCIH) recommendations of 2-4%, 2) the Oklahoma baseline average of 5.55% in 2011 and 4.66% in 2012 and 3) Hospital Refer Rate rankings among Oklahoma hospitals. The NHSP recognized that hospitals with a Refer Rate of less than 2% were considered at least “low” concern (as compared to “no” concern”) since over screening (more than two times per infant prior to hospital discharge) could reduce the reliability of the screening equipment and process.

Ideally, all Oklahoma birthing hospitals would screen all infants born at each facility and reporting results to the NHSP. Therefore, the desired Not Performed Rates and Not Reported would be 0%. This would indicate that all hospitals are in compliance with state mandated screening and reporting. Not Performed Rates and Not Reported Rates concern levels were established based on hospital performance across the state on a quarterly basis. It is important to note that hospitals annual averages may not appear high when compared to their quarterly data. Therefore, these finds suggest that data should continue to be monitored on a quarterly basis.

Analysis of the 2013 hospital reports indicated a significant improvement in all three areas (Refer Rates, Not Performed Rates and Not Reported Rates). Baseline 2011-2012 data revealed a Refer Rates "High" concern category of  $\geq 20\%$ . Following 2013 analysis, the “High” concern category was modified to  $\geq 10\%$  as a result of improved hospital performance across the state. This is a 50% reduction in the average of Refer Rates. The Not Performed and Not Reported Rates “High” concern categories were reduced significantly from  $\geq 20\%$  in 2012 to  $\geq 4\%$  in 2013. That is an 80% improvement from the previous year. Due to hospitals taking ownership of the data, the NHSP has been able to increase the level of expectation for all birthing hospitals in the state of Oklahoma for 2014. Higher expectations in turn helps ensure that infants are getting quality universal newborn hearing screening and assists with follow-up case management efforts, tracking and surveillance, and overall outcomes for children.

Quarterly reports were disseminated to 100% of birthing hospitals in 2014-2015. These reports included results for babies in the previous quarter were analyzed through ongoing quantitative measures. The NHSP team reviewed changes in hospital data monthly, quarterly, and annually. Hospital specific information was provided for each location including the hospital’s annual average, the NHSP concern level as compared with other hospitals in the state, and the hospital’s comparison ranking. The NHSP provided enhanced communication, troubleshooting, technical assistance, and coaching for hospitals with high rates in any of the three areas.

The finalized version of the program evaluation plan has been included.

## 5. Key Evaluation Findings

Information is based on the evaluation questions in the Oklahoma evaluation plan submitted in Year 3. Summarized are the key evaluation findings.

### **System Attribute:** Data Quality

#### **Evaluation Question:**

To what extent is the NHSP receiving accurately marked hearing results from Oklahoma birthing hospitals on the bloodspot filter papers?

(in comparison to actual individual hospital Algo 5 hearing screeners)

#### **Data Collected:**

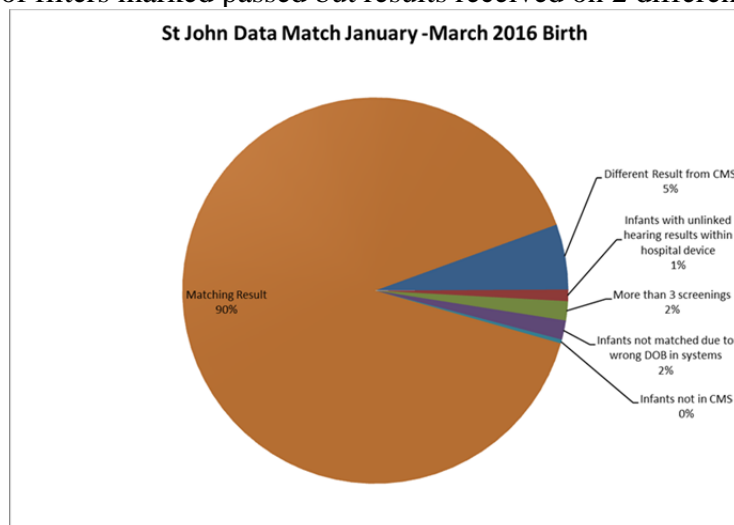
The Oklahoma Newborn Hearing Screening Program compared a sample of the following:

- Raw data from the Oklahoma NHSP Neometrics device Case Management System (dCMS) consisting of individual patient data that was directly sent electronically from St. John Medical Center's Algo 5 hearing screening equipment during January – March 2016
- Reported data from the Oklahoma NHSP Neometrics Case Management System (CMS) which includes data received from bloodspot filter paper results sent by St. John Medical Center from January – March 2016, follow-up results faxed by the hospital, and updated results emailed or received via telephone from hospital leadership

The comparison included an individual one-on-one match for 50% of the 617 identified by the NHSP Neometrics Case Management System (CMS), which includes all infants receiving a newborn hearing screening and/or newborn bloodspot screening during January – March 2016.

