

Enrollment in Early Intervention Services for Infants Diagnosed with Permanent Hearing Loss, 2011-2013

Michigan Department of Health and Human Services

Lifecourse Epidemiology and Genomics Division & Division of Family and Community Health



Michigan Early Hearing Detection and Intervention Program

Background

Hearing loss can affect a child's ability to develop communication, language, and social skills. The earlier children with hearing loss start receiving services, the more likely they are to reach their full potential.



The Michigan Department of Health and Human Services (MDHHS) Early Hearing Detection and Intervention (EHDI) Program follows how many infants are screened, diagnosed with hearing loss, and receiving intervention services. The program also analyzes the type and severity of hearing loss and demographic data on infants with hearing loss. This helps to monitor the impact of efforts to promote infant hearing screening, timely follow-up evaluations, and early intervention services.

In collaboration with *Early On*[®], MDHHS EHDI analyzed data to assess enrollment of infants diagnosed with permanent hearing loss in early intervention services from 2011 to 2013. Results on enrollment by year, age, maternal residence, type and degree of hearing loss are presented in the following pages.

Early On Enrollment by Year, 2011-2013

About 40% of infants diagnosed with permanent hearing loss were not enrolled in *Early On* during 2011 to 2013.

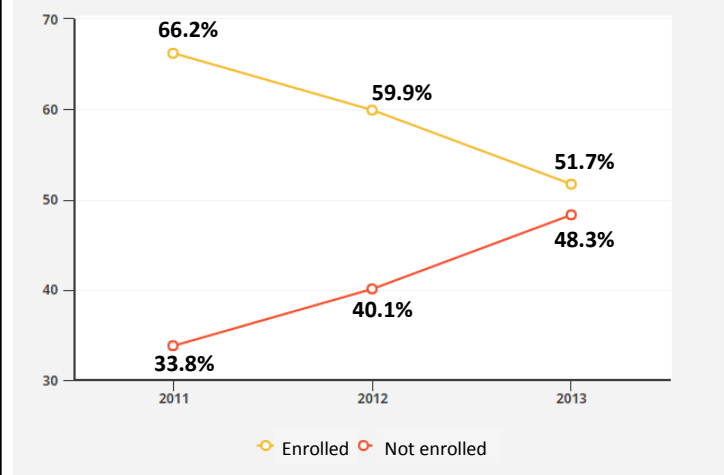
Figure 1: Three Year Average *Early On* Enrollment Rate, 2011-2013



During 2011 to 2013, 60.1% (n=276) of infants diagnosed with permanent hearing loss were enrolled in *Early On*; 39.9% (n=183) of infants diagnosed were not enrolled (Figure 1).

Early On enrollment rates for infants diagnosed with permanent hearing loss decreased over the years.

Figure 2: *Early On* Enrollment Trends, 2011 to 2013

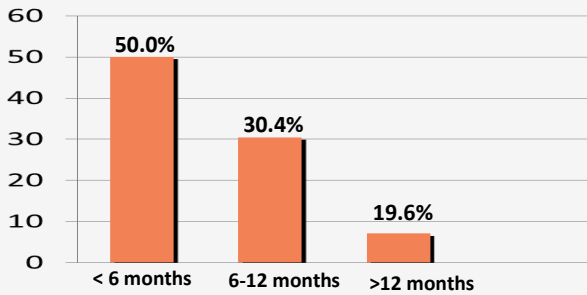


The overall rate of *Early On* enrollment for infants diagnosed with hearing loss decreased from 66.2% in 2011 to 51.7% in 2013— a decrease of 14.5 percentage points (Figure 2).

Early On Enrollment by Age

The National EHDI goal is that all infants identified with hearing loss should receive early intervention no later than six months of age. Newborns diagnosed with permanent hearing loss who do not receive early intervention services are at risk for developmental delay.

