

## **Introduction**

The goal of the Universal Newborn Hearing Screening (UNHS) program is to ensure quality developmental outcomes for all infants and young children identified with hearing loss. The first component of a successful program includes assurance that all newborns are screened for hearing loss before hospital discharge and second that those infants who did not pass the hearing screen receive timely follow-up screening and/or diagnostic services. Infants who did not pass the hospital screen should receive follow-up testing within the first month of life as stated in the JCIH position statement.

The screening of every child for hearing loss before hospital discharge has been proven to be beneficial to children according to Christine Yoshiaga-Itano author of “From Screening to Early Identification and Intervention: Discovering Predictors to Successful Outcomes for Children with Significant Hearing Loss”. This includes a timely follow-up for further audiological evaluation with appropriate Early Intervention services. Research has identified permanent hearing loss as the most common congenital disorder screened for at birth. It is estimated that hearing loss is two times more prevalent than other screen-able newborn disorders combined. National data confirms 3 per 1,000 babies are born with a confirmed hearing loss each day that, if left undetected, can impede speech, language and cognitive development. As with most UNHS programs the major problem is the loss to follow up/loss to documentation on those infants who do not pass their initial hearing screen. It is imperative that solutions are identified and implemented for this set of infants.

Causes for the non-return of infants for further testing are many. In 2011 research was conducted in Arkansas through the Survey Research Center Institute of Government at the University of Arkansas at Little Rock (SRC). This study revealed that the majority of parents surveyed think “it is important to find out whether a child has hearing loss as soon as possible”. However, the highest rating for why parents “do not get follow-up testing for their child” is travel distance/transportation issues followed by the parents’ belief that the “baby’s hearing is fine”, and “the baby’s extended family advising parents to wait or not worry”. The loss to follow up for post discharge infants remains one of the greatest problems in Arkansas. In 2013, 7% of infants did not return for follow-up. Both birthing facilities and the Infant Hearing Program’s (IHP) staff must find new ways to provide access to services along with easily accessible information and educational materials delivered by competent providers to change service delivery and parental perceptions (i.e. beliefs). Quality improvement strategies found to be effective in the Health Research Services Administration’s (HRSA) Mathematica study will be implemented in Arkansas to reduce the number of infants who are lost to follow-up/lost to documentation (LF/LD) following a failed hearing screening. These strategies and other solutions for the overall success of a UNHS system are explored in the Methodology and Work Plan sections of this application.

Problematic issues that can hinder the overall success of the UNHS state system include a shortage of audiological services in some regions of the state. While the IHP has seen an increase of experienced pediatric audiological providers in the central region of the state, other regions report the discontinuation of newborn screening services due to staffing shortages and the lack of appropriate audiological equipment. Reporting issues from medical personnel (audiologists and physicians) who provide services for the 0-3 year-old population have improved over the last three years but it is important to provide continued education to providers for continued progress. The state’s Early Intervention program (Part C, housed in the Department of Human Services) has experienced positive change over the last year in securing

further policy change in eligibility, service provisions and program collection methods through legislative approval. Unfortunately, this program does not report information to the IHP.

Another critical area for a successful program is timely capture of newborn hearing screen results. In 2013, the IHP Electronic Registration of Arkansas Vital Events (ERAVE) system was launched which includes links to Arkansas Department of Health (ADH) death and birth event systems. This enables the infants' primary care physicians and audiologists to access information on infants needing referrals and testing. The on-line system has enhanced the IHP's reporting ability expediting hearing screening information from the birthing hospitals. This has resulted in more timely submission of newborn hearing screen data, in avoiding duplication of data entered at the hospital level and in increased access to information that was previously not collected.

There are several enhancements needed to continue progress toward the follow-up of referred hearing screens: 1) referral and clinical services for those infants needing an audiological diagnostic evaluation; 2) an integrated Early Intervention service program that provides intervention therapies and family support; and 3) a Medical Home capable of managing/coordinating the child's progress. The goals and objectives for this project address strategies toward improvement in all the components of the Universal Newborn Hearing Screening program's success.