Results were as follows:

- Charts reviewed: 311
- Infants not in Case Management system receiving hearing screening: 1
- Infants with unlinked hearing results within hospital device: 3
- Infants with more than 3 screenings noted: 5
- Infants not matched due to wrong DOB in systems: 5
- Different results from CMS: 17
  - % of filters marked as passed but results actually referred: 11 (3%)
  - % of filters marked as passed but results actually incomplete: 4 (1%)
  - % of filters marked as referred but actually passed: 1 (0.3%)
  - % of filters marked passed but results received on 2 different screens: 1 (0.3%)



**System Attribute:** Data Quality (continued)

**Key Findings:**

Though most of the data sent electronically and directly from St. John Medical Center's was accurate, some discrepancies were identified in such as different results from hearing machine and Neometric, infants with unlinked hearing results within hospital hearing device, and infants not matched due to different Date of Births in the two systems.

Overall, the electronically sharing of hearing screening results shows promise for future data collection for the NHSP. However, continued quality improvement and quality assurance efforts need to be completed before expanding this opportunity statewide to Oklahoma birthing hospitals statewide.

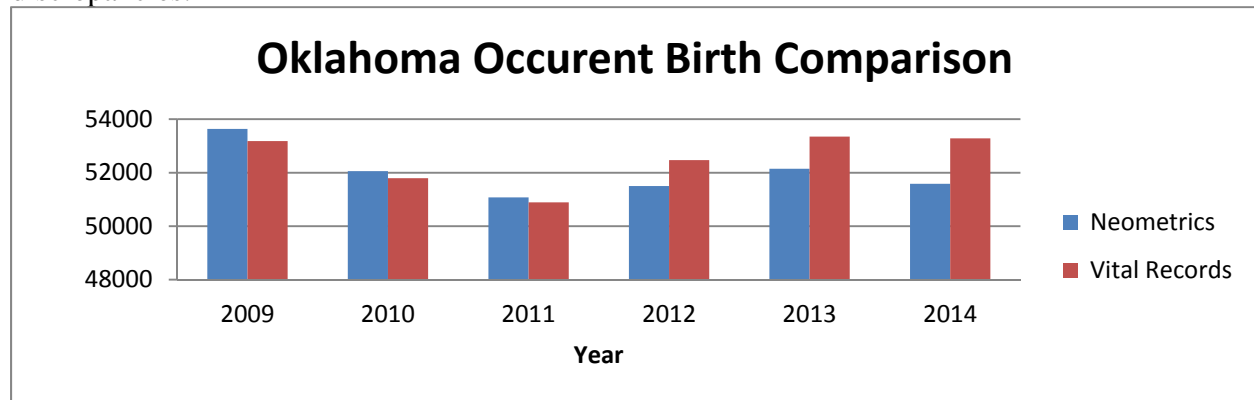
**System Attribute:** Representativeness

**Evaluation Question:**

To what extent have the total number of Oklahoma live births been reported through Neometrics?

**Data Collected:**

The Oklahoma Newborn Hearing Screening Program reviewed the total number of 2009-2014 live births in the Oklahoma State Department of Health (OSDH) OK2SHARE Service database managed by the Oklahoma Center for Health Statistics. The OK2SHARE aggregate data was then compared to the NHSP Neometrics database of all infants receiving a newborn hearing and/or bloodspot screening. The purpose was to determine the extent to which these two databases consistently identify all live births in the state of Oklahoma, as well as to identify discrepancies.



**Key Findings:**

Based on data collected, the program determined that there continue to be variances between the OK2SHARE and Neometrics database systems regarding annual live births and infants receiving newborn screening in the state of Oklahoma. There was a 3-year trend from 2009-2011 where Neometrics reported more individual babies being screened than were reported as live births from OK2SHARE. However, following enhanced quality assurance efforts to reduce duplication of patient charts, a shift was noted from 2012-2014. This shift indicated that there were more babies born in Oklahoma than those who received a newborn screening, which would be more appropriate and accurate.