Figure 3: Enrollment Distribution by Age, 2011 to 2013



Among infants diagnosed with permanent hearing loss, only 50.0% (n=188) were enrolled in *Early On* by six months of age. Newborns that were enrolled, but not within the EHDI goal timeframe include 30.4% (n=84) enrolled between six and twelve months of age and 19.6% (n=54) enrolled later than twelve months of age (Figure 3).

Although the percentage of infants enrolled in *Early On* by six months of age increased from 2011 to 2013, the national EHDI goal is currently not being met.

Figure 4: Enrollment Trends by Age, 2011 to 2013



From 2011 to 2013, *Early On* enrollment by six months of age increased from 46.6% to 59.8%. Enrollment between six and twelve months of age increased from 33.7% to 41.8%. Enrollment later than twelve months of age decreased from 24.2% to 18.2% (Figure 4).

Early On Enrollment by Region of Maternal Residence

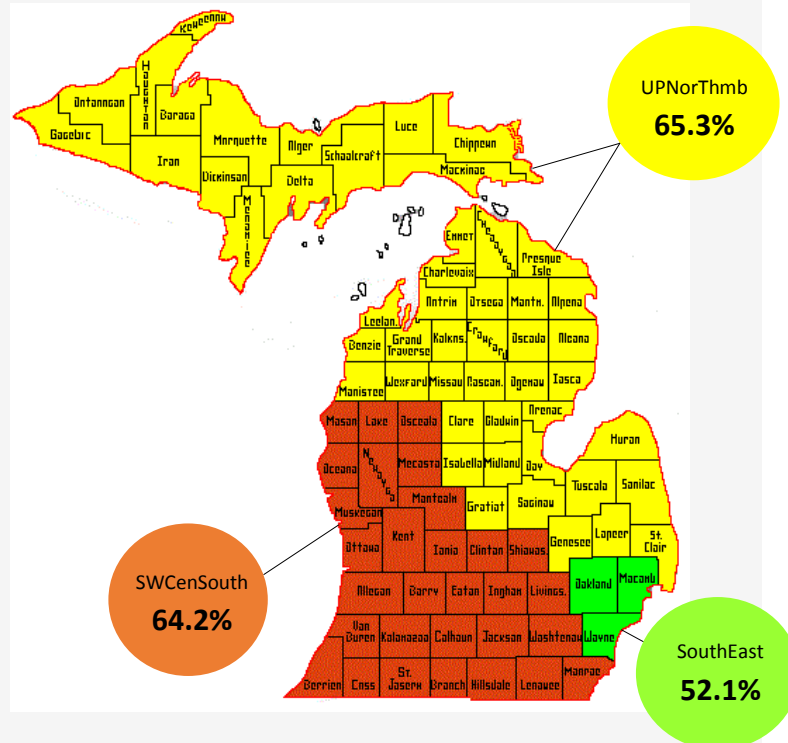
For all regions overall, more than 40% of infants diagnosed with permanent hearing loss were not enrolled in *Early On*.

Table 1: Three Year Average Percent Enrollment by Region, 2011 to 2013

Region	Diagnosed n (%)	Enrolled n (%)	Percent (%) Enrolled
SouthEast	169 (36.7%)	88 (32.2%)	52.1%
SWCenSouth	165 (35.9%)	106 (38.8%)	64.2%
UPNorThmb	72 (15.7%)	47 (17.2%)	65.3%
Unknown	54 (11.7%)	32 (11.7%)	59.3%
Total	460 (100%)	273 (100%)	

Although the percentage of infants diagnosed with hearing loss was highest in the Southeast region (36.7%), the rate of enrollment in *Early On* was highest in the upper peninsula, Northern and Northeastern parts of Michigan (65.3%; Table 1 and Figure 5).

