

Early Intervention Status of a Sample of Aided and Implanted Children

On December 2, 2020, Hearing Australia's data base indicated we supported 5,475 children under the age of 7 years who used a hearing aid or cochlear implant. These children's outcomes will be optimised when they receive early intervention that is delivered by appropriately skilled professionals using principles of family centred early intervention¹. It is currently unclear whether all aided/implanted children are receiving this support.

First Voice Early Intervention Agencies (EIAs)² have expressed concern about the proportion of aided children who are accessing specialist intervention for hearing loss, proposing estimates that as little as 50% of children who are fitted with hearing aids are accessing specialist Early Intervention for deaf and hard of hearing children (EI for DHH). In recent outcomes data published by the NDIA, 33% of children with hearing impairment as their primary disability were reported to be accessing specialist services.³

These figures have been drawn from different sources; we understand that the EIA figure is developed from comparing extracts from several data bases, whereas the NDIA data has been derived from a survey of families whose children had hearing loss listed as their primary disability. It is therefore difficult to understand and compare the data, and to draw conclusions about whether there is in fact an unmet need.

In 2020, as a response to the First Voice concerns, Hearing Australia decided to conduct a desk-top file review for a sample of aided children to better understand how children were obtaining support outside the Hearing Services Program.

Who? The Hearing Australia database was used to identify aided children who either attended in October 2020, or had a review scheduled for that month and who were under 7 years of age on 2/12/20 (data extraction date).

875 records were identified for review. Clinical Coaches then worked with paediatric audiologists to collect information from the files. 719 (82%) had been examined by 19 February 2021, and are included in the analysis. Missing data were distributed quite evenly across age groups. When better ear hearing loss was considered, data were missing more frequently for milder degrees of hearing loss.

Current age group	No. excluded from review	No. included in review	% cohort excluded from file review	% cohort included in file review.
<1 yr	11	56	16%	84%
1-3 yr	67	293	19%	81%
4-6 yr	78	370	17%	83%
Grand Total	156	719	18%	82%

¹ Moeller, M.P., Carr, G., Seaver, L., Stredler-Brown, A., Hlozinger, D. (2013) Best Practices in Family-Centred Early Intervention for Children Who Are Deaf or Hard of Hearing: An International Consensus Statement. *The Journal of Deaf Studies and Deaf Education*, Volume 18, Issue 4, October 2013, Pages 429–445, <https://doi.org/10.1093/deafed/ent034> accessed 16/4/2021

² www.firstvoice.org.au

³ <https://data.ndis.gov.au/media/2525/download>

Table 1: Profile of children whose files were reviewed, according to age group.

Current Better Ear 3FAHL	No. excluded from review	No. included in review	% cohort excluded from file review	% cohort included in file review.
0-40 dBHL	101	410	20%	80%
41-60 dBHL	38	187	17%	83%
61-90 dBHL	14	82	15%	85%
91+ dBHL	3	40	7%	93%
Grand Total	156	719	18%	82%

Table 2: Profile of children whose files were reviewed, according to 3-Frequency Average Hearing Loss in the better ear.

Classification of service type.

Services were classified as specialising in Early Intervention for Hearing Loss if they were one of the established specialist non-government providers (e.g., Can Do, Next Sense, The Shepherd Centre), Education Department specialist schools (e.g., Aurora School, SSENS), other Education Department service provided by itinerant Teachers of the Deaf, or a private Auditory Verbal Therapist.

Other services were classified according to whether they were general disability/ development services (e.g., Cerebral Palsy Education Centre, Early Childhood Development Program [ECDP] Services, Noah’s Ark) and speech pathologists through either state government or privately funded services.

In Queensland, a number of the ECDP services receive visits from a Visiting Teacher of the Deaf. The nature of the file review meant that it was not possible to identify whether children who attended an ECDP were also accessing services from a Visiting Teacher. It is possible that the data slightly underestimates the number of children who had access to professionals who specialise in hearing loss.

