

Michigan Early Hearing Detection and Intervention Program

2006 Annual Update

Background

Congenital hearing loss is one of the most common birth defects. In Michigan, about one to two out of 1000 infants will be diagnosed with hearing loss. The prevalence of hearing loss in Michigan is consistent with the national prevalence of approximately one to three cases per 1000 live born infants.^{1,2} Congenital hearing loss impacts many areas of childhood development, and prior research indicates that early identification and intervention may lead to significant benefits in emotional development, language, learning, and social skills.³

To facilitate early intervention, the Michigan Department of Community Health (MDCH) established the Early Hearing Detection and Intervention (EHDI) Program in 1997. The EHDI program works in collaboration with hospitals, clinics, parents, and audiologists to develop a statewide universal system for timely screening and identification of newborns with hearing loss.



Since 2000, the EHDI program has been supported via state funding and grants awarded by the Centers for Disease Control and Prevention (CDC) and Maternal and Child Health Bureau (MCHB); as of 2007, EHDI also receives funding from Michigan Newborn Screening Card fees.⁴

Representatives from state, federal and national agencies have developed National EHDI program goals, objectives and performance indicators to improve screening, detection, and early intervention services for infants identified with a hearing loss.⁵

The national EHDI goals are as follows:

- Goal 1.** All newborns will be screened for hearing loss no later than **1 month** of age, preferably before hospital discharge.
- Goal 2.** All infants who screen positive for hearing loss will have a diagnostic audiologic evaluation no later than **3 months** of age.
- Goal 3.** All infants identified with hearing loss will receive appropriate early intervention services no later than **6 months** of age.

Michigan EHDI Program Statistics, 2002—2006

Screening Rates

Approximately 129,000 live births occurred in Michigan annually from 2002 through 2006. Table 1 summarizes the number of live births and the percent having completed hospital hearing screens among infants born in Michigan from 2002 to 2006. Newborn hospital screening rates* have increased significantly during the last few years from approximately 92% in 2002 to 97% in 2006. As of 2004, 100% of birthing hospitals conducted pre-discharge newborn hearing screening.⁶

Table 1: Hospital Hearing Screens: Percent Completed in Michigan, 2002-2006^a

Year of Birth	Number Live Births	Percent of Live Births with a Completed Hearing Screen at Birth Hospital
2002	129,518	92%
2003	130,850	92%
2004	129,710	94%
2005	127,518	97%
2006	127,537	97%

^aData Source: Michigan EHDI database, November 2008.

A hospital hearing screen was either completed or attempted for 99% of the infants born in 2006. The reasons for attempted, but incomplete, hospital hearing screens are listed in Table 2.

Table 2: Reasons for Incomplete Hospital Hearing Screens in Michigan, 2006

Reason for Incomplete Screen	Percent of Incomplete Screens
Discharge of infant prior to screening	26.9
Infant in Neonatal Intensive Care Unit	23.3
Infant transferred to another facility	13.6
Infant died	12.3
Equipment problem	9.1
Parental refusal	7.9
Other	4.9
Restless infant	1.7
Environmental noise	0.3

Referral Rates

In 2006, the referral rate** was 3.6%, below the National EHDI goal of 4% or less.⁵ A low referral rate is recommended because, without missing any infants, it is generally best to minimize the number of repeat screens to avoid the costs and potential psychological impacts associated with a failed hearing screen.

Hearing Loss Reported

Both conductive and permanent hearing loss is reported to the EHDI program. Conductive hearing loss occurs when sound is not conducted efficiently through the outer or middle ear. Permanent hearing loss is typically associated with the inner ear or brain stem and can be a sensorineural, auditory neuropathy, or mixed (combination of sensorineural and conductive) hearing loss. Presented here are the number of infants with hearing loss by the type of loss and the results of the last hearing screen. Not all infants have a complete hospital screen; some are first screened in outpatient clinics. Thus, we report cases of hearing loss by result of the last screen. Cases diagnosed following

*The hospital screening rate is the percent of infants with a complete hospital screen among the total number of live births for the year.

**A referral rate is the number of infants who failed their initial hearing screen divided by the total number of infants who completed the hospital hearing screen.

a failed hospital or outpatient hearing screen are considered detected by EHDI screening. Cases who passed their final hearing screen but are reported as having hearing loss by outside sources are considered detected by passive surveillance and may be late onset.