Figure 5: Enrollment Rate by Maternal Resident Region, 2011-2013



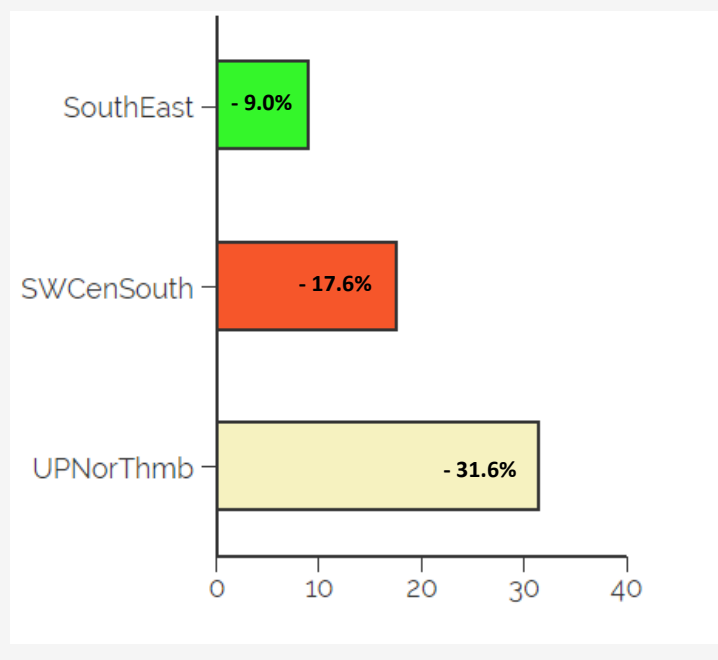
Among infants with permanent hearing loss whose maternal resident regions were known, *Early On* enrollment rates decreased from 2011 to 2013.

Table 2: Trends in Percent Enrollment by Resident Region, 2011 to 2013

Region	Percent Enrolled			2011 to 2013 % decrease
	2011	2012	2013	
SouthEast	54.9%	56.1%	45.9%	9.0%
SWCenSouth	73.4%	61.2%	55.8%	17.6%
UPNorThmb	79.2%	66.7%	47.6%	31.6%

A decline in the rate of *Early On* enrollment is seen in all regions between 2011 and 2013, with the highest decrease occurring in the upper peninsula, Northern and Northeastern parts of Michigan (31.6%, Table 2 and Figure 6).

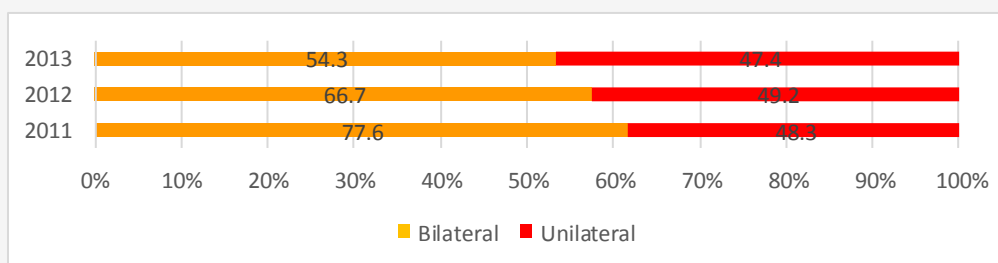
Figure 6: Enrollment Change by Resident Region, 2011 to 2013



Early On Enrollment by Unilateral and Bilateral Hearing Loss

Children with unilateral hearing loss are eligible for *Early On* services. However, from 2011 to 2013, fewer infants with unilateral hearing loss were enrolled in *Early On* compared with those with bilateral hearing loss.

Figure 7: Percent Enrollment by Type of Hearing Loss, 2011-2013



- ◆ Enrollment rates for infants diagnosed with unilateral hearing loss from 2011 to 2013 was 48.3%, 49.2% and 47.4% respectively, compared to 77.6%, 66.7% and 54.3% for infants diagnosed with bilateral hearing loss (Table 3 and Figure 7).
- ◆ There is a statistically significant difference in enrollment between unilateral and bilateral types in 2011 and 2012. Differences in 2013 did not reach statistical significance.