**System Attribute:** Usefulness

**Evaluation Question:**

To what extent are quarterly hospital reports useful in the following 3 areas:

- 1) Reducing Refer Rates
- 2) Reducing infants not screened (Not Performed)
- 3) Reducing infants not reported (Not Reported)

**Data Collected:**

The Oklahoma Newborn Hearing Screening Program launched individual hospital reports with three process-based analyses: 1) Refer Rates, 2) Not Performed Rates, and 3) Not Reported Rates for each Oklahoma birthing hospital in June 2013. Hospitals were provided with two years of retrospective data for 2011-2012 births.

Quarterly Concern levels for Refer Rates for 2011-2012 were as follows:

No	Low	Medium	High	Extremely High
2-5.99%	0-1.99%	6-9.99%	10-14.99%	≥15%

Quarterly Concern levels for Not Performed Rates and Not Reported Rates for 2011-2012 were as follows:

No	Low	Medium	High
0% - 4.99%	5.00% - 9.99%	10.00% - 19.99%	≥20.00%

June 2014 marked the completion of the first full year of quarterly hospital reports. Analysis of the 2013 hospital reports indicated a significant improvement in all three areas (Refer Rates, Not Performed Rates and Not Reported Rates).

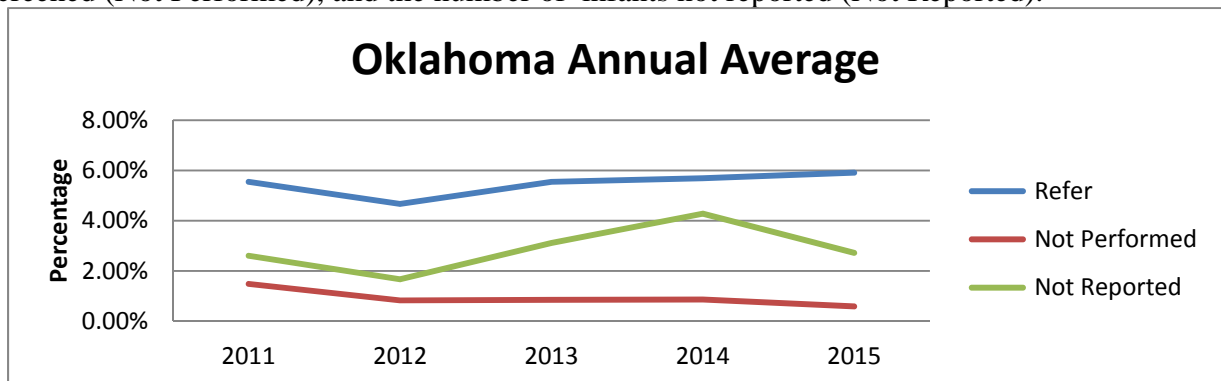
New concern levels were introduced/established for 2014-2105 Refer Rates as follows:

No	Low	Medium	High
0-5.99%	6-7.99%	8-9.99%	≥10%

New concern levels were introduced/established for 2014-2105 Not Performed and Not Reported Rates as follows:

No	Low	Medium	High
0-0.99%	1-1.99%	2-3.99%	≥4%

As of June 2016, a 5-year trend analysis was completed to determine the extent to which quarterly hospital reports were/are useful in reducing Refer Rates, the number of infants not screened (Not Performed), and the number of infants not reported (Not Reported).



**System Attribute:** Usefulness (continued)

**Key Findings:**

Based on data collected, the program determined that enhanced quality assurance measures were needed to ensure proper analysis of data on a quarterly vs. yearly basis. Though it may appear that Not Reported Rates increased in 2014, it was a product of “cleaner” quality of data. Overall findings indicated that quarterly hospital reports are extremely useful for ensuring Oklahoma hospitals meet state mandates (screening and reporting) and guidelines (quality of screens as determined by Refer Rates). This is particularly evident in the range for each category.

**6. Lessons Learned**

Based on the answers to number 5, 3 lessons learned that have potential for the future development of the EHDI-IS and associated program activities.