PART A – All reviewed files.

Of the 719 files reviewed, 74% were engaged with a provider of early intervention supports. 58% were receiving specialist EI for DHH and a further 16% had engaged with another type of Early Intervention provider, including those that provided specialist services for other disabilities, such as cerebral palsy.

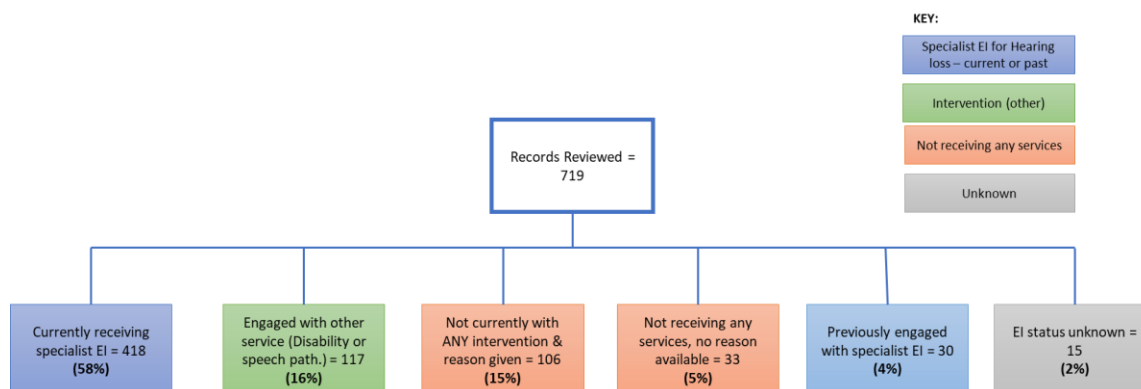


Figure 1: Early intervention outcomes – all children

4 % had previously engaged with a specialist provider of specialist EI for DHH, but had ceased service. 20% were not engaged with any supports. The EI status for 15 children (2%) was unknown.

1. Characteristics of children currently receiving specialist Early Intervention for Deaf and Hard of Hearing children.

Children under the age of 4 years were most likely to be receiving specialist EI for DHH (Table 3). As the degree of hearing loss increased, the proportion of children receiving this support increased (Table 4).

Current age group	Yes (n)	Yes (%)	Total Files reviewed
<1 yr	36	64%	56
1-3 yr	199	68%	293
4-6 yr	183	49%	370
Grand Total	418	58%	719

Table 3: Specialist Early Intervention status according to age group.

Latest 3FAHL	Yes (n)	Yes (%)	Total files reviewed
0-40	197	48%	410
41-60	126	67%	187
61-90	60	73%	82
91+	35	88%	40
Grand Total	418	58%	719

Table 4: Specialist Early Intervention status according to hearing loss.

What type of intervention are children receiving?

Specialist EI for DHH

For the 418 children reported as receiving specialist EI for DHH,

- 38% of children were receiving Education Department services
- 61% were receiving services from a First Voice agency (Can-Do, Hear and Say, NextSense, Telethon, The Shepherd Centre,)
- 1% were receiving services from a private Auditory Verbal Therapist.
- 3% of children were receiving services from two specialist agencies.

Of the 286 children who were not receiving specialist EI for DHH, 117 (41% of the cohort) were reported as being engaged with other disability or allied health services. Of these children 63 (54%) were receiving speech pathology, and the other 54 (46%) were engaged with other specialist disability services.

As the degree of hearing loss increased, so too did the proportion of the cohort who were receiving specialist intervention for hearing loss. Table 5 shows the main intervention service as a proportion of each hearing loss cohort.

Better ear hearing loss (3 FAHL)	Receiving specialist EI for H.Loss	Disability service	Speech pathology	Unknown
0-40 dBHL	70%	11%	15%	4%
41-60 dBHL	80%	10%	9%	1%
61-90 dBHL	82%	8%	6%	4%
91+ dBHL	94%	3%	3%	0%

Table 5: Type of Early Intervention supports according to hearing loss.