### **Needs Assessment**

Geographically, Arkansas is a rural state with many sparsely populated towns and few cities larger than 16,000 in population (2010 U.S. Census Bureau). Arkansas ranked sixth highest in the US for childhood poverty at 27.3%, compared to a national rate of 21.6%. Arkansas' rural regions had child poverty rates that were considerably higher than urban rates such as Phillips County with a poverty rate as high as 51.8%. The demographics have changed in the last few years with significant growth of the Hispanic population, particularly in the Northwest and Southwest regions of the state. Vital Statistics at the Arkansas Department of Health (ADH) report 37,406 births for Calendar year 2013. Newborns with maternal Hispanic ethnicity were reported as 10.21% of the babies born. This reveals a 3.5% increase since 2010 with 4,040 births to Hispanic mothers. The language barriers that exist in this expanding population reveal the need for continued cultural competency education to improve communication.

Currently, there are 41 birthing hospitals in the state and all meet the mandated requirements for providing physiological hearing screens as Universal Newborn Hearing Screening (UNHS) facilities. Out of hospital births comprise less than 1% of the total births in Arkansas and are generally assisted by a midwife or unknown person. Lay midwives are not mandated to provide a physiological hearing screen for newborns but are asked to complete an IHP form to fax or mail to the IHP. Ideally, hospitals' referral rates (children who do not pass the hearing screen) should not exceed 5% although referral rates as high as 6-10% are acceptable according to established guidelines. Over the course of the 13 years of Early Hearing Detection and Intervention (EHDI) existence in Arkansas, hospital referral rates show steady improvement toward the expected rate due to improved screening techniques. Currently, 29 reporting hospitals have a screening referral rate of less than 4%, 6 have a screening referral rate of 5% or less, and 6 have a referral rate of greater than 5%. The Follow-up Consultant continues to work with these hospitals providing in-service guidance to improve referral rates.

CDC data from year 2012 shows Arkansas' loss to follow-up/loss to documentation at 25% with the national average at 39%. Although the state is below the national average, the IHP aspires to reduce this percentage to zero. Since the volume of data from hearing screening through Early Intervention and complete state reporting is large, 2013 data is selected as the most complete for the entire process and will be evaluated in this document. Infant Hearing records indicated 1,420 infants failed the inpatient hearing screen. The 517 babies who failed the newborn hospital screen belong to one of the following categories: 1) did not receive follow-up testing; 2) received follow-up testing in their resident state, or failed babies were not Arkansas residents and were followed up and monitored in their home state; or 3) hearing screen results were unreported at the first level of loss to follow-up/loss to documentation (i.e. before hospital discharge to outpatient screen). Additional infants are loss to follow-up/loss to documentation after the second level of testing – the post discharge hearing screen. Data for 2013 revealed that 75% of infants who did not pass the rescreen were not reported for diagnostic evaluation. There were 75 audiological diagnostic evaluations received in 2013 with 38 children having a confirmed, permanent hearing loss.

When submitting information to the state, hospitals are required to send the infant's screening results to the infant's Primary Care Physician (PCP) or clinic where the baby's physician practices. Infants who pass the hearing screen without risk factors are considered to have a "negative" screening and are automatically closed regardless of PCP data. However, infants who pass the hearing screen with risk factors need periodic follow-up by their PCP. Furthermore, infants who did not receive a test before hospital discharge are required to have their hearing record sent to their physician for follow-up. Hospitals provided infant PCP contact information in the ERAVE record on 98% of babies that failed the hearing screen in 2013.