Table 3: Percent Enrollment by Type of Hearing Loss, 2011 to 2013

	2011**		2012**		2013*	
	Bilateral	Unilateral	Bilateral	Unilateral	Bilateral	Unilateral
Diagnosed (n)	98	60	93	59	94	57
Enrolled (n)	76	29	62	29	51	27
Percent (%) Enrolled	77.6%	48.3%	66.7%	49.2%	54.3%	47.4%

**Statistically significant (2011— $p=0.0002$, 2012— $p=0.0191$)

*Not statistically significant (2013— $p=0.4117$)

Early On Enrollment by Degree of Hearing Loss

There is a significantly higher enrollment among infants with moderate-severe to profound hearing loss compared with slight to moderate hearing loss during 2011 to 2013.

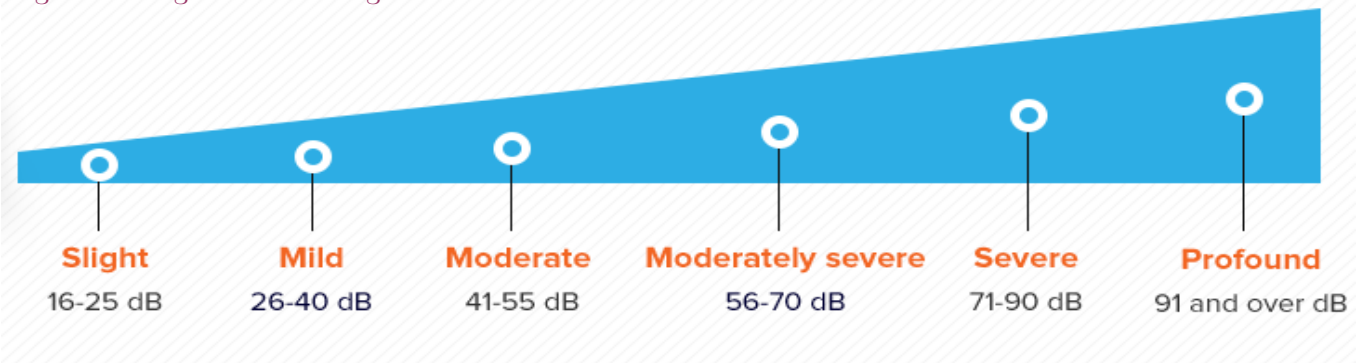
Table 4: Percent Enrollment by Degree of Hearing Loss, 2011 to 2013

Degree	Diagnosed n (%)	Enrolled n (%)	Percent (%) Enrolled
Slight-Moderate**	199 (43.4%)	99 (36.3%)	49.7%
Moderate Severe-Profound**	277 (60.3%)	155 (56.8%)	56.0%
Other	33 (7.2%)	19 (7.0%)	57.6%
Total	459 (100%)	273 (100%)	

**Statistically significant difference (p=0.0001)

- ◆ During 2011 to 2013, more than half of infants diagnosed with moderate-severe to profound hearing loss (56.0%) were enrolled in Early On (Table 4).
- ◆ Significant differences were observed between slight to moderate and moderate-severe to profound degrees.

Figure 8: Degree of Hearing Loss Definitions



Public Health Implications

We found that more than a third of infants diagnosed with hearing loss did not receive early intervention, and of those enrolled in *Early On*, only half were enrolled by six months of age.

Early Intervention for infants diagnosed with hearing loss is needed to maximize the critical period of language development in early childhood. Providers have an important role in educating parents on the benefits of early intervention with a diagnosis of permanent hearing loss.

Helpful websites for health professionals and families

Early On®, Michigan's early intervention system: www.1800earlyon.org

Michigan Early Hearing Detection and Intervention (EHDI) Program: www.michigan.gov/ehdi

National EHDI: www.cdc.gov/ncbddd/hearingloss/ehdi-programs.html



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