2. Characteristics of children not currently receiving specialist EI for DHH.

Overall, 40% (n=286) of children were not currently receiving specialist EI for DHH.

As shown in Table 6, most (70%) of the children who were not receiving specialist EI for DHH had a mild hearing loss or normal hearing in their better ear.

Age group	Better ear 3 FAHL in dBHL (n)				Grand Total	Better ear 3 FAHL in dBHL (%)			
	0-40	41-60	61-90	91+		0-40	41-60	61-90	91+
<1 yr	15	3			18	83%	17%	0%	0%
1-3 yr	51	28	8	2	89	57%	31%	9%	2%
4-6 yr	135	29	11	4	179	75%	16%	6%	2%
Grand Total	201	60	19	6	286	70%	21%	7%	2%

Table 6: Hearing loss profile – children not currently receiving specialist EI for DHH.

Hearing Australia fits Bone Conduction Hearing Aids to children who have or are likely to experience an ongoing conductive hearing loss for at least three months, when necessary to provide the child with access to speech whilst awaiting medical resolution. Such children include

- babies born with cleft palate, who are unable to have grommet surgery until palate repair has occurred and the ear canals are large enough for surgery;
- children on a waiting list for publicly-funded grommets;
- children for whom medical intervention has not yet successfully treated the ear condition and
- children who are not easily able to travel for specialist consultation or surgery.

Children who have a conductive hearing loss due to Atresia/Microtia are also fitted with bone conduction hearing aids, but are not considered in this section because their hearing loss is considered permanent because of structural anomalies of the ear.

Of the children who were not receiving specialist EI for DHH, 86 children were fitted with a BC aid due to ongoing conductive hearing loss. As shown in Table 7, this accounts for just over half of the children aged under one who are not receiving specialist EI for DHH.

Note that this group includes children who had never received specialist EI for DHH and those who had received services and ceased.

Age group	Better ear 3FAHL (dBHL)				Number/ Proportion of all hearing loss in age group
	0-40	41-60	61-90	91+	
<1 yr	6 (50%)	2 (67%)			8 (53%)
1-3 yr	22 (52%)	12 (44%)	1 (13%)		35 (44%)
4-6 yr	35 (28%)	7 (24%)	1 (9%)		43 (26%)
Grand Total	63 (35%)	21 (36%)	2 (11%)		86 (33%)

Table 7: Age & Hearing Loss profile of children who were not receiving Specialist EI for DHH, and were fitted with a bone conduction aid for conductive hearing loss (excluding Atresia/Microtia).

Why are these children not currently engaged with specialist EI for DHH?

When information was available, these children were classified into two groups; those who had never received specialist EI for DHH and those who had received such services at some stage but had since ceased service.

Data were not available for all children in this cohort.

a) Children who had never received specialist EI for DHH.

Of the children who were not receiving specialist EI for DHH, 122 (43%) of the files had information that enabled the reviewer to indicate why this occurred. Within this group of 122 children:

- 10% had prioritised other disabilities when selecting their early childhood service and 16% were diagnosed when they were already at school.
- 24% were aided for conductive hearing loss (excluding atresia/microtia).
- 20% had declined, but a specific reason was not recorded on the file, and
- 12% were still deciding upon their options.

For those children whose families had prioritised another disability, 33% had a mild loss and 67% had a severe loss. Most children who were diagnosed after they had already started school had a mild hearing loss.