The Infant Hearing Program has worked collaboratively with other state and private entities to provide workshops, conferences, and trainings for parents and family support. The Infant Hearing Program partners with Arkansas Hands and Voices, a non-biased support group for families of children who are deaf and hard of hearing. Families are encouraged to use the method of communication that works best for each individual family such as listening and spoken language. Hands and Voices empowers parents of children with hearing disabilities to reach their highest potential. Services include seminars, advocacy training, transition assistance in moving from pre-k to elementary, elementary to middle school, middle school to high school, high school to college, college to work force, family oriented events, and networking resources for these families to become better advocates to improve the quality of life for their children. Arkansas Hands and Voices is a parent-driven and professional collaborative group that is unbiased towards communication modes and methods.

The Arkansas IHP's Parent Consultant diligently works in partnership with Hands and Voices Arkansas Chapter to identify parents of infants/children with hearing loss. The Parent Consultant is currently planning sessions for the annual conference to be held in the spring of 2015. The Parent Consultant will also continue to develop and advocate for new parents of deaf infants relying on experience as a parent of a hearing impaired child to help promote Hands and Voices Arkansas Chapter.

While Audiology service providers are scattered across the state, few consent to see babies for hearing screening and/or audiological diagnostic evaluations. Audiologists were polled to determine if they would be willing to provide services to infants and young children needing screening follow-up and diagnostic testing; the type of clinic equipment was also assessed. Currently, seven clinic sites offer Otoacoustic Emissions (OAE) testing, one site offers

diagnostic Auditory Brainstem Testing, and only one site provides the full battery of diagnostic tests recommended for a comprehensive audiological assessment.

### **Methodology**

The purpose of this proposal is:

- To ensure all newborns are screened for hearing loss before hospital discharge;
- To ensure that those infants who do not pass the hearing screen receive timely follow-up screening and/or diagnostic services; and,
- To ensure that their families receive “Guide by Your Side” parent to parent interaction for parents with hearing impaired children.

The project is two-fold. First, it targets the quality of hearing screen services provided at the hospital level and second, it addresses the follow-up practices and procedures instituted and delivered to assure care coordination.

IHP plans to develop and collaborate with a team of stakeholders to initiate Hands and Voices “Guide by Your Side”. IHP will create a Memorandum of Agreement (MOA) and collect and study data and funding in kind with the following; ACH, ASD, DHS and UAMS/UALR. The aim is to pilot a study with families of recently diagnosed children with hearing loss. Stakeholders will meet quarterly to access data received from this pilot project. The primary agenda item will be to deliver a new chapter of “Guide by Your Side” to the state. CQI data will be reviewed and the PDSA methodology will be used by developing a PDSA model.

The program specific goals, objectives, and activities have been designed to address the most critical issue facing the Universal Newborn Hearing Screening (UNHS) process: the loss-to follow-up/loss to documentation of infants failing the newborn hearing screen (NBHS).

The ERAVE or Infant Hearing Module implementation data reports have become invaluable, enabling staff to determine the “weakest link” in the coordination of care from the nursery to “Early Intervention” enrollment by using multiple ERAVE reports such as “Loss to Follow-Up” percentages from hospitals, to “Missed Appointment” report. As improvement in the percentages occurs, each measure will be updated to new target goals per PDSA methodology.

IHP follow-up staff will continue to make phone calls to parents encouraging them to take their babies to follow-up appointments and send written communication to their home addresses with the same information. Also, the follow-up consultant will perform spot checks of providers (clinics) who enter screening data into ERAVE, monitoring when and what the clinics report and any issues the clinic needs to resolve to ensure timely reporting and correct data submission. Adding enhanced collaboration with Early Intervention (EI) providers should ensure coordination of care. EI will provide what services the family has chosen. EI will enter the service provider in the notes section through ERAVE to complete the UNHS coordination of care process.

