



Protecting, maintaining and improving the health of all Minnesotans

MINNESOTA EARLY HEARING DETECTION AND INTERVENTION (EHDI) PROGRAM

EHDI Goals, Indicators and Benchmarks

The measures described in this document are based on the National Goals, Program Objectives, and Performance Measures for the Early Hearing Detection and Intervention Tracking and Surveillance System from the CDC. They are intended to be used to evaluate progress toward goals accepted by the Minnesota Newborn Hearing Screening Advisory Committee. Indicators are to be assessed annually for children reported to the Newborn Screening Program between January and December of each calendar year. Results are reported in the EHDI Annual Report.

Approved: May 2010, August 2010, November 2010, November 2013

GOAL 1. ALL NEWBORNS WILL BE SCREENED FOR HEARING LOSS.

1.1 Indicator: Number and percent of infants screened for hearing loss

Numerator	Denominator
Infants born in MN and reported to the MN Newborn Screening Program as screened for hearing loss	Infants born in MN minus: a) infants who died before hearing screening was completed & b) infants whose parent(s) declined newborn hearing screening

1.2 Indicator: Number and percent of infants with reported birthweight >1800grams who were screened for hearing loss before 1 month of age.

Numerator	Denominator
Infants born in MN and reported as screened for hearing loss before 30 days of age minus infants with reported birthweight <=1800g	Infants born in MN minus: a) infants with reported birthweight <=1800 g, b) infants who died before hearing screening was completed & c) infants whose parent(s) declined newborn hearing screening

1.3 Indicator: Number and percent of infants with reported birthweight ≤ 1800 grams who were screened for hearing loss before 4 months of age.

Numerator	Denominator
Infants born in MN with reported birthweight ≤ 1800 g who were reported as screened for hearing loss before 4 months of age	Infants born in MN with reported birthweight ≤ 1800 g minus: <ul style="list-style-type: none"> a) infants who died before hearing screening was completed & b) infants whose parent(s) declined newborn hearing screening

1.4 Indicator: Number and percent of infants who do not pass the first reported newborn hearing screen (i.e. the first newborn hearing screening result reported to MDH is a REFER in one or both ears)

Numerator	Denominator
Infants with a REFER in one or both ears on the first newborn hearing screening result reported to MDH	Infants with reported newborn hearing screening results

GOAL 2. ALL INFANTS WHO DO NOT PASS NEWBORN HEARING SCREENING WILL HAVE A DIAGNOSTIC AUDIOLOGIC EVALUATION BEFORE 3 MONTHS OF AGE

2.1 Indicator: Number and percent of infants with reported birthweight > 1800 grams who had a reported REFER result on initial hearing screening and were rescreened within one month of age.

Numerator	Denominator
Infants with reported birthweight > 1800 g who <ul style="list-style-type: none"> a) had a reported REFER result in one or both ears on initial hearing screening & b) were rescreened within 1 month of age 	Infants with reported birthweight > 1800 g who had a reported REFER result in one or both ears on initial hearing screening

2.2 Indicator: Number and percent of infants with reported birthweight >1800 grams who had a reported REFER result on hearing rescreening and received a comprehensive audiological evaluation by 3 months of age.

Numerator	Denominator
Infants with reported birthweight >1800 g who <ul style="list-style-type: none"> a) had a reported REFER result in one or both ears on hearing rescreening & b) had a documented audiological evaluation by 3 months of age. 	Infants with reported birthweight >1800 g who had a reported REFER result in one or both ears on hearing rescreening

2.3 Indicator: Number and percent of infants with a reported REFER result on newborn hearing screening who were lost to follow-up.

Numerator	Denominator
Infants with a reported REFER result in one or both ears on initial newborn hearing screening who <ul style="list-style-type: none"> a) are in “closed” status & b) have been assigned one of the following action codes: <ul style="list-style-type: none"> i. NBNOAUDIO ii. NBNOSHOW iii. NBNORESC iv. NBHRAUDDC v. NBNOFINAN 	Infants with a reported REFER result in one or both ears on initial newborn hearing screening

2.4 Indicator: Number and percent of infants with reported birthweight >1800grams and a reported REFER result on initial newborn hearing screening who were lost to follow-up.