Reason for 'never' attending specialist EI for HL.	Hearing Loss Distribution (Better ear 3 Frequency Average)				
	Number children	Proportion	0-40 dBHL	41-60 dBHL	61-90 dBHL
Conductive hearing loss	29	24%	72%	28%	0%
Declined	25	20%	88%	8%	4%
Discussed, still deciding	15	12%	73%	13%	13%
Late diagnosis – already attending school.	20	16%	90%	5%	5%
Parent not concerned or reported development was assessed and normal.	21	17%	86%	14%	0%
Prioritise other disability	12	10%	33%	67%	0%
Total	122	100%	77%	20%	3%

Table 8: Reasons why children had never attended specialist EI for DHH, according to better ear hearing levels.

Children who had previously received, but ceased, specialist EI for DHH.

Information was available for 26 children in the second category. The majority of these children (n=19) had ceased specialist EI for DHH when they began school. One child's family had decided to prioritise services for other disabilities and six children had stopped services for other reasons.

Reason for stopping	No. children who had ceased specialist EI					Proportion of total children who had ceased specialist EI.				
	0-40	41-60	61-90	91+	Grand Total	0-40	41-60	61-90	91+	Grand Total
At school	9	3	5	2	19	35%	12%	19%	8%	73%
Other disability prioritised		1			1	0%	4%	0%	0%	4%
Other reason	4	2			6	15%	8%	0%	0%	23%
Grand Total	13	6	5	2	26					100%

Table 9: Reason for ceasing specialist EI for HL, according to degree of hearing loss.

PART B – Children who meet access criteria for NDIS

Although most aided children meet the NDIS access criteria for hearing loss, a proportion do not. As previously mentioned, Hearing Australia fits bone conduction hearing aids to children who have chronic conductive hearing loss to help with audibility while the children are awaiting treatment for middle ear disease. These children are usually not likely to meet the NDIS access criteria. Their loss is not considered a permanent impairment as there is a known, available medical treatment that would remedy the impairment.

Children with atresia or microtia in one or both ears have a permanent conductive hearing loss due to middle ear abnormalities, and are usually likely to meet the NDIS access criteria.

Of the children whose files were reviewed, bone conduction aids had been fitted to:

- 52 who had atresia/microtia in one or both ears
- 123 children who had chronic conductive loss but were unlikely to meet NDIS access criteria.

This may in fact underestimate the numbers of aided children who have a conductive loss unrelated to atresia/microtia, as some may have been fitted with air conduction hearing aids. However, more detailed data was unavailable from the current review.

Thus, of the original 719 files reviewed, 596 (83%) were judged likely to meet NDIS access criteria.

1. Children assumed to be likely to meet the NDIS access criteria⁴ for hearing loss.

596 (82%) of children met the NDIS access criteria for Hearing Loss, according to the assumptions explained above. Amongst these children, 79% were engaged with a provider of Early Intervention supports: 65% of the children were receiving specialist EI for DHH, and a further 14% were engaged with either a disability service provider or speech pathologist. 15% of children who were not engaged with any supports. The EI Status for 9 children (2%) was unknown.



Figure 2: Intervention outcomes – children presumed NDIS-eligible only.

As expected, the proportion of the cohort receiving specialist EI increased with increasing hearing loss (Table 10).

Better ear 3FAHL (dBHL)	Currently receiving specialist EI for DHH			Grand Total	Currently receiving specialist EI for DHH (%)		
	No	Unknown	Yes		No	Unknown	Yes
0-40	138	6	175	319	43%	2%	55%
41-60	39		119	158	25%	0%	75%
61-90	17	3	60	80	21%	4%	75%
91+	5		34	39	15%	0%	85%
Grand Total	199	9	388	596	34%	2%	65%

Table 10: EI status according to hearing loss – NDIS eligible.

⁴ [Newly diagnosed hearing loss | NDIS](#)

Early Intervention according to age

Younger children were more likely to be receiving specialist EI for DHH.

Current age group	Currently receiving specialist EI for HL?			Grand Total	Currently receiving specialist EI for HL? (%)		
	No	Unknown	Yes		No	Unknown	Yes
<1 yr	10		34	44	23%	0%	77%
1-3 yr	53	3	184	240	22%	1%	77%
4-6 yr	136	6	170	312	44%	2%	54%
Grand Total	199	9	388	596	33%	2%	65%

Table 11: EI status according to age group – NDIS eligible.