**Goal One: To reduce loss to follow-up/loss to documentation after initial hearing screen refer.**

**Hospital Performance Aided by Materials Provided by the Infant Hearing Program (IHP)**

The IHP will escalate its efforts to increase the infants' return rate for outpatient rescreening of infants referred on the initial newborn hearing screens. To aid in the accomplishment of this goal, the IHP will provide new educational materials to all UNHS hospitals targeting parents of infants who have “referred” (failed) on the initial newborn hearing screen. The IHP Parent Consultant and Follow-up Consultant will utilize the CDC and NCHAM brochures with information specific to the “referred” newborn/infant to educate the facilities to in turn, educate the family of the referred newborn. In addition to the brochures, the Follow-Up Consultant will educate the facility staff to provide the NCHAM video to be viewed by parents of infants who “referred” on the inpatient hearing screen. IHP also plans, as funds are available, to translate the reading materials into Spanish and Marshallese.

The distribution of scripted messages used for communicating screening results to parents will signal a renewed impetus by the IHP to ensure that hospital screeners provide accurate information to parents. IHP plans to collaborate with Arkansas Children’s hospital (ACH) to provide a scripted message video on how to communicate the child’s screening results to the parents and PCP. The IHP will monitor loss to follow-up/loss to documentation to collect and evaluate the video and script. The IHP will accomplish this by following the next one hundred infants who have failed their initial hearing screen (from a composite list across the state provided by ERAVE) for compliance. It has been demonstrated that clear presentation of results can be very important in a family’s decision whether to follow-up after a failed inpatient hearing screen. This is of particular concern when parents are recent immigrants or teen mothers. As funds permit, this same logic model can be used with PCP clinics and their staff to provide the same message to parents across the spectrum of health resources assuring care coordination.

- Plan – Develop scripted video and scripted notes for all healthcare providers to have a consistent verbiage with families concerning their infant’s hearing screen and the results of the hearing screen. By scripted communication across all levels of healthcare the families will have a clear message on the need for infant hearing screens and what to do with the hearing screen results.
- Do – Create a team of stakeholders from ASD, ACH, UALR/UAMS and IHP to create video to address how hospital staff, PCP and staff and Audiologists can address families concerning their infant’s hearing screen.
- Study – Collect the data from the Loss to Follow-up/Loss to Documentation from ERAVE, survey approximately 100 families and present results to team.
- Act - The team of stakeholders will use loss to follow-up/loss to documentation results from ERAVE to determine the success of the video and script.

### **Quality Improvement/Evaluative Measures**

One major component is the development of the new educational binder. The parents of infants who were referred on their newborn hearing screening will be given the opportunity to view a video from NCHAM recommended from the educational binder and rate its value. The second component of the Quality Improvement plan requires the new scripted message to be included in the annual report submitted to each hospital by the IHP. In turn each hospital will complete a survey for the state IHP regarding hospital protocols such as the identification of screeners and newly instituted hospital procedures, etc. This will give the UNHS hospitals a chance to give feedback on their use of the scripted message.

#### **The IHP will expand its range of collaborative relationships with hospital staff.**

The IHP realizes that the cooperation and assistance of hospital staff is required to reduce the loss to follow-up of infants after the infant has a referred screening result on their initial inpatient newborn hearing screening. The IHP proposes to actively pursue new collaborative relationships with additional hospital staff by reintroducing the principles and the importance of the UNHS process to hospital staff. For example, IHP will monitor the hospital's queues in ERAVE closely, follow up and call when any issues such as "DNT-Equipment Down" are observed and offer loaner equipment from the IHP when required.

#### **Establishment of additional hospital post-discharge rescreening programs and flexible clinic hours for existing rescreen programs.**

The IHP will promote additional hospital post-discharge rescreen programs wherever feasible. Currently, there are rescreen programs in thirty (30) UNHS hospitals. In addition to new rescreen programs, the IHP will encourage hospitals with existing rescreen programs to adopt a broader range of times for families to bring in their infant for an outpatient rescreen appointment.

### **Quality Improvement/Evaluation Measures**

The IHP anticipates a 30% increase in both rescreen programs and the institution of open clinic hours for existing rescreen programs allowing more screening to be accomplished in the outpatient setting.