- 1) Following further exploration into non-matching hearing results from existing hospitals utilizing the electronic linkage data process, the NHSP has the potential to expand these efforts to other birthing hospitals across the state. Receiving accurate data by electronic transfer would reduce the need for NHSP staff to perform manual data entry. This would in turn reduce errors that occur. These efforts will also increase the speed at which follow-up case management can be completed for infants across the state of Oklahoma in regards to Refer (not passed) hearing screens.
- 2) Due to variances in the total number of Oklahoma live births reported through Neometrics and OK2SHARE, the NHSP can utilize the data and findings to encourage linkage with Vital Records for a one-to-one correspondence of individual infants. This will assist the NHSP in ensuring that all Oklahoma infants receive a newborn hearing screening regardless of their birthing location (hospital, home birth, etc.)
- 3) The NHSP should continue utilizing quarterly hospital reports to identify hospitals not screening all babies and not reporting all hearing results per state mandate. Hospital reports are also useful for sites with poor technique, protocols, or equipment management. These reports can assist the NHSP in providing additional training, troubleshooting, or technical assistance for Oklahoma birthing hospitals at those sites for whom the program has higher levels of concern in a particular category.

## **7. Recommendations / Next Steps**

Recommendations draw directly on what the NHSP has learned in the evaluation and what the program knows about the EHDI-IS. They reflect what was reported in the **Key Evaluation Findings** section.

- 1) The NHSP should further investigate discrepancies from the data sent electronically directly from St. John Medical Center. Emphasis should be placed on results that were different in the hearing machine and Neometrics.
- 2) The NHSP should re-educate hospitals about the importance of accurate demographics entered into the hearing screening equipment (ie. Date of Birth) as well as linking all initial and rescreens at the facility within the device.
- 3) The NHSP should continue to finalize efforts with the ten hospitals attempting to send electronic data transfer from the hospital vendor.
- 4) The NHSP should further investigate expanding electronic data transfer with other birthing facilities in the state of Oklahoma utilizing an Algo 5 device.
- 5) The NHSP should continue to pursue data linkage with the Oklahoma Center for Health Statistics for vital records matching to ensure all infants receive a hearing screening.
- 6) The NHSP should continue quarterly hospital reports to ensure Oklahoma hospitals meet state mandates (screening and reporting) and guidelines (quality of screens).
- 7) The NHSP should continue utilizing quarterly hospital reports to identify hospitals not screening all babies and not reporting all hearing results per state mandate.
- 8) The NHSP should further investigate how to maximize hospital reports to encourage quality improvement efforts such as presenting to other hospital leadership (ie. Risk Management) or post data on the OSDH website (similar to the newborn screening reports) to increased compliance with state mandates.

## **8. Implementation of Recommendations**

This area discusses in detail how the program plans to apply the recommendations listed above. This includes stakeholders involved for recommendations and potential timeframes.

- 1) In Year 6 of this Cooperative Agreement, the NHSP plans to investigate discrepancies from the data sent electronically and directly from St. John Medical Center. This includes partnerships with the NHSP Program Coordinator, the NHSP Quality Assurance/Data Coordinator, the St. John Medical Center Nursery Leadership Team, Neometrics IT personnel, and OMES IT personnel.
- 2) In Year 6 of this Cooperative Agreement, the NHSP plans to provide key findings of the data quality evaluation and the additional investigations (see item 1) with the St. John Medical Center regarding the importance of accurate demographics entered into the hearing screening equipment (ie. Date of Birth) as well linking all initial and rescreens at the facility. An additional awareness campaign will be sent to all Oklahoma birthing hospitals for quality assurance efforts.
- 3) The NHSP Work plan Goal 1, Objective 1.1 activities indicates “Finalize coding efforts of electronic submission of data from the ten Pediatrix hospitals in Oklahoma City to implement into the Neometrics dCMS module” by June 2017.
- 4) The NHSP Work plan Goal 1 Objective 1.1 activities indicates “Collaborate with five hospitals utilizing Peloton outsource screening vendor as well as the OSDH Messaging Staff to initiate PHINMS installation to send test messages to OSDH” by June 2017.
- 5) The NHSP will continue to collaborate with the statewide Health-e Oklahoma initiative throughout the next Cooperative Agreement cycle in efforts to link newborn screening with vital records. Since this is a larger agency initiative to link all data systems, finalization dates are not available at this time.
- 6) The NHSP Work plan Goal 2 Objective 2.1 activities indicate “Complete hospital reports on a quarterly basis through monthly data abstraction and analysis” by May 2017. These efforts will identify hospitals not screening all babies and not reporting all hearing results per state mandate.
- 7) The NHSP Work plan Goal 2 Objective 2.2 activities indicate “Following the 2015 hospital report dissemination, identify and contact hospitals that do not report at least 95% of all hearing results for their facility over a 1-year process” and “Following each quarterly hospital report dissemination, identify and contact hospitals that do not report at least 95% of all hearing results for their facility” by June 2017.
- 8) Several objectives in the NHSP Work plan Goal 3 indicate collaborative efforts with key stakeholders regarding EHDI data. The NHSP will begin discussions with those stakeholders as well as with the Newborn (Bloodspot) Screening Program to determine enhanced methods of disseminating hospital results to the public. Efforts will begin in Year 6 of this Cooperative Agreement but may be a goal in the subsequent years.