Numerator	Denominator
Infants with reported birthweight >1800 g who <ul style="list-style-type: none"> a) had a reported REFER result on initial newborn hearing screening & b) are in “closed” status & c) have been assigned one of the following action codes <ul style="list-style-type: none"> i. NBNOAUDIO ii. NBNOSHOW iii. NBNORESC iv. NBHRAUDDC v. NBNOFINAN 	Infants with reported birthweight >1800 g who had a reported REFER result on initial newborn hearing screening

2.5 Indicator: Number and percent of infants with reported birthweight ≤ 1800 grams and a reported REFER result on newborn hearing screening who were lost to follow-up.

Numerator	Denominator
Infants with reported birthweight ≤ 1800 grams who <ol style="list-style-type: none"> a) had a reported REFER result on initial newborn hearing screening & b) are in “closed” status & c) have been assigned one of the following action codes <ol style="list-style-type: none"> i. NBNOAUDIO ii. NBNOSHOW iii. NBNORESC iv. NBHRAUDDC v. NBNOFINAN 	Infants with reported birthweight ≤ 1800 grams who had a reported REFER result on initial newborn hearing screening

2.6 Indicator: Number and percent of infants with a reported REFER result on newborn hearing screening who were lost to documentation.

Numerator	Denominator
Infants with a reported REFER result on initial newborn hearing screening who <ol style="list-style-type: none"> a) are in “closed” status & b) have been assigned one of the following action codes <ol style="list-style-type: none"> i. NBHRPCPUN ii. PCPNOCO iii. NBDXPRO iv. NBNODXEXP v. NBHRLPHDP 	Infants with a reported REFER result on initial newborn hearing screening

2.7 Indicator: Number and percent of infants with reported birthweight > 1800 grams and a REFER result on newborn hearing screening who were lost to documentation.

Numerator	Denominator
Infants with reported birthweight > 1800 g who <ol style="list-style-type: none"> a) had a reported REFER result on initial newborn hearing screening & b) are in “closed” status & c) have been assigned one of the following action codes <ol style="list-style-type: none"> i. PCPUN ii. PCPNOCO iii. NBDXPRO iv. NBNODXEXP v. NBHRLPHDP 	Infants with reported birthweight > 1800 g who had a reported as REFER result on initial newborn hearing screening

2.8 Indicator: Number and percent of infants with reported birthweight <=1800grams and with a REFER result on newborn hearing screening who were lost to documentation.

Numerator	Denominator
Infants with reported birthweight <=1800 g who <ul style="list-style-type: none"> a) had a reported REFER result on initial newborn hearing screening & b) are in “closed” status & c) have been assigned one of the following action codes <ul style="list-style-type: none"> i. PCPUN ii. PCPNOCO iii. NBDXPRO iv. NBNODXEXP v. NBHRLPHDP 	All infants with reported birthweight <=1800 g who had a reported REFER result on initial newborn hearing screening

GOAL 3. ALL INFANTS & CHILDREN WITH HEARING LOSS WILL RECEIVE TIMELY AND APPROPRIATE EARLY INTERVENTION SERVICES (MEDICAL, AUDIOLOGIC, AND DEVELOPMENTAL).

MEDICAL SERVICES

3.1 Indicator: Number and percent of infants with congenital permanent confirmed hearing loss (PCHL) who received ENT/ORL evaluation by **4 months of age**.

Numerator	Denominator
Infants reported with congenital PCHL who had an ENT/ORL evaluation by 4 months of age	Infants reported with congenital PCHL minus those <ul style="list-style-type: none"> a.) whose parent(s) declined ENT/ORL evaluation and b.) who were initially diagnosed with a transient hearing loss

3.2 Indicator: Number and percent of infants with congenital permanent confirmed hearing loss (PCHL) who received a genetics evaluation by **1 year of age**.

Numerator	Denominator
Infants with congenital PCHL who had a genetics evaluation by 1 year of age	Infants reported with congenital PCHL minus those <ul style="list-style-type: none"> a) whose parent(s) declined genetics evaluation b) who were initially diagnosed with a transient hearing loss

3.3 Indicator: Number and percent of infants with congenital permanent confirmed hearing loss (PCHL) who received an evaluation by an ophthalmologist with experience with pediatric patients by **6 months of age**.