#### **The IHP Follow-Up Consultant will provide 1) technical assistance to hospitals and 2) post-discharge hearing screens at the local community level.**

Of the 41 UNHS hospitals, four (4) are categorized as outliers with regard to acceptable refer rates. An additional four (4) hospitals fall slightly outside the referral compliance rates of >6-10%. In an effort to help address these deficiencies, the IHP Audiologist and IHP staff will collaborate with the Follow-Up Consultant on screening techniques. The Follow-Up Consultant will have yearly site visits and work one-on-one with all hospitals to achieve a state aggregate goal of <6%. It is anticipated, that the IHP Follow-Up Consultant will observe actual hearing screening, provide hands-on training/education, and make recommendations on improving screening techniques in the hospital setting. This will also be accomplished by giving each hospital an education binder with information to help them meet the goals of 1) lowering hospital refer rates, 2) improving the quality of screens performed, and 3) improving the quality of accurate records when submitting each hearing record into ERAVE. The IHP and team of stakeholders plans to study the feasibility of using graduate students to travel to remote areas of

the state and offer screening and tele-nursery video conference with Audiologists at ACH and ASD. This will provide screening assistance to many families of infants failing the inpatient hearing screen who reside in communities with little to no access to outpatient rescreen programs or audiologists. It is not uncommon for parents to travel three (3) hours to obtain hearing services for their infant. The ability to travel is not possible for many Arkansas families. This provision of outpatient services will be to alleviate this need and increase the number of outpatient rescreens provided. The IHP will investigate sites at the Arkansas Department of Health (ADH) local health units, Arkansas Department of Human Services county offices, and Community Health Centers and PCP offices where infant screening may be conducted. To offer screenings in a PCP office allows us to train and educate the PCP and his/her staff using infant hearing information.

### **Quality Improvement/Evaluative Measures**

Following the onsite training of hospital staff by the IHP Follow-up consultant, it is anticipated that hospitals will achieve the acceptable target refer rate of <6%. Upon completion of training, improvements in target refer rates will be monitored via the ERAVE data management system. Hospitals not meeting improved rates will be given a second training. In addition, with the provision of outpatient rescreens, hospital target percentages should increase and loss-to-follow-up/loss to documentation rates decrease.

### **Goal Two: Enhance the capacity and continue to develop the ERAVE service systems and collaborate with key stakeholders.**

#### **The IHP will provide written guidelines for hospitals based on the Joint Committee on Infant Hearing (JCIH) 2007 Position Statement.**

The IHP will provide guidelines for hospital screening programs with JCIH standards as the guide. The IHP will task a team of stakeholders to review the existing guidelines from three (3) other UNHS states. After a consensus has been reached, the completed guidelines with JCIH standards will be disseminated and implemented across the state. The Advisory Board will also evaluate the HRSA Procedure and edit as needed. The primary agenda item will be to assure coordination of care and that the PDSA methodology will be used.

#### **Provide opportunities for collaboration and input with key stakeholders in the UNHS process**

The IHP will utilize various means of communications to reach both existing and potentially new collaborative partners. The Arkansas Department of Health's communication capacity affords the IHP the ability to utilize telecommunication options such as videoconferencing, satellite downlinks, and teleconferencing for training and technical assistance at the hospital level. The IHP will utilize the "Tele-Nursery" sites as an opportunity to educate and promote IHP to facility nursery staff.

The IHP will collaborate with Hands and Voices to identify and reduce family challenges and barriers related to obtaining needed follow-up services using our parent consultant. The Arkansas Universal Newborn Hearing Screening, Tracking, and Intervention Advisory Board is composed of seven (7) members appointed by the Governor. These members are audiologists, speech language pathologists, an adult deaf person and parent(s) of children with a permanent hearing loss. Currently, the advisory board meets twice annually to assure the program is on

track. IHP would like to re-purpose the Advisory Board to have more impact and influence by asking the team of stakeholders to meet quarterly on subjects of importance to the IHP.