The total prevalence* of infant hearing loss in Michigan was 1.8 infants per 1,000 live births for the years 2004-2006 (Table 3). Approximately 70% of infants with hearing loss born in 2004-2006 failed their last hearing screen, while 30% either passed the last hearing screen or had an incomplete screen. The percent of infants with hearing loss who failed their last hearing screen has increased from 64% in 2004 to 76% in 2006. The average age at diagnosis of hearing loss is significantly lower for infants who are identified through EHDI screening compared to infants who are passively reported to Michigan EHDI, likely reflecting late onset hearing loss among passively reported cases.

Table 3: Infants Reported Having Hearing Loss, by Type of Loss and Results of Final Screen, Michigan 2004-2006^a

Birth Year	Final Screen	Hearing Loss				
		Permanent N (%)	Conductive N (%)	Total N	Prevalence (per 1,000 live births)	Average age at diagnosis (in months)
2004	Fail	95 (65)	52 (35)	147	1.1	8.1
	Pass	51 (76)	16 (24)	67	0.5	22.9
	Incomplete	14 (88)	2 (12)	16	0.1	16.8
	Total	160 (70)	70 (30)	230	1.8	13.0
2005	Fail	85 (66)	44 (34)	129	1.0	6.7
	Pass	28 (64)	16 (36)	44	0.3	14.6
	Incomplete	6 (46)	7 (54)	13	0.1	9.1
	Total	119 (64)	67 (36)	186	1.5	8.8
2006	Fail	102 (47)	114 (53)	216	1.7	4.3
	Pass	22 (42)	30 (58)	52	0.4	7.3
	Incomplete	7 (47)	8 (53)	15	0.1	5.9
	Total	131 (46)	152 (54)	283	2.2	4.9

^aData Source: Michigan EHDI database, November 2008.

Notes: Percentages presented are row percentages. The 2002-2003 data is stored in a different database and is not presented here.

*Prevalence of hearing loss is the number of infants with hearing loss divided by the total number of live births.

References

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2. Van Naarden K, Decoufle P, Caldwell K. Prevalence and characteristics of children with serious hearing impairment in metropolitan Atlanta, 1991-1993. *Pediatrics* 1999;103:570-575.
3. Yoshinaga-Itano C, Sedey A. Early speech development in children who are deaf or hard-of-hearing: Interrelationships with language and hearing. *Volta Review* 1999;100:181-211.
4. Newborn Screening Quality Assurance Advisory Committee Meeting Report, 2006.
5. Centers for Disease Control and Prevention. National EHDI Goals. Oct. 2007 <<http://www.cdc.gov/ncbddd/ehdi/nationalgoals.htm>>.
6. Early Hearing Detection and Intervention. <<http://www.michigan.gov/ehdi>>.
7. Centers for Disease Control and Prevention. 2006 CDC EHDI Hearing Screening & Follow-up Survey. May 2008 <<http://www.cdc.gov/ncbddd/ehdi/data.htm>>.

Michigan's Progress Toward Meeting National EHDI Goals

Each year, the Michigan EHDI program sends data to the National EHDI program. This data is compiled and released as the CDC EHDI Hearing Screening and Follow-up Survey.⁷ The primary National EHDI goals, along with information from the CDC survey on Michigan EHDI's progress toward fulfilling these goals based on data, are as follows:

Goal 1. All newborns will be screened for hearing loss before one month of age, preferably before hospital discharge.

In 2006 among those who had a completed hearing screen, 97.1% of infants in Michigan were screened before one month of age. Therefore, Michigan EHDI has successfully reached the program goal of having newborns screened before one month of age.

Goal 2. All infants who screen positive will have a diagnostic evaluation before three months of age.

In Michigan, approximately 70% (n=1,324) of the children born in 2006 who did not pass their final screen were lost to follow-up. Among infants with a diagnosis in Michigan, the rate of diagnostic evaluation occurring before three months of age was 66.9% in 2006. Figure 1 summarizes the outcomes for the 501 Michigan infants who failed their last hearing screening and have gone on to diagnosis. Of the 101 infants found to have hearing loss, 52 (51.5%) were diagnosed before three months of age. Of the 400 infants with normal hearing, 283 (71%) were identified before three months of age.

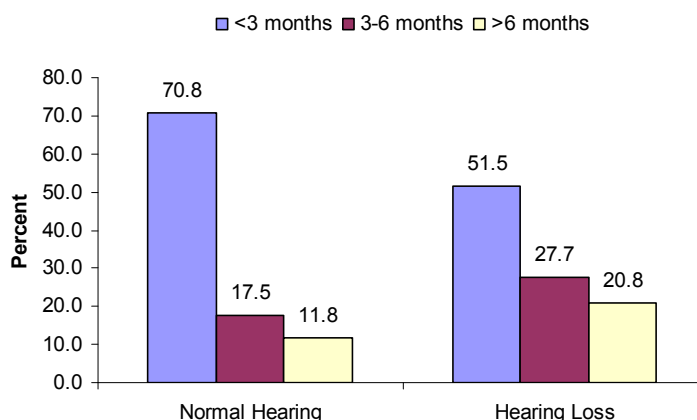


Figure 1: Outcomes of Diagnostic Evaluations for Children who Failed their Last Hearing Screen, by Age at Diagnosis, Michigan 2006^a

^aData Source: 2006 CDC EHDI Hearing Screening & Follow-up Survey⁷

Goal 3. All infants identified with hearing loss will receive appropriate early intervention services before six months of age.