Numerator	Denominator
Infants with congenital PCHL who had a pediatric ophthalmology evaluation by 6 months of age	Infants reported with congenital PCHL minus those <ul style="list-style-type: none"> a) whose parent(s) declined ophthalmology evaluation b) who were initially diagnosed with a transient hearing loss

AUDIOLOGIC SERVICES

3.4 Indicator: Number and percent of infants with bilateral permanent confirmed hearing loss (PCHL) whose parent(s) chose personal amplification and who were fitted **within 1 month of PCHL diagnosis**

Numerator	Denominator
Infants/children with bilateral PCHL who were fitted within one month of PCHL diagnosis	Infants/children with bilateral PCHL who were fitted with personal amplification

EARLY INTERVENTION SERVICES

3.5 Indicator: Number and percent of infants/children diagnosed before 3 years of age with permanent confirmed hearing loss (PCHL) who were reported to be enrolled in Part C Early Intervention services.

Numerator	Denominator
Infants/children diagnosed before 3 years of age with reported PCHL who were enrolled in Part C Early Intervention services.	Infants/children diagnosed before 3 years of age with reported PCHL minus <ul style="list-style-type: none"> a) infants/children who were not eligible for Part C Early Intervention services & b) infants/children whose parent(s) declined Part C Early Intervention services

3.6 Indicator: Number and percent of infants with a reported congenital permanent confirmed hearing loss (PCHL) who were reported as enrolled in Part C Early Intervention services who were enrolled before 6 months of age.

Numerator	Denominator
Infants with a reported congenital PCHL who were reported as enrolled in Part C Early Intervention services (initial IFSP date) before 6 months of age	Infants with a reported congenital PCHL who were reported as enrolled in Part C Early Intervention services minus those who were initially diagnosed with a transient hearing loss

3.7 Indicator: Number and percent of infants/children diagnosed before 3 years of age with a reported permanent confirmed hearing loss (PCHL) who were reported to be enrolled in the Deaf Mentor Family Program or Deaf and Hard of Hearing Adult Role Model Program.

Numerator	Denominator
Infants/children diagnosed before 3 years of age with a reported PCHL who were reported to be enrolled in the Deaf Mentor Family Program or Deaf and Hard of Hearing Adult Role Model Program.	Infants/children diagnosed before 3 years of age with a reported PCHL

3.8 Indicator: Number and percent of infants/children diagnosed before 3 years of age with a reported permanent confirmed hearing loss (PCHL) who were reported to be receiving private speech therapy.

Numerator	Denominator
Infants/children diagnosed before 3 years of age with a reported PCHL who were reported to be receiving private speech therapy	Infants/children diagnosed before 3 years of age with a reported PCHL

3.9 Indicator: Number and percent of infants/children with a reported permanent confirmed hearing loss diagnosed before 3 years of age who were reported to be enrolled in Part C Early Intervention services within two months of initial hearing loss diagnosis.

Numerator	Denominator
Infants/children diagnosed before 3 years of age with a reported PCHL who were enrolled in Part C Early Intervention services (initial IFSP date) within two months of initial hearing loss diagnosis	Infants/children diagnosed before 3 years of age with a reported PCHL who were reported as enrolled in Part C Early Intervention services

3.10 Indicator: Number and percent of families of infants/children ages 0-10 years with reported permanent confirmed hearing loss who received direct family-to-family support (i.e. phone call or personal contact) within one month of their child’s initial hearing loss diagnosis.

Numerator	Denominator
Infants/children ages 0-10 years with a reported PCHL whose families were directly contacted by MN Hands and Voices (family-to-family support organization) within one month of initial hearing loss diagnosis	Infants/young children ages 0-10 years with a reported PCHL minus children whose parent(s) declined family-to-family support contact

3.11 Indicator Number and percent of families of infants/children ages 0-6 years newly identified with permanent confirmed hearing loss (PCHL) who requested a mentor from the Deaf Mentor Family Program and began the SKI-HI curriculum with a mentor within 30 days of their request

Numerator	Denominator
Infants/children ages 0-6 newly identified with PCHL whose families began the SKI-HI curriculum with a mentor within 30 days of requesting a mentor.	Infants/young children ages 0-6 years newly identified with PCHL whose parent(s) requested a mentor from the Deaf Mentor program.

GOAL 4. ALL INFANTS AND CHILDREN WITH LATE ONSET, PROGRESSIVE, OR ACQUIRED HEARING LOSS WILL BE IDENTIFIED AT THE EARLIEST POSSIBLE TIME.

4.1 Indicator: Number and percent of infants and children identified with late onset, progressive, or acquired hearing loss. This number may also include infants with a false negative screen (i.e. those who passed hearing screening, but had a congenital hearing loss).