**Implement a reciprocal agreement between Part C and IHP.**

For several years, the IHP has had an informal agreement with Early Intervention (EI) Service program in the state, the Local Education Agency support of Services for the Deaf and Hard-of-Hearing. All audiologists in Arkansas can report to EI services after diagnosis of a confirmed hearing loss in children. The clinic is also to input the infant's data into ERAVE for the IHP staff to send to EI as well. The establishment of reciprocal reporting between Part C Early Intervention and the IHP has been difficult not only in Arkansas but in most other states. The IHP will endeavor to establish a relationship with Part C that allows reciprocity and Quality Improvement by managing the correct number of referred infants to the EI programs. IHP plans to ask the team of stakeholders to address all barriers to communication and review.

**Enhance the quality of services provided by Part C and Part B early intervention providers.**

Arkansas has the second highest percentages of Latino population growth over the last decade in the United States. In fact, Latino births account for 10.7% of all babies born in Arkansas for 2013. The IHP recognizes a need for culturally sensitive healthcare and early intervention service providers.

**Goal Three: Identify and reduce family challenges in obtaining services.**

It is anticipated that many of the same barriers to follow-up identified in HRSA's Mathematica study (i.e. lack of transportation, language barriers, lack of health insurance, pre-authorization requirement, the transient nature of many families) will be applicable to Arkansas families. The IHP wants to improve care coordination for infants.

**Expand collaborative relationships with special healthcare providers and other key stakeholders.**

The IHP recognizes the necessity and benefits of collaborations with other programs to provide services to infants. In addition to these traditional providers, the IHP will explore new relationships with stakeholders who have been peripherally involved in the UNHS system. The IHP will contact and explore relationships with traditional stakeholders such as providers of childhood healthcare services (i.e. the ADH In-Home Services Maternal Infant Program and the Medicaid Program) and non-traditional stakeholders [i.e. early childhood home-based education providers such as, Home Instruction Program for Parents of Preschool Youngsters (HIPPPY), Arkansas Better Chance programs, physicians (ENT, OB/GYN), and audiological testing equipment manufacturers who provide services to Arkansas hospitals]. The Arkansas IHP currently has a relationship with Arkansas School for the Deaf to test children in underserved area of Arkansas, such as the southeast and the southwest. IHP will also be collaborating with ACH and UALR/UAMS to establish screening and tele-audiology services in remote and underserved areas of the state.

We plan to develop a study to address the follow-up rescreen needs for infants in the rural areas of the state. We will develop an MOA with specific organizations to conduct a study of



loss to follow-up after initial screen. This will require travel from UALR graduate students and video conferencing with audiologists from ACH to manage the child's screening. This will benefit parents who seek follow up screening and for parents of infants/children needing diagnostic testing of babies.

- Plan – Develop a Study to address the follow-up rescreen needs for infants in rural areas of the state.
- Do – Convene the team of stakeholders with their respective MOA's and conduct a study of loss to follow-up/loss to documentation after initial screen and develop a plan of action between UALR, ACH, ASD and IHP to coordinate services.
- Study – Predict this group will decrease the loss to follow up/loss to documentation due to graduate students and ASD audiologist available to travel to rural areas to provide hearing services. The indicators that will be monitored include the ERAVE "loss to follow- up" Report and the "Missed Appointment" queue.
- Act – Receive monthly reports on infants screened from ACH and/or ASD and compare to ERAVE State List, meet quarterly to assess the results of infants who are lost to follow-up/lost to documentation and infants who received services from either ACH or ASD.

#### **Increase UNHS awareness among other cultures.**

The IHP, with the team of stakeholders, will address any communication barriers and advertise accordingly to target the growing Latino population in Arkansas. Over the course of one year, the IHP will place ads in a monthly periodical, El Latino. The IHP has collaborated with El Latino in the past and had success utilizing the periodical to increase awareness of the importance of newborn hearing screening among Spanish speaking families.