## OKLAHOMA LOGIC MODEL



## OKLAHOMA Early Hearing Detection and Intervention Program – Evaluation Plan Template

Evaluation Purpose: Be specific and aligned with the attributes and characteristics of the EHDI surveillance system.						
The purpose of this evaluation plan is to establish a comprehensive and sustainable EHDI System of Care that meets the needs of Oklahoma’s children and families through continuous program evaluation.						
Evaluation Design and Implementation: Define the indicators that will be used to assess the process, performance and data quality of the surveillance system. Specify the source and method for data collection, and timeline and person responsible for a particular evaluation question.						
Design			Implementation			
System Attributes and Characteristics	Evaluation Question(s)	Indicators	Data Collection Methods	Data Collection Sources	Timeline	Person responsible
<b>Data Quality</b>	<p>To what extent is the NHSP receiving accurately marked hearing results from Oklahoma birthing hospitals on the bloodspot filter papers?</p> <p>(in comparison to actual individual hospital Algo 5 hearing screeners)</p>	<p>% of hearing screening data electronically received that matches the bloodspot filter paper results</p>	<p>Compare a sample of the following:</p> <ul style="list-style-type: none"> <li>- Raw data from dCMS (individual patient data that was sent electronically directly from hospital Algo 5 hearing screeners)</li> <li>- Reported data from CMS as received from bloodspot filter paper results sent from hospital</li> </ul>	<ul style="list-style-type: none"> <li>- NSP bloodspot filter papers</li> <li>- Neometrics device Case Management System (dCMS) module</li> <li>- Neometrics Case Management System (CMS) modules</li> </ul>	<p>A three month trial after full implementation of dCMS system and installation of electronic data linkage for a select participating birthing hospital; replication to be determined</p>	<p>NHSP Coord.</p> <p>QA/DC</p>

**OKLAHOMA Early Hearing Detection and Intervention Program – Evaluation Plan Template**

<b>Representativeness</b>	To what extent have the total number of Oklahoma live births been reported through Neometrics?	% of live births reported through Neometrics via the bloodspot filter paper that match the vital records annual report	Data match between annual birthing data from Neometrics (EHDI data) and OK2Share (Vital Records)	<ul style="list-style-type: none"> <li>- Neometrics database</li> <li>- OK2Share Program provided by the Oklahoma State Dept. of Health Vital Records Program</li> </ul>	Annually	QA/DC
<b>Usefulness</b>	<p>To what extent are quarterly hospital reports useful in the following 3 areas:</p> <ol style="list-style-type: none"> <li>1) Reducing Refer Rates</li> <li>2) Reducing infants not screened (Not Performed)</li> <li>3) Reducing infants not reported (Not Reported)</li> </ol>	<p>% of babies referred</p> <p>% of hospitals reporting all results</p> <p>% of hospitals screening all babies</p>	<ul style="list-style-type: none"> <li>- Develop run charts of individual NHSP hospital quarterly reports to determine progress annually over a several year period</li> <li>- Trend analysis of Annual hospital report averages</li> <li>- Compare Oklahoma Annual Average Reports in each of the three areas over a 4-year period (includes baseline data, initial implementation and ongoing application)</li> </ul>	<ul style="list-style-type: none"> <li>- NSP bloodspot filter paper, “Hearing Results Form” (follow-up results)</li> <li>- Neometrics database</li> <li>- Individual NHSP hospital quarterly reports</li> </ul>	Quarterly/ Annually	<p>NHSP Coord.</p> <p>QA/DC</p> <p>Follow-up Coord.</p>