Numerator	Denominator
Infants/children with a reported PCHL who were born after 9/1/2007 and had an initial PASS result for both ears on newborn hearing screening (late onset)	Infants/children with a reported PCHL who were born after 9/1/2007 (implementation of mandate) and whose hearing loss onset is known (congenital or late onset)

GOAL 5. ALL INFANTS WITH HEARING LOSS WILL HAVE A MEDICAL HOME AS DEFINED BY THE AMERICAN ACADEMY OF PEDIATRICS.

5.1 Indicator: Number and percent of infants/children who had a primary care provider at the time of diagnosis.

Numerator	Denominator
Infants/children with a reported PCHL whose primary care provider was confirmed	Infants/children with a reported PCHL

GOAL 6. MINNESOTA WILL HAVE A COMPLETE EHDI TRACKING AND SURVEILLANCE SYSTEM THAT WILL MINIMIZE LOSS TO FOLLOW-UP.

6.1 Indicator: Documentation of number and percent of newborn hearing screening records matched with vital records.

Numerator	Denominator
Infants whose newborn screening record contains a state file number (indicating an officially registered birth that was matched to a newborn screening record).	Officially registered MN births minus infants whose parent(s) declined newborn hearing screening.

6.2 Indicator: Number of audiology reports received by MDH within 10 days of appointment.

Numerator	Denominator
Audiology reports received by MDH <=10 days from appointment (ENTRY TYPE = AUDIO)	Audiology reports received by MDH (ENTRY TYPE = AUDIO)

6.3 Indicator: Number and percent of infants who had incomplete or unreported hearing screening.

Numerator	Denominator
Infants born in MN who had incomplete or unreported hearing screening results minus <ul style="list-style-type: none"> a) infants who died before hearing screening was completed & b) infants whose parent(s) declined newborn hearing screening 	Infants born in MN minus <ul style="list-style-type: none"> a) infants who died before hearing screening was completed & b) infants whose parent(s) declined newborn hearing screening

6.4 Indicator: Number and percent of requested follow-up reports received from audiologists identified as caring for infants/children with permanent confirmed hearing loss (PCHL).

Numerator	Denominator
Number of requested follow-up reports received from audiologists identified as caring for an infant/child with PCHL.	Total number of follow-up reports requested from audiologists identified as caring for an infant/child with PCHL

6.5 Indicator: Number and percent of requested follow-up reports received from primary care providers identified as caring for infants/children with permanent confirmed hearing loss (PCHL).

Numerator	Denominator
Number of requested follow-up reports received from PCPs identified as caring for an infant/child with PCHL	Number of follow-up reports requested from PCPs identified as caring for an infant/child with PCHL

GOAL 7. MINNESOTA WILL HAVE A COMPREHENSIVE SYSTEM THAT MONITORS AND EVALUATES THE PROGRESS TOWARDS THE EHDI GOALS AND OBJECTIVES.

7.1 Indicator: Minnesota state agencies (led by MN Departments of Education and Health) will develop and implement a system to determine and communicate the number and percent of infants/children ages 0-3 with a reported permanent confirmed hearing loss (congenital, late, or unknown onset) who achieve communication development commensurate with their cognitive abilities at 3 years of age.

GLOSSARY

CDC	Centers for Disease Control and Prevention
Congenital Onset	<ol style="list-style-type: none">Any child with a permanent confirmed hearing loss who had an officially reported REFER result for at least one ear on Newborn Hearing Screening.Any child born with atresia.Any child born with a risk factor for hearing loss whose initial hearing evaluation is diagnostic. Risk factors are defined in Appendix 2 of the JCIH Year 2007 Position Statement: Principles and Guidelines for Early Hearing Detection and Intervention Programs.
Decline	In order to formally decline Newborn Hearing Screening, parents must complete a 'Parental Refusal of Newborn Screening' form and return it to MDH. The form can be found at http://www.health.state.mn.us/newbornscreening/docs/parental_refusal.pdf .
EHDI	Early Hearing Detection and Intervention
ENT/ORL	Ear, Nose & Throat/Otolaryngology
Late, Progressive or Acquired Onset	<ol style="list-style-type: none">Any child with a permanent confirmed hearing loss who had an officially reported PASS result for both ears on Newborn Hearing Screening.Any child with permanent confirmed hearing loss whose hearing loss is known to have been acquired after birth (e.g. as a result of infection or injury)
Lost to Documentation	Infants that have had follow-up of a refer result but for whom documentation is not completed and active follow-up has been suspended. Cases that are closed with the following action codes are considered lost to documentation: <ol style="list-style-type: none">PCPUNPCPNOCONBDXPRONBNODXEXPNBHRLPHDP.