#### **Goal Four: Improve the quality and timeliness in the submission and reporting of UNHS data.**

The ability to conduct effective follow-up depends heavily on timely and accurate transmission of hospital screening and audiological evaluation results. The IHP proposes to utilize several methods recommended in HRSA's Mathematica study. The new IHP guidelines will suggest improving quality and timeliness when submitting information to the IHP.

- Plan – IHP will educate and communicate with each hospital, PCP clinic and Audiology clinic to answer questions and monitor through ERAVE to troubleshoot all infant hearing records.
- Do – Following all guidelines introduced from the work team appointed by the Advisory Board the IHP staff will educate initial users with the plan of action needed as defined in the IHP guidelines.
- Study – The infant record data will be monitored by the IHP staff for issues including incomplete records and hearing records that the hospital is unable to submit.
- Act – The IHP staff and the Follow-Up Consultant will provide phone assistance and site visits to educate users in the correct procedure to submit hearing records and to resolve any database issues.

### **Improving timeliness in the reporting of hearing screen and diagnostic results from provider sites**

The IHP staff will request from the primary diagnostic clinics that audiological results be entered within 48 hours, and that birth facilities enter results within 48 hours of screening or newborn discharge. IHP staff will educate the audiologist and staff on the use of the ERAVE database and the Follow up Consultant will analyze any record and review any issues that the IHP has noted or that need to be addressed by the Audiologist.

### **Utilize fax back method to alert PCP of screening results.**

The IHP Follow-up Consultant will mail a physician report alerting PCP's of their patient's audiological test results. We expect the timely reporting of hearing results to help physicians coordinate the hearing screen identify the infant's known risk factors and make timely referrals to audiologists.

### **Enhance the quality of services provided by the UNHS hospitals.**

The IHP will provide educational and site visits to the 41 birthing hospitals. The site visits are a method of building rapport with hospital nursery staff, providing technical assistance, evaluating the hospital hearing screen protocols and procedures, encouraging hospitals to offer post discharge testing, and enhancing each program's overall function.

### **Quality Improvement/Evaluative Measures:**

Following all guidelines and protocols the Follow-up consultant will work with the birthing facilities to improve quality and timeliness when submitting information to IHP.

### **Work Plan**

A detailed work plan, based on the previously discussed goals, objectives, and activities in the Methodology section, is included in *Attachment 1*. For easy reference, each goal is provided with accompanying objectives, activities, timeframes, responsible individual(s), and evaluative methods presented in chart form. In addition, a logic model defining the scope of the project and desired outcomes is included in *Attachment 10*.

### **Resolution of Challenges**

There were two major challenges for implementation of the planned activities, particularly for the first year of the grant. With the current electronic system ERAVE, we are able to resolve the late input of newborn hearing records as well as follow-up delays because the electronic system allowed almost instantaneous submissions of hearing screening records. ERAVE has decreased the problem with submitting hearing records from an average of over 45 days down to two (2) days that the hospitals are taking to submit. Before ERAVE, hospitals mailed in all hearing screens to IHP. Information on the form was often incomplete. ERAVE has stopped this by creating mandatory fields requiring completion before the user can submit the record. The infant hearing screen now has less than a 2 day submission time from infant discharge.

The second challenge is the amount of technical assistance that the hospital will need to do the activities that reduce the loss to follow-up/loss to documentation. Obviously, the fewer infants that fail the newborn hearing screen as an inpatient, the fewer number of hours involved in follow-up for further testing, the more dollars saved in repeat screening and the less worry for

parents. In Arkansas, the hospitals with greater “refer” rates (did not pass) are scattered across the state requiring many hours for travel time to provide onsite staff instruction. Additionally, the activities planned to reduce the loss to follow-up/loss to documentation at the hospital level (see the Methodology Section) and the implementation of the 2007 JCIH guidelines into the hospital protocol will require on site assistance as well as multiple phone calls and, as funding permits, future use of Tele-Nursery video conferencing. The IHP will address these issues by utilizing their Follow-Up Consultant and IHP staff to assist with technical assistance and screening assistance.