Characteristics of children who were not receiving Specialist EI for HL

Table 12 shows the age and hearing loss distribution of children who were not receiving specialist EI for DHH. When both the age of the child and their hearing loss was considered, 70% of the children in this group had mild hearing loss in at least one ear. As noted above, the older children who had profound hearing loss had started at school so weren't engaged with an Early intervention program, or were involved with other services.

Current age group	Better ear 3FAHL				Grand Total	Better ear 3 FAHL (%)			
	0-40	41-60	61-90	91+		0-40	41-60	61-90	91+
<1 yr	9	1			10	90%	10%	0%	0%
1-3 yr	29	16	7	1	53	55%	30%	13%	2%
4-6 yr	100	22	10	4	136	74%	16%	7%	3%
Grand Total	138	39	17	5	199	69%	20%	9%	3%

Table 12: Profile of children who were not receiving specialist EI for DHH, according to age and hearing loss.

Additional information was available for 184 of the 199 children who were listed as not currently receiving specialist EI for DHH.

As shown in Table 13, 82 children (45% of this cohort) were receiving services from either a disability support service or a speech pathologist. Children who had more severe degrees of hearing loss were more likely to be attending a program that specialised in other disabilities, whilst speech pathology services were more commonly used by those with lesser degrees of loss.

Of the children who had a profound hearing loss, information was available for 5 of the 6 children who were not engaged with specialist EI for DHH.

- Two were now at school.
- Three were engaged with other intervention services.

	Type of EI support (n)		Grand Total	Type of EI support (%)	
	Disability services	Speech pathology		Disability services	Speech pathology
0-40	22	29	51	43%	57%
41-60	9	10	19	47%	53%
61-90	6	3	9	67%	33%
91+	2	1	3	67%	33%
Grand Total	39	43	82	48%	52%

Table 13: Other early intervention supports according to hearing loss degree.

27 (15% of the cohort) children were not engaged with any EI supports, but had previously been engaged with a specialist EI service for HL. 18 children (67%) had ceased service when they started school)

67 children (36% of the cohort) were reported to have never engaged with specialist EI services for HL. As shown in Table 14, the most common reasons were that the child was already at school when the hearing loss was diagnosed, or the parents were not concerned/the child's development was on track, followed by parents declining other service. These latter two categories may overlap to some extent.

Several children only had the permanence of their conductive hearing loss confirmed when they started school.

BE 3FAHL	Reason for never receiving specialist EI for DHH -n (% hearing loss cohort)						Grand Total
	Conductive loss	Declined	Discussed, still deciding	Late Dx - at school	Parent not concerned/ Devel. ok	Prioritise other disability	
0-40	1 (2%)	13 (25%)	10 (19%)	15 (28%)	14 (26%)		53 (100%)
41-60	2 (18%)	2 (18%)	1 (9%)	1 (9%)	3 (27%)	2(18%)	11 (100%)
61-90			267%	1 (33%)			3 (100%)
91+							
Grand Total	3 (4%)	15 (22%)	13 (19%)	17 (25%)	17(25%)	2 (3%)	67 (100%)

Table 14: Reasons why children had never received specialist EI for HL, according to hearing loss – NDIS eligible.

Children who were first fitted in the period December 2, 2019 to December 1, 2020

121 children presumed to be NDIS eligible received the first hearing aids in the previous 12 months. the majority of children in the sample had a mild hearing loss in the better ear.

	0-40	41-60	61-90	91+	Total
<1 yr	25	10	7	2	44
1-3 yr	19	7	11	2	39
4-6 yr	35	2	1		38
Grand total	79	19	19	4	121

Table 15 – Children first fitted Dec. 2, 2019 – Dec. 1, 2020, according to age group and better ear 3 Frequency Average Hearing Loss – NDIS eligible

Overall, 71% of this group were engaged with Early Intervention supports, with 59% receiving specialist EI for DHH and 12% engaged with other EI supports.