Lost to Follow-Up	<p>Infants with follow-up of refer result that is known NOT to be completed. Cases that are closed with the following action codes are considered lost to follow-up:</p> <ol style="list-style-type: none"> NBNOAUDIO NBNOSHOW NBNORESC NBHRAUDDC NBNOFINAN.
MDH	Minnesota Department of Health
NBDXPRO	MDH Public Health Lab action code indicating that child has been seen by audiology but complete diagnostic data has not been completed and /or reported to MDH and child had >4 appointments and/or is >6 months old. Case has been closed for active follow-up by MDH.
NBHRAUDDC	MDH Public Health Lab action code indicating that audiology process was started, but family stopped attending/making appointments. Case has been closed for active follow-up by MDH Newborn Screening Program, but case has been referred to Local Public Health for follow-up.
NBHRLPHDP	MDH Public Health Lab action code indicating that information received from Local Public Health indicates that child has been seen by audiology, but diagnosis remains incomplete.
NBNOAUDIO	MDH Public Health Lab action code indicating that primary care provider recommended follow-up with audiology but appointment was never made. Case has been closed for active follow-up by MDH Newborn Screening Program, but case has been referred to Local Public Health for follow-up.
NBNODXEXP	MDH Public Health Lab action code indicating that child has multiple, significant medical issues preventing timely hearing follow-up. Case has been closed for active follow-up by MDH.
NBNOFINAN	MDH Public Health Lab action code indicating that family lacks the financial means (insurance) to obtain follow-up testing at this time. Family has been referred to Local Public Health for assistance. Case has been closed for active follow-up by MDH.

NBNORESC MDH Public Health Lab action code indicating that primary care provider has decided to monitor hearing and not refer for rescreen and/or diagnostic audiology. Case has been closed for active follow-up by Minnesota Department of Health Newborn Screening Program, but case has been referred to Local Public Health for follow-up.

NBNOSHOW MDH Public Health Lab action code indicating that family has not shown or has canceled multiple appointments with audiology for follow-up. Case has been closed for active follow-up by MDH Newborn Screening Program, but case has been referred to Local Public Health for follow-up.

Newborn Hearing Screening

Initial Hearing Screening: The hearing screening protocol performed shortly after birth. The MDH Hearing Screening Protocol specifies that for infants who do not pass the initial screen, hospitals should attempt one rescreen before discharge. Only the results of the final screen performed before hospital discharge or according to out-of-hospital birth algorithms are reported to MDH as the initial screening result and used in the calculation of the initial refer rate.

For infants born out-of-hospital, protocols specify that the initial hearing screening should be done 2-3 days after birth and that these results should be reported to MDH.

Outpatient Re-Screening: Performed for infants who do not pass initial hearing screening.

Complete screening protocols can be found at http://www.health.state.mn.us/newbornscreening/hear_hospital.html#documenting

PCHL Permanent confirmed hearing loss (excludes hearing loss diagnosed as slight, mild, or moderate transient conductive loss only)

PCPNOCO MDH Public Health Lab action code indicating that primary care provider is known to Minnesota Department of Health but PCP has not responded to multiple contact requests. Case has been closed for active follow-up by MDH Newborn Screening Program, but case has been referred to Local Public Health for follow-up.

PCPUN	MDH Public Health Lab action code indicating that primary care provider is unknown to MDH. Case has been closed for active follow-up by MDH Newborn Screening Program, but case has been referred to Local Public Health for follow-up.
Refer	A 'REFER' result for newborn hearing screening indicates that the child did not pass in one or both ears and that the child may have a hearing loss. Children with a refer result in one or both ears on initial screening should receive a rescreen before 1 month of age and children with another 'REFER' result on rescreen should receive a comprehensive audiological evaluation before 3 months of age. Complete screening protocols are published at http://www.health.state.mn.us/newbornscreening/hear_hospital.html#documenting
Unknown Onset	Any child with a permanent confirmed hearing loss <ul style="list-style-type: none"> a) who does not have officially reported Newborn Hearing Screening results and b) whose hearing loss onset cannot be determined based on a known cause of the hearing loss.