### **Evaluation and Technical Support Capacity**

The Infant Hearing Program (IHP) is in the process of rebuilding the majority of the IHP staff. The goal is to make the transition as seamless as possible as we renew the effort to ensure all newborns are screened for hearing loss before hospital discharge. The IHP has two members on staff (with over four years’ experience and three years’ experience) who have provided consistent expertise and knowledge of the IHP. Their talents along with those of the new staff members will bring a variety of expertise necessary for programmatic functions (i.e. Audiology, Psychology, Nursing, etc.). A biographical sketch is included for each key member of the IHP team in *Attachment 3*. Additionally, the IHP Program Coordinator serves as the ADH representative to the Interagency Development Disabilities Council that is the advisory board for the Part C, Early Intervention program in Arkansas.

The IHP has previous experience with research involving the “loss-to-follow-up/loss-to-documentation” in our state. Arkansas was one of five states invited to participate in a Centers for Disease Control and Prevention (CDC) study that was contracted to Research Triangle Institute (RTI). The project is lengthy and runs from one year to another.

Currently, the IHP is working with staff from the University of Arkansas at Little Rock to conduct a program needs assessment of the IHP. Comprehensive objective assessments have been greatly beneficial in defining new protocols and procedures toward the follow-up and tracking of infants/children needing additional testing and the tracking of parents involved in the Early Intervention process.

### **Organizational Information**

The Arkansas Department of Health’s (ADH) mission is “To promote public health policies and practices that assure a healthy quality of life for Arkansas”. The ADH offers services on three levels: Environmental Health Services, Personal Health Services, and Technical/Support Services. Priority areas for Arkansas residents include 1) provision of personal health services in ADH health clinics and in homes of the terminally ill 2) educating and monitoring industries that impact the public’s health (i.e. food service, water systems, etc.) 3) providing guidance and leadership to local communities through collaborative initiatives 4) promotion of healthy behaviors (i.e. tobacco cessation, etc.) 5) responding to public health emergencies (i.e. bioterrorism preparedness, communicable disease, etc.) and 6) monitoring and investigating public health trends and problems.

The Infant Hearing Program, which oversees the Universal Newborn Hearing Screening (UNHS) activities in the state, resides in the Center for Health Advancement, Family Health Branch, and Child and Adolescent Health Section. Agency and Section organizational charts are

included in *Attachment 5*. UNHS legislation was mandated in 1999 with the passage of Act 1559. The law specified that hospitals with greater than 50 births per year must provide or arrange for a physiological hearing screen before hospital discharge. All of the birthing hospitals in the state meet those criteria. The rules and regulations promulgated in accordance with that Act went into effect September 2000. The regulations require all birth hospitals, providers, or physicians administering initial hearing screening and follow-up screening to report to the ADH by the fifteenth (15) day of the month following the month in which the test was conducted. Parents of a newborn/ infant may dissent to hearing screening performed on their child if the test conflicts with personal religious belief or practice.

The Electronic Registration of Arkansas Vital Record (ERAVE) system is provided by the Arkansas Department of Health. The ERAVE system provides authorized users a secure, online method for submitting and managing reports of vital events including deaths, infant hearing screening, births, and fetal deaths. The Arkansas Infant Hearing Program utilizes ERAVE for reporting infant hearing screening results and tracking infants with known or suspected hearing loss (follow up).

The Infant Hearing module went into production on July 1, 2013. Through timely data entry and retrieval it allows nurses and hospital staff, audiologists, PCPs, Early Intervention Specialists and Infant Hearing Program (IHP) staff to better ensure that babies with hearing loss receive the follow-up referrals, evaluations and the specialized care they need as quickly as possible. ERAVE has many available reports and the ability to monitor queues, which allows each hospital and the IHP staff to manage screening results and track infants. The ERAVE database also contains a birth and death record which allows programmatic linkage to the infant hearing record.