2. Children who were not likely to not meet NDIS access criteria for hearing loss.

123 (17%) children were not likely meet NDIS access criteria for hearing loss, according to the assumptions above.

Of those children, 53% were nevertheless engaged with support services. 29 (24%) were engaged with specialist EI services for Hearing Loss. A further 36 (29%) were receiving EI support from either a program for other disabilities (16, 45%) or speech pathology (20, 55%).

44 Children in this cohort were first fitted with hearing aids from December 2, 2019 to December 1, 2020. Of these, 14% were engaged with a specialist EI for DHH, and 18% were receiving other EI supports.

Summary

A total of 719 child files were reviewed, of which 74% were receiving Early Intervention supports. 58% of children were engaged with services that provided specialist EI for DHH, whilst 16% were receiving support from either a speech pathologist or a service that specialised in other disabilities.

Not all children who are fitted with hearing aids meet the NDIS access criteria for Hearing loss. The most likely group of children to not meet access criteria are those who are fitted with bone conduction hearing aids whilst awaiting treatment outcomes for middle ear disease. When these were excluded from the analysis, 596 children or 82% of the cohort were assumed to be eligible for NDIS. Access to Early Intervention supports was slightly higher for this group of children, with 79% accessing intervention (65% specialist EI for DHH, 14% other disability supports or speech pathology).

In the group of children who were presumed not to meet access criteria for NDIS, 53% were receiving EI supports (24% with specialist EI for DHH, 29% with other services).

A number of factors affected whether children were not engaged with specialist EI for DHH. When considering only those children who were presumed to meet NDIS access criteria, the three most common reasons for never engaging with EI were that the child was already at school when their hearing loss was diagnosed and aids fitted, the family were not concerned about the child's progress or developmental assessment had shown no delays and the family declined. These accounted for 72% of the reasons why children had never engaged in specialist EI for HL. 19% of the families had been informed about EI options but were yet to make a decision.

15% of children had previously been engaged with a specialist EI for DHH, but had ceased services. The most common reason for ceasing service was that the child started school.

Those with milder degrees of hearing loss showed more variability in whether they accessed services or not and the type of services chosen, and older children were also less likely to be receiving services.

Discussion and conclusions.

The NDIA, Hearing Australia, Australasian Newborn Hearing Screening Committee and Specialist providers of EI to DHH children are all committed to ensuring that each child and family receives the

support they need to manage the impact of hearing loss on their lives and their child's development. It is therefore important that discussions on this topic have a consistent point of reference.

The results of Hearing Australia's file audit differ significantly from both the Early Intervention Agencies' estimates of children who are accessing specialist EI for DHH and the data reported in the latest NDIA outcomes reports, showing higher levels of engagement with both specialist EI for DHH and a wider range of Early Intervention supports. However, it can also be seen that many factors need to be considered when interpreting data, including the degree of hearing loss, age at diagnosis/fitting, and the impact of other disabilities upon parental priorities.

Additionally, a significant proportion of families decided not to proceed with any services because they weren't concerned about their child's development, and this was a reason more commonly given for those children who had lower degrees of hearing loss. This is consistent with the fact that the impact of mild and unilateral hearing losses varies greatly between children, and there is very little evidence in the published literature to advise about the best intervention for these children.

It is beyond the scope of this report to determine the appropriateness of family choices regarding early supports. This depends upon the individual families' priorities, goals, and the impact of their child's hearing loss on achieving those goals. Additionally there was not enough information available to indicate the type of intervention program undertaken by any of the agencies, and whether the providers of other disability services or speech pathology services were receiving support from professionals who specialised in working with children who are deaf and hard of hearing.