In 2006, 33 of 101 infants diagnosed with permanent hearing loss returned documentation of enrollment in *Early On*[®] services to Michigan EHDI. Among the infants having reported *Early On*[®] enrollment dates, the majority (68%) were enrolled prior to six months of age, meeting the national EHDI goal. Two-thirds (67%) of all infants identified with hearing loss in 2006 did not return documentation of refusal or entry into *Early On*[®] services, making it difficult to accurately assess the number of infants enrolled. The decrease in returned documentation may be due to misconceptions about the HIPAA (Health Insurance Portability and Accountability Act) and FERPA (Family Educational Rights and Privacy Act) regulations governing the sharing of confidential health information. Most privacy rules have exclusions for public health practice as opposed to research. Specifically, when operating within the tenets of public health (i.e., conducting surveillance), sharing of confidential information between health care providers and MDCH is allowed.

Parent and Family Support Programs

Every expectant parent builds dreams for their new baby. These dreams can change when a child is diagnosed with a hearing loss. Many parents find that the diagnosis of their child's hearing loss brings the unexpected responsibility of gathering information and making decisions to help their baby reach his or her fullest potential. The EHDI program works to provide resources to guide families through this process by offering educational materials and parent support programs.

The Guide-By-Your-Side (GBYS) Program is an individualized home visiting support service that provides an opportunity for families of children recently diagnosed with hearing loss to meet with another parent of a deaf or hard of hearing child. The Guides are trained parents who can identify with what the new family may be experiencing and can answer their questions and provide information on available community resources. The program serves families of children 0-6 years of age. For more information, call 517-335-8955 and ask for a brochure to be sent to you or visit the EHDI website at www.michigan.gov/ehdi.



With EHDI support, Michigan Hands & Voices (MI H&V) is an organization dedicated to non-biased support to families who have children who are deaf or hard of hearing. MI H&V believes that families will make the best choices for their child if they have access to balanced information and support. It provides activities and information statewide to parents and professionals, including outreach events, educational seminars, advocacy, parent-to-parent networking, and newsletters. Please visit www.mihandsandvoices.org, e-mail info@mihandsandvoices.org, or call 517-335-8273 for more information.



Community Support Programs

- The EHDI program helps communities develop newborn hearing services that encompass screening and intervention services.
- The EHDI program supports parents/families and professionals by developing resources and literature, providing educational trainings, maintaining and distributing contact lists, building family supports, and increasing public awareness.
- The EHDI program also collaborates with other MDCH programs (Birth Defects Registry, Newborn Screening Follow-up Program, Local Public Health, Michigan Care Improvement Registry, Preschool and School-Age Hearing Screening Program, and Genetics).
- State newborn hearing screening programs have now become the medical/legal standard of care in the United States, with 42 states and Washington D.C. having statutes requiring early hearing detection and intervention programs.

The EHDI program goals are aligned with Project Great Start, Priority Initiatives Aligned to the Governor's Specific Policy Statements (*Health Development and Children's Action Network and Rebuilding Public Health Sections*), Healthy Michigan 2010, Maternal and Child Health, and Health People 2010, Objective 28-11.

Future Directions for the Michigan EHDI Program

- Improve access to information for providers by enabling viewing of hearing screening results in the Michigan Care Improvement Registry
- Support quality care by providing training for pediatric audiologists to ensure competency in pediatric evaluation, management, and family counseling
- Develop an online training module on newborn hearing screening for nurses, technicians and audiologists at birthing facilities
- Collaborate with the Michigan Department of Education to ensure infants are receiving timely early intervention services

Highlights from the Michigan EHDI Program

- Hospital screening rates have increased significantly during the last few years from approximately 92% in 2002 to 97% in 2006.
- From 2002-2006, the referral rate for initial completed screens (2.7-3.6%) was below the national EHDI goal for audiologic follow-up referral rate of 4% or less.
- The percent of infants with hearing loss who failed their last hearing screen has increased from 64% in 2004 to 76% in 2006.

Suggested Citation

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For more information, please visit our website at: www.michigan.gov/ehdi

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